



PROCEEDINGS

RARCS

ZAGREB 2025

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Cite: Rasouli, S. & Timmermans, H. J. P. (eds.) (2025). *Proceedings 31st Recent Advances in Retailing and Consumer Science Conference, Zagreb, July 7-10, 2024*. Eindhoven: RARCS. Once published, cite the published versions of the papers.

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Preface

We have the pleasure to compile these proceedings of the 31st RARCS conference. The conference gives delegates the option to include either an extended abstract or a full paper in the conference proceedings. In addition, a book of one-page abstracts of all presentations is made available to delegates. Proceedings are only distributed among participants and are not submitted to any repositories. Copyright is not transferred. Thus, delegates can submit their work to journals, without facing any formal self-plagiarism issues.

We trust these proceedings and the book of abstracts are useful material for our delegates.

Soora Rasouli & Harry Timmermans
Co-Chairs

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Word of mouth vs. word of machine: an empirical analysis on the use of artificial intelligence in online reviews

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Abstract. A large body of literature has demonstrated that consumers use feedback from previous users in the form of electronic word of mouth (eWOM) to reduce their uncertainty. Therefore, a positive effect of eWOM on sales has been documented for different platforms and product contexts. At the same time, researchers have disagreed on which eWOM metrics and dimensions are the most influential on consumer behavior and firm sales. In parallel to human-based recommendations, the rapid development and adoption of Artificial Intelligence (AI) has transformed and is transforming today's marketplace, where new forms of recommendations based on AI are pervasive. Building on these premises, this paper contributes to the expanding literature on AI applications in retailing and proposes an empirical analysis to compare different forms of human and AI-based recommendations and their impact on consumer behavior. Particularly, this paper is based on two complementary studies: an analysis of real-world data and an experimental assessment. The first study, based on data collected from booking.com regarding a sample of hotels in Rome and London, investigates the (in)consistency between numerical and textual contents of human recommendations as evaluated by AI, by comparing the numerical ratings given by a consumer in online reviews with the numerical ratings that ChatGPT would assign to the textual review provided by the same consumer. The second study, based on a between-subjects experimental analysis, investigates the relative importance of different types and dimensions of recommendations on consumers' purchase intentions by using different treatments (textual vs. numerical components and textual components formulated by humans vs. textual components derived from AI tools). Results document, according to AI predictions, discrepancies between numerical and textual contents of human recommendation, which may lead to significantly different ranking across hotels. This does not necessarily imply inefficacy of AI assessment since there could be a bias in how customers assess textual reviews by their ratings, leading to possible over- or underestimation compared to their textual assessments.

Keywords : artificial intelligence; ChatGPT; online reviews; textual assessments; hospitality sector

Introduction

Consumer reviews play a crucial role in online retailing, helping consumers to evaluate products. A large body of literature has demonstrated that consumers use feedback from previous users in the form of electronic word of mouth (eWOM), a web-based evolution of the traditional concept of word of mouth, based on oral communication that provides a mechanism to shift power from companies to consumer s

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(Hennig-Thurau *et al.*, 2004), because they reduce their uncertainty. Therefore, a positive effect of eWOM on sales has been documented for different platforms and product contexts (e.g., Babic Rosario *et al.*, 2016; Li *et al.*, 2020). At the same time, however, researchers have disagreed on which eWOM metrics and dimensions are the most influential on consumer behavior and firm sales. Particularly, while several analyses used numerical data (i.e., review ratings), other studies included text and similar user-generated content. For instance, Ghose & Ipeirots (2010) analyzed the importance of text style. In terms of subjectivity, informativeness, readability & linguistic correctness. Hu *et al.* (2014) emphasizes the role of online review sentiments, suggesting that numerical ratings may not always be consistent with text sentiments and that a sequential decision-making process may better describe the impact of numerical and textual components of reviews. Proserpio & Zervas (2017) underlined that publicly responding to consumer reviews has lately emerged as a popular reputation management strategy. Nevertheless, while managers may be able to prevent some users from leaving negative reviews by responding – thereby potentially increasing the average rating – others may be even more motivated to leave longer, more detailed negative reviews, knowing that their feedback will be read and assessed.

In parallel to human-based recommendations, either in the form of traditional or electronic word of mouth, the rapid development and adoption of Artificial Intelligence (AI) has transformed and is transforming today's marketplace, where new forms of recommendations based on AI have become pervasive. For example, Amazon has started to provide a brief summary of human textual reviews generated by AI, thus highlighting the potential to combine human recommendations with AI. The comparison between human and AI recommendations and, in general, the way consumers and AI interact has opened a new field of academic interest (Pentina *et al.*, 2023). Longoni & Cian (2022) have introduced the term word of machine, providing evidence that individuals are more (less) likely to choose AI recommenders when utilitarian (hedonic) attributes are important or salient (p. 92). Similarly, Chen *et al.* (2023) found that AI chatbots can trigger higher purchase intention than humans in the context of search products, while the opposite happens in the case of experience products. More recently, Hernández Ortega & Lucia-Palacios (2023) introduced the term word of voice for smart voice assistants as purchase recommenders. In contrast, Paul *et al.* (2023) discussed the multidimensional benefits and potential pitfalls of using AI on Chat Generative Pre-trained Transformer (ChatGPT). Furthermore, Hollebeek *et al.* (2024) explored the impact of AI on consumer engagement.

Building on these premises, this paper contributes to the expanding literature on AI applications in retailing and proposes an empirical analysis to compare the different forms of human and AI-based recommendations and their impact on consumer behavior. The field of study is represented by the hospitality sector, where the use of eWOM is well established, a large amount of data is easily available through online platforms and both utilitarian, and hedonic attributes are recognized as important in travelers' assessments (Kim, *et al.*, 2023). Particularly, this paper is based on two complementary studies: an analysis of real-world data and an experimental assessment.

The first study, based on data collected from Booking.com, regarding a sample of hotels in Rome and London, investigates the (in)consistency between numerical and textual contents of human recommendations as evaluated by AI (i.e., ChatGPT; OpenAI, 2025) by comparing the numerical ratings in online reviews given by a consumer with the numerical ratings that AI would assign to the textual review provided by the same consumer. As a result, this secondary data collection focuses on the efficacy of AI in predicting the numerical ratings from textual input. On the one hand, such research aims to establish the coherence (or not) between textual and numerical reviews, and, on the other hand, the potential of AI tools in predicting human suggestions. Apart from investigating the average consistency of textual and numerical contents, the research project also explores which factors affect AI prediction errors.

The second study, based on a between-subjects experimental analysis, investigates the relative importance of different types and dimensions of recommendations on consumers' purchase intentions by using different treatments (numerical vs. textual components derived from AI tools). We hypothesize that the intention to buy will generally be higher in a scenario which features a higher rating and a highly positive textual review than in a treatment characterized by a lower rating and a weaker positive textual review. We also hypothesize that participants who place greater importance on numerical reviews (ratings), the intention to buy will be higher in a scenario that combines a high numerical review with a less favorable textual review. Conversely, for those prioritizing textual reviews, the intention to buy will be higher when the textual review is more positive despite a lower rating. Thus, the design allows investigating which dimension (numerical vs. textual) is eventually more important on average. The study is then repeated using the same scenarios, but without disclosing the use of AI to generate the textual review, to evaluate the impact of AI awareness on consumers' purchase intentions.

Methodology – Study 1

Research design

The dataset was obtained from Booking.com, a widely used online hotel reservation platform, known for its extensive worldwide collection of hotel listings, customer reviews and user ratings. Ten customer reviews and respective ratings were selected for 20 three- and 20 four-star hotels. Half of the hotels were in Rome and the other half in London. We chose Rome and London because they are prominent cities, and we wanted to evaluate recommendations in Italian, our mother language, and English, a global language. To ensure consistency and relevance, the selection process of these reviews was based on a predefined set of criteria. For both cities, we selected the hotels based on top choices, and focused on the most recent reviews written in Italian (for Rome) and English (for London). Given that the reviews on Booking.com include both a positive and negative textbox, we selected cases where the reviewer filled in both positive and negative comments. Hotels with insufficient reviews were excluded from the database.

The database was created using a three-step process. First, we included 400 textual and numerical reviews by Booking.com customers. Then, we provided AI with the textual reviews of the hotels and asked it to assign a numerical rating from 1 to 10 (where 1 is negative and 10 is positive), based on the content of each review. Third, we provided AI with the textual reviews of each hotel, consisting of 10 reviews per hotel, and requested it to generate a concise summary within a 400-character limit for each hotel. The textual (summary) reviews generated by AI are intended for use in Study 2. As AI tools, we first utilized ChatGPT-3.5 (February, 2024 version), and then sensitivity analysis was conducted using ChatGPT-4 (July, 2024 version) and Claude (October, 2024).

Results – Study 1

The mean rating estimated by ChatGPT of the Rome hotels was 6.81 ($SD = 1.32$, min = 2, max = 9, median = 7), whereas the average value of the customer ratings was 7.51 ($SD = 1.90$, min = 1, max = 10, median = 8). ChatGPT rating is lower by about one percentage point ($p < .001$; Mann-Whitney U test with the Bonferroni correction). For London, ChatGPT mean rating was 6.58 ($SD = 1.57$, min = 1, max = 10, median = 7), whereas customer mean rating was 7.57 ($SD = 1.82$, min = 1, max = 10, median = 8). Again, the difference was around one percentage point in the same direction ($p < .001$), indicating a certain consistency between the two language sets. Moreover, when aggregating the reviews at the hotel level and comparing the average hotel ratings, the prediction significantly changes the rankings of the hotels. Also, 28% of the customer ratings of the hotels in Rome corresponded to their ChatGPT ratings (56 out of 200; $p < .001$; one proportion χ^2 -test against the 50–50 expected distribution). This percentage for the London hotels was 23.5% (47 out of 200; $p < .001$). This suggests that ChatGPT can precisely predict customer ratings from the textual reviews in about 1/3 of the cases. Overall, ChatGPT evaluates customer ratings

differently when compared to direct customer ratings given their reviews of hotels. In both language sets, ChatGPT tends to assign lower ratings and alter the ranking of reviews and this difference is significant. This raises the possibility that ChatGPT may have difficulty in accurately interpreting customer textual reviews. However, the result might also highlight a bias in how customers assess textual reviews using ratings, leading to over- or underestimation compared to their textual assessments (Kahneman, 2012).

To evaluate the robustness of these results, we conducted additional analyses, which included preliminary fine-tuning of ChatGPT (July, 2024), the use of an alternative large language model (i.e. Claude; Anthropic, 2025) and an examination of review length. The preliminary training of ChatGPT was conducted using 10% randomly selected reviews from our dataset, along with an additional 10% comprising of newly collected reviews from Booking.com. These new reviews were obtained using the same selection criteria as before: top-listed choices, focusing on the most recent reviews, where users provided both positive and negative comments, limited to three- and four-star hotels.

The results are presented in Table 1. Comparing ChatGPT-generated reviews with those generated after pre-training, the difference was not statistically significant for the hotels in Rome ($p = .34$), whereas for the hotels in London it was ($p < .05$), using the Mann-Whitney U test with the Bonferroni correction. In terms of mean values, ChatGPT-generated reviews appear to align more closely with customer ratings for Italian reviews than for English ones. As for the Claude-generated reviews, our analysis was limited to the group of Italian reviews (Table 1). We found that Claude-generated reviews of the hotels in Rome were more closely aligned with customer ratings, although the difference remained statistically significant (p -value $< .05$, based on the Mann-Whitney U test with the Bonferroni correction). For the comparison of Claude-generated reviews versus ChatGPT-generated reviews of the hotels in Rome, $p < .001$, indicating a statistically significant difference between the two sets of reviews.

Finally, based on review length, we divided the original dataset into short-length and long-length reviews, defined as reviews below and above the median. For both groups, we found that ChatGPT-generated for both the Italian and English reviews still received lower mean values (7.65 vs. 6.94, for Italian long-length reviews; 7.43 vs. 6.73 for Italian short-length reviews; 7.55 vs. 6.70 for English long-length reviews; 7.57 vs. 6.50 for English short-length reviews). These differences remained statistically significant: $p < .001$ for short-length reviews and $p < .01$ for long-length reviews.

Methodology – Study 2

Research design

The study protocol was pre-registered at <https://aspredicted.org/tbwn-96vv.pdf>, prior to conducting the project. The design of the experiment comprised four treatments. In all treatments, (1) the subject is presented the image of a hypothetical hotel room, in which a textual review and a rating are provided (Fig. 1), and (2) both textual and numerical reviews correspond to textual/rating (summary) reviews, generated by AI, based on (real) human reviews obtained from Booking.com, and (3) subjects are informed about the use of AI from the beginning of the experiment. For this experiment, we consider two hotels:

- Hotel A: a high rating (i.e., 8) with a predominantly positive textual review: *Overall, guests were pleased with their experiences, highlighting aspects like great location, cleanliness and friendly staff. While some minor issues were noted, these did not significantly detract from the overall positive impressions.*
- Hotel B: a lower rating (i.e., 7) with a mostly positive textual review, though some drawbacks are mentioned: *Overall, the reviews suggest a mixed experience. Positive points include convenient location, cleanliness and helpful staff. However, some guests note issues like small room size, noise disturbances and cleanliness concerns. Improvements in room amenities and maintenance could enhance the overall experience.*

TABLE 1 – Overview of key findings from Study 1^a

Treatment	Mean	SD	Median	Min	Max
Customer ratings of Rome hotels	7.51	1.90	8	1	10
Customer ratings of London hotels	7.57	1.82	8	1	10
ChatGPT-generated reviews of Rome hotels	6.81	1.32	7	2	9
ChatGPT-generated reviews of London hotels	6.58	1.57	7	1	10
ChatGPT-generated reviews of Rome hotels with pre-training	7.02	1.60	7	2	10
ChatGPT-generated reviews of London hotels pre-training	6.99	1.46	7	2	10
Claude-generated reviews of Rome hotels	7.29	1.40	8	2	9

^a Differences may also stem from the distinct time periods in which the analyses were conducted (ChatGPT: February vs. July 2024; Claude: October 2024).

TABLE 2 – Summary of experimental scenarios

Treatment 1	The subject is presented with the image of a hypothetical hotel room of Hotel A.
Treatment 2	The subject is presented with the image of a hypothetical hotel room of Hotel B.
Treatment 3	The subject is presented with an image of a hypothetical hotel room, featuring the rating of Hotel A and the textual review of Hotel B.
Treatment 4	The subject is presented with an image of a hypothetical hotel room, featuring the rating of Hotel B and the textual review of Hotel A.

The four treatments are described in Table 2. The image of a hypothetical hotel room was the same in all treatments (Fig. 1). The textual review corresponds to a textual (summary) review, selected from those generated by ChatGPT in Study 1 (London database). As noted in Study 1, for each hotel, we provided ChatGPT with 10 textual reviews and requested it to generate a concise summary within a 400-character limit. From the 40 summary reviews generated by ChatGPT, we selected the one to be used for Hotel A based on the following criteria: (1) it appeared as realistic as possible, (2) it featured a high rating, and (3) it was written in English, as this is the native language of the experimental subjects in this study. The same criteria were used for selecting the textual review used for Hotel B, except that we required a review containing some drawbacks and a numerical rating that was slightly lower than that of Hotel A.

Regarding the numerical ratings, a scale from 1 to 10, where 1 represents the lowest and 10 the highest assessment, was generated by ChatGPT, based on its own summary textual review. In all treatment conditions, participants were first given instructions and a comprehension task. They were then shown the image of a hypothetical hotel room and asked the following questions: (1) the intention to buy the hotel room (i.e., How likely are you to choose to stay overnight at this hotel?; 11-point Likert scale, ranging from 0 (not likely at all) to 10 (extremely likely) to estimate purchase probabilities; Juster, 1966); (2) level of trust in the textual review associated with the hotel room (11-point Likert scale, ranging from 0 (not at all) to 10 (very much)); (3) the level of trust in the rating assigned with the hotel room (11-point Likert scale, ranging from 0 (not at all) to 10 (very much)). Following this section, participants were asked about their general attitudes toward reviews. Specifically, they were asked how often they check reviews before booking a hotel; how much they trust the reviews, and how useful they find textual and numerical reviews for hotel bookings; how much they trust and value ChatGPT in summarizing textual reviews for hotels; and how likely they would be to still read individual (human-written) customer reviews after receiving a summary generated by ChatGPT. In addition, participants reported how frequently they use ChatGPT or similar AI tools (e.g., Claude, Gemini) in their daily lives. All variables were measured using an 11-point Likert scale. Finally, socio-demographic information was collected, including education level, while age and gender were provided via Prolific. Additional information about the participants can be found in the Sample section below. Before starting the questionnaire, all participants were presented with a disclaimer outlining the questionnaire and privacy policy. Once they accepted the disclaimer, they proceeded to the experiment.



Source: Photo by [Lotus Design N Print](https://https://unsplash.com/@lotusdnp). Accessed June 6, 2024.

FIGURE 1 - Hypothetical hotel room presented to participants in Study 2

TABLE 3 – Summary of participants' intention to buy by treatment groups

Treatment	Mean	SD	Median	Min	Max
Treatment 1	6.61	1.96	7	0	10
Treatment 2	4.53	2.29	5	0	9
Treatment 3	6.25	1.89	7	1	10
Treatment 4	5.85	1.96	6	0	10

A second experiment (Study 2b), identical to the one described here, except that participants were *not* informed about the use of AI to generate the proposed textual review, was designed to test whether prior awareness of AI authorship influences participants' purchase probabilities and trust in the textual and rating reviews.

Sample

The survey was programmed using LimeSurvey software, an online survey tool (LimeSurvey Project Team, 2025 - LimeSurvey Community Edition Version 6.8.1 hosted on our university's server), and administered online in March 2025. The participants were recruited through the Prolific online survey platform (Palan & Schitter, 2018) from the UK adult population. Upon entering the study, they were asked to provide informed consent and read the instructions. Before starting the decision task, subjects were asked a control question testing their comprehension of the survey. The survey was completely anonymous and participation was entirely voluntary. A total of 477 participants completed the questionnaire; however, 45 participants, who failed either the attention or comprehension check, were excluded from the analysis. As a result, the final sample consisted of 432 participants (51% female, mean age = 46.39 years, $SD = 15.41$, min = 18; max = 83), evenly distributed across the four treatments.

Results – Study 2

Table 3 summarizes participants' purchase intention across treatment conditions. All treatment comparisons were statistically significant at $p < .001$, except for Treatment 1 versus Treatment 4 ($p < .01$), Treatment 1 versus Treatment 3 ($p = .44$) and Treatment 3 versus Treatment 4 ($p = .52$), which were not significant. Comparisons for trust in ChatGPT's textual reviews and trust in ChatGPT-generated ratings were also not significant, indicating no substantial differences in trust levels across the different treatments. Given the absence of significant findings, these results are not tabulated.

For the results related to participants' purchase intentions, we identified distinct response patterns. First, the baseline hypothesis was confirmed, as Treatment 1 showed significantly higher purchase intentions

compared to Treatment 2 ($p < .001$). Second, the numerical reviews seem to mitigate the negative impact of less favorable textual reviews. Indeed, the comparison between Treatments 1 and 3 - both featuring high numerical ratings - was not significant. At the same time, although the effect was less marked ($p < .01$), purchase intentions decreased from Treatment 1 to Treatment 4, indicating that positive textual reviews cannot fully compensate lower numerical ratings. This tendency is further reflected by the comparison between the mixed conditions: Treatments 3 and 4. Despite the lack of statistical significance, there is an observed mean difference of 0.40 in purchase intention for the higher-rating condition (Treatment 3). As a result, when evaluating mixed information, consumers appear to place a greater weight on ratings than on textual reviews, particularly when the numerical review has a high score. This pattern may reflect differences in the cognitive processing of numerical and textual information, possibly related to intuitive versus reflective decision-making, a distinction that we intend to further investigate in the future.

Conclusions and discussion

This paper investigated the impact of AI-driven review analysis on individual decision-making processes, particularly assessing the potential benefits associated with integrating artificial intelligence tools in the analysis of reviews in hotel management. As underlined in the first study, there are discrepancies between numerical and textual contents of human recommendations, which may lead to significantly different rankings across hotels. This does not necessarily imply inefficacy of AI assessment, since there could be a bias in how customers assess text reviews using ratings, leading to over- or underestimation compared to textual assessments. Moreover, it suggests the need to further investigate the relative importance of different review dimensions (numerical vs. textual) in affecting consumer behavior.

Study 2 complements the secondary data collection with an experimental approach focusing on the way different types and dimensions of recommendations are perceived and used by individuals during their decision-making process. This experiment allowed us to explore the relationship and coherence of the two dimensions of eWOM (textual and numerical) that have often been analyzed separately in the previous literature. The study was also instrumental in exploring the extent to which customers trust AI-based recommendations. We found that, on average, the intention to buy the hotel room was slightly more sensitive to the numerical rating than the summary of the textual review, but the difference is not statistically significant. This result might be affected by the disclosure of the use of AI to generate the summary of the textual review. Indeed, algorithmic advice is often viewed with suspicion, although it has been shown to support better decision-making (Rabinovitch *et al.*, 2024). The replication of Study 2 without the AI disclaimer can provide further evidence on this issue.

In terms of managerial implications in the area of online retailing and reputation management, AI can help to classify and rank reviews not only by numerical scores but also according to the assessment of textual contents as the two dimensions might not always be coherent. Overall, this can enhance the ability of retailers to profile different groups of reviewers and customers, to optimize and enrich their experiences while remaining competitive in a rapidly evolving landscape. Moreover, as AI can be integrated in online platforms to provide potential customers with a summary of human textual reviews (in addition to the usual average numerical rating), the study provides new evidence on the relative importance of numerical vs. textual reviews in consumers' decision making.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

The effect of service quality, reputation and e-WOM on performance variability

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Abstract. The significance of service quality, positive reputation and electronic word of mouth (e-WOM) in enhancing the performance of hospitality organizations is well established. However, the interplay among these factors and their collective contribution to performance variability remain underexplored. This paper aims to deepen our understanding of the individual and combined effects of service quality, reputation and e-WOM on performance, defined as customer satisfaction and loyalty - both critical to the success of hospitality businesses. To achieve this, we conducted a quantitative study, collecting monthly data from hotel guests in Iceland between June 2023 and June 2024. The study yielded 4335 valid responses from guests staying at nine hotels operated by the same Icelandic chain. Our findings reveal that service quality, reputation and e-WOM account for 57% ($R^2 = 0.54$) of the variability in performance. Among these factors, e-WOM exhibits the strongest individual effect ($\beta = 0.53$; $R^2 = 0.10$), underscoring its powerful influence on customer perceptions. Tangible service quality follows with a notable effect ($\beta = 0.15$, $R^2 = 0.008$) and reputation exerts the smallest effect ($\beta = 0.13$, $R^2 = 0.01$). These results highlight the necessity for hotel managers to prioritize effective online presence management as this can significantly enhance customer satisfaction and loyalty. To further enrich this research, employing confirmatory factor analysis (CFA) and structural equation modeling (SEM) could provide deeper insights into the relationships among these key factors. Ultimately, understanding these dynamics can help hospitality organizations optimize performance and improve guest experiences.

Keywords : service quality; reputation; e-WOM; customer satisfaction; customer loyalty; hospitality; performance

Introduction

In the hospitality industry, service quality, reputation and electronic word-of-mouth (e-WOM) play a crucial role in shaping customer perceptions and influencing business success (Anabila *et al.*, 2022; Redditt *et al.*, 2022; Su *et al.*, 2022; Zeithaml *et al.*, 2024). Although the importance of these attributes and their individual effects on hospitality performance is well established, little is known about their interplay and collective contribution to performance. While recent studies have examined the relationship between service quality and reputation in relation to performance (Asgeirsson & Gudlaugsson, 2024; Asgeirsson *et al.*, 2024), the potential influence and interaction of e-WOM remain unexplored. The purpose of this paper, therefore, is to investigate the interconnected roles of service quality, reputation and e-WOM in the hospitality industry.

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By examining their individual and collective impact on organizational performance, measured simultaneously, the findings contribute to a deeper understanding of these dynamics. This study also provides valuable insights for managers in prioritizing these attributes based on their relative importance. The paper proceeds as follows: first, a theoretical overview is presented, followed by a discussion of the methodology used to obtain the findings. Next, the results are outlined and finally, the conclusions and discussion position the findings within the theoretical framework.

Service quality

Service quality refers to how well a service meets customer expectations (Zeithaml *et al.*, 2024). To achieve high service quality, organizations must understand customer expectations and their origins (Crick & Spencer, 2011). Research indicates that service quality strongly influences organizational performance, whether measured by employee satisfaction and loyalty (Heskett *et al.*, 2008), financial metrics such as ROI (Tajeddini, 2010) or customer satisfaction and loyalty (Anabila *et al.*, 2022). Consequently, maintaining high service quality is crucial for service-oriented organizations to enhance performance and remain competitive (Benyoussef & Zaiem, 2017). Services possess unique characteristics, intangibility, inseparability, perishability and variability, which mean they are typically consumed as they are delivered (Zeithaml *et al.*, 2024). These features make measuring service quality complex, necessitating the collection of customer feedback immediately after service encounters. Various methods exist for data collection, including interviews, focus groups and questionnaires, with the choice depending on the research context (Yaoyuneyong *et al.*, 2018). Among these, questionnaires are the most widely used due to their cost-effectiveness and ability to efficiently reach large customer groups (William, 2022). Various instruments, such as SERVQUAL and industry-specific adaptations, help managers and businesses assess and prioritize service quality improvements to remain competitive (Cronin & Taylor, 1994; Parasuraman *et al.*, 1985; Shah *et al.*, 2018).

Reputation

There is no single agreed-upon definition of reputation nor is there consensus on how it is represented in research. Theoretical perspectives vary, some view reputation as an extension or measure of image, while others argue that the two are distinct concepts (Gotsi & Wilson, 2001). In marketing and service-related studies, reputation is often defined as a perceptual representation of companies' past actions and future prospects that describes their overall appeal compared to competitors (Fombrun *et al.*, 2000, p. 72). It reflects customer perceptions of an organization's performance, making it an intangible asset that, if well managed, provides a competitive advantage. Reputation management is increasingly crucial in the hospitality industry and is expected to shape its future (Mohammad *et al.*, 2022; Qoura & Khalifa, 2016).

Reputation can be examined from different perspectives, including behavior, strategy and organizational structure (Fombrun & Van Riel, 2003). It is commonly defined as stakeholder perceptions of an organization (Chun, 2005) and closely resembles brand image (Kotler *et al.*, 2017). These perceptions stem from direct interactions or media portrayals (Chun, 2005; Mukherjee & Sen, 2022). Chun (2005) categorizes reputation into three components: identity (what an organization is), image (how stakeholders perceive it) and desired identity (what it claims to stand for). Unlike image, reputation is shaped by both internal stakeholders (e.g., employees) and managerial intentions (Inversini, 2020).

The concept of reputation in the hospitality industry has evolved, particularly with increasing concerns about social and environmental responsibility (Asgeirsson & Johannesson, 2024). Customers are increasingly evaluating businesses based on ethical considerations, including sustainability practices, fair labor policies and corporate social responsibility initiatives (González-Rodríguez *et al.*, 2021; Mohammad *et al.*, 2022). Businesses that fail to address these evolving customer values may suffer reputational damage, while those that proactively communicate their sustainability efforts can differentiate themselves in a competitive market (Wang *et al.*, 2018).

Electronic word of mouth

In the hospitality sector, word of mouth (WOM) has traditionally played a crucial role in shaping customer perceptions and influencing purchasing decisions. With the rise of digital technology, electronic word of mouth (e-WOM) has become the primary channel for customers to share their experiences. Online reviews on third-party platforms provide a space where customers can openly express their opinions - often anonymously - about their service encounters (González-Rodríguez *et al.*, 2016; Redditt *et al.*, 2022). These reviews have a significant impact on potential customers, as positive or negative experiences shared online influence decision-making processes (Su *et al.*, 2022). However, reliance on third-party review platforms presents challenges for hospitality managers. Since businesses do not own or control these platforms, they have limited influence over how feedback is displayed or analyzed. Additionally, online reviews do not always provide a structured comparison of service quality attributes with performance indicators such as customer satisfaction and loyalty.

This lack of direct control makes it difficult for businesses to integrate customer feedback into their strategic planning (González-Rodríguez *et al.*, 2021). This challenge is particularly pronounced for small businesses, start-ups and independent entrepreneurs. Unlike large hotel chains with extensive customer data collection methods, smaller establishments often lack the financial and technological resources to conduct independent satisfaction surveys. They rely heavily on third-party e-WOM as a proxy for customer feedback and performance assessment (Babić *et al.*, 2016; Tripathi, 2018). This reliance can be risky as negative reviews may disproportionately impact a business's reputation (Sparks & Browning, 2011). Research highlights that personal recommendations from family, friends or trusted individuals significantly influence consumer choices, often more than traditional advertising (Babić *et al.*, 2016; Kotler *et al.*, 2017). In the hospitality industry, the experiences of previous guests play a crucial role in shaping potential customers' expectations, reinforcing the importance of managing online reviews effectively (Lai, 2019). Businesses that actively engage with customer feedback, responding to reviews, addressing concerns and improving services based on feedback, tend to build stronger customer trust and loyalty (Xie *et al.*, 2014).

Hypothetical model and research questions

The proposed hypothetical model is based on the work of Asgeirsson and Gudlaugsson (2024) and Asgeirsson *et al.* (2024), which examine the interplay between service quality and reputation in relation to variability in performance, measured simultaneously. Since ratings, referred to here as e-WOM, after a hotel stay are considered important for future bookings. It is valuable to assess their impact on performance variability alongside service quality and reputation. The hypothetical model is presented in Figure 1.

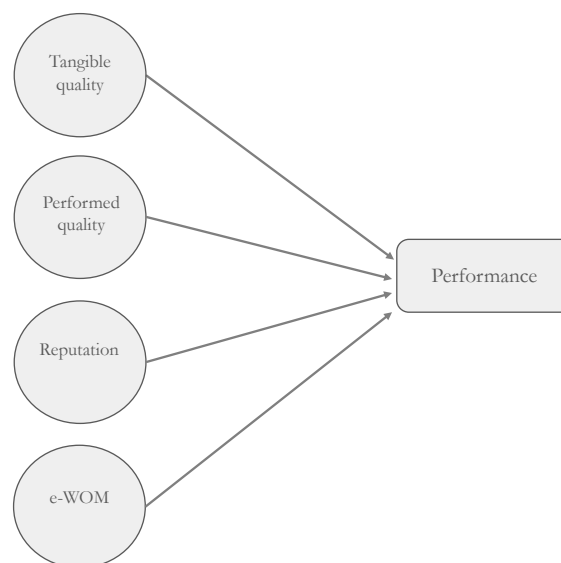


FIGURE 1 – Proposed hypothetical model of service quality, reputation, e-WOM and performance

TABLE 1 – Number of valid responses by month

	Jun 23	July 23	Aug 23	Sept 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24	Tot
# responses	308	360	395	390	350	330	269	253	341	294	247	362	436	4.34
& by month	0.07	0.08	0.09	0.09	0.08	0.08	0.06	0.06	0.08	0.07	0.06	0.08	0.10	1.00

As shown in Figure 1, the proposed five-factor model examines the interplay among four components, tangible quality, performed quality, reputation and e-WOM and their connection to variability in performance. Findings from Asgeirsson & Gudlaugsson (2024) indicate that both service quality and reputation are significant predictors of variability in organizational performance. According to their findings, reputation had a greater unique contribution than service quality in explaining performance variability. However, the findings from Asgeirsson *et al.* (2024) suggest that tangible quality contributed more significantly than reputation to explaining variability in organizational performance. Previous research clearly demonstrates that both service quality and reputation play a crucial role in assessing performance variance, yet it remains unclear which factor is more influential. Additionally, the role of online ratings (e-WOM) in this relationship has not been fully explored. Therefore, the following research questions are posed: (i) Can a plausible model be proposed to explain variation in performance based on quality, reputation and e-WOM? (ii) If so, to what extent do these factors explain variation in performance and is one factor more influential than the others?

Methodology

This section discusses the implementation of the research project, measurement techniques and methods used in data analysis. It begins by outlining the preparation and implementation of the study, followed by a discussion of the measurement instrument and the process used to analyze the data.

Preparation and implementation

This study is based on the QRP model (Asgeirsson *et al.*, 2024), which examines the relationship between service quality and reputation in relation to performance. In this study, e-WOM is introduced as an additional factor, with guests asked to rate the hotel where they stayed. The survey was conducted in collaboration with a hotel chain in Iceland, which distributed it to guests after they checked out. The survey was sent out monthly from June 2023 to June 2024, resulting in a total of 13 survey rounds. The final dataset comprised 4335 valid responses. Table 1 presents the number of valid responses by month.

The questionnaire contained a total of 56 questions. Of these, 19 assessed service quality, three assessed reputation, 10 assessed e-WOM and four assessed performance. Additionally, the questionnaire included 10 questions evaluating the importance of factors when booking a room; however, these questions are not used in this study. Similarly, eight questions assessing respondents' backgrounds and two open-ended questions were excluded from the analysis. The questions related to service quality included traditional SERVQUAL items, questions from online review sites and attributes of particular interest to hotel chain managers (see Ali *et al.*, 2021; Getty & Getty, 2003; Wilkins *et al.*, 2007). Reputation-related questions were methodologically based on the studies of by Conzáles-Rodríguez *et al.* (2021) and Hannington (2016), in which participants shared their opinions and beliefs regarding various aspects of reputation, including overall reputation, social responsibility and environmental responsibility. The questions related to e-WOM were adapted from well-known and widely used booking platforms, such as Booking.com and TripAdvisor. The four questions measuring performance followed the work of Hayes (2008; 2013) on customer loyalty and satisfaction. All items regarding service quality, reputation and e-WOM were measured on a five-point interval scale, ranging from 1 (totally disagree/totally unsatisfactory) to 5 (totally agree/totally satisfactory). Performance variables were scored on an 11-point scale, ranging from 0 (strongly disagree) to 10 (strongly agree). Table 2 shows the results.

TABLE 2 – Numerical information about factors and individual questions

(TANGSQ) Tangible service quality, $M = 4.47$; $SD = 0.58$; Cronbach's Alpha (CA) = 0.89			
Number	Questions	M	SD
1	This hotel has up to date equipment	4.30	0.88
2	This hotel's physical facilities are visually appealing	4.20	0.90
3	This hotel has hygienic bathrooms and toilets	4.62	0.73
4	This hotel has timely housekeeping service	4.66	0.66
6	This hotel's on-line presence and information was clear and up to date	4.49	0.76
7	This hotel offers quality breakfast	4.37	0.92
16	My room was comfortable, relaxing, and welcoming	4.27	0.93
17	My bed was comfortable and clean (mattress, pillow, sheets and covers)	4.64	0.73
18	My room offered a variety of basic products (soap, shampoo, towels, toilet paper...)	4.65	0.70
19	My room equipment was in working order (lighting, toilet, kettle, fridge, TV)	4.52	0.89
(PERFSQ) Performed service quality, $M = 4.72$; $SD = 0.54$; $CA = 0.95$			
5	This hotel provides timely and accurate check-in and check-out procedures	4.73	0.67
8	The hotel employees are well dressed and appear neat	4.78	0.54
9	The hotel employees perform service accurately upon arrival	4.77	0.62
10	The hotel employees perform service at the promised time	4.76	0.59
11	The hotel employees appear to be well trained and knowledgeable	4.72	0.65
12	The hotel employees have good communication skills	4.76	0.62
13	The hotel employees are helpful, friendly, and courteous	4.78	0.61
14	The hotel employees give special attention to guests	4.56	0.75
15	The hotel employees deliver excellent service to guests	4.63	0.72
(REP) Reputation, $M = 4.48$; $SD = 0.54$; $CA = 0.93$			
25	I believe that this hotel has a positive overall reputation	4.60	0.57
26	I believe that this hotel has a good reputation in terms of social responsibility	4.42	0.58
27	I believe that this hotel has a good reputation in terms of environmental responsibility	4.43	0.57
e-WOM, $M = 4.51$; $SD = 0.53$; $CA = 0.92$			
Q20A	Hypothetical review – Employees	4.71	0.60
Q20B	Hypothetical review – Location	4.75	0.58
Q20C	Hypothetical review – Cleanliness	4.77	0.52
Q20D	Hypothetical review - Value for money	4.27	0.82
Q20E	Hypothetical review – Comfort	4.39	0.80
Q20F	Hypothetical review – Facilities	4.35	0.80
Q20G	Hypothetical review - Environmental focus	4.46	0.69
Q20H	Hypothetical review - Social responsibility	4.48	0.66
Q20I	Hypothetical review - Room comfort and quality	4.27	0.88
Q20J	Hypothetical review - Service performance	4.67	0.63
(PER) Performance, $M = 8.41$; $SD = 2.09$; $CA = 0.96$			
22	How likely are you to recommend this hotel?	8.54	2.07
23	How likely would you be to select the same hotel, if you were starting your journey now?	8.33	2.38
24	How likely would you be to select this hotel again, if you were travelling to Iceland again?	8.17	2.51
28	Overall satisfaction with your stay at this hotel	8.61	1.78

All items have $N = 4.335$ since missing values were estimated using the maximum likelihood method

Population, sample and data analysis

The population of interest consisted of guests who stayed at any of the nine selected hotels between June 2023 and June 2024. All hotels belong to the same hotel chain, are located in downtown Reykjavík, Iceland and offer a similar structure of services, rooms and service areas. Each hotel provides 24/7 front desk availability, a breakfast buffet, all-day restaurant service and room service. Additionally, all hotels offer suites and maintain a rating of four stars or higher on review platforms such as Booking.com. Most respondents (70%) were visiting Iceland for the first time, while approximately 13% had visited once or twice before. The majority traveled for leisure (86%) and stayed at multiple hotels within the chain for an average of three to four nights. The largest proportion of participants came from the United States (49.9%), followed by Canada (11.2%), Great Britain (10.2%) and other Nordic countries (7.4%). Other respondents primarily

originated from Europe, Australia, Japan, Brazil and various other countries. Of the participants, who chose to answer the gender question, 35.31% identified as male, 50.37% identified as female and 0.27% defined their gender differently. The age distribution of respondents was relatively high, with approximately 33% being older than 66 years and about 70% aged 46 years or older. According to available data from the hotel chain, these demographics accurately represent their typical guest portfolio.

The survey data was downloaded from QuestionPro. SPSS and Excel were used for data analysis. To assess whether the hypothetical model was supported, a principal component analysis (PCA) was conducted in SPSS. Prior to the PCA, the suitability of the data for factor analysis was evaluated. A correlation matrix was used to examine the interrelationships among the independent components and finally, linear regression analysis was performed to assess both the individual and collective influence of the independent components on variability in the dependent component.

Results

This section presents the results. First, it examines whether there was support for the five-factor model used to estimate variation in performance based on tangible service quality, performance, service quality, reputation and e-WOM. Next, it discusses the explanatory power (R^2) of the model. Finally, the section evaluates whether one factor carries more weight than the others.

The five-factor model

Inspection of the correlation matrix revealed the presence of multiple coefficient values of 0.3 and higher. The Kaiser-Meyer-Olkin value exceeded the recommended threshold of 0.6 (Kaiser, 1970, 1974) and Bartlett's (1954) test of sphericity reached statistical significance, supporting the factorability of the correlation matrix. The PCA, using Oblimin rotation, identified five factors as predicted by the hypothetical model: tangible quality (TANGSQ), performance quality (PERFSQ), reputation (REP), electronic word-of-mouth (e-WOM) and performance (PER). The alpha values for each factor, along with the means and standard deviations for each question, are presented in Table 2.

As shown in Table 2, the questions loading onto TANGSQ related to managerial implications for creating comfort, functionality, cleanliness and visual appeal. Questions concerning PERFSQ addressed service delivery by hotel employees, including their attitude and willingness to serve. REP was measured by three questions assessing participants' perceptions of social, environmental and overall reputation. Additionally, e-WOM was measured by ten questions related to hypothetical reviews, while PER was assessed by four questions evaluating guests' overall satisfaction and loyalty. The alpha values for each factor were very high (Dalyanto *et al.*, 2021; Pallant, 2020), exceeding 0.89 in all instances, confirming that the questions within each factor measured the same construct. The overall scores were high, ranging from 4.2 to 4.78 on the five-point interval scale and from 8.17 to 8.61 on the 11-point interval scale. Figure 2 presents the model, listing the questions associated with each factor.

As can be seen in Figure 2, the hypothesized model was supported. It is composed of service quality, reputation, e-WOM and performance. The resulting model suggests that all four independent components influenced variability in performance. Furthermore, it was assumed that the independent components were interrelated but had co-factors lower than 0.7. Table 3 provides a summary of the mean, standard deviation, alpha value and correlation coefficient of the factors in the model.

Table 3 shows that the correlation between performance and the independent variables was significant and strong ($r > 0.42 - 0.72$) in all cases, which was optimal (Pallant, 2020). In one case, the correlation exceeded 0.7, which is not desirable but may be acceptable if the tolerance value is higher than 0.10 and the VIF value is lower than 10 (Pallant, 2020).

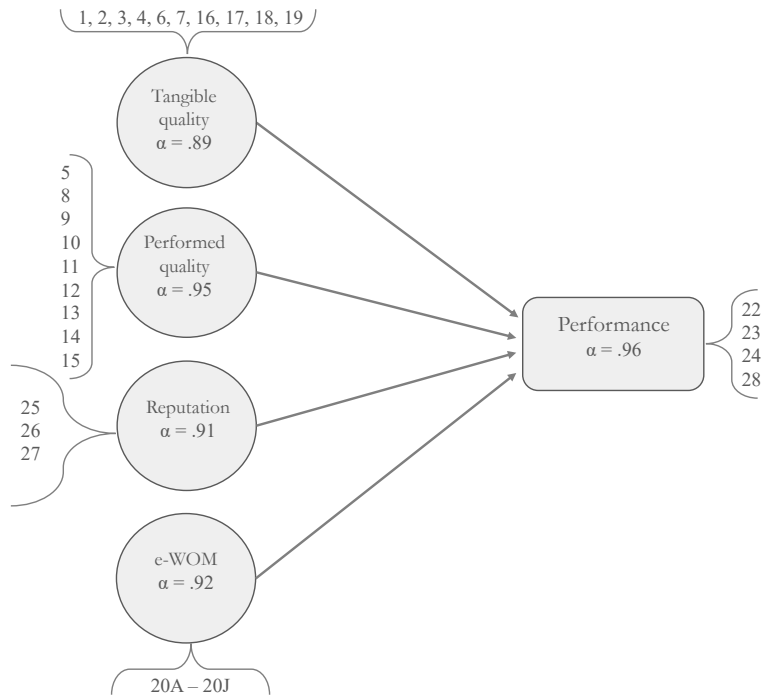


FIGURE 2 – The model and questions behind each factor

TABLE 3 – Summary of average, SD, alpha value and correlation

	N	Average	SD	CA (α)	1	2	3	4	5
Tangible quality (1)	4.335	4.47	0.58	0.89	1				
Performed quality (2)	4.335	4.72	0.54	0.95	0.67	1			
Reputation (3)	4.335	4.48	0.54	0.93	0.50	0.38	1		
e-WOM (4)	4.335	4.51	0.53	0.92	0.77	0.61	0.58	1	
Performance (5)	4.335	8.41	2.09	0.96	0.62	0.42	0.51	0.72	1

TABLE 4 – Results of the regression analysis, four-factor model

	St. (β)	t	Sig	Part	Tolerance	VIF
Tangible quality	0.15	8.84	< 0.001	0.092	0.398	2.510
Reputation	0.13	9.72	< 0.001	0.101	0.654	1.529
e-WOM	0.53	30.47	< 0.001	0.316	0.351	2.845

Explanatory ratio and weight of factors

To address Research Question 2, a multivariate regression analysis was performed. This method is sensitive to potential flaws in the data, making it essential to ensure that all key assumptions of the test are met. The results of the regression analysis indicated that performance quality was not significant. Therefore, the conclusion is based on tangible quality, reputation and e-WOM (four-factor model). Table 4 presents the main results of the regression analysis for the four-factor model. It shows that the main assumptions for the four-factor model were met and that all three factors had a significant relationship with performance ($\text{sig} < 0.001$). The squared partial value (R^2) was highest for e-WOM (0.10), indicating the extent to which each factor individually explained the variation in the dependent variable (Pallant, 2020). The model accounted for approximately 54% of the variation in performance, as illustrated in Figure 3.

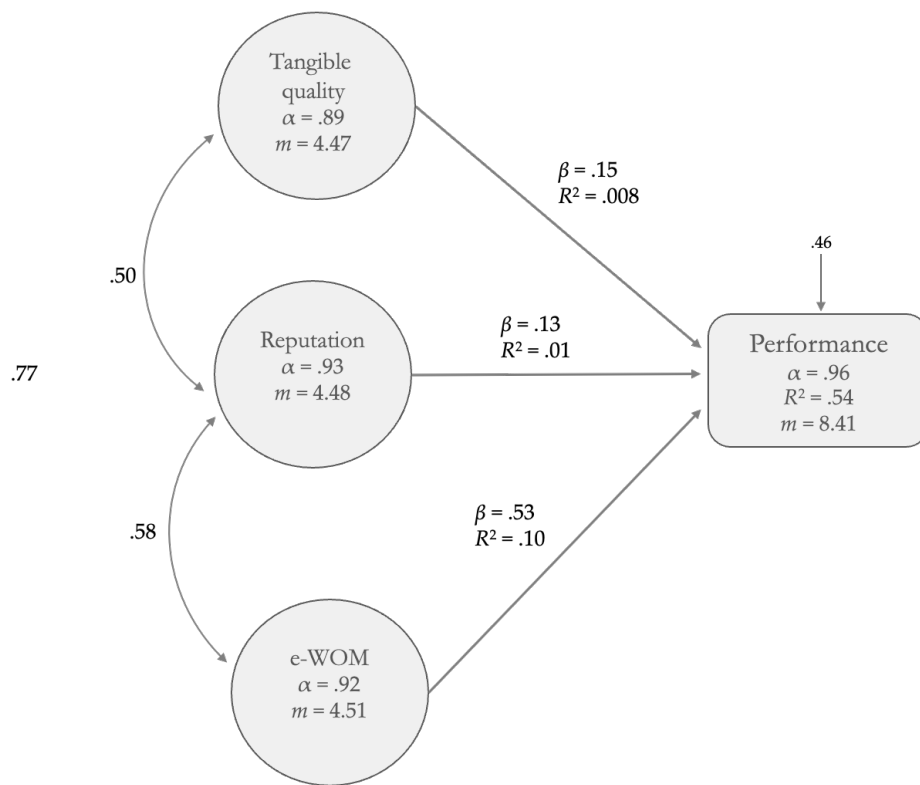


FIGURE 3 – Findings for the four-factor model

Figure 3 shows that e-WOM had the greatest weight ($\beta = 0.53$) and alone accounted for approximately 10% ($R^2 = 0.10$) of the variation in performance. The factors, tangible quality ($\beta = 0.15$) and reputation ($\beta = 0.13$) had significantly less weight, with each explaining only about 1% of the variation in performance.

Conclusions and discussion

The purpose of this article was to explore the interconnectivity of service quality, reputation and e-WOM by examining their individual and collective impact on organizational performance, measured simultaneously. Two research questions were posed to support the paper's objective. The first addressed the plausibility of generating a model that explains variation in performance based on quality, reputation and e-WOM. The second assessed the extent to which these factors explain variation in performance and whether one factor is more influential than the others.

To answer the first question, an exploratory factor analysis was performed, revealing five factors: tangible quality (TANGSQ), performance quality (PERFSQ), reputation (REP), electronic word -of -mouth (e-WOM) and performance (PER). These factors align with the findings of Asgeirsson *et al.* (2024) and confirm the proposed hypothetical model. The alpha value for each factor was high, exceeding 0.89 in all cases, indicating that the items comprising each factor effectively measure the same construct (Pallant, 2020). In constructing the model, it was assumed that all four independent variables were interrelated to an acceptable degree and influenced variability in the dependent performance variable. The correlation matrix confirmed that all model variables were correlated within acceptable limits. The correlation between e-WOM and TANGSQ was relatively high (0.77); however, other essential criteria were met as the tolerance value exceeded 0.10 and the VIF remained below 10, making it acceptable (Pallant, 2020).

As for the second research question, a multivariate regression analysis was performed. The results showed that performance quality (PERSQ) had no significant relationship with variability in performance. Therefore, the conclusions are based only on the influence of TANGSQ, REP and e-WOM on performance

variability, forming a four-factor model. These three independent variables accounted for 54% ($R^2 = 0.54$) of the variability in performance. This finding suggests that 46% of the variance is explained by factors outside the scope of this research and model. The strongest unique connection to performance was through e-WOM ($\beta = 0.53$; $R^2 = 0.10$), aligning with the claimed importance of e-WOM suggested by Redditt *et al.* (2022), Su *et al.* (2022) and others. TANGSQ ($\beta = 0.15$; $R^2 = 0.008$) appeared to be more influential than REP ($\beta = 0.13$; $R^2 = 0.01$), supporting the findings of Asgeirsson *et al.* (2024).

In conclusion, this research has demonstrated that it is possible to develop a model incorporating quality, reputation and e-WOM to explain variability in performance. Among the three independent factors, e-WOM had the greatest weight in this relationship and the strongest individual explanatory power regarding performance variability.

Managerial implications drawn from these findings suggest that the hotel industry should prioritize positive e-WOM to enhance customer satisfaction and loyalty. However, it remains important to also focus on tangible service quality and reputation. Due to the correlation between the independent variables, their collective explanatory power (54%) is greater than the sum of their individual influences (e-WOM 10%; TANGSQ 1%; REP 0.8%).

Theoretical implications derived from these findings contribute to a deeper understanding of the interplay between these factors and their connection to performance. These insights also provide direction for future research, such as incorporating CFA and SEM to achieve more robust results. Additionally, it would be valuable to apply similar methods to data from other locations in Iceland as well as from different countries.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Service orientation and performance in the hospitality industry

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Abstract. Researchers have demonstrated that a strong organizational culture significantly enhances organizational performance. Moreover, it has been suggested that emphasizing service through service orientation (SO), which is a form of organizational culture, leads to improved organizational outcomes. Performance can be evaluated in diverse ways, ranging from precise metrics, such as financial calculations, to more subjective assessments, such as employee and customer satisfaction. The aim of this article is to explore the impact of SO on different aspects of performance in hospitality firms, on both individual and collective levels. The researchers followed the Denison organizational culture framework to assess both SO and performance. SO was measured using 25 questions that are related to various organizational culture elements and performance was categorized into seven areas: sales growth, profitability and ROI, quality of products and services, employee satisfaction, customer satisfaction, innovation and new product development (NPD), and overall performance. Data for this study were collected in the Spring of 2024 from employees and managers ($N = 45$) of a hotel chain in central Reykjavík, Iceland. Results indicate that SO accounted for 49% ($R^2 = 0.49$) of the variance in the seven performance variables collectively. The strongest individual correlations were found between SO and overall performance ($\beta = 0.60$, $R^2 = 0.36$) and between SO and employee satisfaction ($\beta = 0.54$, $R^2 = 0.29$). Conversely, the weakest correlations were observed between SO and innovation ($\beta = 0.40$, $R^2 = 0.16$) and between SO and profitability ($\beta = 0.43$, $R^2 = 0.18$). Further testing, such as confirmatory factor analysis (CFA) and structural equation modeling (SEM), may provide additional insights into these findings. A limiting factor of this study is the small sample size, though all preliminary findings were statistically significant.

Keywords : hospitality; service culture; service orientation; organizational performance; employee satisfaction

Introduction

The importance of service orientation (SO) in enhancing performance among hospitality firms is undisputed. However, within the industry, there is lack of consensus about the definition and categorization of the phenomena (Asgeirsson *et al.*, 2022; Teng & Barrows, 2009). SO has been categorized as belonging either to an employee or to an organization. On the employee level, SO generally refers to how well employees are geared toward delivering excellent service and how well they care for customers. This notion has also been referred to as *customer orientation* (Kim & Jang, 2022; Köşker *et al.*, 2019; Tang, 2014). When discussing SO on an organizational level, it typically regards service strategy and processes or organizational culture (Asgeirsson *et al.*, 2022; Teng & Barrows, 2009).

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In this article, SO refers to organizational culture. This approach has been deemed appropriate to measure SO holistically as it is the underlying factor that steers service strategy and processes, while nurturing employees' service behaviors (Lytle & Timmerman, 2006; Susskind *et al.*, 2018). The paper proceeds as follows: first, a theoretical overview is introduced, which is followed by the methodology that was used to produce findings. Then, findings are presented as is the discussion of the findings in relation to the theoretical framework and the conclusion.

Service orientation

SO has been defined as a combination of attitudes, behaviors and organizational integration, the intention of which is to enable deep understanding and addressing of both current and future customer needs. This approach requires collective employee participation to ensure exceptional service delivery (Voon, 2008, p. 219). Similarly, another definition describes SO as a company-wide commitment to service in which policies, structures and procedures are designed to encourage and reward behaviors that contribute to outstanding service (Lytle *et al.*, 1998, p. 495). These definitions emphasize that responsibility for customer service should extend beyond frontline employees to all members of an organization, regardless of their direct or indirect customer interactions (Grönroos & Ravald, 2011; Gummeson & Grönroos, 2012; Holmqvist *et al.*, 2020). These definitions highlight the importance of workforce integration that fosters cooperation and continuity among employees (Gummerus *et al.*, 2021; Rafiq & Ahmed, 1993; Voon, 2008). Organizations with a strong SO often view employees as internal customers and therefore consider their needs and expectations when designing and implementing services (Arnett *et al.*, 2002; George, 1990; Grönroos, 2011), which suggests that every individual within the organization serves a customer within the service chain, whether internal or external. Consequently, customers become an integral part of the organization, influencing decision-making through their feedback and expectations (Grönroos, 2011; Lin *et al.*, 2021; Wu *et al.*, 2021).

SO has been widely recognized as a critical factor in organizational performance, regardless of whether internal or external performance measures are considered (Heskett *et al.*, 2008; Lytle & Timmerman, 2006). Scholars have, for example, established connections between SO and improved employee satisfaction (Bellou & Andronikidis, 2017; Heskett *et al.*, 2008) as well as increased employee loyalty, as reflected in reduced turnover rates (Babakus *et al.*, 2017; Wahlberg *et al.*, 2017). Furthermore, researchers have demonstrated that SO positively impacts service quality, customer satisfaction (Narentheren *et al.*, 2017) and an organization's ability to recover from service failures (Piaralal *et al.*, 2016), whereas findings from other studies have indicated that SO enhances customer loyalty, which then influences repurchase intent, recommendations and perceived service value (Fernandes & Solimun, 2018; Polo Peña *et al.*, 2017). Organizations with a strong SO tend to experience greater profitability and growth (Heskett *et al.*, 2008; Urban, 2009). They also demonstrate increased sensitivity to market changes, which enables them to adapt more effectively to evolving business environments (Benyoussef & Zaiem, 2017; Seng *et al.*, 2017).

Given its significance, SO must be a priority in organizations that are seeking to improve their performance. One widely recognized tool for measuring SO is the service orientation scale (SERV*OR), which evaluates an organization's service culture across 10 dimensions, including service policies, management approaches, employee behavior, empowerment and service standards (Lytle *et al.*, 1998; Lytle & Timmerman, 2006). The SERV*OR questionnaire comprises 35 questions that enable managers and staff to assess their service performance (Lytle & Timmerman, 2006). However, the present researchers instead employ data from the Denison organizational culture (DOC) survey, following the earlier work of Gudlaugsson *et al.* (2022), who found comparability between the two instruments (SERV*OR and DOC survey), as 25 of the DOC survey questions represent 30 of the 35 SERV*OR scale questions. The advantage of using the DOC survey to measure SO is the performance aspect of the instrument, as employees and managers are asked to evaluate their organizational performance compared to similar companies (Denison, 2000). Performance is measured in seven aspects: sales growth, profit or ROI, service quality, employee satisfaction. Innovation and overall performance (Denison *et al.*, 2014).

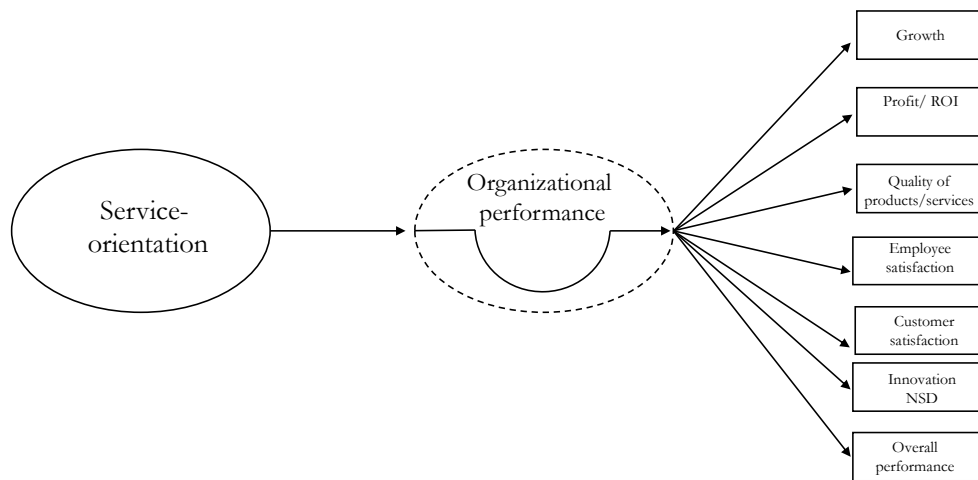


FIGURE 1 – Proposed hypothetical model of SO and performance

Hypothetical model and research questions

As noted, this study and the hypothetical model (Figure 1) are based on Gudlaugsson *et al.*'s (2022) work, in which the DOC survey instrument was used to assess SO and its connection to various performance aspects. As illustrated in Figure 1, it is assumed that SO is connected to performance attributes on both the collective and individual levels, as Gudlaugsson *et al.* (2022) reveal a significant association between SO and various collective and individual performance elements. The strongest affiliation with individual performance indicators is between SO and employee satisfaction and between SO and overall performance, but the relationship is also strong between customer satisfaction and service quality. Gudlaugsson *et al.*'s (2022) research data were derived from nine service-related organizations, although none were from the hospitality sector.

On that note, the hospitality sector, especially the hotel industry, is believed to differ somewhat from other service sectors due to the extended and multifaceted nature of service interactions. Other businesses typically have brief service encounters, whereas hotels often have guests who engage in prolonged stays, thereby making the hotel their temporary home. This necessitates continuous, personalized service, from front desk interactions to housekeeping and dining experiences. Moreover, hospitality professionals must go beyond functional service delivery to create a welcoming and comfortable atmosphere to ensure guest satisfaction throughout their stay. Consequently, hotel organizations and managers must strategically plan service experiences and foster a robust service-oriented culture (Crick & Spencer, 2011; Ford & Sturman, 2018; Reisinger *et al.*, 2001). Given this difference between service sectors, the authors of the present study designed the following questions to determine whether the findings would be similar in the hospitality industry and other service sectors:

1. Can a credible model be produced to explain the relationship between SO and performance in hospitality?
2. To what effect is SO connected to the variability of collective and individual performance indicators?

Methodology

To answer these questions, data were gathered from employees and managers working in nine downtown Reykjavík hotels that belonged to the same chain.

Preparation and implementation

This study is based on that of Gudlaugsson *et al.* (2022), who reveal that the DOC instrument can be utilized to measure SO and that SO is significantly connected to the variability of individual and collective

performance attributes. Data were gathered in collaboration with an Icelandic hotel chain consisting of nine hotels in downtown Reykjavík. The survey was distributed by the chief of staff to all employees and managers who work in or influence any outpost's day-to-day operations; 45 valid responses were gathered in the Spring of 2024 and are the bases for the results presented in this paper. Through the DOC measurement tool, respondents were asked to state how much they agreed that certain cultural aspects applied to the organization and to indicate how well or poorly they believed that the organization performed compared to others in the same or a similar industry (Denison & Mishra, 1995). These questions were answered using a 5-point scale, ranging from 1 (poor performance), 3 (average performance) and 5 (good performance).

Population, sample and data analysis

The survey data were downloaded from QuestionPro. SPSS data analyzers and Excel was used for data analysis. To verify whether the hypothesis was supported, a principal component analysis (PCA) in SPSS was used, prior to the PCA, the suitability of data for factor analysis was assessed. A correlation matrix was used to investigate the interrelationship of the independent components and finally, linear regression analysis was used to examine both the individual and collective influence of the independent components on the dependent component's variability.

The methods used in this study were sensitive to both sample size and missing data (Kline, 2023). The sample was small ($N = 45$) and some data were missing, so the authors needed to eliminate absent information to ensure that the sample would not be reduced further; accordingly, expectation maximum likelihood was the method chosen. This method is sensitive to randomization of the missing value; hence the method can only be used if the missing data are deemed completely at random (Efron & Hinkley, 1978). To examine that criterion, Little's MCAR test was applied to verify that the significance value was greater than 0.05 ($Sig > 0.05$), which would indicate that the missing information was at random (Little, 1988). The MCAR results indicated that the missing data seemed to be completely at random ($\chi^2 = 509$, $df = 553$, $Sig = 0.909$), and therefore missing values could be replaced using expectation maximization (Kline, 2023).

Results

This section presents the results. First, the authors examined whether there was support for the five-factor model used to estimate performance variations based on tangible service quality, performance service quality, reputation and e-WOM. Next, the authors discuss the model's explanatory power (R^2). Finally, the authors evaluate whether one factor carries more weight than the others.

Building the model

Inspection of the correlation matrix revealed the following: many coefficient values were 0.3 or higher, the Kaiser–Meyer–Olkin value exceeded the recommended value of 0.6 (Kaiser, 1974), and the Bartlett (1954) test of sphericity reached statistical significance, thus supporting the factorability of the correlation matrix. The PCA, which used Oblimin rotation, revealed two factors—SO and performance—as the hypothetical model predicted. From the survey responses, 25 questions loaded on the SO factor and the seven performance variables loaded together to form the independent variable. The alpha values, means and standard deviations for each question are presented in Table 1.

As Table 1 presents, 25 questions loaded on the SO factor and seven loaded on the performance factor. The alpha value for each factor was acceptable (Pallant, 2020)—exceeding 0.83—which confirmed that the questions behind the factors measured the same construct. The scores were moderate to high, ranging from 3.51 to 4.40 for the SO factor and from 3.83 to 4.66 for the performance factor. Figure 2 presents the model, listing the question numbers that support each factor.

TABLE 1 – Questions and factors, alpha values, means and standard deviations.

(SO) Service Orientation, Cronbach's Alpha = 0.95			
Number	Text	Mean	Std
1	Decisions are usually made at the level where the best information is available	4.03	0.932
6	People work like they are part of a team	4.42	0.839
7	Teamwork is used to get work done, rather than hierarchy	4.31	0.949
9	Authority is delegated so that people can act on their own	4.04	1.037
10	The "bench strength" (capability of people) is constantly improving	4.06	0.914
11	There is continuous investment in the skills of employees	4.13	1.036
12	The capabilities of people are viewed as an important source of competit	4.12	0.926
13	The leaders and managers "practice what they preach"	4.21	0.868
14	There is a clear and consistent set of values that governs the way we do business	4.24	0.954
23	It is easy to coordinate projects across different parts of the orga	3.49	1.082
26	We respond well to competitors and other changes in the business environment	4.10	0.925
27	New and improved ways to do work are continually adopted	4.02	1.076
29	Customer comments and recommendations often lead to changes	3.94	1.000
30	Customer input directly influences our decisions	3.98	0.959
31	All members have a deep understanding of customer wants and needs	4.11	0.851
32	We encourage direct contact with customers by our people	4.24	0.820
33	We view failure as an opportunity for learning and improvement	4.33	0.816
34	Innovation and risk-taking are encouraged and rewarded	3.51	0.967
35	Learning is an important objective in our day-to-day work	4.40	0.903
38	Our strategy leads other organizations to change the way they compete	3.73	0.933
39	There is a clear mission that gives meaning and direction to our work	4.12	1.005
41	There is widespread agreement about goals	3.83	0.975
42	Leaders set goals that are ambitious, but realistic	4.17	0.877
44	We continuously track our progress against our stated goals	4.13	0.911
45	We have a shared vision of what the organization will be like in the future	3.85	1.026
Performance, Cronbach's Alpha = 0.83			
49	Sales growth	4.44	0.744
50	Profitability/ROI	4.23	0.683
51	Quality of product and services	4.15	0.727
52	Employee satisfaction	4.23	0.934
53	Customer satisfaction	4.66	0.535
54	Innovation (like in new product and/or service development)	3.83	0.694
55	Overall organizational performance	4.21	0.746

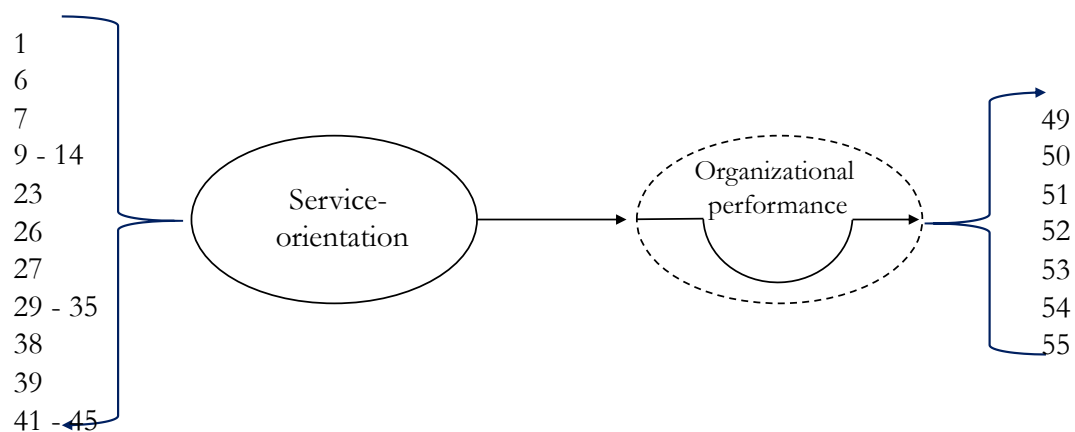


FIGURE 2 – The model and question numbers that support each factor

Figure 2 illustrates that the hypothetical model is supported; in other words, the model is built up by the two distanced components of SO and performance.

Table 2 – Regression analysis results

Dependent variable	Independent variable	R^2	a	b	β
Growth	Service orientation	0.24	<0.001	0.586	0.490
Profit	Service orientation	0.18	0.003	0.469	0.427
Quality of service	Service orientation	0.26	<0.001	0.590	0.505
Employee satisfaction	Service orientation	0.29	<0.001	0.814	0.542
Customer satisfaction	Service orientation	0.25	<0.001	0.428	0.498
Service innovation	Service orientation	0.16	0.007	0.445	0.399
Overall performance	Service orientation	0.36	<0.001	0.722	0.602

Note: R^2 is the explanatory ration, b is the regression coefficient and β is standardized b

Regression analysis

A bivariate regression analysis was performed separately for each performance variable to examine the relationship between SO and organizational performance. The performance variables came from the DOC survey and included growth, profit and performance, product and service quality, employee satisfaction, customer satisfaction, service innovation and overall performance. Table 2 presents the results. As Table 2 displays, the relationship is significant in all cases ($\alpha < 0.05$), but the explanatory ratios (R^2) vary. The explanatory ratio for overall performance is highest, which is followed by customer satisfaction, while the explanatory ratios are lowest for profit and service innovation. These observations can be seen in more detail in Figure 3.

Figure 3 illustrates that SO ($M = 4.06$), as the calculated average of the seven performance factors, explains 49% of the variation in performance ($M = 4.25$). This respectively means that 51% of the variance is explained by something else, which is out of the scope of this research. By examining the performance factors separately, it can be observed that SO explains different amounts of the variation, from 16% for service innovation (where it is lowest) to 36% for overall performance (where it is highest). Additionally, the correlation, measured as β , varies by performance factor and is 0.43 for profit (where it is lowest) and 0.60 in overall performance (where it is highest).

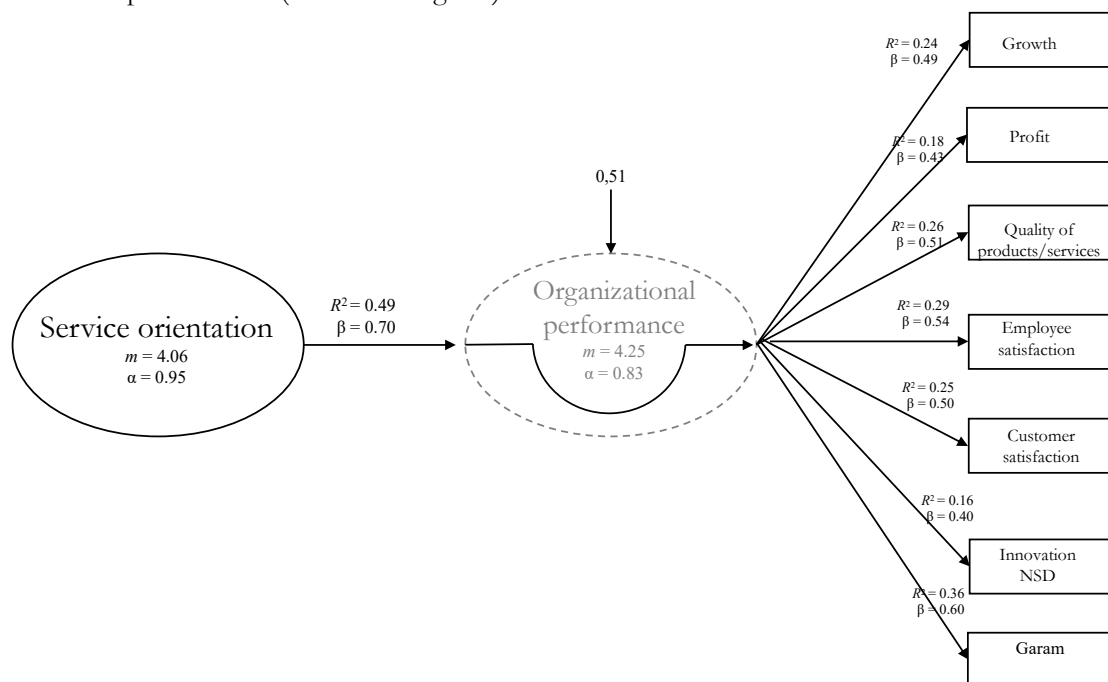


FIGURE 3 – Findings regarding SO and performance relationships

Discussion and conclusion

The purposes of this article were to investigate whether a credible model could explain the relationship between SO and performance using hospitality sector data and to gain insights into the SO's different effects on the variability of collective and individual performance indicators. To address the first purpose, a PCA was conducted on all variables, which revealed a two-factor model that comprised 25 SO variables and seven performance variables. These findings support the hypothetical model produced by Guðlaugsson *et al.* (2022), which suggests that the 25 questions derived from the DOC instrument can be utilized to form the SO factor. Both variables had strong internal validity (Cronbach's alpha (α))—0.95 for the 25 questions that built SO and 0.83 for the performance factor—which suggests that the questions assessed the same construct (Pallant, 2020). The findings also reveal that many of these points had a correlation that was higher than 0.3 but below 0.7, which was desirable.

Regarding the study's second purpose, SO explains 49% of the variation in the seven performance indicators collectively ($\beta = 0.70$, $R^2 = 0.47$). These findings align with those from Guðlaugsson *et al.* (2022), who utilized the same method as this study's authors but employed data from other service industries. The strongest relationship with the variability in individual performance attributes was in overall satisfaction ($\beta = 0.60$, $R^2 = 0.36$) and employee satisfaction ($\beta = 0.54$, $R^2 = 0.29$). The weakest relationships were found between SO and service innovation ($\beta = 0.40$, $R^2 = 0.16$) and between SO and profit ($\beta = 0.43$, $R^2 = 0.18$). This aligns somewhat with Guðlaugsson *et al.*'s (2022) findings as well as with the notion that SO is affiliated with performance in various aspects (Bellou & Andronikidis, 2017; Fernandes & Solimun, 2018; Narentheren *et al.*, 2017; Polo Peña *et al.*, 2017). The weaker connection in profit and growth profit ($\beta = 0.49$, $R^2 = 0.24$) somewhat contradicts Heskett *et al.* (2008) and Urban's (2009) findings, who have claimed that this connection is strong.

To conclude, the findings suggest that it is possible to generate a model of SO and performance using hospitality sector data. Furthermore, the characteristics of the relationship between the two factors nearly mimic the findings from studies of other service sectors despite the sector differences. In a theoretical context. It is important to test findings (as this study's authors have done) in different service sector aspects to enhance the understanding of the character of SO. These findings also underscore the importance of further investigating SO in different hospitality contexts, which could be performed with increased sample sizes and between nonhomogeneous businesses factors, such as different sites, areas, or countries. Additionally, future researchers should consider using different analytical methods, such as CFA and SEM, to increase the concision of the factor analysis and findings. For managers, these findings are important to enhance culture within the company and to increase the understanding of how emphasizing service can increase or affect performance indicators. The main shortcomings of this research are the sample size, as only 45 valid responses were derived from the survey and the limitation of studying only one hotel chain, as all nine outposts were in downtown Reykjavík, which makes the sample homogeneous and therefore unsuitable for generalizing the findings to other hotels or hospitality firms.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Creating sparkle and magic: development and validation of a brand charisma scale

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Abstract. Grounded in Charismatic Leadership Theory, we develop and validate a scale to measure brand charisma. The new scale is developed and validated in a luxury context. Charisma is particularly relevant to luxury brands as it encompasses many of the qualities that make luxury brands desirable and influential. We conceptualize brand charisma as a multi-dimensional construct capturing consumer perceptions of a luxury brand's exceptional qualities and its special magnetic charm or appeal. We report the findings of a six-stage process to develop and empirically validate a 25-item scale to measure brand charisma. The scale comprises 5 dimensions (Honorable; Distinguished; Influential; Distinctive; and Magical) and shows internal consistency, reliability and construct validity. In addition, we examine nomological validity by identifying variables that are related to brand charisma, including brand heritage and consumer devotion. We extend brand personality literature where research has shown that there is a strong connection between consumers and non-human characters, symbols and use charismatic leadership theory as the theoretical base for exploring the brand-consumer interface when conceptualizing consumer perceptions of brand charisma. We validate the new scale using exploratory structural equation modeling (ESEM), an alternative to traditional CFA approaches when evaluating scale structure and validity. A validated scale for measuring the charisma of luxury brands provides brand managers with a comprehensive view of how consumers perceive brand charisma and how to measure it holistically.

Keywords : brand charisma; charismatic leadership theory; scale development

Introduction

Charisma is one of those complex concepts that has drawn much debate and discussion among scholars from the social sciences. Historically, charisma has been carelessly employed, prompting the need for further investigation (Peters, 2010). The term charisma is often associated with other terms such as: attraction. Influence, mystical, extraordinary, magnetic, charming, divine and even 'supernatural' (e.g. Antonakis 2017; Hatton-Jones 2020). This compounds the problem as the definition of the charisma includes concepts that are also difficult to define. While researchers from disciplines such as sociology, psychology, management;

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political science and organizational behavior have all made solid attempts to deconstruct its meaning, the concept of charisma remains elusive in the literature (Hatton-Jones, 2020).

The goal of this paper is to conceptualize, develop and validate a new scale for measuring brand charisma. The new scale for measuring brand charisma uses the rigorous scale development procedures of Churchill (1979) and DeVellis (2016) and provides a rich conceptualization using real consumers. Some researchers have made qualitative inroads (Hatch & Schultz, 2013; Semaan *et al.*, 2019) into defining the main characteristics of brand charisma, but the concept remains elusive because of the nebulous and dynamic nature of consumer perceptions (Antonakis *et al.*, 2016). Several quantitative studies have also attempted to conceptualize brand charisma (Dion & Arnould, 2011; Hatton-Jones, 2020; Workman & Lee, 2021) with limited degrees of success. Our brand charisma scale is developed and validated in a luxury context. Brand charisma is particularly relevant to luxury brands, as it encompasses many of the qualities that make luxury brands desirable and influential. Luxury brands evoke emotions, aspirations and transformative experiences (Dion & Arnold, 2011). Charisma encapsulates the allure, mystique and emotional appeal of luxury brands and inspires devotion and enthusiasm among followers (Dion & Arnold, 2011; Hatton-Jones, 2020). We examine the marketing concept of brand charisma through the theoretical lens of charismatic leadership (Conger, 1999). There are many studies conceptualizing charismatic leadership in psychology and management literature, but there are few in marketing. Charismatic leaders create a sense of excitement among followers, build strong bonds and ultimately exercise strong influence on the values and behaviors of their followers (Wowak *et al.*, 2016). We extend this conceptualization and use Charismatic Leadership Theory (CLT) for exploring the brand-consumer interface when understanding brand charisma.

Methodology

Scale development followed a six-stage process in accordance with the established guidelines of Churchill (1979) and DeVellis (2016). Our first objective was to explore the conceptual domain of brand charisma generate a list of items that represented the underlying content and dimensionality of the construct.

Results

Stage one

Along with the literature review, we conducted five focus groups involving 55 luxury brand consumers and gained deeper insights into the concept. Each focus group involved between 9 and 12 individuals following the recommendations of Churchill & Iacobucci (2002) and lasted between 50 and 75 minutes. At the beginning of the focus group session, participants were provided with an operational definition of brand charisma: one which has exceptional qualities and a special magnetic charm or appeal (Semaan *et al.*, 2019). Participants were then asked what makes a brand charismatic. In addition, participants were asked to identify three charismatic brands (and the reasons why they thought they were charismatic) and three brands that were not charismatic (and the reasons). The focus groups did not focus on specific products, but rather which brands elicit charisma and why. The questions were designed to guide subsequent group discussion. Following Kidd & Parshall (2000), one of the researchers took on the role of moderator during these discussions. Data were collected via whiteboard summaries and written summaries from individuals within each focus group. Using respondents' own words, 71 items that captured the conceptual domain of brand charisma were identified. Five academic experts were then asked to comment on the content and face validity of the items. This process eliminated 7 items, reducing the item pool to 64 items.

Stage two: first measure refinement

Following Stage One, we conducted first measure refinement of the 64-items through the first quantitative data collection stage, using an online panel of luxury brand consumers in the United States (U.S.) (www.prolific.com). The sample selection criterion was that respondents had purchased a luxury brand in

the last 12 months. A luxury brand was defined as a brand having unique characteristics such as social status, uniqueness, conspicuousness, exclusivity, high value, superior quality, craftsmanship and emotional connection (Ko *et al.*, 2019). Luxury brands are characterised by a high rating on each of these characteristics compared to premium brands and masstige brands in a product category. Using these guidelines, the list of luxury brand names identified by consumers was validated by three academic experts familiar with luxury research.

In a pre-screening phase, the research team contacted 692 luxury brand consumers to ascertain whether they had purchased a luxury product in the last 12 months. Three hundred and ten respondents indicated 'yes' based on the luxury definition. The main survey comprising 64 randomized statements generated in Stage One was then distributed to these respondents. They were asked to indicate their level of agreement with each statement for the luxury brand they had purchased in the last 12 months. Two hundred and eighty-four responses were received. Of these, 22 respondents indicated brands that were identified as non-luxury i.e., premium or masstige. These respondents were subsequently eliminated from further analysis, thus reducing the sample size to 262. All 262 respondents correctly answered the two attention check questions randomly distributed in the survey, just under 54% of respondents were male. Respondent's age ranged from 18 to 71 years with a mean of 32.2 years. Just under 67% held an undergraduate and/or postgraduate degree. Fifty five percent of respondents identified annual household income as being above US\$75000 with 34% above US\$100000.

Exploratory factor analysis using principal components analysis (PCA) and oblique rotation (Oblimin with suppression of values less than 0.4) was used to identify the latent dimensions. Examination of the screen plot suggested 7 factors, accounting for 63.9% of the variance in the data. Following the guidelines of DeVellis (2016), 25 items were removed due to either weak loadings or cross loadings and 4 items were reworded, leaving 39 items for further measure refinement.

Stage three: second measure refinement

In this stage, another online survey using Prolific was administered to a new group of luxury brand consumers in the U.S. to refine the measure from the initial 39 items in Stage Two. In the pre-screening phase, ($N=598$), respondents were again asked if they had purchased a luxury brand in the past 12 months. Of the 598 respondents, 304 indicated yes, of which 281 respondents completed the final survey. Of these, 50 respondents identified non-luxury brands and these were eliminated from further analysis. The luxury brands identified by respondents were similar to those identified in Stage Two and were also spread over the product categories of fashion, apparel, watches, jewelry, handbags, cars and hotels. Three of the 231 respondents incorrectly answered the attention check questions and were deleted leaving 228 valid responses. The sample characteristics were reasonably consistent with the sample in Stage Two. No unbalanced distributions were identified following the approach of Clark & Watson (2019). Initially, exploratory factor analysis revealed 6 factors explaining 65.5% of variance in the data. Six items also exhibited weak loadings or cross loadings and were dropped. A second exploratory factor analysis on the 33 items revealed five distinct factors with 4 of the 5 factors each accounting for more than 4% of the variance (DeVellis, 2016) and a fifth factor accounting for just under 4%. These 5 factors characterizing the exceptional qualities of luxury brands were labeled: (1) honorable – 10 items, (2) distinguished – 9 items, (3) influential – 5 items, (4) distinctive – 6 items and 5) magical – 3 items.

In addition to the EFA, DeVellis (2016) advocates examination of inter-item correlations, corrected item-to-total correlation and Cronbach's alpha. Scale length was optimized by deleting items with high inter-item correlations and, therefore, redundant meaning (DeVellis, 2016). This process resulted in the removal of another 8 items. The remaining 25 items were then subject to another EFA which confirmed the five-factor structure: (1) honorable – 7 items, (2) distinguished – 6 items, (3) influential – 5 items, (4) distinctive – 4 items

and (5) magical – 3 items. The 5-factor structure was confirmed using O'Connor's (2000) parallel analysis procedure. The 25-item scale retained reliability, all item-to-item correlations exceeded .50 and all Cronbach's alphas exceeded .70 (DeVellis, 2016). Correlations between composite scores for the 25-item scale and 33-item scale versus 25 items was .92 ($> .90$ recommended by Thomas *et al.*, 2001), confirming that meaning was maintained in the reduced scale. Descriptive statistics and results of the EFA are presented in Table 1.

Stage four: confirm factor structure and test-retest reliability

In Stage Four of the scale development process, we implemented two rounds of data collection using another online sample in the U.S. The goal of collecting data from the same luxury brand consumers at two different times was to determine the temporal stability of the scale as recommended by DeVellis (2016). In the first round of data collection ($N = 254$), a confirmatory factor analysis (CFA) was conducted using structural equation modeling in Mplus 8.8. We also applied ESEM using Mplus and compared the results to CFA to obtain the best fitting measurement model (van Zyl & ten Klooster, 2022). ESEM is an alternative to traditional CFA approaches when evaluating factorial structure and validity and overcomes the need to apply post hoc modifications. In CFA, items are specified to load onto their a priori dimensions, but in ESEM, the items are allowed to be freely estimated (Steenkamp & Maydeu-Olivares, 2022).

TABLE 1 – Rotated component matrix for the final scale – 25 items

	Honorable	Distingui shed	Influential	Distinctive	Magical
This brand is ethical	.793				
This brand is sensitive to changes in the environment	.777				
This brand raises awareness of important environmental issues	.766				
The brand's leaders convey their own personal values	.719				
This brand goes beyond company self-interest	.738				
This brand is honest	.685				
This brand has extraordinary leadership	.691				
This brand is sophisticated		.796			
This brand is charming		.668			
This brand is beautiful		.720			
This brand is classy		.697			
This brand is attractive		.627			
This brand grabs attention		.508			
This brand exudes power			.744		
This brand is assertive			.736		
This brand is powerful and dominant			.699		
This brand is strong			.658		
This brand displays confidence			.597		
This brand is a creator of trends				.734	
This brand is highly talked about by others				.618	
This brand is always generating new ideas for the future				.525	
This brand stands out				.514	
This brand is spellbinding					.754
This brand is mystical					.762
This brand is magical					.710
Cronbach's alpha	.90	.87	.86	.79	.83
% variance	30.06	11.17	6.23	4.87	4.16

ESEM presents several advantages over traditional CFA approaches in that it can simultaneously estimate both CFA and EFA models and estimate less restrictive measurement models that account for cross-loadings. Respondents were again screened to establish if they had purchased a luxury brand in the last 12 months. Of the 604 consumers screened, a total of 333 respondents answered yes. Two hundred and ninety-three responses were received. Of these, 35 brands were identified as non-luxury and were deleted from further analysis. Four respondents also answered the attention check question incorrectly. Product categories and luxury brands identified by respondents were comparable to those identified in Stages Two and Three. Sample characteristics were also consistent with previous stages.

CFA was conducted on the first data collection round and the 5 first-order factors. Recommended rules of thumb for fit indices suggest cutoff values of at least .95 for comparative fit index [*CFI*] and Tucker-Lewis Index (*TLI*) although values around .90 can be acceptable and, at most, .06 for the root mean square error of approximation [*RMSEA*] and .08 for standardized root mean square residual [*SRMR*] (Hu & Bentler, 1999). Fit indices met or came close to the standard criteria χ^2 ($df = 265$, $N = 254$) = 553.062, $p < .001$, $CFI = .94$, $TLI = .93$, $RMSEA = .07$, $SRMR = .05$. An inspection of the modification indices suggested that the inclusion of covariances between two items would improve model fit χ^2 ($df = 263$, $N = 254$) = 498.465, $p < .001$, $CFI = .95$, $TLI = .94$, $RMSEA = .06$, $SRMR = .05$.

We then assessed fit of a first-order reflective, second-order reflective construct. Unlike Semaan *et al.* (2019) who advocated for formative measurement, we operationalized brand charisma as a super-ordinate construct that is manifested by its specific dimensions. The logic underlying a reflective model better fits our conceptualization of brand charisma. The five dimensions are more appropriately considered to be manifestations of brand charisma, rather than formative measures that define it. All items exhibited a significant loading on their designated second order factor. The size of the standardized loadings ranged from .60 to .94 and all *t*-values were greater than 2. There was acceptable model fit: χ^2 ($df = 268$, $N = 254$) = 531.614, $p < .001$, $CFI = .94$, $TLI = .93$, $RMSEA = .06$, $SRMR = .05$.

The one-factor model showed unsatisfactory fit ($CFI = 0.82$, $TLI = 0.80$, $RMSEA = 0.11$ and $SRMR = 0.07$) indicating that common method bias is not a problem for this study. Both the 5 factor first-order model and 5 factor second-order model fit the data well. χ^2 with a higher value theoretically fits worse than the model with lower χ^2 . A χ^2 difference test showed a significant difference in fit between a unidimensional one-factor model which served as the baseline model for our analyses and both the 5-factor first-order model and second-order model ($p < .05$). Following the recommendation of Marsh & Hocevar (1985), first-order factors can be integrated into a higher-order construct if the target coefficient is close to 1. The χ^2 value of the first-order model was divided by that of the second-order model and the value obtained was 0.94, suggesting that the second-order factor structure provided a more parsimonious representation of the data than the first-order model. When comparing models, Cheung & Rensvold (2002) have suggested that a decrease in fit of less than .01 for incremental fit indices such as *CFI*, provides support for the more parsimonious model.

We then compared the results of CFA with those of ESEM. The results indicated that both CFA and ESEM solutions generated acceptable model fit providing evidence concerning the multidimensional structure of brand charisma. If ESEM and CFA models are similar in fit and parameter estimates, the researcher should prefer the more parsimonious CFA model (van Zyl & ten Klooster, 2022). However, results show that the ESEM models outperformed their CFA counterparts as indicated by the better goodness-of-fit measures. Differences in the fit values for the second-order CFA model and second-order ESEM model were above established criterion (Cheung & Rensvold, 2002) (e.g., difference in $CFI \geq .015$).

Convergent validity was demonstrated for all five factors with AVE scores ranging from .55 to .66. To test for discriminant validity, the AVE scores were compared with the squared correlations among constructs (Fornell & Larcker, 1981). All AVEs were higher than .5 and they all exceeded the squared correlation estimate indicating discriminant validity (Fornell & Larcker, 1981). We also used the heterotrait-monotrait ratio of correlations (HTMT). Findings corroborated the existence of discriminant validity using a conservative criterion of .85 (Kline, 2011).

Two weeks after data collection in Stage Four, the same respondents again received the survey for the same luxury brand they had rated previously. Two hundred and seven respondents completed the retest data collection. The reliability score for overall brand charisma was .77 ($p < .01$) and scores for the five charisma dimensions ranged from .70 to .76 suggesting that the scale appeared stable over time.

Stage five: examine nomological validity and model fit

In Stage Five, we recruited another online sample in the U.S. to examine nomological validity. Our review of the extant literature identified brand heritage as an antecedent of brand charisma (Pecot *et al.*, 2019) and brand loyalty as an outcome (Workman & Lee, 2021). We expected brand heritage to be positively associated with brand charisma and greater perceptions of charisma to be associated with increased brand loyalty. Brand heritage is defined as a branded representation of the past, unifying past, present and future timeframes (Pecot *et al.*, 2017) and is instrumental in driving an enduring and constantly favorable brand image (Balmer, 2011). Luxury brands that are infused with heritage should have a positive influence on consumer perceptions of brand charisma which should drive higher levels of brand loyalty. Brand heritage was measured using items adapted from Pecot *et al.* (2019) and brand loyalty was measured using the scale cited by Chaudhuri & Holbrook (2001). Six of the seven items measuring brand heritage loaded together explaining 60.8% of the variance ($\alpha = .87$). All four brand loyalty measures loaded together explaining 68.1% of the variance ($\alpha = .84$). The prescreening survey identified 311 consumers who had purchased a luxury brand in the last 12 months. Two hundred and eighty-six responses were received. Of these, 27 brands were identified as non-luxury brands and three respondents incorrectly answered the attention check question, leaving 256 valid responses. The luxury brands identified by respondents were spread over the same product categories identified in previous stages. Sample characteristics were also comparable.

We again modelled brand charisma as a first-order reflective, second-order reflective construct comprising 5 first order factors. All 5 brand charisma dimensions exhibited an acceptable level of convergent validity and reliability. Fit indices for the CFA model met or came close to the standard criteria χ^2 ($df = 454$, $N = 256$) = 912.091, $p < .001$, $CFI = .89$, $TLI = .87$, $RMSEA = .06$, $SRMR = .07$. The superiority of the ESEM model was again demonstrated χ^2 ($df = 190$, $N = 256$) = 378.118, $p < .001$, $CFI = .93$, $TLI = .89$, $RMSEA = .06$, $SRMR = .04$. Two items measuring brand heritage exhibited loadings between .60 and .70 and were dropped from further analysis following well-established guidelines (Hair *et al.*, 2009). One item measuring brand loyalty was also dropped due a loading below .60. Discriminant validity was established using Fornell & Larcker (1981) and HTMT analysis. Fit indices met or came close to the standard criteria in the structural model χ^2 ($df = 377$, $N = 256$) = 757.495, $p < .001$, $CFI = .90$, $TLI = .88$; $RMSEA = .06$, $SRMR = .06$. The effect of brand heritage on brand charisma was positive and significant ($\beta = .73$, $p < .01$). The effect of brand charisma on customer brand loyalty was also positive and significant ($\beta = .66$, $p < .01$).

Stage six: determine generalizability to the UK

The next stage examined the scale in a new context to determine its generalizability. Following an etic approach to scale development, another online study was conducted in the United Kingdom. Respondents were again asked if they had purchased a luxury brand in the past 12 months. A total of 302 respondents answered yes based on the luxury definition. Two hundred and ninety-five valid responses were received. The luxury brands identified by respondents and sample characteristics were comparable to previous stages.

Following previous data collection rounds in the U.S, we operationalized perceived brand charisma as a first-order reflective, second-order reflective construct. Convergent validity was again demonstrated by $AVE > .50$ (Fornell & Larcker, 1981) and reliability $> .70$ (DeVellis, 2016) for the construct. All items exhibited a significant loading on their designated second-order factor. Discriminant validity was established following Fornell & Larcker (1981), except for the distinctive dimension where the squared correlation with the influential dimension (.71) was higher than the AVE (.50). However, discriminant validity was demonstrated by the more robust HTMT analysis. Fit indices provided good model fit χ^2 ($df = 189$, $N = 295$) = 331.131, $p < .001$, $CFI = .96$, $TLI = .93$, $RMSEA = .05$, $SRMR = .03$). There was also satisfactory model fit for the structural model χ^2 ($df = 377$, $N = 295$) = 702.927, $p < .001$, $CFI = .93$, $TLI = .90$, $RMSEA = .05$, $SRMR = .05$. The effect of brand heritage on perceived brand charisma was positive and significant ($\beta = .61$, $p < .01$). The effect of brand charisma on brand loyalty was also positive and significant ($\beta = .52$, $p < .01$).

Common method bias

From Stage Two onwards, we minimized the risk of common method bias with single-source data, by ensuring that all variables in the questionnaire were randomized and all surveys were anonymous (Akrouf & Mrad, 2023). In addition, we employed a full collinearity approach to assessing common method bias (Kock & Lynn, 2012) and ensuring that the variance inflation factor scores were less than 3.3 so that our data is likely to be free of common method bias.

Conclusions and discussion

Acknowledging that consumers' attributions of brand charisma depend on the observed behavior of the brand, study findings identify a set of behavioral components responsible for such attributions. Following established guidelines for scale development (Churchill, 1979; DeVellis, 2016), we develop and empirically validate a 25-item scale for measuring brand charisma using luxury consumers as the study context. The new scale is operationalized as a higher-order construct and comprises five distinct behavioral attributions: (1) honorable (2) distinguished (3) influential (4) distinctive and (5) magical. Keeping the product categories and brands open to self-selection during the multiple rounds of data collection broadens the theoretical relevance of the scale.

We also illustrate the application of ESEM as an alternative to traditional CFA approaches when evaluating the factorial structure and validity of a scale. The fit indices of the ESEM models in our research suggest a better fit than the corresponding CFA models. Importantly, in the fifth stage of scale development, our brand charisma scale performed in a nomological framework with the construct of brand heritage as an antecedent and brand loyalty as an outcome. This was demonstrated in a U.S. and a U.K. context, suggesting that the scale can be applied to different geographical locations and may be generalizable to wider contexts.

The five underlying dimensions draw insights from both luxury branding and CLT and show a clear amalgamation of these two literature streams. The honorable dimension gauges the extent to which consumers perceive that a brand upholds its ethical and honest principles and is underpinned by sensitivity to environmental changes, strong leaders who convey their personal values and go beyond company self-interest. The luxury industry has witnessed a paradigm shift in recent years with ethicality and sustainability taking center stage. Previous literature on luxury branding has emphasized the importance of ethicality and sustainability as a means of maintaining the brand's prestige and desirability (Osburg *et al.*, 2021). Luxury brands are increasingly under scrutiny for their social and environmental impact and are expected to demonstrate their commitment to ethical and sustainable practices. This includes transparent supply chains and a proactive stance on environmental changes (Amatulli *et al.*, 2021). This dimension also aligns with the principles of CLT which emphasizes the role of leaders in inspiring and influencing their followers.

Charismatic leaders transcend self-interest and embody honesty and authenticity. They convey their personal values and beliefs creating a culture of mutual respect and trust within the organization. Charismatic leaders are not solely driven by organization-interest; they prioritize the well-being and growth of their team members (Conger, 1999).

The Influential dimension measures the extent to which a brand is perceived by consumers as possessing qualities such as power, dominance, strength and confidence. While these attributes are observable to varying degrees across different brands, this dimension exhibits a particularly pronounced intersection with the theoretical framework of charismatic leadership. CLT posits that charismatic leaders are individuals who exhibit a unique blend of qualities that enable them to inspire team members. These leaders are characterized by their willingness to take personal risks in the pursuit of organizational objectives, often displaying unwavering commitment to their vision. Moreover, they exude an aura of remarkable strength, power and self-confidence when making critical decisions (Conger *et al.*, 1997). This charisma allows them to garner the trust, admiration and loyalty of their followers enabling them to attain extraordinary levels of success. In this regard, brands that can project power, dominance, strength and inspire confidence possess a unique and commanding presence within their market. Thus, they elevate themselves assuming an unparalleled influence within the industry. This perception extends to their ability to shape trends, set standards and exercise substantial influence over consumer behavior. In the context of luxury, luxury brands that successfully cultivate an image of influence are often viewed as not only providers of high-quality products or services, but also as aspirational icons and trendsetters within their industry.

The Distinctive dimension converges both brand literature and CLT, as it revolves around the capacity of a brand to foster innovation, stand out prominently within the industry and set trends. Within the luxury industry, brands who consumers perceive as distinctive can differentiate themselves from mainstream luxury brands. These brands are renowned for their proclivity for setting trends that resonate with their consumers. They do not merely follow trends but have the intrinsic ability to shape the landscape of the luxury industry. Distinctive luxury brands have the capacity to introduce novel ideas, aesthetics and experiences that captivate consumers' imagination and foster brand loyalty. This is exemplified by charismatic luxury brands' commitment to craftsmanship, exclusivity and a distinct brand narrative that sets them apart from their mainstream counterparts.

The Distinctive dimension also finds resonance with CLT. Charismatic leaders are often perceived as visionary and inspirational figures who possess an innate ability to generate new ideas and visions for the future. They are seen as pioneers who navigate uncharted territory, seize new opportunities and transcend traditional constraints. Their leadership style is characterized by a magnetic charisma that stimulates their team members to support their vision, instills a sense of purpose and direction within the organization and guides them towards shared goals and objectives (Conger *et al.*, 1997).

The Distinguished dimension encapsulates the brands' level of sophistication, charm and attractiveness while the Magical dimension measures the brand's spell-binding and mystical abilities. These two dimensions, though bearing some resemblance to CLT, predominantly find more relevance within literature on charismatic brands. While charismatic leaders indeed possess charm and the ability to captivate followers (Conger *et al.*, 2000), the distinguished and magical dimensions take on a broader scope when applied to charismatic brands in the luxury sector. These two dimensions encompass elements beyond charm such as elegance, sophistication, beauty, conspicuousness, social status, mysticism and magic. Previous literature shows that luxury brands convey a sense of elevated status and are perceived as symbols of affluence and taste (Han *et al.*, 2010). However, this research demonstrates that brands with distinguished and magical facets possess an inherent allure and an accentuated ability to cast a spell on consumers, creating a deep-rooted fascination that goes beyond conventional notions of luxury such as material wealth and prestige.

Thus, distinguished and magical become indispensable attributes for charismatic brands, as these brands emphasize their ability to mesmerize and enthrall their clientele. They create captivating narratives and immersive experiences through story-telling and enchanting store designs to transport their customers into a world of wonder (Dion & Arnould, 2011).

Acknowledgements

The authors wish to acknowledge the financial support of a Faculty Research Grant (FRG19-M-B53) from the American University of Sharjah, United Arab Emirates.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Idea generation and concept development using ChatGPT – a sample application for fridge/freezer combinations

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Abstract. An interesting application of ChatGPT and other forms of generative artificial intelligence is the user-friendly condensation of large amounts of unstructured data (text. Images, combinations of both) and, based on this, the answering of questions or instructions in the desired format and style using natural language. Consider, for example, customer reviews of a product in an online shop and the manufacturer's question about what customer wishes and needs were expressed and how they should modify the product based on these. We provide an overview of previous and potential applications of this type of generative artificial intelligence in product/service development and, using the example of a home appliance manufacturer, explain how idea generation and concept design can be achieved using ChatGPT. In comparison with the literature, we also discuss the strengths and weaknesses of this application.

Keywords : generative artificial intelligence; ChatGPT; product/service design; online customer reviewa

Introduction

The introduction of the Transformer architecture for neural networks by a research team at Google (Vaswani *et al.*, 2017) has significantly promoted the development of artificial intelligence (Chang *et al.*, 2024): Large language models (LLMs), such as GPT, see OpenAI 2023) and derived chatbots (e.g., ChatGPT, see OpenAI 2024), developed on the basis of this architecture, are now convincing in solving both discriminatory and generative tasks (e.g., answering questions, generating text and images). Chang *et al.* (2024) find that such tools are now convincing when it comes to fluently responding to questions and instructions with correct content and language or summarizing presented collections of text and images in a context-correct manner and deriving desired conclusions, but such tools are still inferior when it comes to capturing inconsistencies and semantic subtleties in texts and images, and, therefore, prone to misinterpretation and sometimes not up to date with the current knowledge required to correctly answer a question or instruction.

In this paper, we discuss possible applications of generative artificial intelligence for idea generation and concept design in product development. In addition to a discussion of previous applications, we present a

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use for idea generation and concept design for refrigerator/freezer combinations and discuss the strengths and weaknesses of such an application. In the following section, we present possible applications in marketing using ChatGPT. Then, we discuss previous applications for idea generation and concept design in product/service development, followed by a concrete application at a home appliance manufacturer. The paper closes with a summary of the strengths/weaknesses of such an application, summary and outlook.

Use of ChatGPT and other forms of generative artificial intelligence in marketing

Generative LLMs and chatbots derived from them, such as ChatGPT (from OpenAI), Ernie (from Baidu), Gemini (from Google), or LLaMa (from Meta), are capable of responding to so-called prompts, as summarized in Table 1. When ChatGPT, the first such chatbot, was made available in December 2022, it sparked great enthusiasm among potential users and investors (Minaee *et al.*, 2024): More than 100 million users in just two months after release, currently more than 3.6 billion accesses per month and enormous investments in ChatGPT and its competitors speak volumes. In addition, these chatbots and the underlying LLMs are continuously being developed with great effort. The first version of ChatGPT published by OpenAI was based on OpenAI's LLM GPT-3, while today's significantly improved version of ChatGPT is based on GPT-4. The very simple (and still largely free) use with high response quality seems to be responsible for this triumph (Deng & Lin 2022). After calling up the chatbot (e.g., via <https://chatgpt.com/>), the user can type or speak a question or instruction, receive an answer and then refine it in the desired direction using so-called prompting, for example, with regard to the content, length, format, style, level of detail and language of the answer.

Table 1 summarizes the most important types and elements of such a prompt. A wide range of targeted interaction options, ranging from simple answers and iterative refinements to complex inputs with data, detailed context and desired output, is immediately apparent. Table 2 shows that uses of ChatGPT in marketing range from relatively simple, yet helpful summarizing tasks (e.g., Bouschery *et al.*, 2023; Jeong & Lee, 2024) and standardized support (e.g., Koc *et al.*, 2023) to replacing customers and experts in surveys (e.g., Guo *et al.*, 2023, Arora *et al.*, 2024, Brand *et al.*, 2024, Sarstedt *et al.*, 2024) up to creative tasks, such as the content design of advertising materials (Sundberg & Holmström, 2024; Tafesse & Wood, 2024). One immediately recognizes the great potential of such support, even supplementing or (partially) replacing work packages previously performed by marketing employees.

TABLE 1 – Types and elements of a prompt when interacting with ChatGPT and other chatbots

Types and elements		Description	Sample
Types	Zero-shot prompts	Simple question or instruction that does not require the provision of context or additional data and information	What do consumers want in a new car?, What are zero- and few-shot prompts?
	Few-shot prompts	Complex question or instruction to which additional context, data and information are provided	Create a suitable advertising campaign for the product described below. Use the following examples as a guide!
Elements	Task	Clearly formulated question or instruction to be answered	Please summarize the customer reviews provided below!
	Context	Background knowledge that guides the content of the answer sought	You are the manufacturer of the product being reviewed and want to know what customers like or dislike about it!
	Data and information	Provided data and information, the evaluation of which makes the answer more specific	Customer reviews of a product provided from online shops or review portals
	Format and style of output	Indication of the format and style in which the answer should be given (e.g., text of a specific length and language, as a table. Image, or a combination)	Please group the strengths and weaknesses identified in the customer reviews and output them sorted by frequency in the form of an Excel spreadsheet!

TABLE 2 – Selected uses of ChatGPT and other chatbots in marketing

Area	Task	Reference
Customer service, complaint management	Automated responses to customer inquiries and complaints, creation of personalized answers	Koc <i>et al.</i> (2023)
Market research and trend analysis	Condensation of customer reviews, product comparisons, overviews Replacing experts in questionnaire development and knowledge provision Replacing traditional surveys with synthetic surveys (silicon samples: the LLM takes on the role of a customer sample, answering questionnaires)	Bouschery <i>et al.</i> (2023), Jeong & Lee (2024) Guo <i>et al.</i> (2023), Sarstedt <i>et al.</i> (2024) Arora <i>et al.</i> (2024) Brand <i>et al.</i> (2024) Sarstedt <i>et al.</i> (2024)
Advertising material design	Creation of product- or service-related advertising materials, campaigns, websites, emails, or campaign guides via prompts	Sundberg & Holmström (2024); Tafesse & Wood (2024)
Idea generation and concept design	Identification of customer needs and trends, conversion into ideas and concepts (see following chapter)	Bouschery <i>et al.</i> (2023), Meincke <i>et al.</i> (2023)

For example, Koc *et al.* (2023) discusses the usefulness of ChatGPT for the automated response to customer inquiries and complaints on TripAdvisor. The authors independently asked responsible hotel management and ChatGPT to answer 30 customer inquiries and complaints posted there. ChatGPT received advanced information on what to look for during processing. The 30 responses from hotel management and ChatGPT were presented anonymously, along with the associated customer reviews, to a total of 40 experts (managers of other hotels, hotel management researchers). They were asked to rate the quality of the processing on 5-point Likert scales regarding degree of reparation, apology, credibility and attentiveness, and perceived distributive and procedural justice. The results showed that the experts perceived ChatGPT's processing as significantly better in terms of attentiveness and reparation (even without the option of monetary compensation), while no significant differences were found for the other dimensions. Koc *et al.* (2023) concluded from their study that ChatGPT is indeed capable of responding to customer reviews with more than sufficient quality. Note that ChatGPT performs different processing even with identical customer reviews. As is common with LLMs, next-word predictions are based on probability distributions of meaningful words.

Tafesse & Wood (2024) investigated ChatGPT's processing of creative tasks in the advertising sector. They collected a total of 357 posts by advertisers in X, each of which suggested an adaptable ChatGPT prompt to facilitate the advertiser's daily work. The collected prompts were then assigned to a total of 19 categories by ChatGPT and an expert to provide advertisers with systematic access to meaningful prompts. The areas identified range from storytelling (e.g., Help me create a compelling brand story for [my product/service] based on the Hero's journey framework) to influencer marketing (e.g., Create a guideline for an influencer marketing strategy for [my product/service], considering the four basic principles of influencer marketing: content, credibility, impact, cost-effectiveness.) to optimizing a company's website (e.g., I'm trying to achieve [the desired result] on my landing page [landing page]. What five compelling calls to action can I use?). The following section will discuss the examples listed in Table 2 for replacing experts or customers in surveys, as well as for idea generation and concept design in product development.

Applications of ChatGPT for idea generation and concept design in product/service development

Product/service development is considered an interesting area of application for generative artificial intelligence in companies, particularly in the early phases involving idea generation and concept design for new products/services (see e.g., Cooper, 2024). The report “The economic potential of generative AI – the next productivity frontier” by McKinsey & Company (2023) states that of the expected productivity gains from generative artificial intelligence, amounting to US\$2.6-4.4 trillion annually worldwide, more than 75%

will be attributable to the four application areas of customer management, marketing and sales, software development and product/service development. The study is based on an evaluation of several other studies and large number of our own case studies from medium-sized and large companies. In this extrapolation, the application area of product/service development was understood primarily to include activities such as product/service-related market research, idea generation and concept design in the early phases, but also prototyping and testing in later phases of product development.

Figure 1, based on Cooper (2024), shows how artificial intelligence can be used during product/service development in the well-known stage-gate system, thus leveraging productivity gains. Stage-gate systems were introduced by Cooper (1990) in the 1980s based on his research into success factors. They describe product/service development as a process in which stages (also: phases) and gates alternate to ensure that only sufficiently tested products/services are launched on the market as a result of product/service development, thus reducing the high costs of potential market failure. In the stages (e.g., idea generation, preliminary analysis, detailed analysis), proven and, if possible, standardized procedures are used. The goal is to capture customer requirements and integrate them into product/service development as best as possible to prevent later rejection, while also being able to assess technical risks by incorporating technical reviews. At the gates, it is controlled whether all checks of the previous stages have been carried out and access to the next stage is only granted if these were successful. A special characteristic of such stage-gate systems is that in the stages from idea generation to commercialization and launch (from left to right in Figure 1).

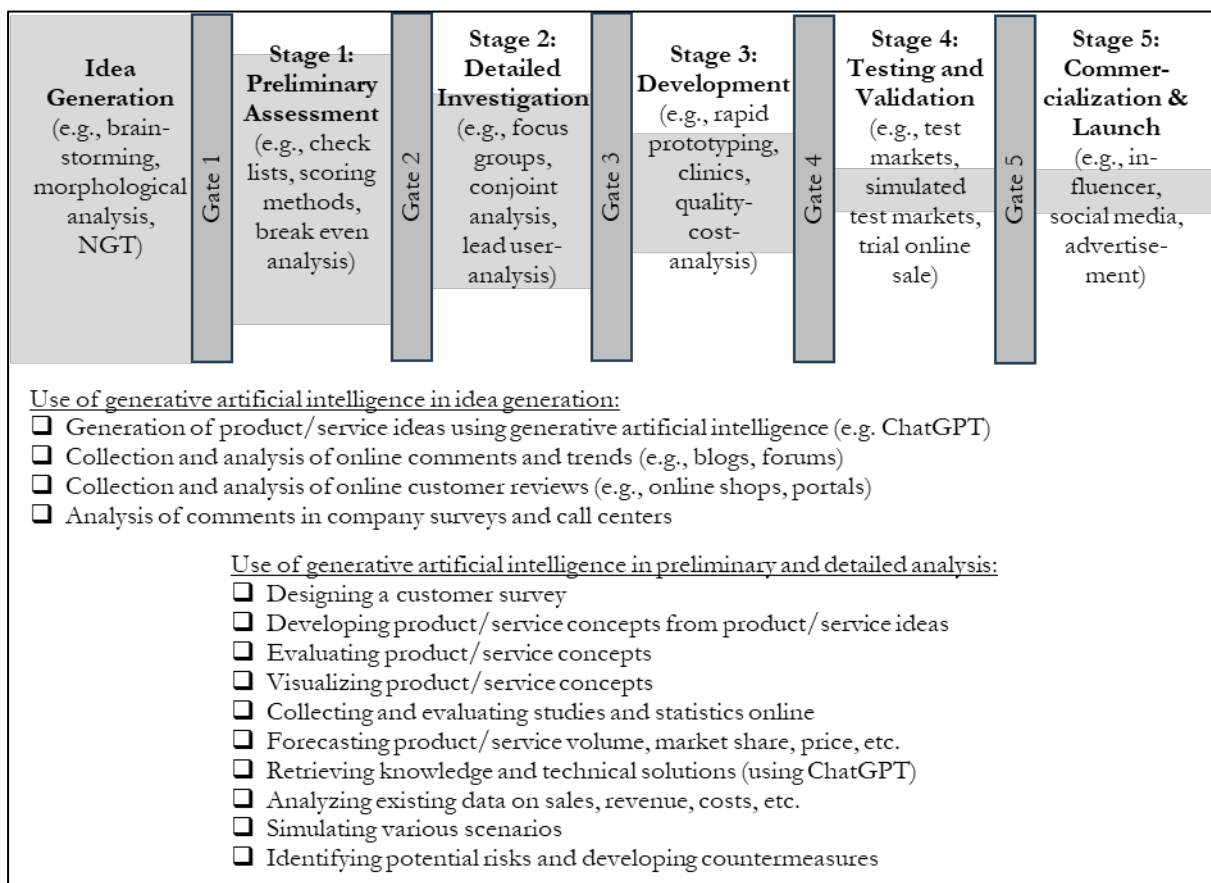


FIGURE 1 – Supporting product/service development in idea generation and concept design through artificial intelligence (based on Cooper 2024)

TABLE 3 – Selected uses of ChatGPT and other chatbots in marketing

Branch	Task	Method	Results	Reference
Equipment for camping	Idea generation and concept development for a new portable battery	Consolidation of assessments, identification of areas for improvement and new solution approaches	ChatGPT helps to condense evaluations and identify areas for improvement	Bouschery <i>et al.</i> (2023)
Furniture (chairs)	Visualization of new furniture concepts	Converting descriptions of new concepts into images with DALL-E	Visualized descriptions facilitate communication and selection	Brisco <i>et al.</i> (2023)
Office supplies	Finding ideas for a new electronic pencil sharpener	Filling a morphological box with functions as parameters	With ChatGPT support (hybrid), more innovative solutions are created than without	Filippi (2023)
No specific branch	Questionnaire development and knowledge provision	Using ChatGPT to develop scales and provide knowledge	ChatGPT provides answers that are rated as particularly helpful in psychology	Guo <i>et al.</i> (2023), Sarstedt <i>et al.</i> (2024)
Dog food	Recording attitudes and willingness-to-buy regarding a new dog food concept	Using GPT-4 to assess attitudes and purchase intentions in a silicon sample vs. traditional survey	Silicon sample delivers similar attitudes and willingness-to-buy values as traditional surveys	Arora <i>et al.</i> (2024)
Retailing	Developing ideas to improve the retail shopping experience	Comparison of brainstorming, Nominal Group Technique (NGT), ChatGPT, hybrid approach	Hybrid approach generates significantly more innovative ideas, followed by ChatGPT and NGT	Bouschery <i>et al.</i> (2024)
Toothpaste, notebooks	Preference analysis and prediction of willingness-to-pay for new products	Use of GPT-3.5 to collect CBC responses vs. traditional CBC survey	Silicon sample provides similar benefits and willingness-to-pay as traditional surveys	Brand <i>et al.</i> (2024)
Hotel	Identification of areas for improvement in hotel service	Consolidation of ratings, finding areas for improvement with ChatGPT	ChatGPT is able to derive valid strengths and weaknesses from evaluations	Jeong & Lee (2024)
Consumer goods for students up to US\$50	Finding ideas for new gifts between students	Idea generation through ChatGPT (zero-, few-shot-Prompt) vs. students	ChatGPT develops particularly innovative and elaborate ideas	Meincke <i>et al.</i> (2023)

Increasingly time and money has to be invested per idea or product/service, but at the same time the number of alternatives examined in a stage is significantly reduced. This makes idea generation activities relatively inexpensive. Traditional creativity techniques such as brainstorming, the Nominal Group Technique (NGT), or the morphological analysis are used. These only incur a very limited amount of time and money per idea, but require a large number of ideas. During later prototyping or even testing, the process is limited to a few alternatives remaining in the process, but these incur considerable costs.

Figure 1 shows that the generative artificial intelligence discussed in the previous chapters can be used very intensively, especially in the early stages (idea generation, preliminary analysis and detailed analysis) and is already being used to a large extent. Table 3 lists well-known and published examples of such applications, which we will refer to repeatedly in the following discussion. The examples by Filippi (2023), Meincke *et al.* (2023) and Bouschery *et al.* (2024) show that ChatGPT is currently being used in idea generation to replace or supplement creativity techniques such as brainstorming, NGT, or the morphological box. With a simple prompt, ChatGPT can be asked to generate ideas for a specified search field (in Table 3, for example, for a

new electronic pencil sharpener, for gifts among students, or for emotional improvements in retail). The ideas documented in these publications are comparable in terms of their number and innovativeness to the ideas that a typical team of 5-7 company employees can generate during a brainstorming session, as expert evaluations have shown. However, two of the three studies also tested a hybrid model in which company employees could use ChatGPT in addition to their brainstorming sessions. It was shown that this hybrid approach led to the best ideas in all studies.

A further improvement in idea generation is also demonstrated with examples in Table 3. If, in addition to the request to generate ideas, ChatGPT also provides customer reviews of the company's existing products from the Internet (or allows ChatGPT to collect these independently via prompts), even better ideas emerge (Bouschery *et al.*, 2023, Jeong & Lee 2024). Table 3 contains another interesting possibility for enhancing idea generation: Guo *et al.* (2023) propose using ChatGPT as an additional (free) expert who can be consulted on trends in technology and market development (with or without independent access to studies on the internet). Guo *et al.* (2023) show in their comprehensive study that the knowledge ChatGPT possesses is considerable and can also be communicated well by the chatbot. When comparing answers given to queries by both human experts and ChatGPT, ChatGPT's answers performed significantly better. They were rated as significantly more helpful by other experts from practice and academia – especially in the social sciences – than those of the interviewed human experts.

According to Figure 1 and Table 3, helpful support can also be expected when designing a concept within the preliminary analysis and detailed analysis stages. For example, Brisco *et al.* (2023) found that DALL-E (a transformer-based text-to-image generator integrated into ChatGPT) is well-suited to create meaningful and realistic images from a description of a product idea or concept, which can then be used in surveys to assess willingness-to-buy and price for various concepts. ChatGPT is also helpful in survey design. Sarstedt *et al.* (2024) pointed out that generative artificial intelligence is very capable of developing a questionnaire and justifying why certain question sequences, content and scales are particularly suitable.

Some authors (Arora *et al.*, 2024, Brand *et al.*, 2024) even go as far as to use ChatGPT to answer these questionnaires. If ChatGPT is prompted to provide answers to a predefined sample, attitudes, willingness to buy and price can be assessed very validly – at least in the opinion of these authors and as demonstrated in their studies – even for highly innovative products. Sarstedt *et al.* (2024) noted some discrepancies in the results in their overview, but it should be noted that there are constant significant methodological advances in the development of LLMs and the chatbots derived from them. In the following section, we will use idea generation and concept design based on customer reviews as an example for a home appliance manufacturer.

Application example: idea generation and concept design at a household appliance manufacturer

Liebherr Hausgeräte GmbH was founded in 1954 in Ochsenhausen, Germany, as part of the family-run Liebherr Group, headquartered in Bulle, Switzerland. Today, it is a globally renowned manufacturer of refrigerators, freezers and wine cabinets for private customers, as well as refrigeration appliances for commercial use. With more than 6,000 employees worldwide and annual sales exceeding €1 billion, it has production facilities in Ochsenhausen, Lienz (Austria), Radinovo (Bulgaria), Kluang (Malaysia) and Aurangabad (India). Liebherr sees itself as a refrigeration specialist for high-quality refrigerators and freezers (www.liebherr.com/de-de/gefrier-kuehlschraenke/qualitaetsversprechen-2451701), with service life and ease of use at the heart of its quality promise. At the main plant in Ochsenhausen, up to 800,000 refrigeration appliances are developed and produced annually, which are sold in roughly equal numbers in Germany and abroad. The appliances can be purchased in Germany in stationary and digital retail stores of partners, e.g., at www.otto.de, www.mediamarkt.de, www.saturn.de, or www.euronics.de. In order to compete with other

household appliance manufacturers, all products and the underlying development process – similar to Figure 1 – are continuously being developed further. Liebherr considered incorporating artificial intelligence into idea generation and concept design early on and has collaborated and continues to collaborate with universities on this topic. The following abbreviated example of a Liebherr refrigerator-freezer combination will demonstrate how ChatGPT can be used for this purpose.

The starting point is a very successful refrigerator/freezer combination in Germany, the KGN 52Vc03 with EasyFresh and NoFrost (<https://www.liebherr.com/de-de/p/cnc-5203-126240-2451427>). This freestanding refrigerator/freezer combination is 185.5 cm high, 59.7 cm wide and 67.5 cm deep, has a refrigerator volume of 227 liter and a freezer volume of 103 liter, and a low operating noise level of 35 dB. The appliance is sold, for example, at www.otto.de in a stainless steel finish as the Liebherr refrigerator/freezer combination KGNefc 1863_091485851. The use of ChatGPT in the example discussed here consists of the following substeps: (1) Familiarizing ChatGPT with the product, including developing a marketing and product concept; (2) collecting and evaluating customer reviews at www.otto.de; (3) improving the product based on the customer reviews. ChatGPT 4o is used, which is available via the ChatGPT Plus license.

(1) Development of a marketing and product concept for the current product

First, ChatGPT is assigned the role of a product management employee at Liebherr Hausgeräte GmbH and asked to describe the current offering of this product at a retailer (www.otto.de). After accessing chatgpt.com, the description available on www.otto.de, including the eight images shown there, is made available by uploading a docx and eight jpg files. Table 4 displays the corresponding instruction as a prompt, along with ChatGPT's response. It can be seen that ChatGPT reproduces the provided text in abbreviated form, but is also able to interpret the content of the eight images (which were provided without descriptive subtitles or text): What can be seen in the images? What advantages of the product can I see in the images?

(2) Collection and evaluation of customer reviews

The fact that ChatGPT can also directly access websites and their content becomes apparent in the next substep. Here, all customer reviews of this product available on www.otto.de are to be collected and evaluated.

(3) Product improvement based on customer reviews

A key advantage is that ChatGPT can be interactively requested to provide recommendations or analyze specific aspects of the customer reviews in more detail (see Table 6). ChatGPT also incorporates information available in its LLM beyond direct input. For example, ChatGPT points out that intelligent technologies, anti-fingerprint coatings and additional interior lighting might be of interest. Furthermore, ChatGPT is always ready to elaborate on the current suggestion or include additional information. Of course, this application only represents a small sample of the potential uses of ChatGPT for idea generation and concept design, as well as its concrete use case within the company. It should be noted here, for example, that ChatGPT can also be supplied with even more internal company information, published studies, e.g., by Stiftung Warentest and the recommendations can be further refined through dialogue. The company also experimented, for example, with whether ChatGPT could support the recommendations with images (prompt, for example: Can you visualize the refrigerator/freezer combination with DALL-E based on these recommendations?). Overall, the product managers at Liebherr determined that the use of ChatGPT offers enormous potential, particularly for trend research and the analysis of large amounts of data. The generative artificial intelligence used provided valuable insights into customer needs and preferences, which can serve as the basis for the development of new products.

TABLE 4 – Description of the current offer by ChatGPT (top: prompt, bottom: answer)

You are a product management employee at Liebherr Hausgeräte GmbH, a manufacturer of refrigeration appliances and are tasked with developing improvement ideas and concepts for the Liebherr refrigerator/freezer combination KGNefc 1863_091485851 to meet customer needs. I have attached a description of this product as it is offered on www.otto.de, along with the eight images of this appliance included in the product offer there. Please describe the offer, including what can be seen in the images.

The Liebherr KGNefc 1863_091485851 refrigerator/freezer combination is a high-quality, freestanding model that stands out with the following features:

Key Features:

1. Usable Capacity:

- Total: 330 liters
- Refrigerator compartment: 227 liters
- Freezer compartment: 103 liters

2. Dimensions:

- Width x Height x Depth: 59.7 x 185.5 x 67.5 cm

3. Features:

- No Frost: Prevents ice crystals from forming, meaning the appliance never needs to be defrosted again.
- LED interior lighting: Provides a clear view of the interior.
- Vario Space: Flexible storage space for larger items.
- Display: Shows the exact internal temperature.

4. Design:

- Stainless steel look
- Modern, sleek appearance

5. Storage:

- Freezer compartment: Three drawers
- Refrigerator compartment: One vegetable drawer, four shelves, three door shelves

6. Energy efficiency:

- Class: C (scale from A to G)
- Operating noise: 35 dB (quiet)

7. Additional information:

- Price: €899.00 (incl. VAT, plus shipping costs)
- 4-year warranty

Image description:

The images show different views of the appliance:

- The elegant stainless-steel design with clean lines.
- The interior of the refrigerator compartment with glass shelves, a wine rack and the sophisticated LED lighting.
- The three freezer drawers in the lower section with transparent fronts.
- Close-ups of the integrated temperature display.
- The spacious interior with practical storage options that can accommodate even larger items.

Conclusion:

The Liebherr KGNefc 1863 refrigerator/freezer offers an ideal combination of functionality, energy efficiency and modern design, perfect for households that value high-quality appliances.

TABLE 5 – Recording customer reviews (top: prompt, bottom: response)

Please retrieve all customer reviews from the websites

- <https://www.otto.de/kundenbewertungen/1662929320/>
- <https://www.otto.de/kundenbewertungen/1662929320/?page=2> and
- <https://www.otto.de/kundenbewertungen/1662929320/?page=3>

and save for each customer review

- the stars awarded (data-rating)
- the title (h3)
- the past days (data-review-age-in-days) and
- the comment (text)

in an Excel file named customer_reviews.xlsx.

Can you summarize them for me? Are they more positive or negative? What is praised, what is criticized?

I extracted the customer reviews from the specified OTTO websites and saved them in an Excel file called customer_reviews.xlsx. The file contains the star ratings, title, number of days since publication and comments for each review. You can download the file here: [customer_reviews.xlsx](#)

Customer reviews for the Liebherr fridge-freezer combination are predominantly positive::

- Total number of reviews: 76
- Positive reviews (4 or 5 stars): 75
- Negative reviews (3 or fewer stars): 1

Positive feedback:

- Customers praise the build quality, especially the durable stainless-steel front
- Accurate fit: the combination often fits perfectly into existing kitchens
- Functionality: features such as No Frost and the LED interior lighting are highly valued
- Efficient delivery: some customers highlight the good delivery service
- Quiet operation: the low operating noise is frequently mentioned as a plus

Negative criticisms:

- The only 3-star review expresses frustration over incorrect product number assignment and the lack of comparison to the advertised appliance.
- Dimensional issues: it's rarely mentioned that the size doesn't fit perfectly with existing cabinets, but this has often been resolved.

Overall, the device receives very positive reviews, particularly for its quality, functionality and modern design. Only a few criticisms relate to individual issues or misunderstandings.

However, there are currently still some challenges to regular use: the fact that ChatGPT, due to the underlying LLM with randomized text completion, generates different texts even with identical prompts and data, takes some getting used to. Furthermore, there are concerns about the originality of the ideas derived from the data analyzed by ChatGPT.

Because the LLM was trained partly on older knowledge, there is a risk that the generated ideas will be a combination or repetition of already known ideas and concepts rather than triggering truly original and groundbreaking innovations. This is particularly problematic for a company that relies on a high-quality promise through innovative solutions. There were also concerns within the company regarding data protection (of customer data, of internal company data, if provided). It is possible to specify in the settings that one does not wish to share or store data, but the extent to which these specifications are then adhered to is largely unclear.

TABLE 6 – Product improvement based on customer reviews (top: prompt, bottom: response)

If a successor model is to be built, what should Liebherr pay particular attention to?

Based on customer reviews and feedback, there are several important aspects that Liebherr should consider when developing a successor model:

1. Build on strengths:

- No Frost technology: this feature is perceived as particularly positive and should be retained
- Quiet operation: the low noise level is a major plus and should be retained
- Stainless steel design: the easy-care, robust front panel impresses customers and should continue to be used
- Flexible interior design: the VarioSpace function and removable shelves are well received and offer adaptability

2. Potential for optimization:

- Size variety: some customers mentioned that it is difficult to find an appliance that fits their kitchen. An expanded model range with different heights and depths could solve this
- More precise product information: there has been criticism about potential confusion regarding model numbers. Clear and consistent communication of product features would be helpful
- Additional color options: in addition to stainless steel, additional color options such as black or white could appeal to more customers

3. New Features:

- Intelligent technologies: integration of smart functions, such as Wi-Fi control or a temperature monitoring a
- Energy efficiency: an upgrade to the highest efficiency classes (e.g., A) would increase environmental friendliness and customer appeal
- Anti-fingerprint coating: to further facilitate cleaning of the front panel
- Additional interior lighting: even more light sources for better visibility inside the appliance

Conclusion: Liebherr should maintain the existing product quality and popular features, but complement them with new technologies, flexible size options and clearer communication. This would make the successor model more attractive to a broader target audience and delight existing fans

TABLE 7 – Strengths and weaknesses of using ChatGPT for idea generation and concept design

Strengths: ChatGPT ...	Weaknesses: ChatGPT ...
... can generate many useful ideas in a short time (Meinke <i>et al.</i> , 2023); a hybrid application leads to highly innovative solutions (Filippi, 2023, Bouschery <i>et al.</i> , 2024).	... is based on training data from which misjudgments and – ethically questionable – discrimination are increasingly incorporated into the LLM (Ali <i>et al.</i> , 2023, Bahrini <i>et al.</i> , 2023, Rane, 2023, Tekic & Füller, 2023).
... can comprehensively collect and analyze data and information on the Internet (Filippi, 2023, Guyt <i>et al.</i> , 2024, Jeong & Lee 2024).	... it remains unclear in many places to what extent data protection and confidentiality of customer and company data are ensured (Bahrini <i>et al.</i> , 2023, Paul <i>et al.</i> , 2023).
... can particularly evaluate unstructured customer feedback (e.g., user-generated content on the Internet with text. Images) (Shahin <i>et al.</i> , 2024, Baier <i>et al.</i> , 2025a,b)	... in the medium term. Its use could lead to creative tasks being increasingly delegated to machines, leaving these human skills untrained (Bahrini <i>et al.</i> , 2023, Paul <i>et al.</i> , 2023).
... can analyze customer feedback virtually in real time and derive suggestions for improvement (George & George, 2023, Rane <i>et al.</i> , 2023) or increase satisfaction by developing personalization ideas (Paul <i>et al.</i> , 2023).	... is trained for probable word completion – not for understanding what is generated – and is therefore prone to errors and misinterpretations, as well as hallucinations (Bahrini <i>et al.</i> , 2023).
... can at least partially replace customer feedback and surveys with synthetic generation (Arora <i>et al.</i> , 2024, Brand <i>et al.</i> , 2024, Sarstedt <i>et al.</i> , 2024).	... is not up to date with the knowledge required to correctly answer a question or follow instructions if training has taken place some time ago (Chang <i>et al.</i> , 2024).
... can integrate expert knowledge into product development (Guo <i>et al.</i> , 2023, Sarstedt <i>et al.</i> , 2024).	... can lead to acceptance problems within the company, as the authenticity and credibility of the idea generator are often crucial, especially when generating ideas and developing concepts (Ali <i>et al.</i> , 2023).
... can develop ideas and concepts for use in market research and advertising in words and images that are appropriate for the target group (Brisco <i>et al.</i> , 2023).	

Liebherr Hausgeräte is therefore initially using generative artificial intelligence primarily in test environments where employees are familiarized with the new technology. The medium-term goal is a hybrid model in which artificial intelligence supports product development, while Liebherr employees, with their specialist expertise, continue to act as the most important control authority.

Strengths and weaknesses of using ChatGPT for idea generation and concept design

This chapter discusses the strengths and weaknesses of using ChatGPT in product/service development, as discussed in the literature, along with the experiences gained from its use in the sample companies (Liebherr and others). Table 7 summarizes the strengths and weaknesses identified. The table demonstrates that using ChatGPT certainly has the potential to increase productivity. Its use, particularly in conjunction with employees in a hybrid approach, can solve simple tasks more quickly and effectively (e.g., collecting and evaluating customer feedback, literature, or online studies), but can also support the processing of more difficult tasks, such as generating and selecting ideas and concepts, or even replacing traditional market research. While there is certainly still a need for further research, especially on these difficult tasks, current experience is already very positive.

One should not ignore the weaknesses observed in the literature as well as in one's own application. For example, every LLM (including the GPT underlying ChatGPT) is based on training data that predetermines its ability to generate new texts and images. This was clearly evident in the refrigerator example, where, despite providing comprehensive instructions and sample images, ChatGPT or DALL-E failed to deviate from its basic concept of an American, extra-wide, refrigerator. A similar observation will certainly be observed when ChatGPT is used in market research: the preferences and desires implicitly contained in its training data will be modifiable only to a limited extent, even with new contexts, questions and instructions. For highly innovative companies, it is certainly also a problem that data and questions are transmitted to ChatGPT via the Internet; an assurance that data will not be saved is of only limited help here.

Conclusions and outlook

This article discusses a highly interesting application area of generative artificial intelligence based on a literature review and a personal application. It is impressive how quickly the marketing environment has already changed due to these new possibilities and will certainly continue to do so in the future. The enormous productivity gains predicted by McKinsey & Company (2023), especially in product/service-related research and development, will certainly not all be realized, but they do provide an interesting foretaste of the enormous disruptions to come.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Understanding consumers' purchasing behaviour when buying counterfeit luxury fashion items with a focus on online availability and social networks

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Abstract. This study examines the motivational factors that influence the purchasing behaviour of consumers regarding counterfeit luxury fashion items, with a focus on online availability and social networks. A systematic literature review was conducted including the Theory of planned behaviour, the Theory of Reasoned Action (TRA) and Perceived risk in consumer behaviour theory as a theoretical foundation. The empirical data was collected via an online questionnaire ($N = 173$), 5-point Likert scale in May 2024. People aged 18 and over, resident in Austria, were surveyed using quota sampling (age, gender). The data was analysed using descriptive statistics, correlation analysis and hypothesis testing to identify key trends and influencing factors, using SPSS. The results of the empirical study show that the price advantage was the strongest purchase motivation, rated significantly higher than product quality. A strong identification with a brand (lifestyle, values) correlated significantly with the number of purchased counterfeit luxury items. People who perceive less social stigmatization and low legal risk tend to be more willing to buy counterfeit luxury fashion items. The online availability of counterfeit items makes it easier for consumers to purchase them. On social networks, it is easier for consumers to justify the purchase of counterfeits, especially if the seller profile conveys a trustworthy image through many likes and positive comments. Social validation through likes and comments increases the perceived value and trustworthiness of sellers, peer influence increases the acceptance and normalization of buying counterfeit products.

Keywords : counterfeit products; consumer behaviour; luxury fashion; social networks; online availability

Introduction

The increasing prevalence of counterfeit luxury goods represents a significant challenge for businesses, regulatory authorities and consumers worldwide. The global market for counterfeit products continues to grow, driven by advances in digital commerce and changing consumer attitudes (OECD & European Union Intellectual Property Office, 2019). Counterfeit fashion products, particularly those mimicking high-end brands, are widely available through multiple channels, including e-commerce platforms, social media marketplaces and dedicated counterfeit-selling websites. This proliferation creates challenges not only for luxury brands but also for governments attempting to curb intellectual property violations and protect

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consumer interests. Product piracy violates intellectual property rights such as trademarks, copyrights and patents. It can lead to significant economic, health and legal consequences for consumers, companies and society. In a globalizing world, the protection of intellectual property plays a decisive role. Accordingly, companies have a strong interest in combating product piracy, as it causes considerable economic damage (Garas *et al.*, 2023; Iyer *et al.*, 2022).

In Europe, the issue of counterfeit luxury fashion has gained increasing relevance. As online platforms lower the barriers to accessing counterfeit products, the motivations behind consumer engagement with fake luxury items have evolved. Previous research has identified economic, social and psychological factors influencing counterfeit consumption (Staake *et al.*, 2009; Penz & Stöttinger, 2012). The Internet has made it much easier to obtain counterfeit products and offers consumers a convenient way to order items without physical restrictions. A product piracy study shows that 28% of all respondents in Germany use the internet to buy counterfeit products (EY, 2022). The main risk is that sellers manipulate online advertising services by linking their criminal activities to brands and place ads on legitimate websites or social media platforms to drive commerce to websites or online marketplaces offering their counterfeit products (BMF, 2023).

This study aims to bridge that gap by investigating how online accessibility affects purchasing decisions and identifying key motivational drivers behind consumer engagement with counterfeit goods. It examines the motivational factors that influence the purchasing behaviour of consumers regarding counterfeit luxury fashion items, with a focus on online availability and social networks. Understanding these dynamics is essential for developing effective anti-counterfeiting measures. Improving consumer awareness and strengthening brand protection strategies.

Methodology

The research was guided by the following key questions: What motives influence consumers' purchasing behaviour when buying counterfeit luxury fashion items? and How do online availability of counterfeit products and social networks affect this behaviour?. First, a systematic literature review was conducted including the Theory of planned behaviour, the Theory of Reasoned Action (TRA) and Perceived risk in consumer behaviour theory as a theoretical foundation.

Theory of Planned Behavior (TPB), developed by Ajzen (1991), posits that an individual's behaviour is driven by their intention to perform the behaviour, which is. In turn. Influenced by their attitude towards the behaviour, subjective norms and perceived behavioural control. In the context of counterfeit purchases, consumers' positive attitudes (e.g., cost savings, brand association), social pressures (e.g., peer influence, desire to fit in) and the ease of purchasing online (low perceived control or risk) all contribute to their behavioural intentions.

The Theory of Reasoned Action (TRA) assumes that a consumer's behavioural intention is determined primarily by their attitude toward the behaviour and the subjective norms surrounding it (Fishbein & Ajzen, 1975). In the context of counterfeit luxury fashion items, consumers develop positive or negative evaluations of purchasing counterfeit products based on perceived benefits, such as cost savings and the allure of owning a symbolically valuable item, even if it is not authentic. For instance, when consumers view the lower price as a significant advantage, this positive attitude increases their behavioural intention toward making the purchase (attitudinal factors). The influence of peers, family and social media plays a critical role. If an individual perceives that their social group accepts or even encourages the acquisition of counterfeit goods, this normative pressure strengthens their intention to engage in such behaviour. For many consumers, especially younger ones, the approval or disapproval of significant others can substantially affect their decision to buy counterfeit products (subjective norms).

Perceived risk is another crucial dimension extensively discussed in this study. It refers to the consumer's subjective evaluation of the potential negative consequences associated with a purchase decision. In the case of counterfeit luxury fashion items, the study identifies several risk components that impact consumer behaviour (Mitchell, 1992):

- **Functional Risk:** Concerns about the quality and performance of counterfeit products. Consumers may worry that the lower price comes at the cost of durability or design integrity.
- **Financial Risk:** The possibility of wasting money on a product that does not meet expectations. Despite a lower price, the risk of poor performance can deter some buyers.
- **Legal and Ethical Risk:** The awareness of possible legal repercussions, as well as ethical considerations regarding the support of illicit trade. However, the thesis notes that for many consumers, these risks are often minimized or rationalized, particularly when weighed against the potential benefits.
- **Social Risk:** The potential for social stigma if the counterfeit nature of the product is revealed, which can affect the consumer's social image. In some contexts, the social risk is mitigated by the normalization of counterfeit purchases within certain peer groups or online communities.

While perceived risk generally functions as a deterrent in consumer behaviour models. In the domain of counterfeit luxury goods, these risks are frequently downplayed by consumers. This occurs due to factors like the high value placed on cost savings, the normalization of counterfeiting in digital environments and the mitigating influence of positive online reviews and social endorsements.

By combining the insights from TRA with the concept of perceived risk, the theoretical framework provides a richer understanding of counterfeit consumption behaviour. It suggests that Behavioral Intentions are shaped not only by cost and convenience but also by a complex interplay between favorable attitudes (enhanced by TRA) and the mitigation of perceived risks. When consumers view the benefits as outweighing the potential negatives, their intention to purchase counterfeit goods increases. Social Influences and Norms play a dual role by both positively reinforcing the purchase decision through social acceptance (TRA) and reducing the impact of perceived risks through a collective minimization of potential drawbacks. Consumer Rationalization often involves discounting risks (both financial and legal) when the allure of a lower price and the perceived prestige of the associated brand are strong motivators.

Research design and sample

To empirically assess the hypotheses derived from the literature review, a quantitative survey was conducted among Austrian consumers. An online questionnaire was distributed via social media and email lists, targeting individuals aged 18 and above (5-point Likert scale. In May 2024). The survey included both closed- and open-ended questions to capture consumer attitudes, motivations and behaviours. A total of 173 respondents completed the survey. The collected data were analysed using descriptive statistics, correlation analysis and hypothesis testing. Women comprised 50.87% of the sample, men accounted for 49.13%. This distribution closely reflects the overall gender ratio in Austria. Concerning the age groups the group of 25 to under 30-year-olds has the highest participation (15.61%). Participation slightly decreases in the higher age groups, with individuals over 65 constituting only 0.58% of the sample. The average age of the respondents was 40.28 years.

The survey further shows that the most common highest educational attainment among participants is the high school leaving certificate (30.06%), followed by individuals with a bachelor's degree (26.01%), participants with a master's degree (16.76%), vocational qualification (15.03%). Respondents who completed compulsory school account for 8.09% and doctoral candidates (3.47%). The largest group of respondents, 41.04%, have a net monthly income between 1,500 and 2,500 Euros. This is followed by

TABLE 1 – Hypotheses results

H1: Men in Austria are more likely to purchase counterfeit luxury fashion items than women.	confirmed $p < .001$, $d = 0.97$
H2: Financial factors play a larger role in the purchase of counterfeit luxury fashion items than quality.	confirmed $p < .001$
H3: Identification with certain lifestyles or values conveyed by brands increases the willingness to purchase counterfeit luxury fashion items.	confirmed $r = .44$, $p < .001$
H4: The lower the social stigma associated with the purchase of counterfeit luxury fashion items, the higher the consumers' willingness to buy.	confirmed $r = .38$, $p < .001$
H5: The lower the perceived likelihood of prosecution for counterfeit luxury fashion items, the higher the willingness to purchase.	confirmed $r = .30$, $p < .001$
H6: The greater the online availability of counterfeit luxury fashion items, the higher the willingness to purchase those items.	confirmed $r = .41$, $p < .001$
H7: Consumers under 30 years of age purchase fake products online more frequently than individuals over 30.	rejected $p < .05$
H8: Products with a high number of positive reviews on social media increase the willingness to purchase counterfeit luxury fashion items.	confirmed $r = .40$

25.43% of respondents who earn between 2,500 and 3,500 Euros per month net. Next are participants earning between 3,500- and 5,000-Euros net, accounting for 15.61% of the sample. The lowest income, ranging from 0 to 1,500 Euros net, comprises 11.56% of respondents, while the smallest group, with only 6.36%, has a net income exceeding 5,000 Euros. The study employed the Wilcoxon test to compare ranked motivational factors and conducted regression analysis and correlation analysis to determine the relationship between online availability and counterfeit purchase likelihood.

Results

The results of the empirical study show that the price advantage was the strongest purchase motivation, rated significantly higher than product quality. A strong identification with a brand (lifestyle, values) correlated significantly with the number of purchased counterfeit luxury items. People who perceive less social stigmatization and low legal risk tend to be more willing to buy counterfeit luxury fashion items. As for price sensitivity, the most significant motivation for purchasing counterfeit luxury items was the price advantage, with 53.18% of respondents stating that they preferred counterfeits due to their affordability. Regarding perceived legal risk, a significant negative correlation was found between the perceived risk of legal prosecution and purchase intent ($r = -0.30$, $p < .001$). Indicating that stronger enforcement could deter counterfeit purchases. The online availability of counterfeit items makes it easier for consumers to purchase them. The hypothesis that consumers under the age of 30 buy counterfeit items online more frequently than people over 30 could not be confirmed. On social networks. It is easier for consumers to justify the purchase of counterfeits, especially if the seller profile conveys a trustworthy image through many likes and positive comments. Social validation through likes and comments increases the perceived value and trustworthiness of sellers, peer influence increases the acceptance and normalization of buying counterfeit products. The ease of online access positively correlated with purchasing behavior ($r = .41$, $p < .001$), suggesting that digital platforms play a crucial role in counterfeit consumption. As for social media influence, 40% of respondents relied on online reviews and influencer endorsements when purchasing counterfeit goods ($r = 0.40$, $p < .001$), emphasizing the role of digital communities in shaping consumer trust. Contrary to expectations, younger consumers did not show a significantly higher propensity to purchase counterfeits online ($p < .05$), challenging the assumption that digital-native generations are the primary buyers of counterfeits.

The empirical findings collectively indicate that the purchase of counterfeit luxury fashion items is driven by a complex interplay of factors. The dominant influence of price and financial considerations suggests that many consumers are motivated primarily by cost-saving. However, the symbolic value associated with luxury brands, reflected in consumers' desire to align with lifestyles and social images, also plays a significant role. Furthermore, digital factors, such as online availability and the impact of social media reviews, are crucial in shaping purchase behaviour, while perceived legal risks and social stigma can moderate these tendencies.

Conclusions and discussion

In the study, the motives behind the purchasing behaviour of consumers regarding counterfeit luxury fashion items were investigated. In particular, the study examined how the increasing online availability of these counterfeit products influences consumer behaviour. A multitude of influencing factors can be divided into cultural, social, personal and psychological aspects. The purchasing behaviour for luxury fashion items is determined by a complex interplay of internal and external influences, with the needs for individual self-fulfilment and social recognition playing central roles.

The evaluations of the quantitative survey show that there are various motives that can influence purchasing behaviour with respect to counterfeit luxury fashion items. Many consumers decide to purchase counterfeit luxury fashion items because they are available at a fraction of the price of the original products. This financial aspect is particularly strong, as luxury fashion items are often associated with high costs that are unaffordable for many consumers. Another significant factor is social acceptance and the pursuit of a specific image. Counterfeit luxury fashion items enable buyers to maintain the appearance of wealth and fashionable style without having to bear the high costs of genuine luxury items. The survey results indicate that identification with certain lifestyles or values conveyed by brands increases the willingness to purchase counterfeit luxury fashion items.

Individuals who perceive less social stigma are generally more willing to buy counterfeit luxury fashion items. This observation is supported by existing findings that demonstrate that the perception of social acceptance plays a decisive role in consumption behaviour. In societies where the purchase of counterfeit luxury fashion items is less stigmatized, consumers feel more encouraged to acquire such products. Furthermore, the empirical results illustrate that respondents who expect minimal legal consequences for purchasing counterfeit luxury fashion items tend to acquire a higher number of such items. This finding is supported by studies indicating that low levels of prosecution for private individuals are often used to justify the purchase of counterfeit products (Thaichon & Quach, 2016, 85–86). Furthermore, the relatively low concern regarding legal consequences suggests that awareness campaigns could be an effective deterrent. Previous research has shown that ethical considerations influence purchasing behaviour and informing consumers about the broader economic and social impact of counterfeits may reduce demand (Buchanan *et al.*, 2018).

The strong correlation between online availability and counterfeit purchases suggests that stricter enforcement on e-commerce platforms could mitigate the spread of counterfeit goods. Social media also creates an environment in which social validation through likes and comments increases the perceived value and trustworthiness of sellers and their offerings. This empirical observation underlines the importance of social networks as an influencing factor on purchasing behaviour. Individuals who actively use social media and trust the reviews on these platforms tend to make their purchasing decisions based on this social validation. Several brands have already implemented AI-driven detection tools to identify counterfeit listings, but further cooperation with policymakers is required (Staake *et al.*, 2009).

Overall, the results of the quantitative survey demonstrate that price. Identification with certain lifestyles or values of the original brands, online availability and the role of social media are central factors that significantly influence purchasing behaviour with respect to counterfeit luxury fashion items. The low price makes counterfeit luxury fashion items particularly attractive for consumers who wish to avoid the financial burden of genuine products. The easy and convenient availability of these products online lowers the threshold for purchase. Finally, social media, through likes, comments and reviews, reinforces consumers' trust in the providers of counterfeit items and directly influences their purchasing decisions.

These findings align with existing literature on counterfeit consumption but also present new insights into consumer behaviour. Price remains the dominant driver, as previously observed in international studies (Bian *et al.*, 2016). However, the role of social media as an enabler of counterfeit trade highlights a growing concern for brand owners and regulators (Eisend, 2008). In summary, this study shows that price. Identification with certain lifestyles or values of the original brands, online availability and the role of social media are key factors that influence purchasing behaviour of counterfeit luxury fashion items. Social networks reinforce people's trust in the suppliers of counterfeit items through likes, comments and ratings, thus directly influencing purchasing behaviour.

Managerial implications

From a managerial perspective, the findings of this study suggest several implications. First, the confirmation that financial considerations outweigh quality concerns indicates a need for brands to re-evaluate their pricing strategies. Offering a wider range of products at lower price points may capture price-sensitive consumers who might otherwise turn to counterfeit alternatives. Moreover, the significant role of lifestyle identification implies that luxury brands can further strengthen their appeal by aligning their marketing efforts with aspirational lifestyles and values. Engaging in storytelling and brand experiences that resonate with consumers' self-concepts can reduce the allure of counterfeit products.

The rejection of the hypothesis regarding age differences suggests that online counterfeit consumption is not exclusively a younger phenomenon. Thus, strategies should not solely target younger demographics but also consider broader consumer segments that engage in digital shopping. Since a lower perceived social stigma increases the likelihood of counterfeit purchases, brands should work to protect and reinforce the exclusivity and authenticity of their products. Educational campaigns that highlight the negative consequences of counterfeiting on brand heritage and consumer safety could help restore a higher level of social disapproval for counterfeit consumption. Given the impact of perceived legal risk, policymakers and industry stakeholders need to improve public awareness about the legal and ethical ramifications of purchasing counterfeit goods. Stricter enforcement of intellectual property laws, combined with consumer education initiatives, could raise the perceived risks associated with counterfeiting.

Finally, the strong influence of online availability and social media reviews calls for a robust digital strategy. Luxury brands should invest in advanced monitoring systems on digital platforms to identify and remove counterfeit listings. Furthermore, collaboration with online marketplaces to enforce stricter seller verification processes and authenticity checks can mitigate the proliferation of fake products.

Limitations and future research

This study has certain limitations that should be acknowledged: The sample size of 173 respondents, while sufficient for preliminary analysis, may not fully capture the diversity of Austrian consumer behaviour. Moreover, the study primarily relies on self-reported data, which may be subject to social desirability bias. Although validated scales were used to assess variables such as risk perception, social influence and brand identification, some constructs may have inherent measurement errors. The subjective nature of terms like social stigma and online availability might lead to variations in interpretation among respondents. In

addition, the focus on Austrian consumers provides a context-specific analysis that may not be applicable to other countries or cultures. Factors influencing counterfeit consumption could differ significantly in markets with varying economic conditions, cultural norms and regulatory environments. While the study includes empirical results from quantitative data, the lack of an extensive qualitative component limits the depth of understanding regarding the underlying motivations and psychological factors. Future research incorporating more in-depth interviews or focus groups could enrich the findings.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Zero waste: are retailers and consumers on the same page?

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Abstract. Working towards the United Nations (UN) sustainable development goals (SDGs) is crucial from an environmental, economic and social perspective. The concept of zero waste addresses several SDGs, particularly SDG 12, responsible production and consumption. Zero waste refers to the application of 5R behaviors (refuse, reduce, reuse, recycle and rot) to minimize environmental impact and waste, whether by producers, consumers, or other supply chain members such as retailers. Retailers, in particular, can reap great benefits from engaging in zero waste behaviors themselves and encouraging these behaviors among consumers. They are also ideally positioned to do so. However, the role of retailers in promoting zero waste behaviors among consumers is still poorly understood. Specifically, understanding retailers' approach to zero waste and whether this aligns with consumers' zero waste behaviors could provide a sense of synergy that encourages zero waste behaviors more effectively. To this end, the purpose of this study was first to explore how retailers approach the 5Rs of zero waste behaviors and second to determine whether this aligns with South African consumers' engagement in the 5Rs of zero waste behaviors. This study used a mixed methods approach. Qualitative data were obtained from the annual sustainability reports of three leading South African retailers and analyzed using NVivo. Quantitative data were obtained from a convenience sample of 486 South Africans which was subjected to pairwise comparisons using the AHP technique. The results showed a misalignment between South African retailers' engagement in the 5Rs and that of consumers.

Keywords : zero waste; zero waste retailing; green retailing; sustainable development goals; analytical hierarchy process

Introduction

Consumers are becoming increasingly aware of the negative impact of consumption decisions on the environment (de Wilde & Parry, 2022). This has prompted a growing demand for sustainable alternatives and given rise to the zero-waste concept (Bogusz *et al.*, 2023). Zero waste (ZW) refers to the conservation of all resources by means of responsible production, consumption, reuse and recovery of products, packaging and materials without burning and with no discharges to land, water, or air that threaten the environment or human health (Zero Waste International Alliance, 2018) and applies to municipalities, manufacturers, businesses, communities and consumers (Zaman, 2022). For consumers, ZW means limiting

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environmentally harmful consumption behaviors (de Wilde & Parry, 2022), minimizing waste during the consumption process and responsibly managing post-consumption waste (Zaman, 2022; Martins Felix *et al.*, 2024) by engaging in the '5Rs', namely, to refuse, reduce, reuse, recycle and rot (Johnson, 2013). These five sets of behaviors guide consumers in their everyday consumption and waste management decisions, encouraging them to *refuse* what you do not need; *reduce* what you do need; *reuse* what you consume, *recycle* what you cannot refuse, reduce, or reuse; and *rot* (compost) the rest to achieve ZW (Johnson, 2013).

Encouraging ZW behavior among members of the supply chain, including producers, retailers and consumers, has multiple economic, environmental and social benefits (Nangia *et al.*, 2024). Embracing ZW can stimulate new business opportunities (Zaman, 2022), aid manufacturers and retailers in increasing profits, promote a positive brand image (Jere *et al.*, 2021) and benefit consumers in terms of increased spending power and prosperity (Pietzsch *et al.*, 2017). However, ZW behavior is a challenging task that requires the collaboration of all members of the supply chain, including producers, consumers and retailers (Zaman, 2022).

Retailers are key to influencing consumer behavior and achieving more sustainable production and consumption practices (Naidoo & Gasparator, 2023). They represent intermediaries between product manufacturers and consumers, making them ideally positioned to influence change along the supply chain, whether an upstream influence on production processes or a downstream influence on consumer behaviors (Haywood *et al.*, 2021; Jere *et al.*, 2021). Not only do retailers have the power to affect change, but they also benefit greatly from doing so. Currently, South African retailers face multiple challenges, such as poor economic growth, reduced profits. Increasing global competition, changing regulations (Ndiweni *et al.*, 2024) and negative consumer sentiment due to retailers' lack of environmental efforts (Singh *et al.*, 2023). Proactively addressing sustainability, such as promoting ZW behavior, can help retailers improve consumer sentiment, build emotional connections and trust with their consumers (Singh *et al.*, 2023) and create a competitive advantage (Malander Advisory, 2024). Many South Africans are willing to pay more for sustainably produced and sourced goods (Ndiweni *et al.*, 2024) and switch retailers to bring about positive environmental changes (Naidoo & Gasparatos, 2023). Ultimately, consumers are becoming increasingly aware of retailers' environmental responsibility (Singh *et al.*, 2023) and demand that they operate more sustainably, provide more sustainable product alternatives and use more environmentally friendly packaging. Consumers expect businesses, such as retailers, to take the lead in promoting sustainability, such as ZW behaviors (Ndiweni *et al.*, 2024) & to disclose their sustainability initiatives (Haywood *et al.*, 2021).

Given retailers' unique positioning and influence on both producers and consumers, they can help promote ZW behavior by making a range of strategic and operational decisions. These may include selecting sustainable suppliers who develop environmentally friendly products and packaging and communicating these decisions to consumers. For example, many consumers recycle their plastic waste and look for products with recyclable packaging. Providing a recycling possibility for product packaging can require the retailer to select their suppliers carefully, but also to promote consumers' purchase of these recyclable packaged products through marketing efforts. Furthermore, retailers can facilitate recycling by offering in-store reverse-vending machines or similar recycling drop-off initiatives. This is just one example of how aligning retailers' operational and marketing efforts with consumers' ZW behavior could provide a sense of synergy that encourages ZW behavior adoption.

Practically. It is evident that encouraging ZW behaviors among consumers contributes to SDGs and is thus environmentally, economically and socially beneficial (Nangia *et al.*, 2024), particularly for retailers (Singh *et al.*, 2023; Naidoo & Gasparatos, 2023). Furthermore, as a developing country, South Africa lags in sustainability issues (Hoosain *et al.*, 2023). This society is characterized by consumer groups who engage in

sustainable behaviors, such as ZW behaviors, to different extents (Szejda *et al.*, 2021). This means that as a country. It does not exploit all the benefits associated with ZW behaviors.

The ZW concept addresses several of the United Nations' (UNs) Sustainable Development Goals (SDGs) (UN, 2023), particularly SDG 12, the need for responsible production and consumption (Henriques *et al.*, 2023). Theoretically, Investigating ZW behaviors and encouraging them is beneficial. Recent studies have investigated the application of ZW principles in the production of food (Nenciu *et al.*, 2022), textiles, electronics (Al-Sanea, 2024) and fast-moving consumer goods (FMCG) (Nwabekee *et al.*, 2024). Among consumers, the adoption of ZW behaviors (Botha & Wiese, 2024; Kolli & Goala, 2023; Mustafa *et al.*, 2023) and ZW products (Abumalloh *et al.*, 2024; Huda *et al.*, 2023; Prakash *et al.*, 2024) have also been increasingly investigated. Previous studies have also investigated the application of ZW principles in supply chains (Nassani *et al.*, 2023; Liu *et al.*, 2024), ZW retail stores (Setiawan & Rizkalla, 2023; Prelikova *et al.*, 2022) and retailers' implementation of food waste reduction (Riesenegger & Hübner, 2022; Sengupta & Dreyer, 2023). There is a growing call for marketers to work towards the SDGs and marketing academics are encouraged to incorporate these goals into their research (Nangia *et al.*, 2024). SDG 12 is especially well-suited to consumer research (Mende *et al.*, 2024) and research on implementing the 5Rs of ZW by retailers is scarce. However, no previous studies have investigated retailers' implementation and reporting of the 5Rs of ZW and whether this aligns with the ZW behaviors of consumers. Thus, this study aimed to explore how retailers approach 5R behaviors and determine whether this aligns with South African consumers' 5R behaviors.

Methodology

Research design

This study used a mixed-methods approach to address this research problem. First, qualitative research was conducted to understand three leading South African retailers' approaches to ZW. This was achieved by analyzing these retailers' annual sustainability reports for 2023 using NVivo14 and searching for words related to the 5Rs (refuse, reduce, reuse, recycle and rot). Sustainability reports are suitable for investigating company actions as they form part of the required reporting of public companies in line with Companies Amendment Bill of 2023 and King IV (and King V) reporting standards (Karishma, 2025).

Second, quantitative data were collected using a self-administered web-based questionnaire created and hosted using Qualtrics. Items measuring the five sets of ZW behaviors, namely refuse (four items), reduce (nine items), reuse (nine items), recycle (four items) and rot (four items) and items used for pairwise comparison (five items) of these five dimensions were adapted from Johnson (2013), following the method used by Dolnicar & Leisch (2008). ZW behaviors were measured on a five-point Likert scale ranging from 'never' (1) to 'always' (5), while the pairwise comparisons of the five dimensions of ZW behaviors were measured on a numerical scale ranging from 'extremely less frequent' (1) to 'extremely more frequent' (9), as proposed by Saaty (1980).

A questionnaire pre-test was conducted with a convenience sample of the study population and minor adjustments were made to the questionnaire based on the feedback received. A link to the final questionnaire was distributed on social media platforms, which constituted non-probability convenience sampling. This was deemed appropriate, given the successful use of such sampling techniques in similar studies (Herabadi *et al.*, 2023; Ahmed & Rashid, 2025) and the key role played by social media in promoting ZW behaviors (Săplăcan & Márton, 2019). Of the 517 responses collected, 31 were removed during cleaning and coding, resulting in a final sample size of 486. This was deemed an acceptable sample size based on the sample sizes of similar previous studies (Herabadi *et al.*, 2023; Watson & Smith, 2020) and the suggested sample size to conduct a pairwise comparison using the analytical hierarchy process (AHP) (Melilo & Pecchia, 2016). The

486 responses were subjected to pairwise comparison using AHP to determine the relative frequency with which respondents engaged in each of the five dimensions of ZW behaviors.

Solving complex decision-making problems requires the use of a multi-criteria decision-making (MCDM) framework (Tavana *et al.*, 2023); and the application of MCDM techniques to address real-world problems such as SDGs has gained popularity (Rawat *et al.*, 2022). One of the most popular and efficient MCDM methods is the AHP developed by Saaty (1980) (Tavana *et al.*, 2023; Rawat *et al.*, 2022). AHP assists researchers in making complex decisions and breaking them down into the sub-criteria of that decision. The decision's sub-criteria are then presented to individuals in the form of pairwise comparisons to determine the relative importance of each sub-criterion in the overall decision (Rawat *et al.*, 2022). In the case of this study, applying the AHP was appropriate, as engaging in ZW behaviors could be considered a complex decision, given its multidimensional nature. ZW behaviors consist of five dimensions (subcriteria) that determine an individual's overall engagement in ZW behaviors. As part of AHP, three steps were followed. First, pairwise comparisons of the five dimensions of ZW behaviors were undertaken. Second, the weight of each dimension was estimated, after which the consistency ratio was computed, which formed part of the study's validity and reliability assessment.

Step one was carried out by the respondents when they completed the questionnaire. They had to rate the five ZW dimensions relative to each other in line with the pairwise comparison scale proposed by Saaty (1980). In step two, the scale values were recoded, a pairwise comparison matrix was constructed and the sum of each column in the matrix was calculated. A normalized matrix was then obtained by dividing each number in the matrix by the appropriate column total. The average across each row was calculated and the obtained values represented the relative weights of each of the five ZW dimensions. Step three consisted of calculating the consistency ratio. The computed consistency ratio value (0.4422) was greater than the suggested threshold of 0.1 (Saaty, 1980), but researchers investigating how individuals weigh the importance of the criteria of a decision may include values larger than 0.1 (Apostolou & Hassell, 1993b) without influencing their overall findings (Apostolou & Hassell, 1993a).

Results

Sample

Approximately two-thirds of the respondents were female (66%) and a third male (33,1%). The majority of the respondents were aged 25 to 34 years (42,2%), followed by those aged 18 to 24 (22,2%) and 35 to 44 (18,5%). Almost half of the respondents belonged to Generation Y (Millennials) (born from 1981 to 1996) (49,8%), followed by Generation Z (born from 1997 to 2012) (28,4%) and Generation X (born from 1965 to 1980) (18,9%) (Beresford Research, 2021). Based on the income categories suggested by the Bureau of Market Research (BMR) (Momentum, 2021), most of this study's respondents could be categorized as the low emerging middle class (25,1%), followed by the emerging middle class (22,2%), low-income (20,8%), or very low-income (17,3%). Only 14,7% of the respondents formed part of the realized middle class, emerging affluent and affluent and wealthy categories. Most respondents held a tertiary qualification (60,5%), followed by those who had completed secondary schooling (33,5%).

Data analyses

The results of the NVivo14 analysis indicate that retailers mostly used terms related to the recycle and reduce Rs in their sustainability reports, while there was limited reference to terms related to the refuse, reuse and rot Rs, thereby indicating their perspective. The results of the pairwise comparison revealed that the respondents engaged in the 5Rs to different extents. They engaged in reuse behaviors most often (0.29), followed by recycling (0.19), reducing (0.18) and rot behaviors (0.18), while refuse behaviors (0.16) were engaged in least often compared with the other ZW dimensions.

These findings highlight the misalignment between retailers and consumers' approaches toward the 5Rs of ZW behaviors. While retailers focus on engaging in and reporting recycling and reducing initiatives, respondents most frequently engage in reuse behaviors. The analysis showed that retailers did not mention reuse initiatives at all in their sustainability reports. This indicates that retailers do not capitalize on consumers' engagement in reuse behaviors, nor do they help promote these behaviors among consumers. Furthermore, while respondents also engage in rot (composting) and refuse behaviors less frequently, retailers do not mention engaging in these behaviors in their sustainability reports. Like reuse behaviors, retailers are thus not capitalizing on consumers' engagement in rot and refuse behaviors, nor are they helping to promote these behaviors among consumers. What seems to be better aligned is retailers' recycling initiatives and consumers' engagement in recycling.

Conclusions and discussion

Overconsumption and its negative environmental implications have led to the emergence of the ZW concept (Bogusz *et al.*, 2023). While promoting ZW behaviors among consumers has multiple environmental, economic and social benefits (Nangia *et al.*, 2024), encouraging such behaviors among consumers is particularly beneficial for retailers, who can benefit from increased profits. Improved brand image (Jere *et al.*, 2021) and increased consumer trust (Singh *et al.*, 2023) and for consumers. As the role of retailers in promoting ZW consumer behavior remains poorly understood, this study aimed to explore how retailers approach the 5Rs of ZW behaviors and to determine whether this aligns with South African consumers' ZW behaviors.

The results showed a misalignment between South African retailers' engagement in the 5Rs and that of consumers. Specifically, while retailers seem to focus on engaging in recycle and reduce initiatives, consumers most frequently engage in reuse behaviors. Retailers completely lack reuse initiatives. Indicating that they do not capitalize on consumers' frequent engagement in reuse behaviors, nor do they help promote these behaviors among consumers. Based on these findings, we recommend that retailers engage in more reuse initiatives and report them to actively promote them among consumers. For example, retailers can source and sell reusable, refillable and rechargeable alternatives for everyday products (e.g., refillable shampoo and conditioner and other personal care products). Retailers can then actively market these refillable alternatives to their consumers and offer refill services in-store to encourage them to use these sustainable alternatives. In-store refill services should be easy to understand and use (Kuks, Koopmanschap & De Koeijer, 2023) and can be normalized via behavioral marketing campaigns (Moss *et al.*, 2022). This can be achieved by, for example, making instructional videos showcasing a shopper using refill services, playing these videos on in-store screens and sharing them on the retailer's social media platforms.

The results further show that, while respondents engage in rot (composting) and refuse behaviors, retailers do not. Retailers thus do not capitalize on consumers' engagement in rot and refuse behaviors, nor do they help promote these behaviors among consumers. Based on these findings, we recommend that retailers engage in more rot (composting) initiatives and report on these practices to promote composting behaviors among consumers. Barriers to composting for many individuals include a lack of the right infrastructure and knowledge of the composting process (Musicus *et al.*, 2022). Retailers can thus enable consumer composting activities by sourcing and selling sustainable composting 'starter kits that are easy to set up and move around. The lack of knowledge barriers can be overcome by sharing educational videos on the composting process, whether in-store next to the composting starter kits' product display or via the retailer's social media platforms. Retailers can also share educational videos showing consumers how to compost and retailers can also compost their food waste. Retailers discard large amounts of food waste each month. By composting this food waste, retailers can generate an additional income stream from selling this compost.

The compost can also be donated to community gardens or other nonprofit initiatives, thus improving the retailer's public image.

From these results. It is evident that retailers' recycling initiatives and consumers' engagement in recycling behaviors are better aligned. However, retailers can further capitalize on this alignment by sourcing products with recyclable packaging, making consumers aware of these recyclable alternatives through their marketing efforts and offering in-store recycling initiatives to enable consumers to recycle more effectively. Retailers can, for example, place reverse vending machines, also known as recycling vending machines. In stores and encourage consumers to recycle for monetary gain. Like the refill services. Improving the ease of use of these reverse-vending machines will improve consumers' adoption of these recycling vending machines (Zhang *et al.*, 2024). Thus. Instructional videos may be an effective marketing strategy.

Acknowledgements

We thank Dr. Marthi Pohl for her statistical support, particularly in conducting the pairwise comparison using the AHP. Furthermore, we would like to thank the ICM Erasmus+ 2022 program for facilitating and funding the partnership between JIBS and the University of Pretoria, which made the knowledge exchange and collaboration on this project possible.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Diversity and inclusion in retail: consumers' perceptions and brand outcomes

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Abstract. As consumers increasingly expect brands to engage with social issues, diversity and inclusion (D&I) have become strategic priorities also for retailers. This study investigates how D&I initiatives implemented by retail firms affect brand reputation, trust and loyalty. Drawing on a longitudinal design, we surveyed representative samples of Italian consumers in 2022, 2023 and 2024. Structural equation modeling was used to test the relationships between perceived D&I commitment, awareness and key brand outcomes. Results show that commitment to D&I drives awareness and improves reputation, which in turn fosters trust and loyalty. While awareness alone does not enhance reputation. It contributes to loyalty. The findings emphasize the strategic relevance of D&I in building long-term consumer relationships and the impact as a form of social sustainability in retail.

Keywords : diversity; inclusion; marketplace; retail; consumers' responses.

Introduction

As diversity and inclusion (D&I) become relevant in society and public policy, as well as in consumer expectations, companies face increasing demands to play a role through their policies. Diversity acknowledges individuals' physical and socio-cultural differences, while inclusion involves integrating and valuing diverse groups to foster belonging and address exclusion (Henderson *et al.*, 2023; Arsel *et al.*, 2022; Patrick & Hollenbeck, 2021), inclusion demands active participation and equal opportunity, expanding beyond representation to address exclusion and marginalization. The multidimensional nature of identity encompasses various aspects, including age, gender, sexual orientation, religion, socioeconomic status, disabilities, ethnicity, physical appearance and more (Patrick & Hollenbeck, 2021). Businesses and brands have a crucial role in fostering and spreading an inclusive culture, focusing on both employees and market audiences (Madera *et al.*, 2023; Khan & Kalra, 2022; Shultz *et al.*, 2022).

In this scenario, retailers are increasingly called to address social challenges and act as agents of change within the marketplace, as they also play the role of gatekeepers between producers and consumers

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(Vadakkapatt *et al.*, 2021; Wiese *et al.*, 2015). Among the emerging responsibilities, D&I represents a critical dimension of retail firms' commitment to sustainability, particularly within the people pillar of the Triple Bottom Line (Wilson, 2015), thus addressing social sustainability. Retailers can contribute to a more inclusive marketplace by designing services that cater to diverse consumer needs (Branca *et al.*, 2024). This includes providing accessible services for people with disabilities, creating inclusive experiences for all customers, representing minorities in marketing materials and ensuring accessibility in-store and online (e.g., Song & Park, 2023; Yang, 2023; Rydzik *et al.*, 2021; Dias de Faria & Moreira Casotti, 2019). Retailers can also promote inclusivity by restructuring distribution channels to cater to a more diverse customer base and through their assortment design, as an example by offering products that appeal to underrepresented groups. Among others, an interesting initiative is the *Quiet Hour*, promoted by Carrefour to make shopping more comfortable for individuals who are particularly sensitive to noise and visual stimuli, such as some people on the autism spectrum. However, while previous studies have highlighted the strategic role of D&I in shaping organizational culture and internal processes, less is known about its impact on consumer-brand relationships (e.g., van Bommel *et al.*, 2024; Branca *et al.*, 2024), especially in retail settings. Moreover, the effectiveness of D&I policies in the marketplace depends not only on the initiatives undertaken by retailers, but also on consumers' awareness and perceptions of brand commitment (Henderson *et al.*, 2023; Ferraro *et al.*, 2023). Indeed. It seems relevant to understand what the consumers' response might be when retail brands decide to implement targeted D&I actions. The study addresses the following research question: What impact do diversity and inclusion-focused strategies have on brand reputation, brand trust and brand loyalty?

Empirical studies on the consumer-level outcomes of D&I in retail remain limited. In particular, it is still unclear how D&I-related strategies implemented by retail firms affect brand reputation, trust and loyalty, as relevant factors shaping long-term consumer relationships (Castaldo, 2024). Previous literature studied the relationship between CSR policies and their consequences in terms of brand outcomes (e.g., Castaldo & Grosso, 2019). Promoting D&I can positively affect brand evaluation (e.g., Henderson *et al.*, 2023; Ruggs *et al.*, 2018; Strebinger *et al.*, 2018) and loyalty (Bennett *et al.*, 2013; Homburg & Ukrainets, 2021; Loughran Dommer *et al.*, 2013). Brand reputation has a positive effect on brand trust (Han *et al.*, 2015). Also, brand trust positively impacts brand loyalty (e.g., Castaldo *et al.*, 2010).

This research aims to address this gap by analyzing the structural relationships among D&I marketplace policies and brand outcomes in the Italian retail context, using longitudinal data collected across three waves (2022–2023–2024). The study focuses on a sequential model, in which D&I commitment influences D&I awareness, which in turn affects reputation, trust and loyalty. By narrowing the scope to the retail sector and leveraging time-series evidence, this work contributes to a more granular understanding of the value of D&I in consumer-facing brand strategies.

Methodology

The methodological approach is based on three main elements. First, by conducting a desk analysis, we identified retail companies that promoted D&I initiatives in the Italian market. Second, employing a survey, we tested the theoretical relations proposed in this research. Third, comparing the results of the survey at three separate time points, we aim to comprehend the evolution over time of consumer response to D&I initiatives. The study adopts a longitudinal design based on three annual survey waves conducted in 2022, 2023 and 2024 with representative samples of Italian consumers. The number of participants across all years accounts for 470 responses in 2022, 404 in 2023 and 320 in 2024. This empirical analysis focuses exclusively on the retail sector, drawing from the Diversity Brand Index database. Data was collected through structured questionnaires administered online by a professional panel provider. The measurement model relies on validated multi-item scales. We analyzed our survey data employing Structural Equation Modeling (SEM).

TABLE 1 - Summary of results over the years.

Path	2022	2023	2024
D&I Commitment → D&I Awareness	0.961 ***	0.949 ***	0.965 ***
D&I Commitment → Reputation	0.366 *	0.450 ***	0.360 *
D&I Awareness → Reputation	0.090 (ns)	0.115 (ns)	0.200 (ns)
D&I Awareness → Loyalty	0.253 ***	0.336 ***	0.361 ***
Reputation → Trust	0.755 ***	0.810 ***	0.796 ***
Reputation → Loyalty	0.209 ***	0.143 **	0.236 ***
Trust → Loyalty	0.438 ***	0.434 ***	0.309 ***
Reputation → Trust → Loyalty	0.332	0.357	0.249

*** = Significant at $p < 0.001$; ** = Significant at $p < 0.01$; * = Significant at $p < 0.05$; (ns) = non-significant ($p > 0.05$)

Results

Among more than 350 brands cited by the respondents in 2022, 12 retailers were perceived among the 50 top inclusive brands. Moreover, 10 retailers were perceived among the 50 top inclusive brands among almost 300 brands cited by the respondents in 2023 and 13 retailers were in the top 50 among almost 500 brands cited in 2024. Before performing SEM, we conducted preliminary analyses, including factor analysis, to assess the validity and reliability of the measurement model. *CFI*, *IFI*, *NFI* and *TLI* showed good fit across the three years. Not all the tests are reported in this manuscript. Thus, we present here only preliminary results, summarized in Table 1.

Conclusions and discussion

Across all three waves, the effect of D&I commitment on awareness is strong and consistent, suggesting that brand-level commitment is a key driver of consumer awareness. The path from D&I commitment to reputation is significant at all time points, in line with previous literature (e.g., Henderson *et al.*, 2023; Ruggs *et al.*, 2018; Strebinger *et al.*, 2018), but shows a decrease in the last year. Probably, increasing consumer expectations suggests a need for continued innovation or authenticity in D&I efforts to maintain reputational gains and transparent communication can shape consumers' responses (Yang & Battocchio, 2021). Interestingly, the effect of D&I awareness on reputation remains non-significant across all years. Consumers likely evaluate D&I initiatives based on their perceived authenticity or alignment with the brand's core values, not just visibility. Thus, awareness alone is not sufficient to increase a brand's reputation. However, the path from D&I awareness to loyalty shows an upward trend, confirming that promoting D&I can positively affect loyalty (e.g., Bennett *et al.*, 2013; Homburg & Ukrainets, 2021; Loughran Dommer *et al.*, 2013). As public sensitivity to inclusion increases, being known for inclusive practices may become a differentiating factor for retailers, especially among more socially engaged consumer segments. In line with previous literature (e.g., Castaldo, 2024; Han *et al.*, 2015), the effect of reputation on trust, as well as of reputation on loyalty, are strong and significant across all years. Reputation continues to be a primary driver for positive consumer attitudes and long-term relationships. The path from trust to loyalty is significant and strong in all years (Castaldo *et al.*, 2010). However, it shows a decreasing trend. This decline could indicate that while trust remains essential, its marginal effect on loyalty is weakening slightly, possibly as other factors (e.g., alignment with values, perceived impact of initiatives) start to influence loyalty more directly. This trend is also reflected in the decreasing indirect effect from reputation to loyalty via trust. Consumers might expect demonstrable social impact, long-term consistency, or other moral credentials to sustain loyalty.

This study provides empirical evidence on the consumer-level impact of D&I strategies in the retail sector. By analyzing longitudinal survey data from 2022 to 2024, we show that consumers consistently recognize and reward brand commitment to D&I, particularly through increased awareness, enhanced reputation and

stronger loyalty. While awareness alone is insufficient to improve brand reputation, it contributes to loyalty, indicating a growing consumer sensitivity to inclusion. Reputation and trust remain key drivers of long-term consumer relationships, though their effects on loyalty appear to evolve over time. Overall, the findings highlight the strategic value of D&I as a lever for differentiation and sustained brand equity in retailing. By emphasizing how retailers can act as catalysts for social inclusion, this research aims to inform both scholars and practitioners on the strategic importance of D&I in the retailing sector. Moreover, this study highlights the positive impact of commitment in D&I for retailers. In terms of consumer perceptions and consequent business outcomes.

Acknowledgements

This study was funded by the European Union - *NextGenerationEU*, Mission 4, Component 2. In the framework of the GRINS - *Growing Resilient, Inclusive and Sustainable* project (GRINS PE00000018 – CUP B43C22000760006). The views and opinions expressed are solely those of the authors and do not necessarily reflect those of the European Union, nor can the European Union be held responsible for them.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Promoting healthy food choices: analyzing the impact of a fruit and vegetable challenge through a loyalty app

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Abstract. Loyalty programs have become a key marketing strategy to increase customer lifetime value and influence shopping behavior (Bijmolt *et al.*, 2011; Bombaij & Dekimpe, 2020). However, they are underutilized for promoting societal benefits like healthier food consumption, especially in digital environments. For instance, research shows that marketing promotions can effectively increase fruit and vegetable (F & V) sales during a campaign, but little is known about the long-term impact on healthier food choices post-promotion (Panzone *et al.*, 2024). The aim of this study is to analyze the effectiveness of a fruit and vegetable challenge through Konzum's MultiPlusCard loyalty app, designed to encourage healthier food choices. The challenge ran in June 2024, offering up to 20 bonus euros based on customer purchases of specific fruits and vegetables. The impact of personalized rewards on shopping behavior, focusing on the relations between app engagement and fruit and vegetable consumption will be explored. Data includes sales, app interactions, and customer demographics. Planned analysis includes evaluating the challenge's effectiveness to stimulate F & V sales, evaluating the policy implications for the promotion of healthier food choices.

Keywords : loyalty programs; fruit and vegetable consumption; retail marketing; consumer behavior; gamification

Introduction

Loyalty programs are ubiquitous in food retailing, primarily aimed at increasing customer retention and influencing purchasing patterns (Bijmolt *et al.*, 2011; Bombaij & Dekimpe, 2020). The effects are often stronger among light and moderate buyers and vary depending on how common and frequently purchased the product category is (Lin & Bowman, 2022; Liu, 2007). Digital loyalty programs, especially those using personalized rewards, can make shoppers more responsive to promotions and less sensitive to competitors'

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offers (Zhang & Breugelmans, 2012). Over time, well-designed programs can improve customer retention and help attract new buyers (Lewis, 2004; Meyer-Waarden, 2008). While the commercial benefits of loyalty programs are well documented, their use in promoting socially desirable outcomes, such as healthier food consumption, has received comparatively less attention. App-based programs add new dimensions by enabling real-time feedback, personalization, and behavioral nudges, creating fertile ground for integrating behavioral science into everyday consumption (Lim *et al.*, 2021; Seid *et al.*, 2024; Villinger *et al.*, 2019). Despite this, the role of app engagement and gamified features in sustaining long-term dietary changes remains underexplored (Chen *et al.*, 2021).

Mobile apps have been shown to support healthier eating, increase F & V purchases (Panzone *et al.*, 2024), and improve diet-related health outcomes (Lim *et al.*, 2021; Seid *et al.*, 2024; Villinger *et al.*, 2019). However, most interventions rely on general discounts rather than personalized strategies, despite evidence that the latter are more effective and profitable (Nguyen *et al.*, 2019). Apps can also enhance food safety awareness and behavioral tracking (Seow *et al.*, 2022), yet the combined effect of such features on sustained healthy shopping behavior has not been comprehensively evaluated.

Gamification, the use of game-like mechanics such as points, challenges, and rewards, has emerged as a promising approach in digital health. It has been shown to increase F & V intake among adolescents (Yoshida-Montezuma *et al.*, 2020), encourage lower-calorie choices (Ögel Aydın & Argan, 2021), improve nutritional knowledge (Suleiman-Martos *et al.*, 2021), physical activity (Looyestyn *et al.*, 2017; Patel *et al.*, 2017) and sustainability outcomes (King *et al.*, 2013; Lewis *et al.*, 2016; Mulcahy *et al.*, 2021). However, there is limited evidence on which gamification elements are most effective in complex, real-world environments (Deterding *et al.*, 2011). As Pavlicek & Cradock (2025) observe, health apps and loyalty systems are often examined in isolation, hindering a full understanding of their combined influence. Despite this potential, the majority of empirical studies examine short-lived promotional effects, neglecting longer-term behavioral outcomes or sustained engagement (Panzone *et al.*, 2024). This fragmentation presents a clear research gap: how can app-based loyalty programs, embedded in routine grocery shopping, effectively promote healthier food choices in a scalable and lasting manner?

To address this gap, this study investigates the behavioral impact of two gamified fruit and vegetable (F & V) challenges implemented through Konzum's MultiPlusCard—Croatia's largest digital grocery loyalty app. Conducted in June and October 2024, the challenges offered bonus euros based on customer spending on selected fruits and vegetables, reinforced through personalized prompts and real-time progress feedback. Drawing on a 24-month dataset (2023–2024) that includes transactional histories, app usage metrics, and demographic variables for 86,338 users, the study examines how digital engagement and incentive design influence short- and longer-term purchasing patterns.

This paper contributes to the intersecting literatures on digital nudging, gamification, and health-oriented loyalty marketing. By analyzing large-scale, real-world data from an active retail setting, it provides novel insights into the behavioral mechanisms underlying sustained healthy food choices. The findings have implications for the design of scalable interventions at the intersection of public health, behavioral economics, and retail strategy.

Methodology

This study analyzes anonymized loyalty card data provided by a retail partner, collected under GDPR-compliant conditions and with ethical approval from the relevant university ethics committee. Personally identifiable information (PII) was not accessible to the research team, and all data were used exclusively for academic purposes and stored securely. MultiPlusCard is Croatia's largest retail loyalty program, operated in

partnership with Konzum, the country's leading grocery chain, which accounts for approximately 25% of national grocery sales and serves over 500,000 customers daily across 700 stores. MultiPlusCard reaches around 70% of Croatian households, offering a robust digital and in-store platform for collecting points, redeeming rewards, and accessing personalized promotions. We evaluate the impact of a fruit and vegetable challenge implemented through Konzum's MultiPlusCard loyalty app in June 2024. The dataset spans 24 months (2023–2024) and includes detailed consumer-level information such as monthly store visits, total and category-specific spending (e.g., fresh and dried fruits and vegetables), SKU-level purchases, and app engagement metrics like access frequency, clicks, and reward points. It also captures sales of promoted items (e.g., watermelon, tomatoes) and includes demographic variables such as age, gender, and region.

Research design

In June 2024, the MultiPlusCard launched a digital challenge, aimed at encouraging customers to buy fresh fruits and vegetables at Konzum. By activating specific offers in the loyalty app—for items such as apples, tomatoes, peaches, cucumbers, and others—participants could earn bonus euros by reaching set spending or quantity thresholds. The campaign featured personalized motivational messages (e.g., “Bravo, you’re taking care of your daily dose of vitamins!”) and allowed real-time tracking of progress through the app’s dashboard. For instance, one user was prompted to purchase an additional 1.758 kg of apples to receive 2 BONUS euros. A progress bar visually displayed advancement toward the reward goal. The challenge combined product-specific discounts (e.g., 20%) with bonus incentives, creating a gamified shopping experience that encouraged healthy choices while offering direct financial rewards.

In October 2024, a second fruit and vegetable challenge was introduced through the MultiPlusCard app, offering participants the opportunity to earn up to 10 bonus euros for purchasing fresh produce at Konzum. The challenge was structured around two components: a general spending threshold and multiple product-specific “mini-challenges”. Participants could earn up to 8 bonus euros by spending on any fresh fruit and vegetables during the month, with incremental rewards unlocked at predefined spending levels; up to 12 bonus euros by activating and completing specific challenges tied to individual products such as tomatoes, apples, cucumbers, watermelons, nectarines, and peaches. Progress was displayed visually within the app, and shoppers received personalized prompts to motivate continued participation via viber (a social media messaging service like WhatsApp), so that they received reminders of how much more was needed to be purchased to unlock the next bonus. This dual structure combined broad category incentives with targeted goals, with the aim of enhancing engagement and encouraging a wider variety of healthy food purchases.

HOW TO EARN AN EXTRA 20 BONUS EUROS?

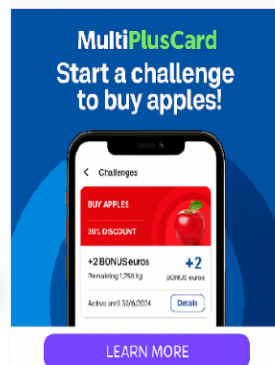
Participation in the challenge is simple:
1. Buy fruits and vegetables at Konzum during June and earn up to 8 BONUS euros by crossing each spending threshold.
2. Activate challenges for purchasing tomatoes, peaches and nectarines, cucumbers, apples, and watermelon, and earn up to 12 additional BONUS euros.

Track your progress on the main screen of the MultiPlus app!



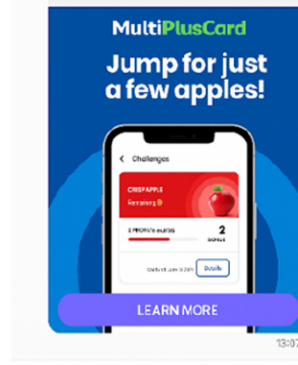
Great, you're taking care of your daily dose of vitamins!

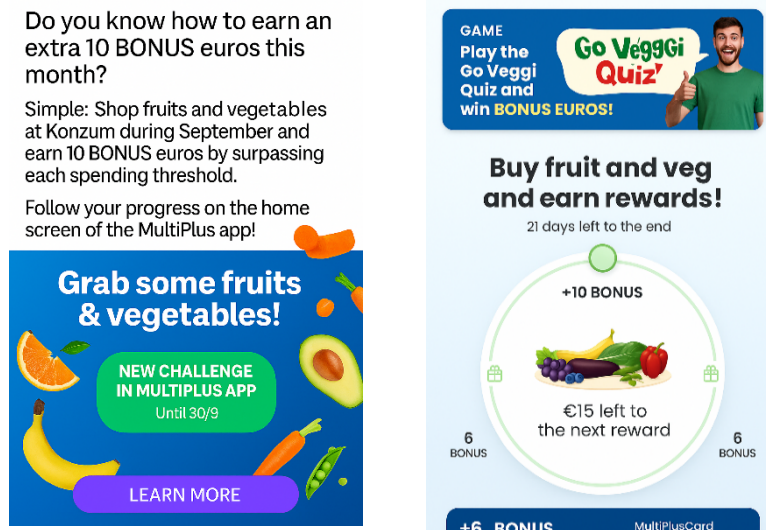
Start a challenge to buy apples and earn more BONUS euros.



Bravo, Ružica, you're taking care of your daily dose of vitamins!

Jump for just 1.758 kg of apples, and an extra 2 BONUS euros will appear on your account!





Sample

The dataset information on 86,338 unique customers. This comprehensive dataset allows for a robust assessment of the campaign's effects on consumer purchasing behavior and digital engagement.

Conclusions and discussion

This study provides novel insights into how gamified, app-based loyalty interventions can influence consumer behavior in a real-world retail setting. By leveraging rich transactional and engagement data, it explores both the effectiveness of financial incentives and the behavioral mechanisms driving sustained healthy food purchases. The findings will inform the design of scalable digital tools that align public health goals with retail strategies, contributing to both academic research and applied policymaking.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

AI talks: unveiling the digital customer experience revolution in everyday services

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Abstract. In today's rapidly evolving digital landscape, customer interactions are increasingly influenced by Artificial Intelligence. Understanding AI's impact on customer experience is crucial as businesses integrate AI into their services. This research explores the dynamic interplay between service contexts and varying levels of AI integration during phone support for essential (e.g., hospital reservation) and non-essential (e.g., hotel reservation) services. Through an online experiment, participants were assigned to one of six groups, examining the impact of service context and AI integration level on customer engagement during booking. Three categories of AI integration were tested: low AI with numeric options, high AI with natural language and a control group with human support. Findings reveal nuanced insights into the evolving landscape of customer interactions. Consumers perceive human agents as providing the most natural service experience, followed by high AI integration, with low AI integration trailing behind. While overall satisfaction did not significantly differ between AI integration levels, high AI integration exhibited lower satisfaction, possibly due to the Uncanny Valley effect. Both types of AI integration induced higher anxiety levels among users compared to human agents, emphasizing the importance of understanding user emotions and responses to AI interactions. Low AI integration and human agents were equally convenient for users, while high AI integration was the least convenient, highlighting current limitations in AI technology. Theoretical implications include advancing the understanding of conversational AI's impact. Practically, the study offers actionable insights for industries leveraging conversational AI, suggesting strategic tailoring of AI integration levels to optimize consumer satisfaction.

Introduction

As Artificial Intelligence (AI) technologies become increasingly integrated into customer service systems, firms are rapidly adopting conversational agents and voice-based automation to handle tasks once performed by human employees. While these tools promise greater efficiency and scalability, they also raise critical questions about how customers perceive AI-based service interactions, especially in situations where the human touch has traditionally been essential. Surprisingly, despite the surge in AI adoption across industries, we still know little about how different levels of AI integration—from simple automation to fully anthropomorphized AI agents—affect customer satisfaction, perceived value and behavioral intentions. Existing research has tended to isolate AI implementation or consumer emotions but has not systematically

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examined how these dynamics play out across different service contexts (Collier & Sherrell, 2010; Klaus & Zaichkowsky, 2020). In particular, the role of service essentiality - whether a service is critical or discretionary - has not been fully explored in relation to AI acceptance and customer experience.

This study addresses this gap by investigating how customers respond to varying levels of AI in essential vs. non-essential service settings and what psychological mechanisms - such as perceived control, convenience and anxiety - mediate these responses. Theoretically, this research builds on literature in technology adoption, human-computer interaction and services marketing to propose a comprehensive model of AI-enabled service evaluation. Practically, it provides immediate and actionable insights for service managers grappling with AI deployment decisions: Where does AI fit best? When does it backfire? What emotional or cognitive reactions should managers anticipate and manage?

Research gaps and contributions

This research offers several key contributions. First, it contextualizes AI in service essentiality. While prior studies have explored AI in retail and hospitality (e.g., Meuter *et al.*, 2005; Waytz *et al.*, 2014), we uniquely examine how essential vs. non-essential services shape customer tolerance or resistance to AI agents. Moreover, unlike most research that treats AI as binary (AI vs. human), we evaluate a continuum of AI integration, distinguishing between low and high anthropomorphism and comparing them with traditional human support. Also, we propose and test a model where emotional (anxiety) and cognitive (control, convenience) perceptions mediate customer evaluations, extending theories of service quality and self-service technology (Berry *et al.*, 2002; Hui & Toffoli, 2002). Finally, our findings help service providers decide which service types are best suited for AI integration, how to design emotionally intelligent AI and how to mitigate customer discomfort through strategic framing and channel design. Through two scenario-based experimental studies, this research delivers novel insights into the fit between AI design and service context, helping bridge the gap between theoretical exploration and business implementation.

Theoretical background

AI service agents and customer experience

AI integration into customer support functions has become a defining characteristic of modern service environments. From basic automated prompts to sophisticated conversational agents, AI is now central to how firms manage customer interactions. As conversational AI evolves to simulate human interaction through voice, tone and responsiveness (Gao *et al.*, 2019; Shum *et al.*, 2018), it is crucial to examine how customers evaluate service agents that differ in their level of AI integration. Despite rapid adoption, research on the psychological and behavioral consequences of AI-driven service delivery remains fragmented. Early research on self-service technologies (Meuter *et al.*, 2000; Collier & Sherrell, 2010) focused on customer readiness and technology anxiety. More recent work considers the design of AI agents, including their anthropomorphic features, which influence perceptions of trust, warmth and competence (Waytz *et al.*, 2014; Epley *et al.*, 2007). However, the context in which AI is deployed - specifically the type of service - may moderate these effects, a gap this study aims to address.

Essential vs. non-essential services

The pandemic-era classification of services as essential or non-essential (CISA, 2020; PAHO, 2020) has highlighted differences in the expectations, emotional involvement and stakes associated with various service types. Essential services, such as healthcare, financial services and utilities, are perceived as critical to daily functioning and well-being. In contrast, non-essential services, such as hospitality, leisure, or luxury retail, are more discretionary and often sought for emotional or experiential value. Service essentiality influences customer expectations, especially regarding service delivery mode and perceived appropriateness

of automation. For example, customers may accept reduced human interaction in essential services for the sake of speed or safety but may prefer high-touch human engagement in non-essential services that are hedonic or personalized in nature. This distinction has not been systematically examined in AI service research, yet has critical implications for understanding customer reactions to AI across service domains.

Design of AI: anthropomorphism and social presence

Anthropomorphism - the attribution of human characteristics to non-human agents - plays a central role in AI design and acceptance (Epley *et al.*, 2007). Prior research suggests that anthropomorphic features, such as human-like names, voices, or facial avatars, can increase perceived social presence, leading to stronger engagement and trust (Chandler & Schwarz, 2010; Wan *et al.*, 2017). However, such effects are context-dependent. In hedonic or leisure-oriented services, anthropomorphism can enhance the customer experience (Aggarwal & McGill, 2007). In contrast, in high-risk or essential services, it may undermine perceived competence or provoke unease (Kim & McGill, 2011; Jörling *et al.*, 2019). This study builds on this stream by manipulating three levels of service interface: (1) Live Human Agent, (2) Low-Anthropomorphism AI and (3) High-Anthropomorphism AI, to evaluate how customers perceive service quality, value and behavior under different design conditions.

Cognitive and emotional mediators of service evaluation

Customer responses to AI are shaped by both cognitive and emotional appraisals of the service interaction. Three mediating variables are central to our conceptual model: (i) *Perceived Control*: defined as the customer's belief that they can influence, understand, or predict the service process (Langer, 1983; Lee & Allaway, 2002). Perceived control enhances satisfaction and reduces uncertainty, especially in high-stakes or unfamiliar service settings (Hui & Toffoli, 2002). AI interfaces that are overly complex or unpredictable may erode this sense of control; (ii) *Perceived Convenience*: refers to the degree to which a service is easy to use, time-saving and efficient (Berry *et al.*, 2002; Brown, 1990). AI can significantly improve convenience by reducing wait times, offering 24/7 availability and accelerating information retrieval (Farquhar & Rowley, 2009), and (iii) *Perceived Anxiety*: customers often experience anxiety when engaging with unfamiliar technology, particularly in situations where errors are costly or understanding is low (Meuter *et al.*, 2003; Gelbrich & Sattler, 2014). These mediators provide the psychological mechanisms through which AI design and service essentiality are expected to influence customer evaluations.

Customer satisfaction, perceived value and behavioral intentions

The final outcomes of interest (customer satisfaction, perceived value and behavioral intentions) are core constructs in service marketing (Zeithaml *et al.*, 1996; Oliver, 1999). Satisfaction captures the emotional evaluation of the service encounter, while perceived value reflects the trade-off between benefits received and resources spent (Holbrook & Corfman, 1985). Both constructs are strong predictors of behavioral intentions, including repeat usage and word-of-mouth advocacy (Anderson, 1998; Wangenheim & Bayón, 2007). In the context of AI service agents, these outcomes are influenced not only by the technical performance of the service but also by the psychological experience of the interaction, particularly the extent to which customers feel in control, at ease and efficiently served.

Research model and hypotheses

The relationship between the type of service support and customer evaluation

This study examines three forms of customer service support that reflect varying levels of AI integration: (1) Live human support, (2) Low AI integration, such as pressing numeric prompts in an automated phone system and (3) High AI integration, which involves engaging in natural voice conversations with an

anthropomorphized AI agent. These designs reflect a continuum from no AI (human-led interaction) to full AI (autonomous conversational agents), consistent with the typology proposed by Marinova *et al.* (2016), in which smart technologies are implemented either to augment or replace frontline employees.

Voice-based conversational AI systems are increasingly deployed to simulate human interaction using natural language (Ram *et al.*, 2017; Gao *et al.*, 2019) and their ability to engage users in natural conversations may improve the overall consumption experience. However, consumer reactions to these AI agents likely vary depending on how human they appear and how deeply they are integrated into the service process. Studies in human-robot interaction suggest that auditory anthropomorphism - how human-like a system sounds - shapes customer reactions to AI (Waytz *et al.*, 2014; Eyssel *et al.*, 2012). Technologies that simulate human voices and emotional expressiveness are often evaluated more positively in terms of trust and perceived capability. Furthermore, anthropomorphized technology has been shown to enhance product and brand evaluations (Aggarwal & McGill, 2007; Chandler & Schwarz, 2010). Thus, customers may respond more favorably to high-AI systems with strong auditory anthropomorphism than to more mechanical low-AI systems, particularly when those systems lack responsiveness and personalization. Despite growing interest in AI-human interaction, little research has examined how different levels of AI integration and auditory anthropomorphism affect core customer evaluations—specifically, satisfaction (an affective response) and perceived value (a cognitive judgment). To address this gap, we hypothesize:

H1a: *Live support and high AI integration with auditory anthropomorphism will lead to greater customer satisfaction than low AI integration.*

H1b: *Live support and high AI integration with auditory anthropomorphism will lead to greater perceived value than low AI integration.*

Moderating role of service essentiality

Customer responses may also depend on the essentiality of the service. Essential services—such as healthcare or financial assistance—are instrumental to basic needs and safety. Non-essential services—such as travel or entertainment—are discretionary and more emotionally driven. This distinction is supported by Maslow’s hierarchy of needs, where essential services correspond to physiological and safety needs & non-essential services relate to social, esteem and self-actualization needs (Hollebeek *et al.*, 2020).

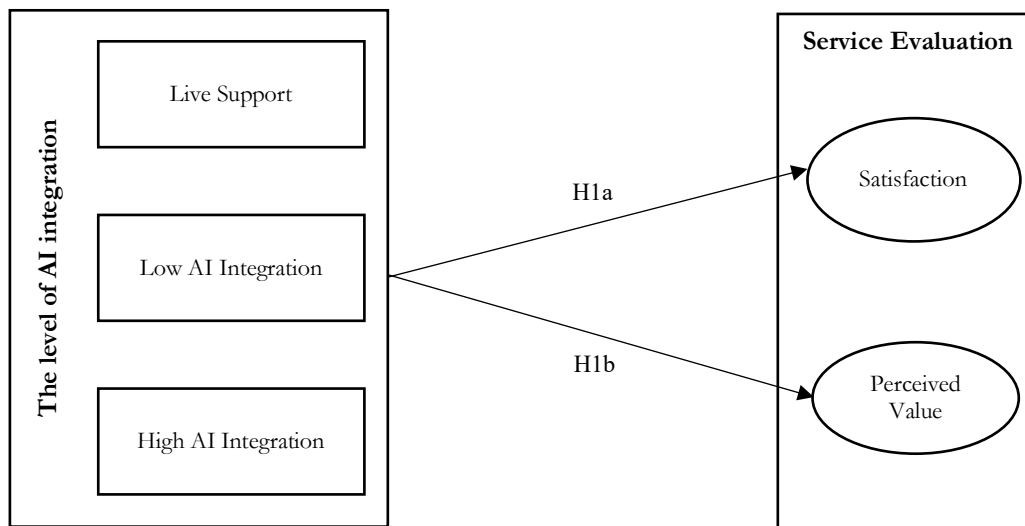


FIGURE 1 – Proposed model 1: main effects of service support type on satisfaction and perceived value

When customers engage with essential services, they are more likely to prioritize efficiency, speed and functionality and may therefore tolerate or even prefer AI-enabled interfaces that deliver results quickly. In contrast, customers engaging with non-essential services may expect more personalized and emotionally rich interactions, making live human support or naturalistic AI more desirable. Therefore, we propose that service essentiality moderates the effect of AI integration on service evaluations:

H2a: *For non-essential services, customer satisfaction will be significantly lower when low AI integration is used, compared to live support and high AI integration. For essential services, there will be no significant difference in satisfaction across the different levels of AI integration.*

H2b: *For non-essential services, perceived value will be significantly lower when low AI integration is used, compared to live support and high AI integration. For essential services, there will be no significant difference in perceived value across the different levels of AI integration.*

Mediation effects: psychological mechanisms

While service support type and service essentiality are expected to shape satisfaction and perceived value, these effects are likely mediated by customers' psychological responses during the service encounter. We examine three key mediators: perceived control, perceived convenience and perceived anxiety.

Perceived control

Self-service technologies (SSTs), including AI systems, have been shown to enhance perceived control by allowing customers to manage the pace, flow and content of their interaction (Lee & Allaway, 2002; Collier & Sherrell, 2010). Control is positively associated with satisfaction, especially when technology enables choice and agency (Wang, 2012). Anthropomorphized AI may enhance control by making the system feel more social and responsive (Jörling *et al.*, 2019), especially through voice interfaces that simulate flexible communication (Klaus & Zaichkowsky, 2020).

H3: *Perceived control mediates the relationship between the interaction of AI integration level and service essentiality and customer evaluations (satisfaction and perceived value).*

Perceived convenience

Technology is often adopted for its convenience—especially when it saves time, reduces effort and facilitates multitasking (Kim *et al.*, 2010; Buvat *et al.*, 2018). Voice-based AI offers touchless, oral interfaces that increase ease of use and functionality. Past studies have demonstrated that perceived convenience enhances satisfaction and value perceptions (Berry *et al.*, 2002; Wang, 2012). Anthropomorphism may also increase perceived convenience by making the interaction feel more natural and intuitive (van Esch *et al.*, 2019).

H4: *Perceived convenience mediates the relationship between the interaction of AI integration level and service essentiality and customer evaluations (satisfaction and perceived value).*

Perceived anxiety

Despite benefits, AI-based services may trigger anxiety, particularly in early stages of adoption or in emotionally sensitive settings (Venkatesh *et al.*, 2003). Technology-related anxiety has been shown to negatively impact satisfaction (Meuter *et al.*, 2003). However, anthropomorphic design can reduce anxiety by making the system feel more familiar, empathatic and socially present (Aggarwal & McGill, 2012; Wan *et al.*, 2017).

H5: *Perceived anxiety mediates the relationship between the interaction of AI integration level and service essentiality and customer evaluations (satisfaction and perceived value).*

Downstream behavioral effects

Satisfaction and perceived value are both well-established predictors of behavioral intentions, including repeat use and word-of-mouth (WOM) (Zeithaml *et al.*, 1996; Wangenheim & Bayón, 2007). These relationships apply in both traditional and technology-based service environments (Belanche *et al.*, 2012; Lin & Hsieh, 2007), making them relevant to AI-driven customer support as well.

H6: Customer satisfaction with the service interaction leads to greater repeat intention and positive word-of-mouth.

H7: Perceived value of the service interaction leads to greater repeat intention and positive word-of-mouth.

Study 1: Methodology

This research employed two online scenario-based experimental studies. Study 1 was designed to test the effects of different types of customer service support—representing three levels of AI integration—on customer satisfaction and perceived value.

Design and procedure

Study 1 utilized a between-subjects experimental design in which participants were randomly assigned to one of three conditions representing different types of phone-based service support during a booking scenario:

1. Live Support (No AI): The customer interacted with a live human agent.
2. Low AI Integration: The customer interacted with a traditional automated phone system using numeric keypad options and a robotic voice.
3. High AI Integration: The customer engaged in a natural-language conversation with a voice-based conversational AI designed to mimic human interaction (i.e., auditory anthropomorphism).

Participants listened to a 90-second audio simulation of a booking interaction between a customer and the service provider, with the conversation varying based on assigned condition. All participants then completed a structured questionnaire including manipulation checks, the dependent variables (satisfaction and perceived value) and basic demographic questions.

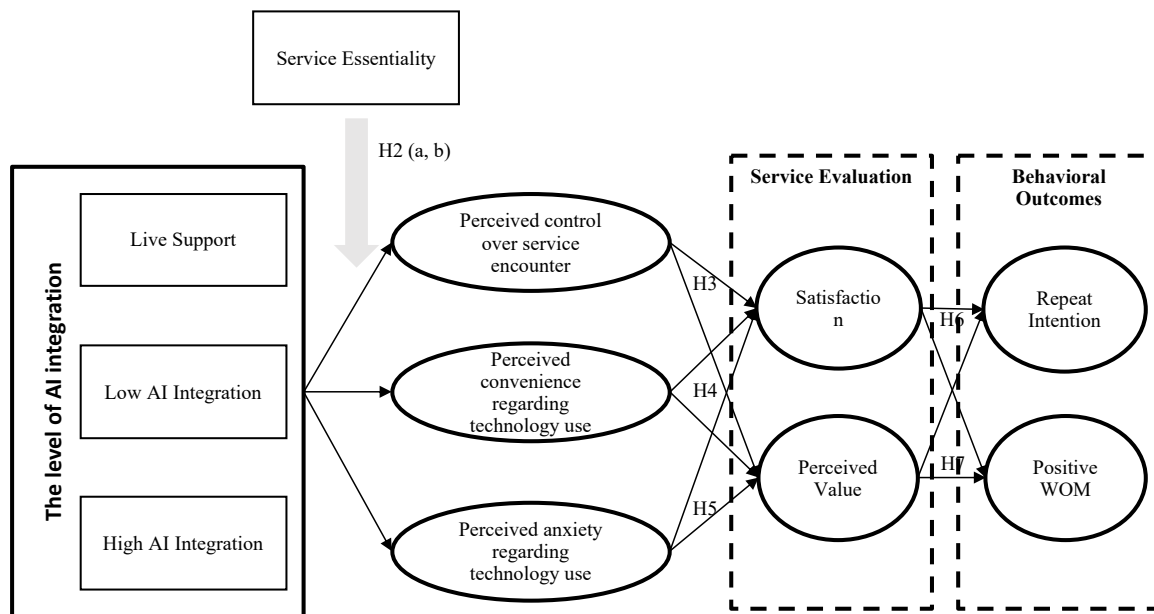


FIGURE 2 – Proposed Model 2— full mediation and behavioral outcome model

Measures

Two dependent variables were assessed using validated scales. Customer Satisfaction was measured using three items adapted from Wan *et al.*, (2016): This service performance during the booking is good; This service performance is better than I expected; I am happy with this booking service. Perceived Value was measured using three items from Kim *et al.*, (2007): Compared to the effort I need to put in, this technology is beneficial to me; Compared to the time I need to spend, this technology is worthwhile to me; Overall, this technology delivers me good value. All items were measured on 7-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree).

Sample and data cleaning

A total of 500 participants were recruited via Amazon Mechanical Turk (MTurk). Standard quality control procedures were applied, including bot detection, attention checks and minimum time thresholds to ensure data validity. Participants who failed attention checks or spent fewer than five minutes on the survey were removed, leaving 161 valid cases. An additional round of screening removed participants who failed the manipulation checks, resulting in a final analytic sample of 82 participants.

A majority of participants were aged 26–35 (48%), followed by 36–45 (26%) and 45+ (22%). A small proportion (5%) were aged 18–25. The sample consisted of 56% males and 44% females and was predominantly White/Caucasian (63%), followed by African American (24%). Smaller percentages identified were Asian (5%), Hispanic (2%), Native American (1%), Pacific Islander (1%), or Other (2%). Most participants reported annual household incomes between \$50,000 and \$74,999 (39%). The next largest groups were \$30,000–\$49,999 (21%) and below \$30,000 (16%), with smaller proportions at higher income levels. The majority held a bachelor's degree (40%) or a master's degree (27%). Others had some college education (23%), a high school diploma or less (9%), or a doctoral degree (1%).

Study 1 results

Mean comparisons revealed initial patterns across the three service support types. For customer satisfaction, participants rated the human agent condition the highest ($M = 6.00$, $SD = 0.95$), followed by high AI integration ($M = 5.49$, $SD = 1.48$) and low AI integration ($M = 5.14$, $SD = 1.02$). For perceived value, the human agent again received the highest rating ($M = 5.83$, $SD = 0.86$), followed by high AI integration ($M = 5.20$, $SD = 1.47$) and low AI integration ($M = 4.80$, $SD = 1.09$).

Multivariate and univariate tests

A one-way multivariate analysis of variance (MANOVA) was conducted to assess the effect of AI integration level on customer satisfaction and perceived value. The overall multivariate effect was statistically significant, Wilks' Lambda = 0.884, $F(4, 156) = 2.48$, $p = .046$, partial $\eta^2 = .060$, indicating that the type of service support had a significant combined effect on the two dependent variables. Follow-up univariate ANOVAs showed significant differences across conditions for both outcomes: Customer Satisfaction: $F(2, 79) = 3.51$, $p = .035$, partial $\eta^2 = .082$; Perceived Value: $F(2, 79) = 5.16$, $p = .008$, partial $\eta^2 = .115$. These results support Hypothesis 1, indicating that the level of AI integration significantly influences both satisfaction and perceived value.

Post hoc comparisons (Tukey HSD)

To further test Hypotheses 1a and 1b, we examined pairwise differences between the three support types: For satisfaction, participants in the human agent condition reported significantly higher satisfaction than those in the low AI integration condition (Mean difference = 0.86, $p = .026$). No significant differences were found between human and high AI integration ($p = .269$), or between low and high AI integration ($p = .512$). For perceived value, the human agent condition also led to significantly higher ratings than low AI

integration (Mean difference = 1.03, $p = .005$). Differences between human and high AI integration and between high and low AI, were not statistically significant.

Hypothesis testing summary

H1a (Satisfaction): Partially supported. Satisfaction was significantly higher for human agents than for low AI, but high AI did not significantly differ from either.

H1b (Value): Partially supported. Perceived value was significantly higher for human agents than low AI, but high AI did not differ significantly from either.

Study 2: Methodology

Following the initial evidence from Study 1 that the level of AI integration significantly influences service evaluations, Study 2 was conducted to investigate the psychological mechanisms underlying these effects and the moderating role of service essentiality. Specifically, the study tested whether the effects of service support type on satisfaction and perceived value are indirectly mediated by perceived control, convenience and anxiety and whether these effects vary depending on whether the service is essential or non-essential.

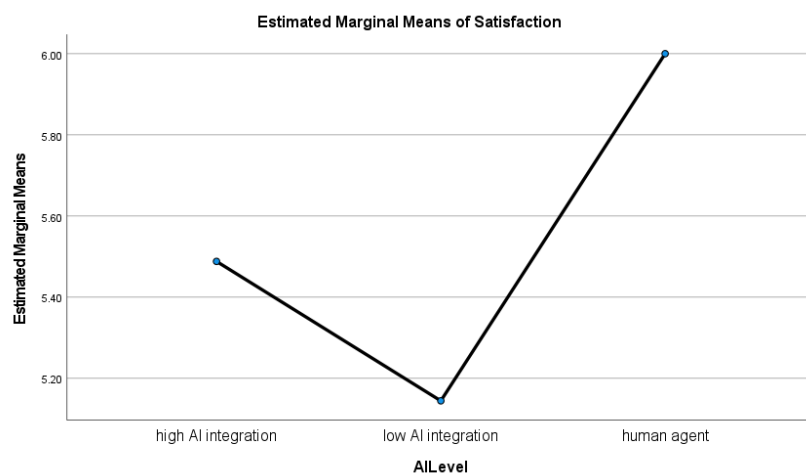


FIGURE 3 AI integration effect on satisfaction

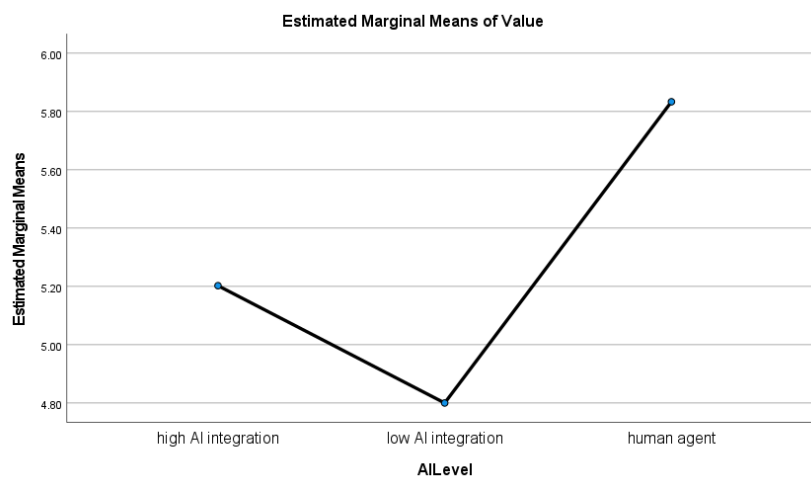


FIGURE 4 AI integration effect on perceived value

Design and procedure

Study 2 employed a 2 (Service Essentiality: Essential vs. Non-Essential) $\times$ 3 (AI Integration Level: Live Human Support, Low AI, High AI with Anthropomorphism) between-subjects experimental design. Participants were randomly assigned to one of six conditions. Each condition included a short 90-second audio recording of a booking service interaction featuring: Either an essential service (e.g., healthcare appointment) or a non-essential service (e.g., hotel reservation). One of three types of service support: Live human support (no AI integration), Low AI integration (automated numeric prompts with robotic voice) or High AI integration (conversational AI with a natural, human-like voice). Participants were instructed to imagine themselves using this service and then completed a survey assessing key psychological responses, service evaluations, behavioral intentions and demographic characteristics.

Sample and recruitment

Participants were recruited through Prodege, a leading panel provider in political and consumer research. A nationally representative sample of 2,000 U.S. consumers was initially collected. After removing suspected bots, participants who failed attention checks, or who completed the survey in under five minutes, the dataset was reduced to 981 valid responses. Additional manipulation checks were conducted to confirm that participants correctly recognized the service type (essential vs. non-essential) and perceived the intended level of anthropomorphism using a five-item scale adapted from Bartneck *et al.*, (2009). Participants who failed these checks were removed, resulting in a final analytic sample of 282 participants.

Demographic profile

The sample was evenly split, with 49.6% identifying as men, 49.6% as women and 0.7% as trans men. Approximately 38% had a high school diploma or less, 28% had some college or an associate degree, 21% held a bachelor's degree, 11% had completed some graduate school or a master's degree and 3% held a doctoral or professional degree. The majority of participants were identified as White (non-Hispanic) (69%), followed by Hispanic or Latino (16%), Black or African American (9%), Asian (5%) and other or multiracial groups (1%). The sample reflected a wide income distribution, with 16% earning under \$35,000 annually, 28% earning between \$35,000 and \$74,999 and 56% earning \$75,000 or more.

Measures

All participants completed validated scales assessing the following constructs: Customer Satisfaction (3 items; Wan *et al.*, 2016), Perceived Value (3 items; Kim *et al.*, 2007), Perceived Control (Lee & Allaway, 2002; Collier & Sherrell, 2010), Perceived Convenience (Berry *et al.*, 2002; Wang, 2012), Perceived Anxiety (Meuter *et al.*, 2003; Bujisic *et al.*, 2017), Word-of-Mouth Intention (Lin & Hsieh, 2007) and Repeat Intention (Zeithaml *et al.*, 1996). All items were measured on 7-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree).

Study 2: Results

Study 2 tested whether the effects of AI integration level and service essentiality on customer satisfaction and perceived value were mediated by perceived control, convenience and anxiety (H3–H5) and whether satisfaction and value predicted repeat intention and word-of-mouth (WOM) (H6–H7).

Step 1: Effect on dependent variables

A 2 (Service Essentiality: Essential vs. Non-Essential) $\times$ 3 (Support Type: Live, Low AI, High AI) MANOVA was conducted to examine the effects on customer satisfaction and perceived value. The multivariate effect was significant for support type (Wilks' Lambda = .751, $F(4, 550) = 21.15$, $p < .001$, partial $\eta^2 = .133$) and service type $\times$ support type interaction (Wilks' Lambda = .954, $F(4, 550) = 3.27$, $p = .011$, partial $\eta^2 = .023$). Follow-up ANOVAs revealed significant main effects of support type and service type and a significant interaction on both outcomes: Satisfaction: $F(2, 276) = 45.59$, $p < .001$; interaction:

$F(2, 276) = 5.84, p = .003$; Perceived Value: $F(2, 276) = 28.11, p < .001$; interaction: $F(2, 276) = 4.41, p = .013$. These results support H2a and H2b. Indicating that service essentiality moderates the effect of AI integration level on satisfaction and value. Specifically, low AI integration produced the lowest satisfaction and value in non-essential contexts, but differences diminished in essential services where efficiency was more critical.

Step 2: Effect on mediators

A second MANOVA examined the effects of support type and service essentiality on perceived control, convenience and anxiety. Multivariate tests showed significant effects of Support type ($F(6, 548) = 16.20, p < .001$, partial $\eta^2 = .151$) and Service type $\times$ support type interaction ($F(6, 548) = 3.59, p = .002$, partial $\eta^2 = .038$). ANOVAs confirmed that perceived control and convenience varied significantly across conditions ($p < .001$), supporting H3 and H4 and anxiety was influenced by support type, but did not significantly predict outcomes when entered as a covariate, offering no support for H5.

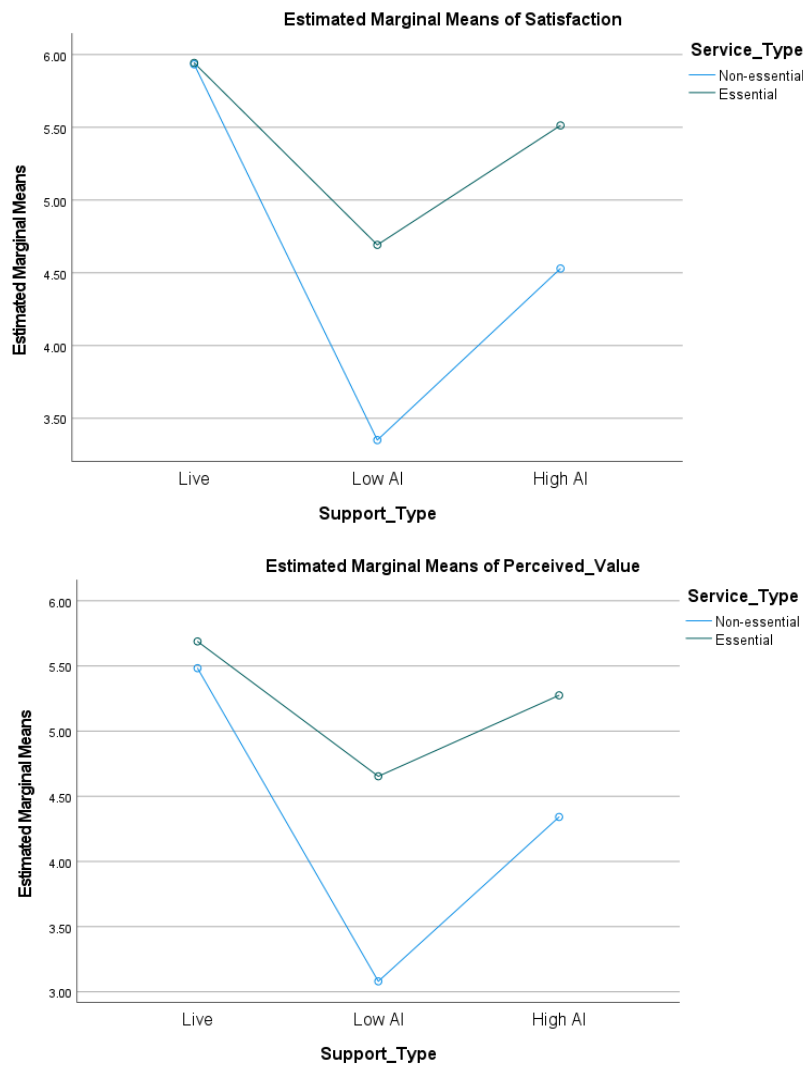


FIGURE 5 Relationship between service type, support type, satisfaction and perceived value

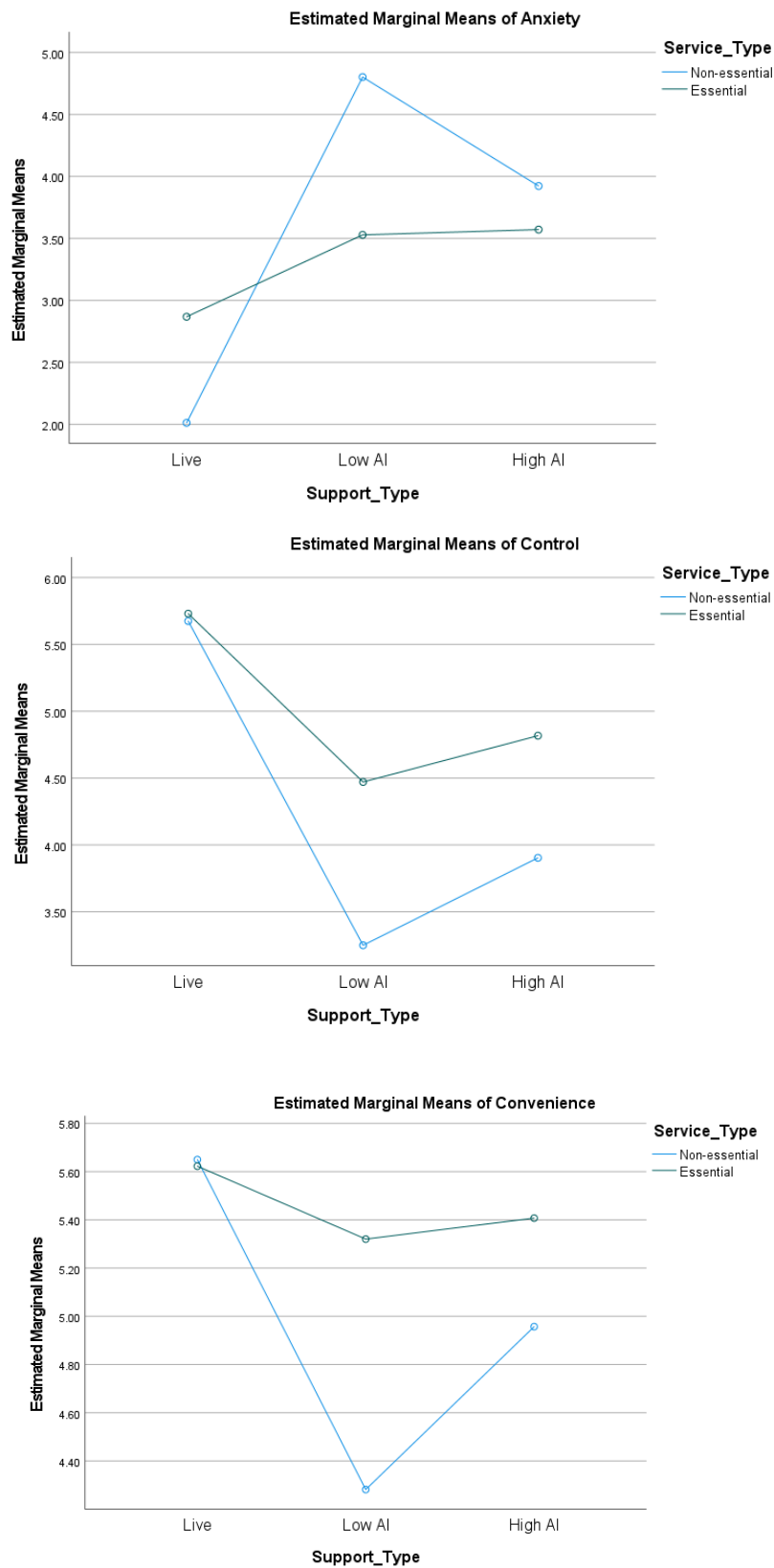


FIGURE 6. Relationship between service type, support type and mediators

Step 3: Mediation test (ANCOVA with mediators as covariates)

To test for mediated moderation, satisfaction and perceived value were analyzed with control, convenience and anxiety as covariates. After including mediators, the previously significant interaction effect of service type $\times$ support type became non-significant: Satisfaction: $F(2, 273) = 0.87, p = .419$; Value: $F(2, 273) = 0.40, p = .672$. Importantly, perceived control and convenience remained strong, significant predictors of both satisfaction and value ($p < .001$), while anxiety was not significant ($p > .18$). These findings confirm partial mediated moderation through control and convenience, providing support for H3 and H4, but not H5.

Downstream effects on behavioral intentions

To test H6 and H7, a final MANOVA examined the effects of satisfaction and perceived value on repeat intention and WOM. Both predictors were significant: Satisfaction: $F(1, 273) = 43.92$ for repeat intention; $F = 45.79$ for WOM, $p < .001$; Perceived value: $F(1, 273) = 99.59$ for repeat intention; $F = 66.20$ for WOM, $p < .001$. These results support H6 and H7.

Discussion

This research set out to explore how different levels of AI integration and service essentiality affect customer service evaluations and how these effects are mediated by perceived control, convenience and anxiety. Across two experimental studies, we found robust evidence that both cognitive and affective service evaluations (i.e., satisfaction and perceived value) vary systematically based on the design of customer service support. Specifically, the results extend prior research by demonstrating that low AI integration, often represented by impersonal, robotic systems, leads to lower satisfaction and value—especially in non-essential services, where consumers expect more personalized and engaging interactions.

Theoretical implications

First, our findings confirm and extend the AI integration continuum proposed by Marinova *et al.* (2016), showing that not all technology-mediated interactions are equally effective. In line with prior work on auditory anthropomorphism (e.g., Waytz *et al.*, 2014; Eyssel *et al.*, 2012), we show that high AI systems with human-like features perform comparably to live human agents on core evaluation metrics. This provides additional support to the notion that perceived humanness is a critical design feature in AI applications (Aggarwal & McGill, 2007; Chandler & Schwarz, 2010). Second, we contribute to the growing literature on contextual influences in technology acceptance (Venkatesh *et al.*, 2003; Meuter *et al.*, 2005) by demonstrating that service essentiality moderates the effect of AI support on consumer outcomes. In essential service contexts (e.g., healthcare or financial assistance), consumers appear more outcome-oriented, placing less emphasis on how the service is delivered. However, in non-essential services, interpersonal richness and personalization play a larger role in shaping evaluations—echoing Maslow's hierarchy as conceptualized by Hollebeek *et al.* (2021). Third, this study advances theoretical models of mediated technology effects. While prior research has highlighted perceived control and convenience as core drivers of satisfaction in self-service technologies (Lee & Allaway, 2002; Wang, 2012), our findings are among the first to demonstrate that these psychological mediators explain the interaction between service context and AI design. Interestingly, perceived anxiety, while frequently cited as a barrier to technology adoption (Meuter *et al.*, 2003), did not mediate service evaluations in our study, suggesting that design improvements, like anthropomorphism, may already mitigate those concerns in modern AI systems. Finally, we confirm that satisfaction and perceived value significantly influence repeat intention and word-of-mouth, extending classic service marketing theories into the realm of AI.

Managerial implications

The findings offer several practical takeaways. For companies deploying AI in customer service, the level of integration must be carefully matched to the nature of the service. Low AI interfaces, while cost-effective, may damage customer perceptions, particularly in non-essential services where brand personality

and user experience are critical. By contrast, high AI systems designed with human-like voices can effectively replicate many of the benefits of live human agents while maintaining the efficiency of automation. Moreover, firms should recognize that psychological design elements, especially those enhancing a sense of control and convenience, play a pivotal role in shaping the perceived success of AI encounters. Investing in voice design, flexible response timing and conversational logic that mimics human interaction can greatly increase customer satisfaction and long-term loyalty.

Contributions to the literature

This study makes several contributions. It demonstrates that consumer responses to AI are not monolithic but depend on the degree of anthropomorphism and perceived integration into the service process. It introduces service essentiality as a novel and theoretically grounded moderator in AI-customer interaction research. It applies and confirms a mediated moderation framework, revealing that psychological mechanisms, such as perceived control and convenience, drive service evaluations. Together, these findings offer a richer and more nuanced understanding of how consumers interact with AI-driven customer support, advancing both theory and practice in the domains of marketing, service design and human-computer interaction.

Conclusions

This research offers new insights into the effectiveness of AI in customer service settings, particularly in relation to how much AI is integrated, the human-likeness of the system and the contextual role of service essentiality. Across two experimental studies, we found that live human agents and anthropomorphic AI were evaluated more favorably than traditional, low-level AI systems. These effects were especially pronounced in non-essential services, where personalization and emotional resonance matter more. Furthermore, we showed that these effects are mediated by perceived control and convenience, confirming the psychological pathways through which technology design influences consumer evaluations. Importantly, the findings demonstrate that high AI integration can match or even outperform low AI systems, provided it includes human-like features that mimic natural conversation. This aligns with and extends previous work in technology acceptance and anthropomorphism and offers practical design principles for organizations seeking to implement AI-based service solutions.

Limitations and directions for future research

Despite these contributions, several limitations must be acknowledged. First, there are limitations in the scenario-based design. While audio-based vignettes provide a high degree of control over experimental manipulation, they may not fully capture the emotional and contextual complexity of real-world service encounters. Future studies could employ field experiments or live AI interactions to replicate these effects in naturalistic settings. Second, there are sample constraints: Although Study 2 used a nationally representative U.S. sample, generalizability may still be limited by cultural, demographic, or regional differences. Future research should examine cross-cultural differences in AI acceptance and perceptions of service essentiality. Third, we have used limited behavioral measures: we measured intended behaviors (repeat use, WOM) rather than actual behavior. Follow-up studies should incorporate behavioral tracking, clickstream data, or usage logs to evaluate real outcomes. Next, we should recognize the narrow scope of AI designs. Our study focused on three types of service support: live human agents, low AI (robotic voice) and high AI with auditory anthropomorphism. Future work could examine additional design dimensions, such as visual avatars, emotional intelligence in AI responses, or adaptive AI systems that change based on user behavior. Finally, as for temporal and longitudinal effects, this study used a single-interaction framework. Yet, AI experiences are often repeated over time, with trust and comfort potentially increasing (or decreasing) as familiarity grows. Longitudinal research could uncover how relationships with AI evolve across multiple encounters. By addressing these limitations, future research can continue to enrich our

understanding of human-AI service interactions, identifying not just when and where AI works—but why and how it succeeds in delivering meaningful customer experiences.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

To pay or not to pay: exploring financial and non-financial nudges to promote sustainable delivery choices in e-commerce

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Abstract. Existing research exploring methods to persuade consumers toward pro-sustainable delivery options mostly focus on individual experiments rather than employing discrete choice designs. To address the gap in research and practice, the objective of this study is to examine the extent to which consumers are willing to adopt more sustainable last-mile delivery options, and how these options can be designed to remain attractive. Additionally, it explores the influence of different nudging techniques on consumer choices. An online survey targeting Belgian consumers with prior online shopping and delivery experience was conducted, employing choice-based conjoint experiments. To assess the impact of various nudging strategies, three distinct but homogenous samples of 600 respondents were gathered. Each group was presented with the same scenario description, but a different nudging strategy was applied to the "sustainability communication" attribute. Two non-financial nudges were tested: one group saw a traffic light labeling system (ranging from A to E), while the second group received a traffic light labeling joined with a social norm nudge. In the third group, the traffic light label was combined with a financial nudge, where consumers were asked to pay more for less sustainable options. The findings across all three groups show that delivery price is the most significant factor influencing consumer preferences, with home delivery emerging as the most preferred location. In group 1 and 2, where non-financial nudges were applied, the results were quite similar, with sustainability information playing a relatively minor role. However, in group 3, where a financial nudge was introduced, sustainability gained more importance, suggesting that consumers are more inclined to choose sustainable options when incentivized financially.

Introduction

In the rapidly digitizing retail landscape, every click, every purchase and every delivery choice made by consumers not only determines what ends up at their doorstep but also sets in motion a complex logistics chain that shapes retail operations. As consumer demand for e-commerce continues to rise, the volume of parcel deliveries has grown significantly by 3% to 73% between 2019 and 2022 (Pitney Bowes, 2023). This significant increase of parcel delivery has led to greater use of light goods vehicles and hence magnifying the externalities associated with greenhouse gas emissions, traffic congestion, pollution and noise pollution in urban areas where pressure is already high due to the increase in urban density (Allen *et al.*, 2018; Cardenas *et al.*, 2017; Jaller & Pahwa, 2020; Mangiaracina *et al.*, 2015).

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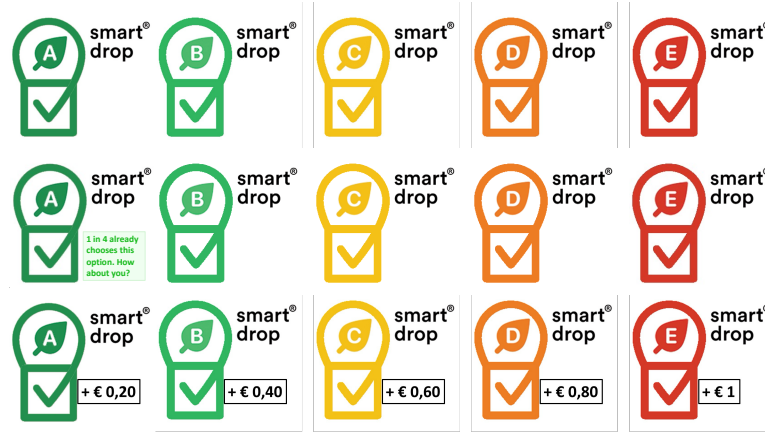


FIGURE 1 – Print screens of the levels of attribute Sustainable Information adapted for each intervention

A critical contributor to these issues is the last-mile delivery (Boysen *et al.*, 2021; Morganti *et al.*, 2014), the final leg of the supply chain that transports goods from the distribution centre to the consumer's doorstep (Goodman, 2005). Despite accounting for a relatively small proportion of the total e-commerce supply chain, the last mile is responsible for a disproportionately high share of direct and external costs (Buldeo Rai *et al.*, 2021; Wang *et al.*, 2016; Weber & Matthews, 2008). In addition, the expectations and choices of consumers to deliver in terms of speed, cost, service and quality (Manerba *et al.*, 2018; Nogueira *et al.*, 2021) adds to the growing challenges of sustainability for retailers and logistics service providers. This underscores how important it is to encourage consumers to adopt more sustainable behaviours.

Nudging, a behaviour modification technique introduced by Thaler & Sunstein (2008), can help with engaging consumers in the transition. It involves adapting consumers' choice architecture to influence their behaviour. The choice of intervention depends on the context and the desired behavioural change, as highlighted by Münscher *et al.* (2016). Their taxonomy categorizes choice architecture interventions into three groups: decision information (e.g., simplifying or reframing information), decision structure (e.g., setting defaults or altering effort) and decision assistance (e.g., reminders or facilitating commitment).

In the context of e-commerce and the delivery of parcels, where price holds a significant weight for consumers (Buldeo Rai *et al.*, 2018; Nogueira *et al.*, 2021), a financial nudge (e.g., price incentives), which align with decision structure techniques can be impactful as they modify the effort or consequences associated with the different delivery options (Münscher *et al.*, 2016). On the other hand, since consumers currently face limited opportunities to make sustainable choices due to insufficient communication and availability of such information (Sallnäs & Björklund, 2020), non-financial nudges, such as eco-labels, which fall under decision information techniques can also be impactful in the context of e-commerce. While financial and non-financial nudges have been studied in isolation, their combined effect in encouraging sustainable delivery choices remains underexplored.

TABLE 1 – Overview of delivery attributes and level

Delivery price	[(1) Free; (2) Free as from € 50; (3) € 2.99; (4) € 3.99; (5) €5.99]
Delivery term	[(1) Within two hours; (2) Tomorrow; (3) Within 1-3 days; (4) Within 3-5 days; (5) Within 5 days but delivery date of choice]
Delivery location	[(1) Home delivery (8am-6pm); (2) Home delivery (6pm-10pm); (3) Collection points (during business hours); (4) Parcel locker (24/7); (5) Store (during business hours)]
Sustainability information	[(1) A-label; (2) B-label; (3) C-label; (4) D-label; (5) E-label]

This study addresses the research gap by examining how financial and non-financial nudges influence consumer willingness to adopt sustainable last-mile delivery options. It also investigates how these options can be designed to remain both attractive and effective in encouraging sustainable behaviour. Additionally, it explores the influence of different nudging techniques on consumer choices. To this end, three online surveys were conducted among a representative sample of Belgian consumers ($N_1 = 698$; $N_2 = 663$; $N_3 = 631$) with prior online shopping and delivery experience, employing choice-based conjoint experiments.

Methodology

While research has explored strategies to encourage consumers to choose more sustainable delivery options (Agatz *et al.*, 2021; Buldeo Rai *et al.*, 2021; Ignat & Chankov, 2020; Kelting *et al.*, 2024; Kokkinou *et al.*, 2024; Nijssen *et al.*, 2023), these studies have primarily examined financial and non-financial nudges separately. Additionally, they focus on single attributes rather than investigating the trade-offs consumers make between multiple factors, leaving the effect of an incentives on the different delivery attributes largely underexplored. To address this gap, this research employs three online surveys incorporating a choice-based conjoint (CBC) experiment. The experiment includes four key attributes (see Table 1): delivery price, delivery location, delivery term and sustainability information. While the core CBC experiment remains the same across all three surveys, the presentation of sustainability information varies incorporating three different nudging interventions (see Figure 1). By doing so, this study investigates how delivery options can be designed to remain both attractive and effective in fostering sustainable behaviour. Additionally, it explores the influence of different nudging techniques on consumer decision-making.

The data was collected through an online survey conducted between April 10 and April 18, 2024, using the Sawtooth Lighthouse Studio v9.15 software (Sawtooth Software Inc., 2024). The surveys, distributed via a market research panel, yielded 1992 respondents after data cleaning. Statistical tests confirmed no significant socio-economic or demographic differences ($p > 0.05$) across the three samples, ensuring their robustness for comparison. Respondents were randomly assigned to one of three nudging interventions, ensuring approximately equal sample sizes (Survey 1: 698, 2: 663; 3: 631 participants) across conditions. Data cleaning criteria included removing responses with completion times below half of the average and reviewing open-ended responses to ensure they were meaningful and, if necessary, re-categorizing them.

Traditional survey methods often rely on directly asking respondents about their preferences, which can sometimes lead to biased responses. In contrast, choice-based conjoint (CBC) experiments are a form of a discrete choice experiment that simulate real-world decision-making by presenting respondents with realistic choice scenarios, where they must select between different alternatives (Eggers *et al.*, 2022). This approach allows researchers to analyse how individuals make trade-offs between various attributes, providing deeper insights into the decision-making processes of people (Eggers *et al.*, 2022; Shang & Chandra, 2023; Steiner & Meißner, 2018). While CBC experiments have been applied in consumer behaviour studies within the transportation literature and for understanding pro-environmental behaviour, they remain less common (Buldeo Rai *et al.*, 2018; Caspersen & Navrud, 2021; Nguyen *et al.*, 2019) in service marketing and logistics..

Results

The survey data was analysed using the integrated analysis tool in Sawtooth Lighthouse Studio software. The analysis was conducted separately for each of the three samples, based on 5584 (survey 1), 5304 (survey 2) and 5048 (survey 3) choice tasks. Chi-square tests confirmed that all four attributes significantly influenced consumer choices ($p < 0.001$). Across all three samples, delivery price emerged as the most influential attribute in consumer preference for the delivery choice, followed by delivery location, sustainability information and, finally, delivery term.

Table 2 provides a summary of what consumer prefer as delivery option expressed as part-worth utilities of the attribute levels and average importance scores of attributes. Overall, consumer prefer the option of a free next-day delivery, at home (day, 8am-6pm and evening delivery 6pm-10pm) with an A-eco-label. Consumers strongly prefer free delivery, though they are also receptive to a free delivery with a minimum purchase amount of €50 and a small delivery fee (€2.99). A third-order polynomial utility function for delivery price reveals a nonlinear relationship. Utility decreases sharply with initial price increases, stabilises at mid-range prices and declines steeply again at higher prices. This suggests that consumers are highly sensitive to losing free shipping, but once they accept a small delivery fee, further increases have a diminishing effect, until prices reach a level that feels excessive, triggering another strong negative reaction. It highlights the importance of pricing strategies, where small delivery fees might still be tolerated, but crossing a certain threshold may induce losing consumer interest. This trend was consistent across all three samples, confirming price as a key determinant of delivery choice.

While less influential than price, delivery location still played a significant role. Home delivery was the most preferred option, with minimal differences between day (8 am and 6 pm) and evening (6 pm and 10 pm) time slots, suggesting consumer indifference to those specific delivery windows within home delivery. Conversely, parcel lockers, in-store pickup and collection points received negative part-worth utility values, indicating that those alternatives are less preferred. Sustainability information also had a smaller impact on the delivery choice. Consumers favoured higher eco-scores (A- and B-label), while lower scores (C-, D- and E-labels) resulted in decreased preference. Based on the results of the full sample, sustainability preferences exist but they are secondary. Delivery time was the least important attribute. The part-worth utilities show that consumers do not want to wait five days, even when given the option to select their delivery date. However, there was no strong preference for ultra-fast delivery (within two hours). The most preferred options were next-day delivery and waiting 1 to 3 days.

Conclusions

This study confirms that while consumers prioritize cost and convenience, they are responsive to nudging interventions, especially when financial incentives are involved. The combination of eco-labels and surcharges proved more effective than information or social norms alone. These findings offer insights for policymakers, e-commerce platforms and logistics providers designing delivery systems that support sustainability goals without compromising consumer appeal.

Acknowledgements

Heleen Buldeo Rai is a Senior Postdoctoral Fellow supported by Research Foundation - Flanders (FWO Grant 12ZX923N). The Sawtooth Software Academic Grant has been awarded to Kathleen Cauwelier.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Omnichannel retailing in circulatory fashion analysis

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Abstract. As fast fashion continues to lead the way in consumer overconsumption while contributing to the increasing problems of fashion waste, a growing number of small fashion brands across the globe are staking their claim in the sector of circular fashion. These companies use an assortment of techniques and resources to combat the harmful effects of fast fashion including using up-cycling used textile goods into new products, breaking textiles down to fibers and notions, creating new fabrications and repurposing trims for resale (Coscieme *et al.*, 2022). Omnichannel retailing provides products to consumers through two or more mediums in a seamless manner (Massi *et al.*, 2023). To stay competitive in today's fast fashion market, circular fashion retailers must use omnichannel retailing to meet customer needs and increase profits (McNeill & Snowdon, 2019). Education is one key point in their omnichannel integration that is an invaluable component of the circular fashion consumer journey. Education includes sustainable awareness. Information and taught skills, which serve as a medium to inform seamless integration in the customer's experience. Circular fashion education may include providing information about the harmful effects of fashion waste or teaching consumers how to mend or repurpose used textiles (Marcella-Hood, 2023, p. 8). This study aims to explore a small selection of American circular fashion brands and how their use of effective omnichannel retailing is serving their consumers. This data will be analyzed by using a new conceptual framework which combines the three primary strategies for core omnichannel retailing set within a niche retail products framework (Bridis *et al.*, 2021, Bieline & Ulbinaite, 2020). This study will contribute to the ongoing efforts to promote sustainable fashion as a highly valued option, while from a retailing perspective, this study will analyze how circular fashion education positively impacts channel strategies used to meet the consumer's needs.

Keywords : circular fashion; sustainable; upcycle; omnichannel; retailing; education; awareness

Introduction

The growing number of small circular fashion brands using fashion waste to create new fashion apparel and home goods can slowly help turnaround the negative impact of fast fashion. The term circular refers to the minimization of textile waste, keeping textiles in a closed loop cycle through the process of design, manufacturing and consumption (Aus *et al.*, 2021). Some of the processes used to minimize textile waste and close the loop include, using previously worn or used textiles, scraps from garment manufacturing, breaking down fibers of previously worn or used textiles and manufacturing scraps to create new goods, as well as reselling, mending, renting and promoting rewearing apparel (Brydges, 2021). Many of the small

circular fashion (CF) brands (less than 50 employees) reviewed in preparation of the study focus on one specific CF process to close the life cycle loop of previously used textiles. These particular brands also depend on social media to educate consumers how their CF process positively impacts the environment and four retailing channels including one brick-and-mortar location to provide products and services to their local community. This four-part fully integrated omnichannel strategy for a CF and textiles brand is key to compete within the fashion retail market for visibility among larger retailers, as well as create environmental awareness that supports the value their goods and services add to the overall customer experience (Grootboom *et al.*, 2023).

This research takes place in two phases, focusing on three American CF retailers, the sustainable education they provide to consumers through Instagram and how the channel offering and education may impact the customer's journey. The purpose of this research is to analyze the channel retailing strategies of the American CF retailers and conduct phase one of a qualitative analysis of how each retailer uses education on their Instagram to support their channels. This analysis will include a review of three chosen CF retailers, a review of literature sources that lay the foundation for successful omnichannel retailing and CF and sustainability education for consumers. This study will also discuss the CF sampling procedure, process of analysis using a new framework to review each retailer, followed by a findings and discussion section. The sample CF retailers selected for this analysis include SUAY in Los Angeles, California; Zero Waste Daniel in New York, New York, and The Drift Collective in Portsmouth, New Hampshire. Research objectives include the effects of omnichannel strategies on consumer behaviors in the following context: inside the brick-and-mortar store, using online store applications, using social retailing applications and understanding how channels work together seamlessly overall (Massi *et al.*, 2023). The right mix of channel strategies and sustainability education in circular fashion retailers may enhance customer experiences and increase brand loyalty as the brand continues to grow. Fashion sustainable education may increase the fast fashion consumer's acceptance of resale stores, second-hand apparel goods and upcycled fashion (Massi *et al.*, 2023). The main objective of this phase one qualitative analysis is to answer two research questions. The research questions this analysis will answer are: RQ1 - How do CF retailers channels provide a seamless customer experience? RQ2 - How do CF retailers use sustainable fashion education on Instagram in their omnichannel retail approach?

In a preliminary analysis, a new conceptual framework based on the McKinsey & Company customer journey model and a niche fashion omnichannel model, was established to analyze SUAY, one of the CF retailers in this study. Based on the preliminary analysis, this new conceptual framework worked as a lens to explore how the channels work together, the sustainable education provided and the journey of the customer based on offerings found while shopping online. The education variables CF retailers may promote through Instagram in the framework provide the customer with awareness, information and a skill to practice sustainability. This study contributes to the field of CF brands and their growth in the fashion market. The growth of established CF brands and possible start of new CF brands by new designers entering the field, may do a small part to offset the waste created from fast fashion and close the loop in the life cycle of some textile objects. With growing global concerns about the harmful effects of fashion waste on the environment, continued research in CF should be conducted, to educate and capture today's fast fashion-driven consumer (Marcella-Hood, 2023).

Retailer introductions

SUAY

Established in 2017 by slow fashion enthusiast Rose Medoff, Suay is a small company, with only one brick-and-mortar store in downtown Los Angeles, California. Neighboring the LA Fashion District and clusters of artist galleries, Suay's store is located among fellow artist, tastemakers and creatives who frequent the downtown LA arts area regularly. The store's online store and interactive Instagram showcase a small

capsule collection of upcycled fashion goods for men and women, including tops, pants, skirts, dresses, jumpsuits and outerwear, while the walls are lined with shelves of upcycled pillows, cushions and other simple home goods. The company's website and online store ships globally and provides ample information on two major service initiatives offered; community dye baths, giving discolored or no longer desirable textile goods a new look; and Suay's custom studio, open to a large variety of personalized services available for individuals (direct to customer) as well as other brands (B2B opportunities) (Medoff, n.d.).

The brand uses Instagram and Facebook to post content including; information about its services, showing examples of custom projects; knowledgeable employees modeling its ready-to-wear capsule collection in-store; and details for specific store events, including sewing and upcycling workshops, community dye baths and charity clothing drives (Suay IG, n.d.). This Instagram (and Facebook) retail channel strategy, showing a behind the scene look at Suay's goods and production space, identifies the value adding qualities of Suay's goods and services as suggested by the Iglesias-Pradas *et al.*'s 2021 article, as well as providing followers with an example of the customer experience Suay provides through custom work and dye bathes as supported in the Thaichon *et al.*'s 2024 article. These speciality value adding services are unique and are not offered as a community staple regularly at any neighboring business in the area. According to Sheth (2021), this type of value adding service and technology cannot only keep the online channels activated, as Suay accepts textiles by mail to dye for non-LA customers, but will also increase foot traffic and loyalty with a monthly service. Suay's website mirrors Instagram seamlessly to work with branding, company information, product details and the promotion of corporate social responsibility (CSR) initiatives being consistent across all channels. Excluding outside press from local publications and online platforms, consumers may interact with the Suay Instagram and Facebook profile 24/7, asking questions on posts, direct messaging the Suay team and viewing content to gain a better understanding of products, services and events. Although both social media platforms are active and provide similar information, their Instagram platform has more interactive content, engaging with approximately 16000 more followers than Facebook. Customers may also contact the company via an online form for consultations and custom work, while local customers may visit the store directly to experience touch. Immediate gratification at the point of sale, reduce risk (while also being social) by engaging with associates and receive personal service face to face as seen through the website and Instagram content. Although Suay only has one brick-and-mortar location, the brand utilizes social media stories and posts to bring the atmosphere of the store to their followers and customers. Lynch & Barnes (2020), states that the findings indicate an enhanced range of decision-making stages, channels and devices used at each stage and highlight the affective experience of high-involvement fashion consumers along the journey. Suay meets this goal by offering customers the chance to be a part of the high-involvement redesign process, while also providing more information and examples circular fashion and homegoods via the website, paired with videos of the sewers, pattern makers and dying artists showing the full process on social media, accessible through two channels. Although customers outside of LA can only access two of the three channels, tours of the Suay workshop further the experience of the brick-and-mortar location on their digital devices.

Zero Waste Daniel

Daniel Silverstein established his brand in 2015 in Brooklyn, New York, after working in the New York City garment district as a high-end women's wear designer for large fashion brands. Having worked in a business that creates fashion waste in the cutting process, Silverstein was inspired to produce apparel goods using the scraps created daily in the production of fashion goods, not only from the company he worked for, but other fashion houses in the New York garment district. The foundation of Silverstein's business model focuses on a CF process of using the small production scraps to create rolls of patchworked fabric that he calls re-roll. With this re-roll fabric, he and his small staff of approximately 18 employees, create one-of-a-kind apparel and accessories for men and women, as well as custom fashion for all ages. As seen with SUAY, the Zero Waste Daniel online store and interactive Instagram showcase a small capsule collection of upcycled unisex fashion goods for including tops, pants, skirts, dresses, jumpsuits and

outerwear and unique fashion accessories. The company's website and online store ships globally and offers custom work for individual clients as well as performance costumes (Silverstein, n.d.).

The brand uses Instagram and Facebook to post content including; information about its services, showing examples of custom projects; Silverstein himself modeling one-of-a-kind pieces in his studio and retail space; and detailed video clips of how certain fashion objects were constructed (Zero Waste Daniel IG, n.d.). The brand's website (online and mobile) mirror's Instagram seamlessly to work with branding, company information, product details and the promotion of CSR initiatives creating consistency across all channels. Excluding outside press from local publications and online platforms, consumers may interact with the Suay Instagram and Facebook profile 24/7, asking questions on posts, direct messaging Silverstein and his team and viewing content to gain a better understanding of products and events. The brand's instagram platform has more interactive content, engaging with approximately 105,000 more followers on Instagram than Facebook. Customers may also contact the company via an online form for questions and custom work, as well as visit the store in person to engage with associates and the unique fashion piece in person.

The Drift Collective

The Drift Collective is the third and final brand and retailer included in this study, established in the fall of 2016 in downtown Portsmouth, New Hampshire. Emily Stearn began the company as a way to earn extra income upon graduating from graduate school by designing and creating bikinis and selling them via her online store. With continued research in the world of fast fashion and the harmful effects of the garment industry, Stearn decided to refocus her brand as an upcycling fashion company. Most of the fashion goods made in the brand's workshop are made from secondhand textiles sourced at local thrift stores (Voyage Group Magazines, 2017). The thrifted pieces are then cut up and re-assembled into new garments or slightly altered and made new with a screen print design, bleaching, or patchwork detail added. The brand employs a small staff of approximately 15 employees and features many of the creatives behind the scenes on the website as well as social media. As seen with SUAY and Zero Waste Daniel, The Drift Collective's online store and interactive Instagram showcase a small capsule collection of upcycled men's and women's fashion goods for including tops, hoodies and fashion accessories. The company's website and online store ships globally and offers custom work for individual clients including, design, construction/ reconstruction, mending and alterations and dying (Stearn, n.d.).

As with SUAY and Zero Waste Daniel, The Drift Collective uses Instagram and Facebook to post content including information about its services, highlighting textile goods available for purchase, details about retail events and behind the scenes content (Stearn, n.d.). The brand's website (online and mobile) mirror's Instagram seamlessly to work with branding, company information, product details and the promotion of CSR initiatives creating consistency across all channels. As with SUAY and Zero Waste Daniel, excluding outside press from local publications and online platforms, consumers may interact with the brand on Instagram and Facebook profiles 24/7, asking questions on posts, direct messaging Stearn and her team and viewing content to gain a better understanding of products and events. The brand's instagram platform has more interactive content, engaging with approximately 40000 more followers on Instagram than Facebook. Customers may also contact the company via an online form for questions and to start an online account, as well as visit the store in person to engage with associates and the unique fashion piece in person (Stearn, n.d.).

Literary review

Omnichannel retailing

These literary sources for this study were divided into three categories that fit within scope of research for omni channel retailing in circular fashion. These categories included business and economics, psychology, CF business created a foundation for this study. Economic and business practices in retailing reiterate the

value of a brick-and-mortar location, website or online store, mobile and social retailing all seamlessly working together to enhance the customer's journey in the buying process. In Sheth's (2021) "Future of brick-and-mortar retailing: how will it survive and thrive?" he described brick-and-mortar stores as an endangered species against online shopping and focused on value adding and low to high tech experiences to position and reposition stores to survive and thrive. For CF retailers, a brick-and-mortar store that also acts as the manufacturer or workshop also adds value for on-site services. These services may include alterations and custom design, of which a consumer may not have available and affordable access to in fast fashion brand retailers. CF retailers should consider Sheth's (2021) recommendation for brick-and-mortar stores to be location-centric, convenience-centric and experience-centric to transform and keep up with the ever-evolving fashion retail market. The book "Exploring the role of omnichannel retailing technologies: future research directions" (Thaichon, *et al.*, 2024), explored omnichannel retailing and the role of technology in identifying the customer perspective of value, experience, showrooming/webrooming within channel integration. Sheth (2021) and Thaichon *et al.* (2024) both emphasize the use of technology as the most significant value-adding attribute a retailer can offer. According to Thaichon *et al.* (2024), the 21st century emerging phenomenon in value-adding technology impacting the retailing landscape was the ability to shop online. This phenomenon rapidly progressed to include mobile retailing and social retailing, where consumers shop comfortably anywhere with a handheld device. For the consumer, these channels provide a shopping experience that may be accessed online and offline, anywhere and anytime for a fully integrated system (Iglesias-Pradas *et al.*, 2021). By analyzing the design and implementation of this system a company's level of omnichannel operation may be examined (Iglesias-Pradas *et al.*, 2021). Iglesias-Pradas *et al.* (2021) address six dimensions of a fully integrated channel system:

- 1) Three or more customer touch-points, with company-consumer one-directional or bi-directional interaction.
- 2) Channel consistency, with the brand image, visuals, products and prices being consistent across all channels.
- 3) Integrated promotions, with cross channel promotions and activities across all channels.
- 4) Integrated information, with consistent information and data accessible for consumers across all channels.
- 5) Integrated fulfillment, where products come directly to the customer in a reliable and dependable manner consistently through all channels that offer or require delivery.
- 6) Integrated customer care availability, whether customers may contact the retailer at any point in the shopping experience, via phone, email and online platform, for assistance.

Using the six dimensions above, in combination with an engaging digital and social media experience, customers are more likely to become loyal to a brand or retailer (Cook, 2014; Bieline & Ulbinaitė, 2020). The final literary source in business and economics is one of the leading global business consulting and marketing firms, McKinsey & Company (Mehta *et al.*, 2022). McKinsey & Company provides a table model of the customer journey through value-adding attributes that build loyalty and engagement, while fulfilling needs in the buying process. This five step buying process is outlined by Levy & Grewal (2023) in "Retailing Management". The buying process includes the steps a customer goes through to purchase a product or service from a brand or retailer. Step one begins with the customer recognizing their unsatisfied needs, which may be utilitarian for function, or hedonic, fulfilling a pleasure need. In step two, the customer gathers information from brands and retailers and their channels. It is in step two, that technology becomes a high value-adding attribute for brands. In the case of small CF retailers with only one brick-and-mortar, product information, sustainable education and engagement provided through social media may help them thrive in the fashion market (Sheth, 2021; Marcella-Hood, 2023; Thaichon *et al.*, 2024). Step three involves an evaluation of the retailers their channels, ending step four, the purchase of a product or service and step five the postpurchase and evaluation of satisfaction from process, products and services received (Levy & Grewal, 2023).

In the area of psychological and consumer behavior, Lynch & Barnes (2020) conducted qualitative research on omnichannel retailing and the customer decision-making process among high-involvement fashion consumers. According to Lynch & Barnes (2020), fashion brands like the glue needed to link all channels, which may impact the customer's decision-making process. High-involvement customers are defined as those who value self-expression through clothing and prioritize choosing the right products according to their needs and values as a consumer (Lynch & Barnes, 2020). Their findings proved that high-involvement customers that were pleased by their buying process and products and services, were more likely to post and tag about their experience on social media. For small CF brands and retailers with limited marketing, depending on social media to promote their brand and create community, Instagram could be that glue. Value-adding attributes such as alterations, custom work, store events and sustainable workshops hosted by some CF retailers may also capture this high-involvement customer.

Some consumer behavioral sources theorize the importance of consistent messages across all channels to enhance the consumers' purchase intention and perceptions of brand authenticity through signaling theory (Massi *et al.*, 2022). In Massi *et al.*'s (2022) quantitative study, the findings proved that retailers with the most consistent message across all channels were viewed as trustworthy, and participants reported having a better customer experience than retailers with inconsistent channel messaging. In the case of small CF brands with only one brick-and-mortar, consistent channel messaging becomes important to gain customers in multiple geographic markets (O'Connor, 2020). In consistent messaging across all channels, visual and audio stimuli matching the brick-and-mortar experience may also result in an enhanced customer experience (Paz & Delgado, 2020).

The final category focused on omnichannel retailing for CF businesses and sustainability. Grootboom *et al.* (2023) directly connected circular fashion retailers to the importance of omnichannel retailing for education and to create a constant feedback loop between the retailer and the consumer. This article sets the foundation for how circular fashion retailers should use omnichannel retailing to service the customer with specialty and custom upcycled goods and track consumer experience.

This literature review provided a foundation of conceptual frameworks, including that of McKinsey & Company, Bieline & Ulbinaité (2020) and Grootboom *et al.* (2023), to inform a new framework to analyze the three sample CF retailers. Small CF brands could use the addition of sustainable fashion education across all channels, especially in social media to add value, increase customer involvement and create engagement in steps two, three, four and five in the customer buying process.

Circular fashion education

In steps two and three of the customer buying process, information about retailers and channels are collected and evaluated (Levy & Grewal, 2023). For small CF brands that are CSR focused, the education provided in these steps may be the glue within their channels to service customers and create brand loyalty, especially to consumers who prioritize sustainable fashion (Lynch & Barnes, 2020; Bennetta & Oeppen Hill, 2022; Grootboom *et al.*, 2023). Bennetta & Oeppen Hill (2022) focus on variables of education. These variables may be plugged into the channel integration model for CF retailers to enhance all channels, better inform the customer's buying process and improve the overall customer journey. These educational variables include awareness, information and teaching a skill (Bennetta & Oeppen Hill, 2022). CF and sustainability educational awareness includes factual news, reports and statistics about the dangers of fast fashion to the environment and human bodies, as well as how sustainable fashion practice can make improvements for both. Many academic sources about fashion sustainability and CF open with awareness to set the foundation for the value to their study,

The fashion and textile industry is one of the world's most polluting industries, mainly because its volume of production dwarfs most other industries. Textiles production requires a lot of land for crops and uses a

lot of water, energy, chemicals and other resources leaving often untreated pollution behind and has a highly negative environmental, economic and social footprint (Aus, et al., 2021).

This awareness message introduces consumers to factual details about goods that they interact with daily and impact their health and the world around them. Providing consistent awareness across all channels could increase the importance of the consumer fashion purchasing choices and trust in small CF retailers. CF and sustainability educational information provides consumers with knowledge about ways to practice sustainability in fashion, which could trigger cognitive responses and inform the customer's decision-making journey (Turunen & Halme, 2021).

An example of this information includes a list of sustainable practices, as listed on the Ellen MacArthur Foundation website: Circular business models designed to keep products in use – such as rental, resale, repair and remaking – allow companies to make revenue without making new clothes and represent an opportunity for new and better growth in the fashion industry (Ellen MacArthur Foundation., n.d.).

Providing consistent information across all channels, while also showing behind the scenes content on social media on how this information is used to create CF goods and services could increase engagement and trust in small CF retailers. CF and sustainability education through teaching is defined as providing consumers with hands-on skills by a professional instructor, so they may practice sustainable fashion on their own (Bennetta & Oeppen Hill, 2022). This skill mainly consists of sewing by hand or machine, to repair or upcycle used textiles, but may also include teaching over dying techniques to give new life to used garments. While this education option is not as common among sustainable retailers, facilitating workshops in this area at a cost, could increase profits, create postpurchase engagement and community and impact brand loyalty, especially for highly involved customers.

Conceptual methodology framework

Three sources in particular were used to create a detailed framework for phase one and two of this study. The leading framework used was inspired by Ulbinaite & Bieline's (2020) framework for evaluating the relationship between the omnichannel online sales approach and the performance outcome in niche product manufacturers and retailers (Figure 1). This framework is made of multiple sections, starting with the omnichannel system model set in the top portions, showing that all retailing channels should work together to affect the niche manufacturer, oftentimes, with the retailer also acting as the manufacturer as well to yield the performance financial and non-financial outcome (Ulbinaite & Bieline, 2020). Using this framework as an inspiration, the four channels utilized by the three CF sample retailers and the concept of sustainable education through Instagram were set into the top portion of the new conceptual framework (Figure 3).

The placement of the channels within the new framework were adjusted to reflect a continuous circle, with each channel working back and forth with another, instead of row across the framework. In addition, the customer was pulled into and centered in the omnichannel illustration. Two-way arrows, enhanced by the Instagram sustainable education variable, were also added between each channel and the customer. These two-way arrows suggest that there is an open access communication between the customer and the channel at any time.

Next, the three sustainable education approaches CF retailers may use were set just below the omnichannel portion of the framework, pulled from Bennetta & Oeppen Hill (2022). In the final portion of the new conceptual framework, the customer journey information from the McKinsey & Company table was added to consider the customer experience through the entire framework as this study continues in phase two (Figure 2) (Briedis *et al.*, 2021).

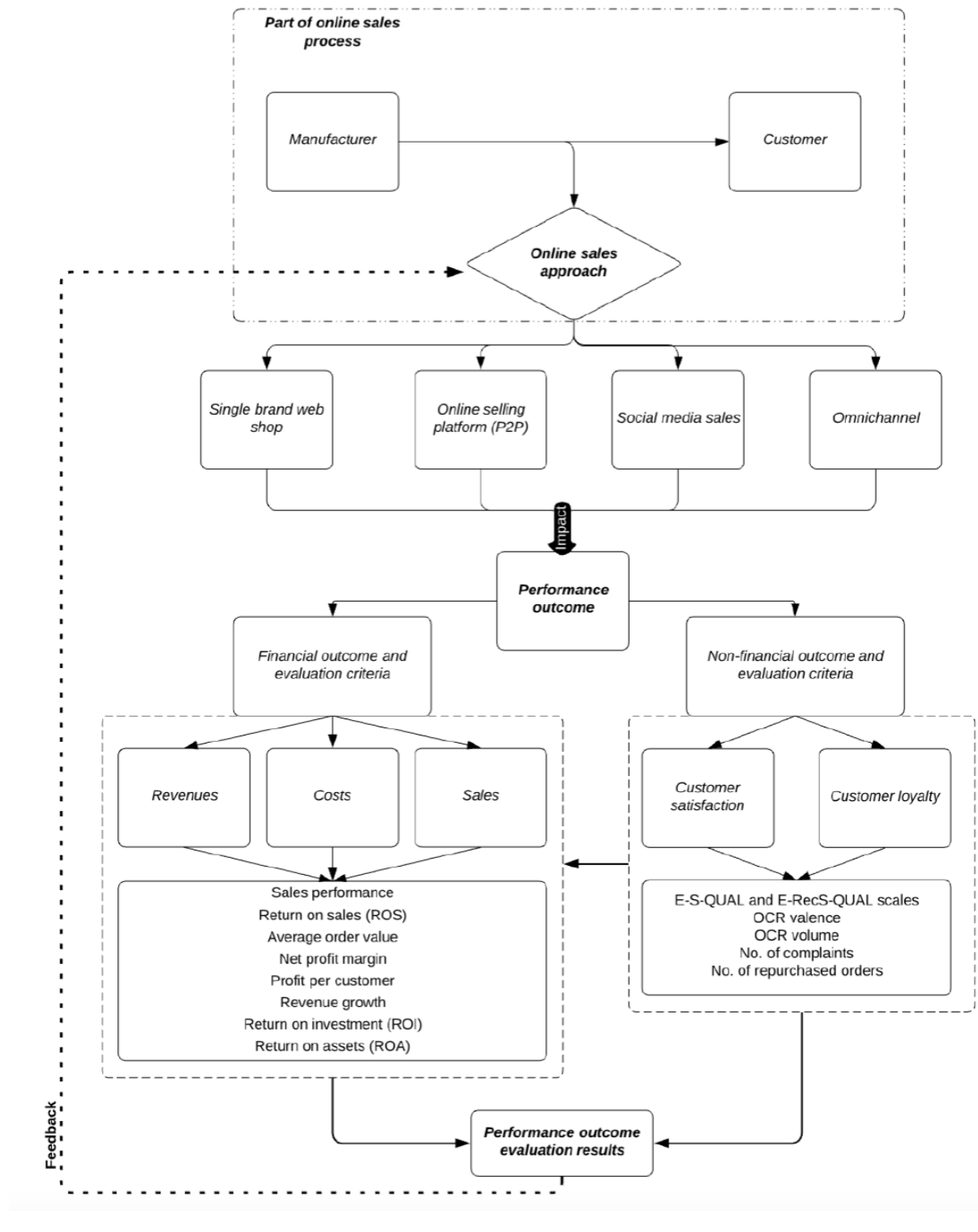


FIGURE 1 - Framework for evaluating the relationship between the omnichannel online sales approach and the performance outcome in the case of niche products (Bieline & Ulbinaite, 2020).

		Commerce	Personalization	Ecosystem
		Superior cross-channel shopping experiences in-store and online	Tailored, targeted, and relevant cross-channel engagement, at scale	Rich cross-channel platforms integrated with consumer needs and lifestyles
Customer journey	Discover and consider	Product focus. Marketing content focuses on elevating product and offers.	Tailored offer. Marketing, messaging, and content are personalized to people like me.	My 360° offer. Content is tailored dynamically to what I am doing and feeling today.
	Purchase and enjoy	Convenience and reliability. I can choose how I receive my product, and I have multiple return options.	Integrated shopping. I can switch easily between channels when shopping, receiving my order, and making returns.	Experience at the center. I can engage with the brand across my shopping, purchases, experiences, and different channels seamlessly.
	Engage and advocate	App and loyalty. The mobile app and loyalty program keep me engaged and incentivize me to return.	Engagement outside the transaction. The app and loyalty program enhance the experience and keep me engaged even if I don't purchase.	Access to a community. The brand ecosystem gives me access to new experiences, content, and other like-minded users.

McKinsey
& Company

FIGURE 2 - McKinsey & Company customer purchase journey model (Briedis *et al.*, 2021)

This table describes the three primary omnichannel through the perspective of three categories of the customer's journey, grounded on McKinsey & Company. Lastly, following Ulbinaite & Bieline (2020) and Grootboom *et al.*, (2023), a feedback loop flowing throughout the omnichannel portions and the customer journey portion was placed. The original two frameworks were chosen for reviewed literature sources as these models best fit the purpose of this study and the scope of the two research questions. The new conceptual framework was first used to analyze SUAY in the preliminary stage of this study and are included in the findings and discussion section of this paper. The proceeding sections, sampling and methods, will provide more details on how this framework was used to aid in choosing CF retailers similar to SUAY and the process of analysis according to each part of the model.

Sampling and qualitative analysis method

Sampling

The sample CF retailers selected for this analysis, SUAY, Zero Waste Daniel & The Drift Collective, all have certain attributes in common based on the new conceptual framework. These attributes include, having all four of the same channels (one brick-and-mortar, online/website retailing, mobile retailing and social retailing) and the one brick-and-mortar location also acting as the manufacturer/workshop. The sample CF retailers also have an active social media account through the Instagram platform, where they post sustainable education, retailer events, promotions, marketing and behind the scenes content showing the store and workshop interior, staff and videos of events in real time.

The sample CF retailers also share similar business models, all started by one young fashion artist who uses second hand textiles to create new fashion goods, with a small staff of 15-18 employees. According to the company websites, CSR initiatives are an important aspect of their business models, using ethical techniques and forms of labor to produce and sell textile goods. All three brands produce and retail their own goods, which are only sold through their company channels and ship globally for customer convenience.

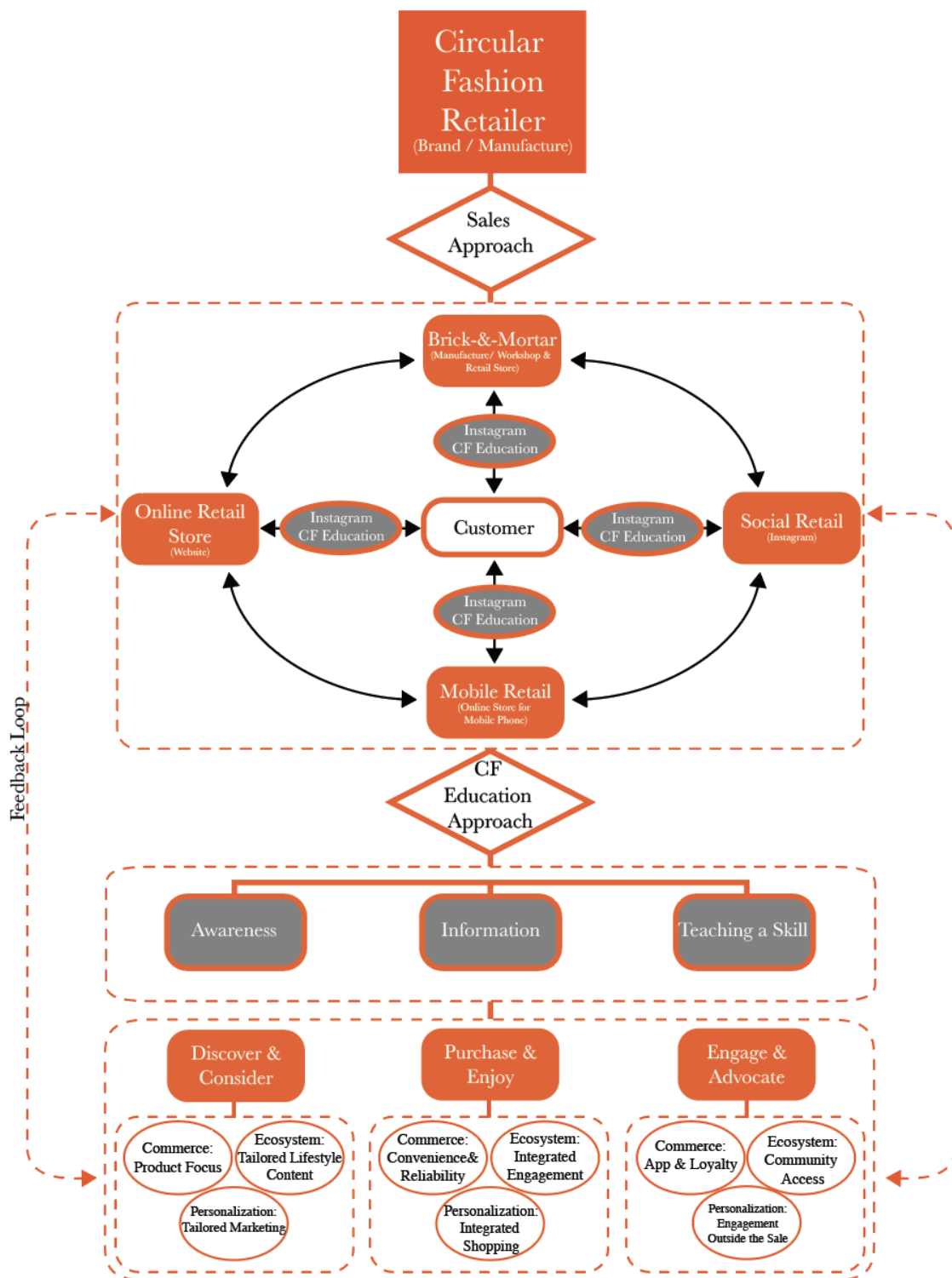


FIGURE 3 - Circular fashion omnichannel retailing model (Corbin, 2024)

Following the omnichannels and Instagram use as dictated in the new conceptual framework, a combination of Google searches for the key words, sustainable fashion/ circular fashion, sustainable apparel/ circular apparel and sustainable textile goods/ circular textile goods were to generate a list of 24 sustainable fashion companies that practice circular fashion by using previously used textiles to create new fashion goods (Appendix A). This list was cross-referenced with the same hashtag search through Instagram, to generate additional CF brands, as many of the original 24 did not fit the omnichannel and Instagram education framework. Manual coding was used to review all brands that were found through Google search and Instagram, with the list brands being further reduced to American brands that fit the framework model and

had similar business model attributes to SUAY. SUAY was originally chosen for the preliminary study, as the aim of this study is to focus on small upstart brands that produce most of their product from previously used textiles. The small number of retailers chosen for the second phase of this study to expand into a comprehensive sampling of similar brands that could be qualitatively analyzed within a three months period. This study may also serve as an overall outline and framework repeated to analyze additional similar small CF retailers globally to gather more data on the types of sustainable education in social media to enhance channel integration.

Qualitative analysis method

The qualitative analysis method used in phase one of this study includes a two-part review of each sample CF retailer for phase one. Part one of the review includes a look at each of the retailers channels based on information available through digital platforms, while part two includes an analysis of each retailer's Instagram platform. A combination of reviewing the retailer's website/online store, mobile store and social retailing will be used to understand how all four channels work together to provide information, goods and services to consumers. Channels will be cross referenced to see if all messaging is consistent, using Iglesias-Pradas *et al.* (2021) six dimensions of a fully integrated channel system. These six dimensions per retailer will be placed into a table to cross-examine their omnichannel retailing. Part two of this study will analyze each retailer's Instagram posts about fashion sustainability and CF practices. The top five posts, determined by the highest number of likes and interactions (likes, comments and shares), that provide any text or audio stimuli about fashion sustainability and CF practices in the past year (November 1, 2023 through October 30, 2024). Each of the top five posts will be categorized by the type of content or education the post provides, awareness, information and/or teaches the view how they could perform a technique in sustainable fashion practices on their own. This process begins by considering the overall total posts within the year and how many of the total posts that include any details about fashion sustainability and CF practices. These top five posts will be placed into a table to cross-examine how similar or different the education provided from each retailer compared, while a deeper qualitative analysis will include a look at consumer engagement through comments left on the number one post from each retailer. Upon completing the omnichannel review and Instagram analysis, the findings will be discussed for a comprehensive understanding of this study.

Analysis and findings

The six dimensions of channel integration

The first part of this analysis used all three of the sample CF retailer's website/online store, mobile store and social retailing to explore how the retailer performs the six dimensions of channel integration (Figure 4). Due to the analysis and findings being very similar for each of the six dimensions, the analysis and findings section have been combined. SUAY, Zero Waste Daniel and The Drift Collective all have four company-to-customer channels that are all bi-directional. These channels, described above, also include one brick-and-mortar location. For dimension one, customer touch-points, customers of all three CF retailers have access to interact with the retailer face-to-face in their one location, as well as a tab on the online and mobile store to send a message directly to the staff. Direct messaging may also be accessed using Instagram while shopping through social retailing. As for dimension two, channel consistency, customers of all three CF retailers can see the same brand images, similar visuals and the same products, services and prices on all three digital channels. Although direct analysis inside the three CF retailers has not been conducted, video footage and images of the brick-and-mortar locations on all channels, social media and YouTube, show a consistent visual to all digital channels. Dimension three focuses on integrated promotions, across all channels. The analysis for all three retailers and their three digital channels found that as of the first of November 2024, SUAY and The Drift Collective promotions were the same on the online store, mobile store and social retail platform, while this is not so with Zero Waste Daniel. Zero Waste Daniel features a sale for holiday items at the very top of the store accessible through the website and mobile stores, while

the social retail platform does not include this promotion. As for dimension four, all three CF retailers provide the same brand/ retailer information including the brick-and-mortar street address, website for online and mobile shopping. Unlike the online and mobile store, each of their social retailing platforms only show the brick-and-mortar street address in the Instagram profile. For dimension five, integrated fulfillment, information found on all three digital platforms shows that products may be shipped directly to the customer from the retailer/manufacturer locations. SUAY ships directly to the customer nationally, while Zero Waste Daniel and The Drift Collective ship internationally. Finally, dimension six, integrated customer care is offered through all four channels, in the same manner as dimension one, through customer touch-points.

Sustainable and CF education via Instagram

To provide background and context for the Instagram platforms, each sample CF retailer analysis and findings section below starts with some profile information (Figures 5, 6 and 7). This information includes the number of followers that are most likely to engage with the retailer, number of overall posts in 365 days and the number of those posts that provide any text or audio about sustainable and CF education. This background information provides an understanding of the amount of consumers that may or may not already be customers of the retailer, that encounter the retailers messaging and education on a regular basis. The number of posts in the past full year show how often the retailer creates content to encourage consumer and follower interaction and how often the platform is used to educate them. The actual analysis takes a deeper look at the top three educational posts from each CF retailer, as one of them only has three education posts in the past year. Analyzing the top three posts provides examples of how some American CF retailers share their CSR priorities with consumers, while considering the likes and comments/ shares shows an estimated amount of consumers who interacted with this education. The following data was documented the first day of November in 2024 to include a full year, starting the first day of October in 2023.

SUAY

With 46,5000 followers on Instagram, SUAY has a total of 47 images and videos posted in the past year. Many of their posts feature the inside and outside of the store in downtown Los Angeles, featuring the retail interior, products merchandised on racks and tables and the workshop. Content includes texts in the images and videos as well as in the caption, describing the post and providing more details. Of the 47 posts, 14 include awareness and information about sustainable fashion education. The majority of these posts provide awareness about the fate of disposed fast fashion, burning in landfills and polluting the air and water sources. Information provided include ways consumers could offset the harmful effects of fast fashion and the overconsumption of textiles, which include continued wear, use of textiles the consumer owns or upcycling them by donating them to or over dyeing them at SUAY's monthly dye bath. SUAY's top three posts had an average of 136,700 likes and 8,714 comments/shares. The top post from the 25th of October, 2024, opens with a retailer marketing team member walking Instagram users throughout the brick-and-mortar while providing sustainable CF information about how trash or disposed fast fashion can become jackets, pants, bags and quilts sold by the retailer. The post was commented on and shared 26,585 times, with comments ranging from consumer questions requesting more information about upcycling, donating and purchasing, to compliments on the work the retailer is doing to support sustainability and the look of the products.

Zero Waste Daniel

Zero Waste Daniel has the second most Instagram followers, with 153,000. This retailer has 113 posts overall, mostly consisting of videos with audio. Many of their posts feature a close up of the brand owner working with his industrial sewing machine to create goods using industry scraps. Other posts feature Daniel and his friends wearing pieces from the collection with text and audio over the video explaining what the garments were made from. Of the 113 posts, only three include awareness and information about sustainable fashion education. The majority of these posts provide awareness about how long it takes man-made fibers to break down and information about how upcycling can create positive change.

6 Dimensions of a Fully Integrated Channel System (Iglesias-Pradas et al., 2021)					
RQ1: How do CF retailers channels provide a seamless customer experience?					
CF Retailer	"Customer touchpoints" with "company-consumer one-directional / bi-directional interaction across all digital channels & IG	"Channel consistency" with the brand image, visuals, products, & prices being consistent across all digital channels & IG	"Integrated promotions" with cross channel promotions & activities across all digital channels & IG	"Integrated information" with consistent information & data accessible for consumers across all digital channels & IG	"Integrated fulfillment" where products come directly to the customer in a reliable & dependable manner consistently through all digital channels & IG
SUAY	4-Customer touchpoints: - 1 Brick-and-Mortar (CA) - Online Store - Mobile Retail - Social Retail - Additional available access to retailer through DM and comments	Channel consistency: - Brand image, products, prices and visuals are consistent across all channels - Additional videos through IG featuring audio and text stimuli providing more details about retailer, CF, & goods/ services	Integrated promotions: - promotions currently listed on all digital channels match. - Additionally promotions currently posted on IG match promotions across all channels	Integrated information: - information about the retailer are accessible & match across all digital channels match. - Additionally IG post feature content showing the store location, retail space and workshop	Integrated customer care: -according to the 3 digital platforms: : online & mobile- has the retailer phone number, email, and a question submission area : social retailing- does not show retailer phone number or email, but has access to retailer assistance through direct messaging or comments on posts
Zero Waste Daniel	4-Customer touchpoints: - 1 Brick-and-Mortar (CA) - Online Store - Mobile Retail - Social Retail - Additional available access to retailer through DM and comments	Channel consistency: - Brand image, products, prices and visuals are NOT consistent across all channels. As the website features holiday sales not found on the social retailing platform. - Additional videos through IG do feature the retail owner with pre-used textiles, sewing & creating CF goods	Integrated promotions: - promotions currently listed on all digital channels match. - Additionally promotions currently posted on IG match promotions across all channels	Integrated information: - information about the retailer are accessible & match across all digital channels match. - Additionally IG post feature content showing the store location, retail space and workshop	Integrated customer care: -according to the 3 digital platforms: : online & mobile- has the retailer phone number, email, and a question submission area : social retailing- does not show retailer phone number or email, but has access to retailer assistance through direct messaging or comments on posts
Drift Collective	4-Customer touchpoints: - 1 Brick-and-Mortar (CA) - Online Store - Mobile Retail - Social Retail - Additional available access to retailer through DM and comments	Channel consistency: - Brand image, products, prices and visuals are consistent across all channels. - Additional videos through IG featuring retail owner obtaining pre-used textiles from thrift stores & creating CF goods	Integrated promotions: - promotions currently listed on all digital channels match. - Additionally promotions currently posted on IG match promotions across all channels	Integrated information: - information about the retailer are accessible & match across all digital channels match. - Additionally IG post feature content showing the store location, retail space and workshop	Integrated customer care: -according to the 3 digital platforms: : online & mobile- has the retailer phone number, email, and a question submission area : social retailing- does not show retailer phone number or email, but has access to retailer assistance through direct messaging or comments on posts

FIGURE 5 - Small American CF retailer channel IG snapshot: 11/01/2023 - 11/01/2024
(Corbin, 2024)

Channel & IG Snapshot 12/01/2023 - 11/30/2024		Top 3 Sustainable Education Instagram Posts 12/01/2023 - 11/30/2024				
CF Retailer		CF Retailer				
SUAY		SUAY				
# Retail Channels	4	Date of Post	10/25/2023	10/11/2023	09/20/2023	Average:
# IG Followers	465,000	# of Likes	207,000	105,000	98,100	136,700
# Total Post	47	# of Comments/ Shares	26,585	16,755	12,803	8,714
# CF Edu. Posts	14					
Zero Waste Daniel		Zero Waste Daniel				
# Retail Channels	4	Date of Post	12/16/2023	10/19/2023	12/19/2023	Average:
# IG Followers	153,000	# of Likes	1,303	1,213	458	991
# Total Post	113	# of Comments/ Shares	145	130	15	96
# CF Edu. Posts	3					
Drift Collective		Drift Collective				
# Retail Channels	4	Date of Post	11/12/2023	11/24/2023	04/08/2023	Average:
# IG Followers	42,500	# of Likes	9,954	1,709	1,141	4,268
# Total Post	138	# of Comments/ Shares	3,969	496	38	1,490
# CF Edu. Posts	10					

FIGURE 6 - Small American CF retailer sustainable education on IG snapshot: 11/01/2023 - 11/01/2024 (Corbin, 2024)

Top 3 Sustainable Education Instagram Posts 11/01/2023 - 10/30/2024				
CF Retailer	RQ2: How do CF retailers use sustainable fashion education on Instagram in their omnichannel retail approach?			
SUAY				
Date of Post	10/25/2024	10/11/2024	09/20/2024	
Type of Content	Awareness: NONE	Awareness: NONE	Awareness: what happens	
Type of Education	Information: how they participate in CF	Information: how they participate in CF	to disposed textiles if not recycled	
	Teaching a Skill: NONE	Teaching a Skill: NONE	Information: how they participate in CF	
			Teaching a Skill: NONE	
 Zero Waste Daniel				
Date of Post	12/16/2023	10/19/2024	12/19/2023	
Type of Content	Awareness: NONE	Awareness: the amount of time it takes fast fashion to breakdown	Awareness: NONE	
Type of Education	Information: how they participate in CF	Information: how consumers can participate in CF	Information: how they participate in CF	
	Teaching a Skill: NONE	Teaching a Skill: NONE	Teaching a Skill: NONE	
 Drift Collective				
Date of Post	11/12/2023	11/24/2023	04/08/2023	
Type of Content	Awareness: statistics on how little fashion gets recycled	Awareness: low pay for garment workers in the fashion industry	Awareness: the amount of textiles produced and how long they will last on the planet.	
Type of Education	Information: how they participate in CF (upcycling)	Information: telling consumers to buy less cheap clothing	Information: how they participate in CF (thrifting & upcycling)	
	Teaching a Skill: NONE	Teaching a Skill: NONE	Teaching a Skill: NONE	

FIGURE 7 - Small American CF retailer sustainable education IG posts with the most likes and engagement: 11/01/2023 - 11/01/2024 (Corbin, 2024).

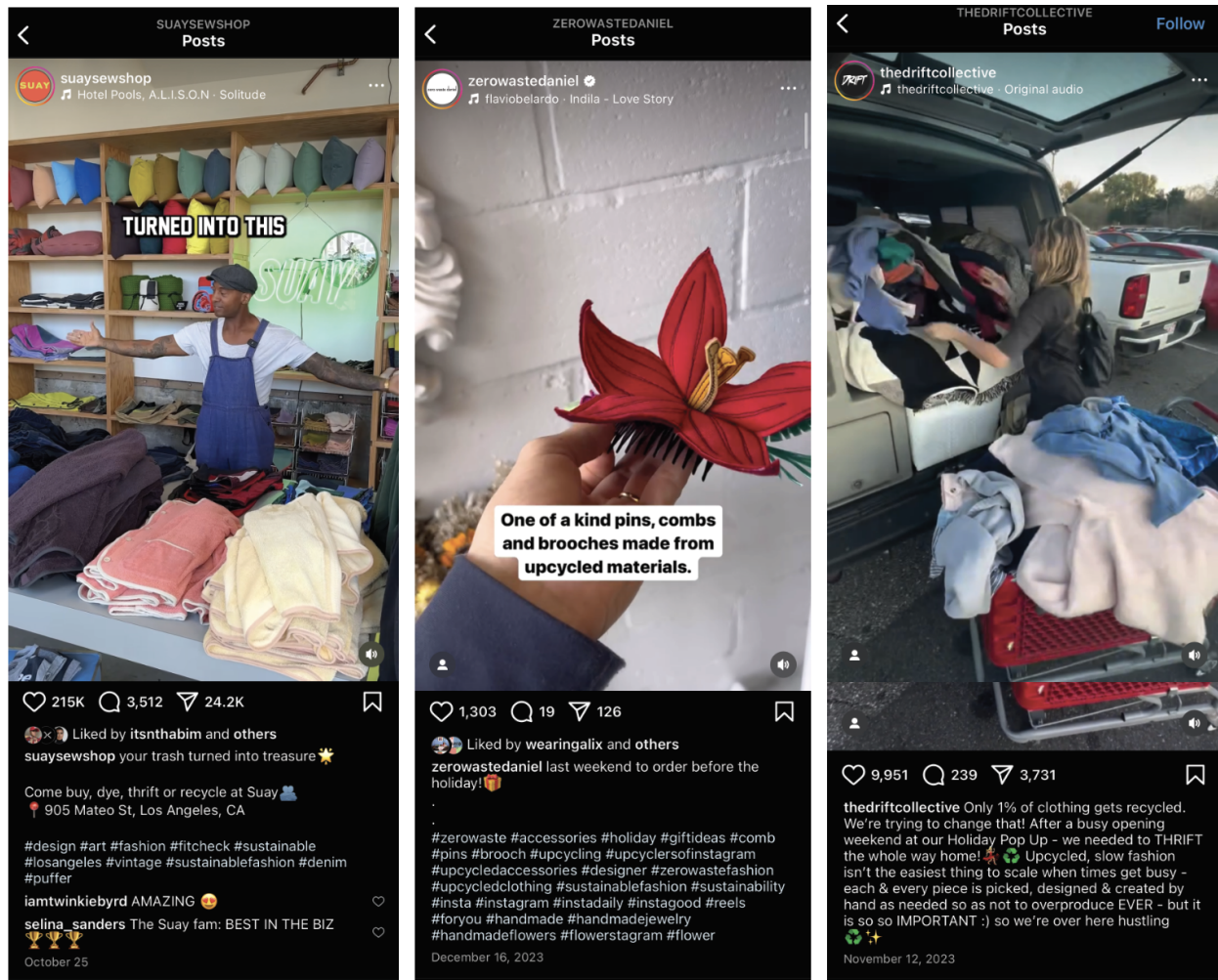


FIGURE 8 - Sample CF retailer Instagram top posts, SUAY, Zero Waste Daniel and The Drift Collective (Instagram, 11/01/2024)

Information provided include ways the brand uses scraps to offset the unrecycled fashion waste to create unisex collections. Zero Waste Daniel's only three posts had an average of 991 likes and 96 comments and shares. The top post from the 16th of December, 2023, provides text over music, telling the viewer the accessory in the post was made from upcycled materials. The post was commented on and shared 145 times, with comments from consumers requesting tutorials (skill-based instruction) and compliments on the design accessory featured.

The Drift Collective

The Drift Collective has the least amount of Instagram followers, with 42,500. This retailer has the most overall posts, at 138, with an even mix of product images, videos showing garment production, retail store set up and videos of staff thrifting for materials to upcycle. Many of their posts show a behind the scenes look at the business and staff members and feature music and events hosted by the retailer. Of the 138 posts, ten include awareness and information about sustainable fashion education. The majority of these posts provide awareness about fast fashion over consumption and how upcycling can create positive change, as well as ethical fashion. The retailer's top three posts had an average of 4,268 likes and 1,490 comments and shares. The top post from the 12th of November, 2023, shows a staff member packing her car with pre-worn apparel from a local thrift shop. Text in the caption offers awareness about the small percentage of clothing that gets recycled and information stating that practicing upcycling is the key to overproduction in the fashion industry. The post was commented on and shared 496 times, with comments from consumers

asking what exactly will happen to all the garments purchased and compliments on how the brand is helping the environment by reusing donated clothing.

Discussion

Part one of this analysis and findings starts at the upper portions of the new conceptual framework, focusing on the four channels and how they perform according to the six dimensions of channel integration. This portion answers RQ1 - How do CF retailers channels provide a seamless customer experience? Overall, according to the digital platforms, online and mobile stores and social retailing, all three of the sample CF retailers provide consistency across all six dimensions and channels. Each retailer offers bi-directional customer touch-points, allowing customers to interact and communicate with each retailer anywhere and anytime in the buying process. Customers accessing all four channels can find the same messaging, which may increase trustworthiness of not only the products and services but also the CSR the retailers claim they practice (Massi *et al.*, 2023). These opportunities for bi-directional customer touch-points also contribute to what Bielnie & Ulbinaitė's (2020) framework and Grootboom *et al.* (2023) refer to a feedback loop in omnichannelling. This feedback loop is a continuous dialogue that happens at any channel in segment two at any point in the customer's journey in the lower portion of the framework. Channel consistency may also promote trust, as all three digital platforms and images and video footage found through Instagram, Facebook and YouTube show how all four channels offer the same brand image, visuals, products and mood. This constituency also includes the ability to create a shopper account that can be accessed through all three digital platforms. The shopper account allows shoppers to seamlessly continue their buying process on any of the three digital platforms. Integrated promotions are mirrored across all three digital platforms for SUAY and The Drift Collective, including featured products and collections and seasonal sales promotions. Unlike SUAY and The Drift Collective, Zero Waste Daniel is the only CF retailer whose channels do not provide integrated promotions. According to the online and mobile store, Zero Waste Daniel offers 30% off holiday stocking stuffers, while this promotion is not found on the retailer's Instagram platform. Integrated information matches across all retailer's channels, with limited information about the brand on Instagram for all retailers. This limited Instagram information may be due to the limited character space available through the platform's profile area. Finally, integrated fulfillment for all retailers and digital channels provide the same details for shipping nationally or internationally, directly to the customer. SUAY provides an additional service to their customers by offering a take back program, as well as mending services for customers to ship their pre-used textiles to the Los Angeles location as a donation or to be mended and shipped back respectively.

Part two of this analysis and findings focus on the sustainable CF education (awareness, information, or a taught skill) to answer RQ2 - How do CF retailers use sustainable fashion education on Instagram in their omnichannel retail approach? With the most followers, likes and engagement and the most educational posts, SUAY leads the sample CF retailers in using Instagram in their omnichannel approach. Although The Drift Collective has the least amount of Instagram followers, they have the second most educational posts and second most likes and interactions. Although Zero Waste Daniel has the second highest number of followers, the retailer has the least amount of posts including education for consumers. The posts that do include any of the three educational variables, have the least amount for text and audio stimuli, compared to SUAY and The Drift Collective. None of the retailers use Instagram to teach a sustainable CF skill to Instagram users, while they do all show video content of the skill. As for awareness, all SUAY and Zero Waste Daniel only add this form of education in one third of their top posts, while The Drift Collective has included awareness in all three top posts. All retailers provide information by focusing on upcycling and advising Instagram users not to participate in overconsumption and how their brand upcycles pre-worn textiles, closing the loop. To directly answer RQ2, the sample CF retailers use education to share sustainable awareness and information with consumers through Instagram which follows five of the six dimensions of channel integration. The retailers use the same channel strategy in their Instagram that highlights education

to also provide a fifth customer touch-point source, content consistency integrated promotions (in the case with SUAY and The Drift Collective) and integrated information in the profile and some of the posts. By using the same strategy as seen in the channel integration, with Instagram, the social platform becomes a channel extension and a more interactive source to educate consumers about the value of their goods and services in sustainability.

The third and lower portion of the new conceptual framework provides a guide for a qualitative review of the customer's journey through the three digital platforms and Instagram interaction. This segment is based on the three primary omnichannel strategies table found in McKinsey and Company, showing the objectives in a series of blocks and ovals. Three blocks separate out the customer's journey: discover and consider, purchase and enjoy and engage and advocate. Underneath each block there are three bubbles, one for each of the three primary omnichannel strategies. The goal here is to consider the customer journey at each block by evaluating what well Suay's omnichannel strategy provides within each bubble.

For the first block, discover and consider and commerce oval, the customer may use all four channels to see products offered and access the same information about all products. According to all three retailer's digital platforms, they each only offer Commerce: Product Focus in the first part of the customer's journey. Therefore, the customer's journey to discover and consider is only fulfilled a third of the way, as only one of the three primary strategies are being used here, reflected by this block being shaded in one third of the way.

For the second block, purchase and enjoy and commerce: convenience and reliability oval, the customer may use all four channels with all three retailers to order products offered, receiving them in person at point of sale in store, order and pick-up in store, or shipped. Personalization: integrated shopping and ecosystem, and integrated engagement are also available through all three retailers and channels, work together to provide the same shopping information in a variety of ways. Each digital channel also provides the same educational awareness and information. The customer's journey to purchase and engage with all three retailers is completely fulfilled in all three strategies.

For the third block, engage and advocate and commerce: app and loyalty oval, none of the retailers have an application, nor do they have a customer rewards program according to the three digital platforms. The personalization, engagement outside the sale oval, relates to the engagement experience through a retailer application and customer loyalty program, which none of the retailers have. Therefore, these two variables in the customer experience are not satisfied. The remaining oval, ecosystem: community access, may be experienced by all three of the retailer's customers, as community access is provided through channels working together to provide details about opportunities to attend retailer community events, workshops, or performances. The customer may engage in community at all three of the brick-and-mortar stores, meeting like minded shoppers and staff members, while also connecting with them on Instagram and Facebook. The customer's journey to engage and advocate is only fulfilled a third of the way, as only one of the three strategies are being used. This review of the three primary omnichannel strategies through the customer's journey may be used to support RQ 1 in ways the channels may work together to offer customers add-value and show where channels may improve to enhance the customer's journey.

Conclusion

This study contributes to the gaps in research of sustainable start-up fashion business, upcycling fashion waste and pre-used textiles to close the loop in the fashion industry created by fast fashion. The original framework, created by Bielie and Ulbinaitė (2020) suggested, that niche fashion business use these models an unlimited amount of time to continue to evaluate a retailer's omnichannel strategy. Constant reevaluation can help fashion retailers continue to grow their omnichannel integration, which is necessary as suggested

by Iglesias-Pradas *et al.*, (2021), in stating that the average integration level for most clothing companies is at about 60%. Although most of the three sample CF retailer channels are integrated, there is work to be done within those channels to enhance the customer's journey. As circular fashion retailers and manufacturers grow to become main staples in their communities in the global fashion market, pathways to constant feedback and evaluation will be key to improving omnichannel retailing strategies and improving the customer's journey. This study may offer established and new CF brands a framework of channel integration and education methods through social media to promote sustainable and ethically made textile goods to grow their business.

Limitations and future research

The limitations of this study include a lack of access to brick-and-mortar locations and the reliability of the data collected based only on the author's qualitative analysis. To confront these limitations, research will continue with a short qualitative survey for each of the three CF retailers. Phase two of this continued research has been submitted and reviewed with the University of Georgia's IRB and has been accepted. The retailers have been contacted through email and will be surveyed to provide retailer information about their channels and education (Appendix B). This study may continue to a third phase that focuses on the customer journey experienced by those who shop at the three CF retailers. Overall, this research will serve not only small start-up CF brands and retailers, but may also help build fashion education programs in universities, encouraging students to create more CF businesses to close the loop that fast fashion keeps open through overproduction.

Acknowledgements

I extend my gratitude to my fashion retailing professor, Clair McClure and her encouragement for me to continue to pursue research in the area of retailing and fashion sustainability. Her support in the research has been invaluable as I look forward to contacting the CF retailers outlined in this paper. Dr. Sha'mira Covington and her passion and work in fashion sustainability in relation to women and minorities have also been a great inspiration in this continued research. Her guidance in sustainability has helped build the lens of fashion through which I explore retailing and scholarship to fill the gap in research of small CF brands. Finally, my sincerest thanks to my peers and advising professors of the Textile, Merchandising and Interiors, Family Consumer Science Department at the University of Georgia for their support of this scholarship. Their critiques and notes provided during this research process has been crucial to its development and progress.

Appendix A

The first list of Upcycled Fashion Brands provided via Google Search of the words Upcycle Brands. This served as the starting point to continue research for brands that used upcycling process of using pre-worn textiles to create new garments.

*Zero Waste Daniel

Fanfare Label

Antiform LTD

Beyond Retro

E.L.V. Denim

PRELOVED

RubyMoon Gym to Swim

Outerknown

Patagonia

1/OFF

Broken Ghost Clothing

GOAT Vintage

LOTI

MUD Jeans

Psychic Outlaw

The Epicycle Company

Urban Renewal

CHRISTY DAWN

Doodlage

Ecoalf

Gaala

Girl Of The Earth

Anekdot

* = one of the additional brands to be included in phase two of this study

Appendix B: Qualitative survey questions for each CF retailer:



College of Family and Consumer Sciences

Textiles, Merchandising & Interiors

UNIVERSITY OF GEORGIA

TXMI 9010 Omnichannel Retailing, Circular Fashion, & Consumer Education

Qualitative | Quantitative Survey

Circular Fashion Brand: _____

Role/ Position at Brand: _____

Consumer Education:

- 1) In your store, online, or via social media, does your brand provide education/ information about the negative impact of fast fashion on the environment to consumers? YES | NO

If so, what information does it provide, and through which retail channel is it provided? (in-store, online, or via social media) _____

- 2) In your store, online, or via social media, does your brand provide education/ information about the positive impact of sustainable and circular fashion on the environment to consumers? YES | NO

- 3) In your store, online, or via social media, does your brand provide consumers with education about how your products are made using circular fashion techniques? YES | NO

If so, what is the message, and through what medium and retail channel is it provided?

- 4) In your store, online, or via social media, does your brand provide consumers with education about how they can learn and practice circular fashion techniques with fashion items they already own? YES | NO

If so, what education is provided (e.g: how to videos and workshops), and through what medium and retail channel is it provided? _____

- 5) Through which channel or platform (store, online, or via social media) does your brand receive the most customer feedback and inquiry about how your products are made using circular fashion? _____

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Shopping well-being through mobile apps: a congruence theory perspective

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Abstract. Drawing on the congruence theory (e.g., Sirgy *et al.*, 2000), this study posits that, beyond the retail apps' functional utility, shoppers are drawn to shopping apps that align with their personal identities in terms of self-congruity and lifestyle congruity. These distinct app-related congruities are hypothesized to directly impact shoppers' well-being. Particularly, functional congruity, self-congruity and lifestyle congruity with a shopping app are expected to exert differential and interactive effects on shoppers' well-being. The sense of well-being derived from shopping via apps is, in turn, likely to yield important retailing outcomes. Data were collected from a survey of actual mobile shoppers using fashion retail apps in two culturally distinct markets: the USA and Japan. Structural Equation Modeling with SmartPLS was employed to validate the proposed model. The results generally support the hypothesized relationships. Along with functional congruity, identity-based congruity such as self-congruity and lifestyle congruity emerge as key drivers of shoppers' well-being. Additionally, shopping well-being significantly influences positive attitudes toward the app intentions of continuous app usage and retailer loyalty. The results are invariant across American and Japanese shoppers. This paper provides valuable insights for mobile retailers and offers theoretical contributions by advancing our understanding of how shopping apps shape shopper identity and well-being.

Keywords : retail app; fashion app; shopping app; shopping well-being; functional congruity; self-congruity; lifestyle congruity; PLS.

Introduction

Shopping apps serve as digital extensions of the self, providing spaces for self-expressiveness and fostering personal connections with brands and retailers (Abu Farha *et al.*, 2024; Iyer *et al.*, 2018). As they become omnipresent in consumers' daily routines, these apps have shifted from being mere shopping facilitators to

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enablers of self-expressiveness, a key factor in shaping consumer well-being (cf., Sirgy *et al.*, 2016). However, research on mobile shopping has hitherto largely overlooked the personal identity aspect when examining the impact of apps on shopper behavior. Particularly, research on the role of personal identity in shaping mobile shopping experiences and influencing shoppers' well-being is scarce or almost inexistent. The Eudaimonistic Identity Theory (EIT; Waterman, 1993) and Self-Determination Theory (SDT; Deci and Ryan, 1985) suggest that shopping apps are likely to reinforce shoppers' self-expressiveness and inherently contribute to their well-being.

The present research aims to address two key gaps in the literature. First, drawing on the congruence theory, it examines the role of identity-based constructs (i.e., self-congruity and lifestyle congruity) in shaping mobile shopping experiences by particularly focusing on the effects and interplay between self-congruity, lifestyle-congruity and functional congruity. From this standpoint, it is worth mentioning that prior research has largely adopted a piecemeal approach, isolating these concepts or focusing on singular aspects (e.g., functional attributes). In the same vein, previous mobile retailing studies allude to the role of identity-based constructs by considering certain aspects of the self-concept (e.g., actual self-congruity, social norms) while overlooking other key dimensions (e.g., Iyer *et al.*, 2018; Mähner *et al.*, 2011). In contrast, this study posits that these three distinct aspects of congruence should be understood as interrelated elements that collectively shape shoppers' experiences. Second, this study explores how shopping apps contribute to shoppers' well-being, emphasizing their potential to fulfill intrinsic psychological needs rather than serving merely as transactional tools. Furthermore, it explores the differential and interactive effects of functional congruity, self-congruity and lifestyle congruity on shopping well-being within a shopping app setting. Finally, this research explains why mobile retailers should prioritize shoppers' well-being in the context of shopping apps.

Shopping well-being represents the extent to which shopping activities contribute to an individual's overall quality of life by influencing key life domains, such as consumer, social, leisure, family and community life (El Hedhli *et al.*, 2013; Sirgy *et al.*, 2016). We extend the concept of shopping well-being to the digital shopping environment and define it as the perceived contribution of a shopping app to satisfaction in key life domains - including consumer, family, social, community and leisure life - spilling over into overall life satisfaction. Sirgy *et al.* (2000) distinguish between two main types of congruity, namely functional congruity and self-congruity. More recently, congruity theory has been extended to include lifestyle congruity (Grzeskowiak *et al.*, 2022; Grzeskowiak *et al.*, 2016; Sirgy *et al.*, 2016). Prior mobile shopping research has primarily focused on aspects related to functional congruity (e.g., ease of use, perceived usefulness, enjoyment) while overlooking the roles of self-congruity and lifestyle congruity. By considering the full spectrum of congruity (functional, self and lifestyle), this study offers a more comprehensive understanding of how mobile shopping apps influence shoppers' attitudes and behaviors.

Figure 1 presents the conceptual model of this study. Guided by congruity theory, the model posits that shopping well-being in a shopping app context is determined by functional congruity and identity-based congruity (i.e., self-congruity and lifestyle). Particularly, the model advances hypotheses focusing on differential and interactive effects of these three types of congruity on shopping well-being. Additionally, the model proposes that shopping well-being positively influences key retailing outcomes, namely shoppers' attitudes toward the app, their intentions to continue using it and their loyalty to the retailer. Purchase frequency via the app was included as a covariate to control for its effects on positive attitudes toward the app and intentions for continuous app use. Similarly, retailer equity was included as a covariate to account for its effect on retailer loyalty. The model posits the following hypotheses:

- H1:** *The perceived functional congruity of a shopping app positively influences shopping well-being.*
- H2:** *At the highest construct level, self-congruity within a shopping app context positively influences shopping well-being.*
- H3:** *Lifestyle congruity within a shopping app context positively influences shopping well-being.*

H4a: Self-congruity has a stronger effect on shopping well-being than functional congruity.

H4b: Lifestyle congruity has a stronger effect shopping well-being than functional congruity.

H5: Self-congruity within a shopping app context positively moderates the relationship between functional congruity and shopping well-being.

H6: Lifestyle congruity with the app positively moderates the relationship between functional congruity and shopping well-being.

H7: Shopping well-being positively influences shoppers' attitudes toward the app.

H8: Shopping well-being positively influences shoppers' intentions to continue using the app.

H9: Shopping well-being positively influences retailer loyalty.

Methodology

Data collection and sampling procedures

Our study specifically focuses on retail fashion apps, a decision supported by compelling statistical trends highlighting the rapid growth of mobile commerce retail fashion sales. We utilized the services of a market research firm specializing in online consumer panels to collect data. The screening sampling criterion was American and Japanese shoppers who had made purchases through a fashion retailer's mobile app within the last three months. We selected mobile shoppers from the United States and Japan for several reasons.

First, both countries exhibit substantial engagement with retail fashion apps. A 2023 report from Statista reveals that approximately 43% of internet users in the United States have made purchases via mobile devices[†], while over 70% of smartphone users in Japan similarly engage in mobile shopping[‡]. This widespread adoption of retail fashion apps in both markets provides a strong foundation for exploring the influence of these apps on shoppers' attitudes and behaviors. Additionally, collecting data from these two culturally distinct countries offers a unique opportunity to assess the cross-cultural applicability of the proposed model. The United States and Japan represent divergent cultural orientations: American consumers tend to be more independent, while Japanese consumers are typically more interdependent (Hashimoto, 2021; Kitayama *et al.*, 2010; Markus & Kitayama, 1991). This cultural contrast allows us to investigate how these differing orientations may shape the study's hypothesized relationships[§].

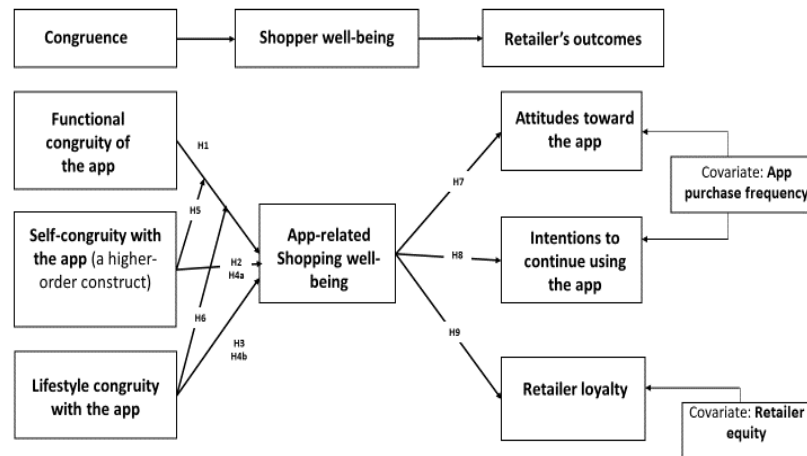


FIGURE 1 - Conceptual model

[†] Mobile commerce share in the United States - 2023 | Statista

[‡] Mobile commerce share in Japan - 2023 | Statista

[§] It is crucial to note that we do not present formal hypotheses regarding cultural differences in this study. Given the novel nature of the relationships in the proposed model, there is a lack of sufficient prior evidence to support the formulation of specific hypotheses concerning cultural variations. As such, we adopt an empirical approach to investigate whether (or not) the hypothesized linkages may differ across the cultural contexts of the United States and Japan.

The survey was distributed by the market research firm to nationally representative panels** in the United States and Japan via email invitations sent to registered participants. To encourage participation, automated follow-up reminders were sent 24 hours after the initial invitation. A random sampling technique was used to gather data from both panels, which helps reduce selection bias and improves the generalizability of the study's findings to the target population of fashion mobile shoppers. We made efforts to align the demographic characteristics of the study sample with those of mobile clothing shoppers in both countries. The panels used were chosen for their robust demographic profiling and broad coverage of diverse population groups. By doing so, the sample composition was designed to closely mirror the demographic distribution of US and Japanese retail fashion app users. The panel firm utilized strict demographic profiling procedures to select participants representing a wide range of characteristics, including age, gender, education, income, employment status and geographic location. Strict demographic quotas were applied to align the participant profiles as closely as possible with the demographic composition of the target populations—fashion mobile shoppers in the United States and Japan. Moreover, participants were recruited from various regions within both countries, covering urban, suburban and rural areas. This inclusive strategy aimed to reduce the likelihood of regional bias. Utilizing these nationally representative panels along with demographic profiling help address potential biases associated with online panel data and strengthens the generalizability of the study's results to the broader population of fashion app users in both countries.

The market research firm distributed the questionnaire to 2,000 invitees, of whom 509 completed it (256 from Japan and 253 from the U.S.). This sample size was determined to balance statistical power, representativeness and practical feasibility, supported by power analysis. The pooled sample consisted of a slightly higher proportion of female respondents (52.9%), primarily due to the U.S. sample, which had 56.1% female participants, while the Japanese sample had an equal gender distribution. The majority of respondents in the pooled sample were under 35 years old (with 37% aged 18-24 and 35% aged 25-34), a trend consistent across both the Japanese and U.S. samples. In terms of education, the respondents in the pooled sample were generally well-educated, with 33.8% holding a diploma and 35.8% a bachelor's degree. In the Japanese sample, 31.6% had a diploma and 33.2% a bachelor's degree, while the U.S. sample showed slightly higher percentages at 36% and 38.3%, respectively. Regarding employment, 63.1% of the pooled sample were employed full-time, with 56.3% in Japan and 70.4% in the U.S. The majority of respondents (43.2%) in the pooled sample reported an income range from \$25,000 to \$75,000, with 50.8% in Japan and 41.1% in the US. In terms of ethnicity, all respondents in the Japanese sample identified as Asian, which contributed to 55.2% of the pooled sample being of Asian descent. 53.4% of U.S. respondents identified as White. Regarding app usage, approximately 10% of respondents in the pooled sample reported using the app daily, while 25.7% used it once a month. The most frequently used apps in the pooled sample were Nike (14.8%) and Uniqlo (7.5%). In Japan, Uniqlo (15.4%) and Zozotown (8.3%) were the most popular apps, whereas Nike (24.5%) and Shein (11.6%) were the most commonly used in the US.

Measurements

All items were adapted from well-established measures. To ensure content validity, two academic experts reviewed the survey items before administration. A pre-test with 60 panel members from the targeted population (i.e., mobile fashion shoppers) was undertaken, during which participants completed the survey and provided feedback on clarity and appropriateness. Since no issues emerged from the pre-test, no further revisions were made to the questionnaire.

Three items from Yoo *et al.* (2000) were adapted to measure retailer equity. App purchase frequency was assessed with three items from McLean *et al.* (2020), while retailer loyalty was measured using four items

** It is worth noting that the nationally representative nature refers to the panels from which the sample was drawn, rather than the study's sample itself. The study's sample reflects rather the demographic profile of mobile fashion shoppers in the US and Japan.

adapted from Zeithaml *et al.* (1996). Positive attitudes toward the app were evaluated through five items from McLean *et al.* (2020) and Kim *et al.* (2016) and intentions for continuous app use were measured with three items from McLean *et al.* (2022) and Venkatesh *et al.* (2012). App-related shopping well-being was captured using seven items from El Hedhli *et al.* (2013) and Sirgy *et al.* (2016). Functional congruity was assessed using three items adapted from El Hedhli *et al.* (2013). Respondents were asked to consider app features commonly valued by shoppers, such as design aesthetics, ease of use, security, speed, product variety, personalized promotions, entertainment features, issue responsiveness and delivery accuracy. They were then prompted with the statement: Compared to my ideal mobile shopping app, i believe that the [retailer name]'s mobile app functionality is..., followed by three items measuring functional congruity. Self-congruity, a higher-order construct, was measured using thirteen items adapted from Grzeskowiak *et al.* (2022), capturing four dimensions: actual self-ideal self-, social actual self- and social ideal self-congruity. Lifestyle congruity was measured using four items from Grzeskowiak *et al.* (2016, 2022).

Retailer equity, app purchase frequency, retailer loyalty, positive app attitudes, intentions of continuous app use and functional congruity were measured with a 7-point Likert scale. The self-congruity dimensions (actual, ideal, social actual and social ideal) and lifestyle congruity were measured with a 5-point Likert scale. Shopping well-being was assessed with a 7-point semantic differential scale. The questionnaire concluded with demographic questions. An initial Yes/No screening question was included at the beginning of the questionnaire to ensure respondents met the necessary criteria (e.g., Do you have a fashion retailer's app installed on your smartphone that you regularly use for purchases?). Those who responded affirmatively were then asked a follow-up filter question to confirm whether they had made a purchase through the app in the past three months. This approach allowed us to target only active app users (Abu Farha *et al.*, 2024).

Common method bias

To mitigate a common method bias, we implemented several measures. Specifically, we utilized varying scale rating points and types, including 5- and 7-point Likert scales and semantic differential scales. In the questionnaire, the measurement items related to the dependent variables were positioned before those associated with the predictors. The respondents were assured of the confidentiality of their responses. We also conducted Harman's single-factor test, which revealed a variance below the critical threshold of 50% (Podsakoff *et al.*, 2003). Additionally, all examined relationships demonstrated a Variance Inflation Factor (VIF) of less than 3.3, indicating an absence of multicollinearity (Kock & Lynn, 2012).

Results

Measurement model

The measurement model was validated using SmartPLS 4.1. The factor loadings of the measurement items exceeded .70. The composite reliability (CR) and Cronbach's Alpha (CA) ranged from .84 to .951. The average variance extracted (AVE) for each construct was above .50. Additionally, the square root of the AVE for each construct was higher than the correlation with any other construct. The heterotrait-monotrait (HTMT) ratios were below .90 (Hair *et al.*, 2020). These results collectively support the internal consistency, convergent validity and discriminant validity of the study's constructs.

Hypotheses testing: a structural equation model

To test the study's hypotheses, a structural equation model (SEM) was estimated using SmartPLS 4.1. First, separate SEMs were estimated for each country individually to assess potential variations in the relationships within each cultural context. Next, we conducted multi-group analyses (MGA) to statistically test whether the observed patterns differed significantly between the two countries. This approach follows standard practices in cross-cultural research, allowing us to compare the consistency of relationships across groups while accounting for both shared and unique cultural dynamics. Finally, given the results of the MGA, we estimated a SEM based on the pooled sample by combining data from the US and Japan.

TABLE 1 - MGA results

Path	(β) Japan	(β) USA	Original difference	Permutati on mean difference	2.50%	97.50%	<i>p</i> -value
Functional Congruity -> Shopping Well-being	0.318	0.274	0.044	-0.003	-0.291	0.286	0.792
Self-congruity -> Shopping Well-being	0.237	0.378	-0.141	-0.001	-0.266	0.271	0.315
Life Style Congruity -> Shopping Well-being	0.229	0.137	0.092	0.001	-0.335	0.323	0.608
Self-congruity*Functional Congruity -> Shopping Well-being	0.104	0.006	0.097	0.003	-0.286	0.314	0.532
Life style Congruity*Functional Congruity -> Shopping Well-being	0.125	0.105	0.020	0.005	-0.358	0.344	0.21
Shopping Well-being -> App Attitudes	0.368	0.263	0.105	-0.004	-0.196	0.181	0.294
Shopping Well-being -> Intentions of Continuous App Use	0.290	0.181	0.108	-0.004	-0.192	0.189	0.265
Shopping Well-being -> Retailer Loyalty	0.101	0.139	-0.037	-0.002	-0.17	0.154	0.636
App Purchase Frequency ^b -> App Attitude	0.502	0.525	-0.023	0.003	-0.176	0.175	0.831
App Purchase Frequency ^b -> Intentions of Continuous App Use	0.444	0.524	-0.081	0.004	-0.178	0.183	0.421
Retailer Equity ^b -> Retailer Loyalty	0.768	0.606	0.162	0.003	0.144	0.153	0.029

^bApp purchase frequency and retailer equity and are included as covariates.

Multigroup analysis

To evaluate whether the structural relationships in our model differed between American and Japanese shoppers, we conducted an MGA following the procedures outlined by Sarstedt *et al.* (2011). Table 1 presents the results of the MGA, which reveal that nearly all model relationships did not differ significantly between Japanese and American shoppers. For instance, the difference of the effects of functional congruity ($\Delta\beta = 0.044$, $p = 0.792$), lifestyle congruity ($\Delta\beta = 0.092$, $p = 0.608$) and self-congruity ($\Delta\beta = -0.141$, $p = 0.315$) on shopping well-being were not statistically significant across the two groups. Additionally, the interaction effects of both self-congruity and lifestyle congruity with functional congruity on shopping well-being were not statistically significant in either group ($\Delta\beta = 0.097$, $p = 0.532$ and $\Delta\beta = 0.020$, $p = 0.210$, respectively). The same goes with the difference of the effects of shopping well-being on the outcome variables across the two groups. The difference of the effects of shopping well-being on app attitudes ($\Delta\beta = 0.105$, $p = 0.294$), intentions of continuous app use ($\Delta\beta = 0.108$, $p = 0.265$) and retailer loyalty ($\Delta\beta = -0.037$, $p = 0.636$), were not statistically significant across the two groups. In conclusion, the MGA supports the invariance of the structural relationships between the constructs across U.S. and Japanese shoppers. These findings suggest that the data from both the US and Japanese samples can be pooled. In the next section, we test the study's hypotheses using the results from the pooled sample.

Pooled sample

The SEM results for the pooled sample are presented in Table 2. The results indicate that purchase frequency via the app positively influences app attitudes ($\beta = 0.542$; $SE = 0.046$; $t = 11.789$; $p < 0.001$) and intentions for continuous app use ($\beta = 0.513$; $SE = 0.047$; $t = 10.827$; $p < 0.001$). Additionally, retailer equity

positively influences retailer loyalty ($\beta = 0.722$; $SE = 0.038$; $t = 19.181$; $p < 0.001$). The model explains 48.60% of the variance in shopping well-being, 55.70% of the variance in app attitudes, 43.90% of the variance in intentions of continuous app use and 62.70% of the variance in retailer loyalty. Stone-Geisser's Q^2 values are higher than zero (shopping well-being = 0.464, app attitudes = 0.582, intentions of continuous app use = 0.471 and retailer loyalty = 0.639), which support the predictive relevance of the study's model (Hair et al., 2020).

The results indicate that shopping well-being is positively influenced by functional congruity ($\beta = 0.269$; $SE = 0.071$; $t = 3.796$; $p < 0.001$), self-congruity ($\beta = 0.315$; $SE = 0.063$; $t = 5.018$; $p < 0.001$) and lifestyle congruity ($\beta = 0.175$; $SE = 0.079$; $t = 2.207$; $p = 0.027$). These results lend support to H1, H2 and H3, respectively. Aligned with the standardized coefficients, the effect sizes show that functional congruity ($f^2 = 0.054$) and self-congruity ($f^2 = 0.058$) have a greater impact on shopping well-being than lifestyle congruity ($f^2 = 0.017$). Self-congruity demonstrated the strongest effect on shopping well-being. Across all 5000 samples, self-congruity had a significantly greater effect on shopping well-being than both functional congruity and lifestyle congruity, yielding p -values of < 0.001 for each comparison. These results support H4a. Additionally, in 5000 samples, the effect of functional congruity on shopping well-being exceeded that of lifestyle congruity. These results reject H4b. The interaction effect between functional congruity and self-congruity on shopping well-being was not statistically significant ($\beta = 0.074$; $SE = 0.073$; $t = 1.016$; $p = 0.31$), nor was the interaction effect between functional congruity and lifestyle congruity ($\beta = 0.054$; $SE = 0.087$; $t = 0.629$; $p = 0.529$). These results reject H5 and H6. As for the outcomes of shopping well-being, the results show that it positively influences app attitudes ($\beta = 0.313$; $SE = 0.048$; $t = 6.514$; $p < 0.001$), intentions of continuous app use ($\beta = 0.239$; $SE = 0.049$; $t = 4.902$; $p < 0.001$) and retailer loyalty ($\beta = 0.116$; $SE = 0.041$; $t = 2.831$; $p = 0.005$). These results provide support for H7, H8 and H9, respectively.

TABLE 2 - Pooled SEM results ($N = 509$)

Effects of	On	(β) ^a	SE	t	f ²
Functional congruity	Shopping well-being	0.269***	0.071	3.796	0.054
Self-congruity	Shopping well-being	0.315***	0.063	5.018	0.058
Life style congruity	Shopping well-being	0.175**	0.079	2.207	0.017
Self-congruity*Functional Congruity	Shopping well-being	0.074	0.073	1.016	0.003
Life style congruity* functional congruity	Shopping well-being	0.054	0.087	0.629	0.002
Shopping well-being	Positive app attitudes	0.313***	0.048	6.514	0.169
Shopping well-being	Intentions of continuous app use	0.239***	0.049	4.902	0.078
Shopping well-being	Retailer loyalty	0.116**	0.041	2.831	0.025
App purchase frequency ^b	Positive app attitudes	0.542***	0.046	11.789	0.506
App purchase frequency ^b	Intentions of continuous app use	0.513***	0.047	10.827	0.358
Retailer equity ^b	Retailer loyalty	0.722***	0.038	19.181	0.972

^a Standardized path coefficients; ^b App Purchase Frequency and Retailer Equity and are included as covariates.
Note: *** $p < 0.001$; ** $p < 0.05$

Conclusions and discussion

As mobile shopping and apps become increasingly ingrained in consumers' daily lives, they appear to play a significant role in shaping their personal identities and well-being. However, research on how shopping apps influence shoppers' identities and well-being remains scarce. The current research addresses this gap by proposing an integrative conceptual framework and providing empirical evidence on how shopping apps shape a shopper's self-concept and foster well-being. Specifically, it integrates the congruity theory, self-determination theory and eudaimonistic identity theory to shed light on how shopping apps facilitate identity expression and fulfill intrinsic psychological needs. By considering the roles of self-congruity (actual ideal, actual social and ideal social), lifestyle congruity and functional congruity, this research offers insights into the role of shopping apps in influencing consumer self-concept, well-being and engagement. The findings reveal that shopper-app congruence enhances shopping well-being, which in turn, fosters consumers' supportive behaviors toward both the app and retailer, including favorable attitudes toward the app, intentions of continued app usage and retailer loyalty.

This research makes several contributions to the mobile retailing and consumer behavior literature. First, it provides insights into the role of shopping apps as identity-reinforcing catalysts rather than mere transactional tools. Second, this research extends the notion of congruity into a shopping app setting and broadens it by integrating functional congruity, self-congruity (including actual self-ideal self-, actual social self- and ideal social self-congruity) and lifestyle congruity. This comprehensive and novel approach provides a more holistic and nuanced understanding of how shoppers relate to shopping apps. Third, it extends the concept of shopping well-being into the mobile shopping context, demonstrating how shopping apps contribute to shopper fulfillment of intrinsic psychological needs beyond transactional and extrinsic benefits. Fourth, this study proposes and empirically validates an integrative model elucidating the role of identity-based facets in influencing shoppers' well-being. Fifth, it provides empirical evidence supporting the view that shopping well-being enhances key retailer outcomes, including consumers' attitudes toward the app, their intentions to continue using it and their loyalty to the retailer.

The study findings offer straightforward and actionable insights for mobile retailers aiming to enhance shopping well-being and foster supportive shopper behaviors, including favorable attitudes and intentions toward apps as well as increased retailer loyalty. While functional, self- and lifestyle congruity are key factors, the mobile shopping literature has predominantly equipped retailers with strategies to enhance app functionality. However, the findings of this research hint at the fact that mobile retailers need to pay close attention to the role of self-congruity and lifestyle congruity, as they are shown to be instrumental in shaping shopping behavior and driving positive retail outcomes. Additionally, mobile retailers should rethink their marketing communication strategies to emphasize self-expressiveness and social positioning. Rather than focusing solely on convenience and performance, promotional tactics should highlight how the app aligns with shoppers' self-concept and aspirations.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

When brands collide - how automobile brands affect driver aggression

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Abstract. Our research investigates how the relative status of automobile brands affects consumer responses to the dangerous driving of others. We theorize that drivers of high-status automobile brands are more likely to respond aggressively to other drivers who drive dangerously. Aggressive driving responses include honking, rude or angry hand gestures and tailgating that can escalate into physical altercations (i.e., road rage). We conducted an experiment in which participants used a driving simulator and were randomly assigned to drive either a BMW (higher-status) or an Acura (subordinate-status) vehicle. In the simulation, all participants were exposed to a dangerous driving situation (i.e., they were not allowed to merge onto a busy roadway by another driver). We found that participants who drove a BMW (versus an Acura) were significantly more likely to honk their horn and flash their lights at the dangerous driver. Our results have important implications for our understandings of brands and how their relative status affect consumers.

Keywords : Brand status; consumer aggression; automobile brands; brand consumption; experiment

Introduction

We investigate how the relative status of automobile brands affects driver aggression in response to dangerous driving situations. We conducted an experiment in which participants driving an auto simulator experienced a scenario in which another driver did not allow them to merge onto a busy roadway. We measured how the participant driver responded to the dangerous driver with both perceptual and behavioural measures. We theorize that drivers' reactions to dangerous driving by others depends on the relative status of the automobile brands involved. We argue and find evidence that drivers of higher-status vehicles are more likely to respond aggressively to dangerous drivers than drivers of subordinate-status vehicles. Our rationale is that an interaction with a dangerous driver will lead drivers of higher-status brands to react to restore their superior status. Hence, higher status drivers will be more likely to engage in socially visible behaviours such as flashing their lights and honking their horn, but not more likely to engage in private responses (i.e., responses that will not be noticed by the dangerous driver). Moreover, we posit that the status of the brands involved in the negative interaction will not evoke stronger negative emotions such as anger, fear and frustration.

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We examine brand-related perceptions and behaviours in driving environments for three reasons. First, automobiles are high-involvement purchases in terms of the financial investment and the social symbolic and hedonic consequences (Park *et al.*, 1986). Second, consumers tend to dehumanize other drivers, which makes them more likely to act aggressively toward them (Delbosc *et al.*, 2019; Horbovetz 2019). Third, brand interactions in driving environments are dynamic (i.e., consumers experience a large number of different brand-related interactions just driving to the grocery store) and the interactions are exogenously determined and therefore unplanned. Testing our theory using driver simulators offers significant advantages in terms of ecological validity by measuring real-time driver behaviours in a highly-engaging context. Consequently, our approach also minimizes socially desirable responding (Fisher, 1993; Fisher *et al.*, 2024).

Our research contributes to the growing literature on consumer aggression and retaliation. Aggression is defined as behaviours that are intended or likely to harm another person or object (Kristofferson *et al.*, 2017). Aggression is associated with antisocial, criminal and violent behaviours (Loeber, 2004). Within the context of driving interactions, aggressive behaviours include following too close, weaving in and out of traffic, passing on the shoulder, speeding, cutting off other vehicles, honking, flashing headlights and inappropriate gestures. In the extreme, these types of behaviours can lead to physical confrontations between drivers, which is commonly known as road rage. In the present context, retaliation is defined as an intentional attempt to harm the other driver because they have harmed us (Grégoire & Fisher, 2008). Hence, retaliation is a specific type of aggressive response that is designed to obtain revenge for a perceived harm.

Our theory is that driving aggression is significantly more likely to occur when dangerous driving interactions involve brands that represent different status levels. Differences in the relative status of the vehicle brands reflect differences in power, wealth and other driver characteristics. Prior research has found that status differences have important consequences for interpersonal interactions. We posit that higher-status drivers' feelings of power are diminished when they have a negative interaction with a subordinate-status driver. Consequently, they will try to restore their status through aggressive behaviours that are visible to the other driver. Drivers of higher-status automobiles tend to feel entitled to act aggressively because higher-status drivers feel powerful relative to subordinate-status drivers. In turn, they will have less empathy for the subordinate-status driver, be less inhibited in their reactions and be more apt to take risks (Anderson & Galinsky, 2006; Keltner *et al.*, 2003). Based on the same logic, we posit that subordinate-status drivers are less likely to act aggressively toward higher-status drivers because their deficient power makes them less likely to see the negative interaction as something they can or should respond to.

Methodology

Research design

Our driving simulator required advanced graphics and processing capabilities. Hence, we ran our experiment in a specialized computer graphics lab in the Computing Sciences Building at the University of Alberta. The study was a between-subjects experiment with the brand of the automobile driven by the participant the single factor. We asked participants to imagine that they were driving either a BMW or an Acura. The brand manipulation had two components. First, the steering wheel in the driving simulator either had a BMW or an Acura logo visible during the entire driving session. Second, participants were informed that they were driving their friend's BMW (or Acura) in the introduction to the training session and before each of two driving scenarios. Participants were seated at a computer station equipped with a monitor and a Logitech G20 steering wheel and pedals. After reading the study purpose and formally agreeing to participate, participants were trained via a tutorial that took approximately five minutes to complete. First, participants were informed of the location of the turn signals, horn, lights, gas pedal, brake pedal and so forth. Once participants were able to correctly press each of simulator's buttons, turn the steering wheel in each direction and depress the gas and brake pedals correctly, they were allowed to proceed to test drive the simulator on

both an open road and an urban driving environment. No other cars were visible during the tutorial. The driving simulator program tracked each participant's driving behaviours during the training session. The driving part of the tutorial timed out after two minutes or when the participant had successfully reached a predetermined location in the scenario.

After the training session, participants were told that they would face two common driving situations in the main study. In the first scenario, participants were asked to park their automobile in a virtual replica of an actual parking lot at a supermarket close to their university. Participants were instructed to park in an open spot and then guided toward it via on-screen arrows and the voice of their virtual passenger. Immediately before turning into the parking space, the virtual passenger asked participants to stop and signal their intention to park. When they began parking, another car was programmed to steal their spot at the last possible moment. The virtual passenger then exclaimed that their parking spot had been stolen and that they would have to find another space. Once the participant continued past the stolen spot, they answered questions about their emotional and behavioural reactions to the driver who had stolen their parking space. The survey questions were integrated into the driving simulator program so that we captured their immediate reactions to the parking scenario. The parking scenario was designed to further familiarize participants to driving the simulator and to prime them for the second driving experience.

After completing the parking scenario at the local supermarket, participants were asked to drive home via one of the city's major roadways. When participants attempted to merge onto the busy road, a car appeared on their left and remained in their field of vision. The car was programmed to block the participant so that they were unable to merge, just before the merging lane ended, the dangerous driver forced the participant to stop on the shoulder. The dangerous driver then made a rude gesture and accelerated away. Participants were then asked to report their emotions and behavioural responses related to the merging scenario. After completing these questions, participants received a complimentary drink and snack before they exited the lab.

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Sample

Research assistants were hired to approach students, faculty and staff in and around the Computing Sciences Building. We ran the study over a two-week period from approximately 11 am to 1:30 pm each day. Our sample included 248 participants ($M_{\text{age}} = 21.6$ years; Male = 68.5%, Female = 30.2%, Other = .8% and No answer = 1.2%). Most participants were undergraduate students (86.7%), but our sample also included graduate students (11.3%), faculty (8%) and staff (1.2%). The entire study including the training component took approximately 25 minutes.

Results

DRIVING BEHAVIOURS DURING TRAINING. We collected data on participants' driving behaviours during the open road part of the training scenario. We measured driving behaviours including the top speed attained, the number of times the brake was applied, rates of acceleration and deceleration and number of times the steering wheel achieved its maximum rotation in either direction.

MANIPULATION CHECKS. We found that the majority of participants correctly identified the brand of automobile they were driving. For participants in the Acura condition, 81.9% correctly identified the brand they were driving in the first scenario and 87.1% in the second scenario. For participants in the BMW condition, 97.7% correctly identified the brand they were driving in the first scenario and 98.5% in the second scenario.

EMOTIONAL RESPONSES. After each scenario, we asked participants to indicate the degree to which they felt angry, frustrated, scared, afraid and annoyed on a 1-7 Strong disagree to Strongly agree scale in response to the other driver in the merging scenario ($M = 3.94$; $SD = .87$; $\alpha = .71$). We found no difference in the emotional responses to the dangerous driver because of the brand manipulation in the merging scenario ($F(1, 246) = 1.00$; $p = .318$; $M_{\text{Acura}} = 3.92$; $SD = .84$; $M_{\text{BMW}} = 3.96$; $SD = .91$).

BEHAVIOURAL RESPONSES. We distinguish between behavioural responses that are visible versus private signals of the participant's reaction to the dangerous driver. Visible behaviours are those that can be observed by the dangerous driver and therefore have the potential to provoke retaliation from the dangerous driver, which could result in road rage. Moreover, visible behaviours reflect or signal impression management, self-presentation and social desirability concerns (Fisher et al., 2024). Private behaviours, in contrast, are independent of social concerns (Fisher, 1993). We measured visible behavioural responses as the self-reported willingness to honk the horn or flash the headlights at the dangerous driver after either the participant had driven away (in the parking scenario), or the dangerous driver had driven away (in the merging scenario). Given that participants might use only one type of visible response at a time and it would be exceedingly difficult to do both at the same time, we treat both visible and private responses as composite

measures ($M = 3.32$; $SD = 1.15$). We measured private behaviours as the self-reported willingness to yell at the other driver (though the window was closed so the other driver would not hear it), drive more aggressively after the encounter and make a rude gesture that was not visible to the other driver ($M = 3.01$; $SD = .13$).

HYPOTHESIS TEST. We found support for our hypothesis that BMW drivers are more visibly aggressive toward the dangerous driver than are Acura drivers. We found that the BMW drivers were significantly more likely to respond by honking their horn and flashing their lights at the dangerous driver. We ran an ANOVA and found that participants who were told they were driving a BMW were significantly more likely to respond with visible aggression than were participants who thought they were driving an Acura ($M_{BMW} = 3.46$; $SD = .09 > M_{Acura} = 3.17$; $SE = .11$; $p = .047$).

Second, we ran an ANCOVA in which we included the two theoretically relevant behavioural variables from the training data that preceded the main experiment. We began our analysis by examining the potential for participant behaviors during the training session to predict driver aggression. We speculated that driving behaviors that were extreme or highly variable during the training session might be characteristic of drivers that were prone to aggressive behaviors because they had poor self-control. We, therefore, began our analysis by assessing the correlations between participants' emotional and behavioral responses to the dangerous driver in the merging scenario and each of the driving behaviors observed in the training session. Of the 21 possible correlations between the three dependent variables (emotions, visible reactions and private reactions), we found only two significant correlations. The first was a significant positive association between the maximum acceleration rate during training and the visible behaviors of honking and flashing headlights ($r = .132$; $p = .037$) in the merging scenario. The second was a significant negative association between the number of braking events and the private reactions in the merging scenario ($r = -.131$; $p = .04$). We, therefore, used these variables as covariates in the subsequent hypothesis test.

We found that only the change in acceleration rate was a significant covariate ($F = 4.61$; $p = .033$), but its inclusion did not change the significant brand differences in visible forms of aggression ($M_{BMW} = 3.46$; $SD = .09 > M_{Acura} = 3.17$; $SE = .11$; $p = .041$). The fact that change in acceleration rate during the training session was a positive covariate suggests that a lead foot is a behavioural marker of the greater tendency to respond aggressively when confronted with a dangerous driver.

Third, we ran an ANCOVA to account for individual differences in the tendency to respond to dangerous driving. We did so by including our measure of private expressions of aggression as a covariate, which was positive and significant ($F = 57.77$; $p < .001$), but its inclusion did not affect the hypothesis that participants who drove a BMW in the simulator were significantly more likely to respond with visible aggression than were participants who drove an Acura ($M_{BMW} = 3.46$; $SD = .09 > M_{Acura} = 3.17$; $SE = .11$; $p = .033$). We provide the full details of the three models in Table 1 and present the key result graphically in Figure 1.

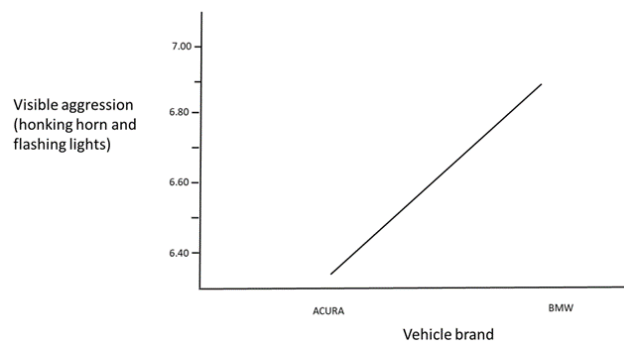


FIGURE 1 - Effects of brand on visible forms of driver aggression

TABLE 1 - Effects of brand on visible forms of driver aggression

Panel A: No covariates

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	20.80	1	5.20	3.99	0.05
Intercept	10844.27	1	2711.07	2080.93	0.00
Brand : Acura = 0; BMW = 1	20.80	1	5.20	3.99	0.047
Error	1281.97	246	1.30		
Total	12254.00	248			
Corrected Total	1302.77	247			

Panel B: Covariates - braking and acceleration behaviours from training session

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	44.978	3	14.99	2.91	0.04
Intercept	2611.58	1	2611.58	506.62	0.00
Brand : Acura = 0; BMW = 1	21.68	1	21.68	4.20	0.041
Braking frequency	0.57	1	0.57	0.11	0.74
Maximum acceleration	23.77	1	23.77	4.61	0.03
Error	1257.80	244	5.15		
Total	12254.00	248			
Corrected total	1302.77	247			

Panel C: Covariates- private forms of aggression (yelling, gestures and driving more aggressively after interaction)

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	265.425	2	132.71	31.34	0.00
Intercept	479.53	1	479.53	113.25	0.00
Brand : Acura = 0; BMW = 1	18.41	1	18.41	4.35	0.04
Private reactions	244.62	1	244.62	57.77	0.00
Error	1037.35	245	4.23		
Total	12254.00	248			
Corrected total	1302.77	247			

Conclusions and discussion

We found evidence that the brand of automobile being driven by consumers can have a significant effect on how they respond to dangerous driving events caused by other drivers. We found evidence that when the participants in our study thought they were driving a higher-status vehicle (i.e., a BMW) rather than a subordinate-status vehicle (i.e., an Acura) in the simulator, they responded more aggressively to a driver who intentionally would not allow them to merge onto a busy roadway and who gave them the finger. It is important to note that pretests indicated that although Acura is a higher-priced automobile in Canada, it is not perceived to be equivalent to the BMW in status, and it is at a significantly lower MSRP for equivalent models. For example, the 2025 Acura RDX ranges from \$53,800 to \$62,630 CDN while the comparably sized 2025 BMW X5 starts at \$87,100 and goes up to \$106,100 (Driving.ca, 2025). The fact that the Acura is a premium rather than standard brand suggests that our findings are conservative (i.e., stronger effects might be found if the comparison was between a BMW and standard brands such as Chevrolet, Honda, or Volkswagen).

We distinguished between these two types of aggressive behaviours because of our interest in understanding how and why dangerous interactions on the road escalate. The finding that significant differences in visible but not private forms of aggression between the brand conditions implies that the social visibility of the aggressive responses is important. We propose that two social explanations are most likely. The first relates to impression management, which might occur because the drivers of the higher-status brand are acting in accordance with social norms. For example, participants who were in the BMW condition might have thought it was more appropriate to display their anger than participants in the Acura condition. This could occur because participants have previously observed that BMW drivers are more likely to flash their lights and honk their horn at drivers who have offended them in some way. If participants have observed that drivers of higher-status brands are more likely than drivers of subordinate-status brands to display their displeasure in these ways it will become the descriptive norm (Fisher & Dubé, 2011).

Our second explanation for the significant brand effects for visible expressions of aggression is that they are designed to retaliate against the driver of the offending vehicle. By flashing their lights or honking their horn, drivers of higher-status automobiles are communicating their displeasure to the subordinate-status driver. In doing so, they are attempting to signal that the offending driver has broken either formal or informal rules of the road. In our merging scenario, the offending driver broke the formal rules of the road because of the illegal nature of their actions, but they also broke the informal rules by making an offensive gesture. It could be that our participants in the BMW were attempting both to signal the driver that their behaviour was unacceptable, to punish them for their actions and to encourage them not to behave in the same way in the future. More research is being undertaken to explain more precisely why our results occurred.

Finally, our study rules out several possible explanations for the observed effects. We found no differences in the degree of negative emotions reported by participants in our study. Participants were not significantly more frustrated, fearful, or angry in the BMW versus the Acura condition. Neither did the brand affect the perceived seriousness of the interaction, the psychological closeness of the participant to the brand, nor the perception that the other driver acted intentionally. We plan additional studies to understand the underlying reason for the brand effects.

Acknowledgements

The researchers received support from the Social Sciences and Humanities Research Council of Canada

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Word social media trends: unraveling the phenomenon

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Abstract. This study examines the psychological, social and structural factors influencing engagement with social media trends. Across three interrelated studies, we analyze platform data from 200 TikTok trends, conduct an experiment on emotional drivers of participation ($N = 196$) and test audience perceptions of influencer imitations ($N = 214$). Results show that emotional pleasure is the strongest predictor of participation and sharing, while content type and hedonic attitudes play a lesser role. Influencer authenticity significantly enhances sharing intentions, whereas thematic fit has minimal impact. The findings highlight the affective and self-expressive nature of trend participation and offer practical insights for marketers and content creators. By integrating perspectives from diffusion theory, social proof and psychological reactance, the study advances understanding of digital virality and contributes to international research on social media engagement.

Keywords : social media; trend participation; digital virality; consumer engagement; multimethod approach

Introduction

Social media has fundamentally reshaped how individuals and organizations create, share and engage with content, making it a central aspect of everyday digital communication. With over 4.95 billion users worldwide (Kaplan & Haenlein, 2010; Wearesocial, 2023), platforms such as TikTok, Instagram and Twitter serve as dynamic spaces for content dissemination, community formation and brand interactions. These platforms not only allow consumers to connect and communicate but also provide businesses with significant opportunities to establish a digital presence, engage audiences and shape cultural narratives (Kietzmann *et al.*, 2011; Aral *et al.*, 2013). One of the defining characteristics of social media is its ever-evolving landscape, where certain types of content rapidly gain traction and spread across platforms. These trends, patterns of content creation, engagement and replication that achieve widespread popularity within a short period (Kaplan & Haenlein, 2010), play a crucial role in shaping digital interactions. Beyond their online presence, social media trends influence consumer behavior, shape cultural narratives and even impact political discourse (Highfield, 2022). However, while only a few social media trends translate into sustained engagement and long-term impact, many experience only fleeting bursts of virality before fading into obscurity. Understanding why some trends endure while others fade requires examining how trends emerge and spread in the first place. Unlike traditional media, where trends were primarily shaped by editorial

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decisions and gatekeepers, social media trends emerge in a decentralized and participatory manner, influenced by peer interaction, influencer engagement and automated recommendation systems (Abidin, 2021; Hödl & Myrach, 2023).

As a result, social media trends take on various forms, ranging from viral challenges (e.g., the Ice Bucket Challenge for ALS awareness) and trending hashtags (e.g., #MeToo, #BlackLivesMatter) to memes (e.g., Distracted Boyfriend or Woman Yelling at a Cat) and short-form video formats (e.g., TikTok dances like the Renegade). These trends often spread through platforms such as TikTok, Instagram and Twitter via user-generated content and algorithmic amplification. A prime example of a social media trend that gained global traction is the Ice Bucket Challenge, launched by the ALS Association in 2014, to raise awareness and funds for amyotrophic lateral sclerosis (ALS). The challenge involved individuals filming themselves pouring a bucket of ice water over their heads, sharing the video on social media and nominating others to participate. The campaign was remarkably effective, amassing millions of participants, including celebrities and public figures and raising over \$115 million for ALS research (ALS, 2014). Similarly, the Harlem Shake Dance, which emerged in 2013, exemplifies the power of social media in driving digital trends. Initially a niche internet meme, the Harlem Shake exploded into a global phenomenon when consumers began creating and sharing videos featuring a short dance sequence that started with an individual dancing alone and culminated in an abrupt scene change with a group performing erratic dance moves (Soha & McDowell, 2016). The trend spread exponentially, generating millions of imitations and variations, including adaptations by corporations, sports teams and educational institutions. Both examples highlight the mechanisms through which social media trends capture public interest and spread rapidly across digital networks. These trends are not only vehicles for entertainment but also play a crucial role in shaping digital marketing strategies, brand communication and consumer engagement (Tafesse & Wood, 2021). Social media has created an environment where content dissemination is no longer controlled by traditional media gatekeepers but is instead shaped by consumers, influencers and algorithmic recommendations (Bucher, 2019; Cotter, 2019). However, while some trends achieve significant engagement and virality, others fail to gain traction. Despite the increasing prevalence of viral phenomena, little is known about the underlying psychological mechanisms that drive consumer participation in social media trends. This knowledge gap is particularly relevant for businesses, which invest heavily in digital marketing campaigns and influencer collaborations but still struggle to understand why some trends resonate with audiences while others fail. Additionally, the unpredictability of virality poses a challenge for marketers and content creators who seek to maximize engagement and visibility. Understanding the cognitive and emotional motivations behind trend participation is essential for developing effective content strategies that increase the likelihood of virality.

Businesses can derive significant benefits from social media and trends, including increased visibility and reach, enhanced customer engagement and improved brand perception (Kaplan & Haenlein, 2010). Recognizing this potential, companies and brands increasingly integrate trending content into their marketing strategies, leveraging the participatory nature of social media to foster engagement and strengthen brand visibility (Blut *et al.*, 2023). However, the fleeting nature of trends poses a challenge, as topics can shift rapidly, requiring marketers and content creators to constantly adapt, in an economy where consumer attention is a valuable commodity, companies must develop targeted, compelling content that aligns with their audience's interests to maintain relevance (Tellis *et al.*, 2019). Furthermore, incorporating clear calls-to-action can encourage consumers interaction, ultimately driving higher engagement and conversion rates (Mu *et al.*, 2022). Understanding the psychological motivations behind consumer behavior is therefore essential for crafting emotionally resonant marketing campaigns. By effectively implementing these strategies, businesses can transform virality and visibility into tangible revenue, maximizing the potential of social media platforms. While previous research has examined online virality and influencer marketing, the role of psychological and social mechanisms in trend participation remains underexplored (Leung *et al.*,

2022; Blut *et al.*, 2023). This gap is particularly relevant for businesses, as understanding why consumers engage with trends can help brands develop more effective marketing strategies. However, most existing studies focus on algorithmic factors rather than consumer-driven motivations, overlooking the complex interplay between content, engagement dynamics and the perceived authenticity of influencers. By integrating insights from psychology, marketing and consumer research, this study advances theories on digital engagement by identifying the key drivers behind trend diffusion and consumer participation. Gaining deeper insights into these motivations not only enhances our understanding of online consumer behavior but also enables businesses to craft more compelling, trend-driven campaigns that foster long-term brand engagement and cultural relevance in the digital age. Building on these insights, this study addresses three key research gaps that are crucial for understanding what drives the engagement in and perception of social media trends. First, existing studies on content virality and influencer marketing have predominantly focused on platform algorithms and engagement metrics, often overlooking how structural elements of social media platforms, such as follower networks contribute to the engagement in and virality of trends. Second, psychological mechanisms like social identity, social interaction and hedonic motives that contribute to influencers participation of trends remain insufficiently understood, while these factors may determine whether a trend gains widespread traction or quickly fades. Third, the perception of the audience, those consumers who do not actively participate in a trend by imitating, but still engage with the trend through viewing and sharing. Given the growing importance of trend-based marketing, understanding these underlying drivers is essential for developing more effective engagement strategies. By integrating psychological, social and marketing perspectives, this study aims to identify the key factors that contribute to the virality and sustained engagement of social media trends. Accordingly, it explores the central research question: What factors influence the engagement in and perception of social media trends?

Theoretical background

We tested our research question using a multimethod approach across three interrelated studies, which build upon one another to contribute to a comprehensive understanding of the determinants of social media trend engagement and perception, looking at their trend virality, why influencers participate in specific trends and the resulting effects on consumer perceptions and behavior (see Figure 1). These three studies systematically investigate the mechanisms underlying the spread, participation and reception of social media trends. Together, these perspectives provide insights into network effects, psychological motivations and audience perceptions, offering a comprehensive framework for understanding the factors influencing trend virality, participation and audience perception. By identifying the key drivers behind the engagement in and perception of social media trends, this research provides both theoretical and practical implications for researchers and marketers. Understanding these mechanisms allows companies to better evaluate upcoming trends to identify emerging interests, needs and desires within their target demographic (Tellis *et al.*, 2019).

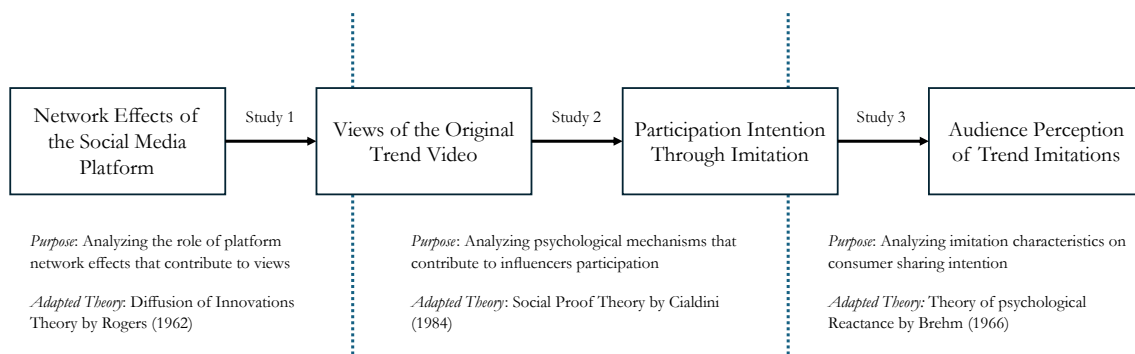


FIGURE 1 - Overview of the research studies

Overview of the Studies

By analyzing viral and non-viral trend videos, study 1 primarily serves to determine whether user engagement has any measurable impact on trend formation. It investigated the role of platform network effects in determining content engagement on social media, identifying the conditions under which trends achieve widespread reach, grounded in Rogers' (1962) Diffusion of Innovations Theory. This framework identifies four critical components that influence the spread of innovations: (1) the innovation itself, (2) communication channels, (3) social systems, and (4) time. In the context of social media, these elements correspond to content characteristics (innovation), engagement metrics such as likes and comments (communication channels), influencer participation and network effects (social systems) and momentum-building effects over time (temporal factors). Rather than making definitive claims about the mechanisms driving trends, this study first and foremost assesses whether engagement metrics have any discernible effect on a trend's visibility. It further examines how algorithmic promotion, virality triggers and engagement incentives contribute to the visibility of trends, offering a more granular understanding of how platforms amplify content. In the context of trends, views serve as a suitable metric and engagement factor as it directly reflects the extent of a trend's reach and visibility within the social media landscape (Wies *et al.*, 2023). By tapping into trends, companies can significantly increase their visibility and reach. Content that resonates with current trends or viral topics is more likely to be shared, commented on and liked, thereby amplifying the brand's presence across platforms (Blut *et al.*, 2023). This enhanced engagement fosters a deeper connection with the target audience, increasing brand awareness and potentially leading to higher conversion rates (Goh *et al.*, 2013, Mu *et al.*, 2022).

Study 2 explored the psychological mechanisms influencing consumer participation in social media trends, drawing on Cialdini's social proof theory (1984), which suggests that individuals are more likely to engage in actions they observe others performing, perceiving them as socially acceptable. By focusing on the psychological motivations driving trend adoption, this study identifies the individual and social incentives that lead users to engage with and create trend-related content. In the context of social media, consumers often face uncertainty about how their content will resonate with their audience or reflect on their personal brand. By joining trends and replicating popular content, consumers gain confidence that their contributions will be positively received, as they are adopting behaviors validated by the community. Additionally, the study incorporates moderating effects from the uses and gratifications theory by Katz *et al.* (1974), considering egoistic and altruistic motivations behind consumer engagement. This perspective offers insights into the emotional and cognitive factors that drive participation, as highlighted by Cao *et al.* (2021), such as the need for belonging, social approval, social proof and self-expression (Audrezet *et al.*, 2020). Furthermore, participation in trends can significantly boost a brand's visibility, as trend-aligned content tends to receive more shares, likes and comments, enhancing brand presence (Blut *et al.*, 2023). This, in turn, strengthens audience connections, raising brand awareness and potentially improving conversion rates (Goh *et al.*, 2013; Mu *et al.*, 2022). Crucial to a trend's virality is not only the widespread viewing, liking and commenting by the community but also the active participation of consumers in creating content related to the trend, whether through stylistic imitation or expanding upon the trend with original ideas. This study helps explain why some trends see high levels of consumer participation, whereas others fail to gain traction.

Study 3 focused on audience perceptions of influencer participation in social media trends through imitation. While influencers play a pivotal role in amplifying trends, their involvement is not always viewed positively by audiences. According to the Theory of Psychological Reactance (Brehm, 1966), individuals tend to resist behaviors they perceive as attempts to influence them, which can lead to disengagement. This study explores the conditions under which influencer involvement either enhances or hinders engagement, offering insights into the interplay between authenticity and credibility in shaping engagement intentions. Resistance can vary depending on whether the audience perceives the influencer's participation as authentic, value-aligned, or merely a commercial strategy. Furthermore, a successful and emotionally resonant imitation may generate

more positive perceptions and increase engagement through sharing intentions, while a perceived lack of authenticity or overt commercialism may result in disengagement. Research by De Veirman *et al.* (2017) highlights the importance of an influencer's perceived credibility and authenticity in shaping audience reactions. Similarly, recent studies show that influencers' authenticity management strategies significantly drive digital engagement (Liao & Chen, 2024). Moreover, the perceived relationship between influencers and their followers has been shown to impact psychological well-being and loyalty, further influencing sharing intentions (Kim & Kim, 2022). By systematically examining audience perception, this study contributes to a more nuanced understanding of social media trends and the characteristics of imitation that shape consumer perception.

Study 1

Given the exploratory nature of this preliminary study, we aimed to gain an initial understanding of the structural characteristics and interaction patterns within social media networks in general. Here, we are exploring how the participation intentions of individuals and groups influence the engagement of viral trend videos especially promoted by companies on social media through market data analysis. Social media trends often capture consumer attention due to their novelty and engaging nature, prompting consumer interaction and participation, as highlighted by Djafarova & Bowes (2021). In this expanded investigation, we are applying the principles of the diffusion of innovation theory, originally proposed by Rogers (1962), to understand how these trends proliferate across different consumer groups. In general, the diffusion of innovation theory assumes that four key factors: 1) innovation, 2) communication channels, 3) the social system itself and 4) time, providing a detailed examination of how, why and at what rate new ideas and technology spread through cultures, emphasizing the process's temporal nature among participants in a social system. Central to the theory is the concept of innovation, defined as an idea, practice, or object perceived as new by an individual or adoption unit. Furthermore, the communication channels range from social media and newspapers to personal interactions, acting as the pathways for transmitting knowledge from one entity to another (for example comments or sharing's). The social system, a network of interrelated units engaged, is manifested through the system's norms, the roles of opinion leaders and the decision-making processes regarding the adoption of innovations.

Lastly, time, as an essential element of the theory, covers the innovation-decision process duration, the relative speed of adoption compared to other innovations and the adoption rate within a society. In the context of social media, the perception of innovation often aligns with the emergence of new trends and content formats. This perception is subjective, residing in the consumers' recognition of a trend as fresh and engaging, which motivates their engagement and dissemination efforts (de Vries *et al.*, 2012; Kumar *et al.* 2016). Communication channels play a pivotal role in this diffusion process, especially on platforms like YouTube, Instagram and TikTok, which serve as dynamic, interactive mediums for information exchange. These platforms facilitate rapid communication through likes, comments and sharing, significantly accelerating the spread of trends (Blut *et al.* 2023). Furthermore, the social system influences the adoption and diffusion of trends. Consumer engagement and participation shape this social system and consumers further propagate trends through their own followers, potentially amplifying the virality of the original trend video (Wies *et al.* 2023).

Time also plays a crucial role in the diffusion of innovations, influencing the rate at which trends are adopted and the overall speed of their spread across the social media landscape. The innovation-decision process, which refers to the time it takes for an individual to embrace a trend, varies among consumers but is generally expedited on social media platforms due to their highly visual and engaging nature (Cascio Rizzo *et al.* 2023).

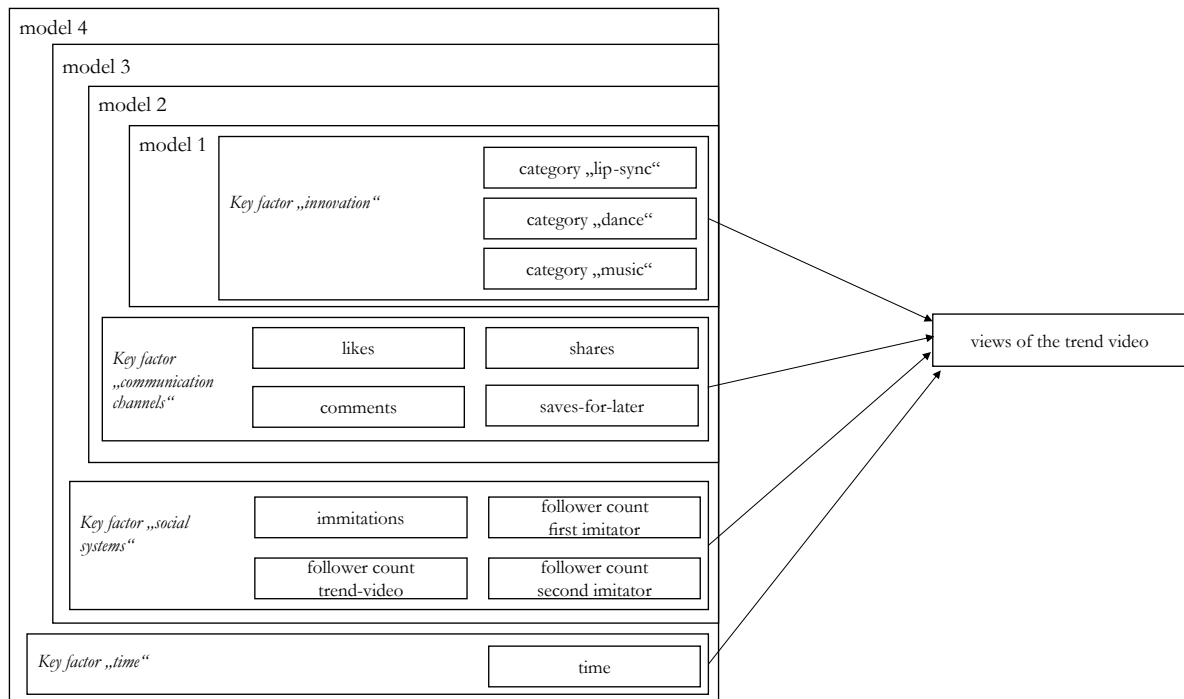


FIGURE 2 - Research model of Study 1

Based on these considerations, we developed the following research model in Figure 2, which will be tested in this study across four models using a regression method. Although the categories lip-sync, dance and music all include auditive elements within the key factor innovation in Model 1, they emphasize different aspects, with either a longer audio component, choreographed movements, or dialogue taking center stage. The four models examine the effects stepwise of the individual key factors (instrumentalized with market data from the social media platform TikTok). This methodical approach allows us to isolate the effects of individual components and understand their contributions in a controlled manner.

Method of Study 1

In the context of this explanatory approach, we focused on the social media platform TikTok, which offers a multitude of different functions for each individual video. Notably, TikTok enables the consumers to engage with videos not only through likes and comments, but also by actively participating, for example, by commenting in a shared split-screen mode or by imitating the original video. This means that any video can potentially become a trend video if a significant number of other consumers mimic, quote or interact with the original video in any form. This aspect of TikTok presents a research opportunity to gather a comprehensive quantitative dataset (Table 1) consisting of real market data from a social media platform.

For our study, we captured the data from 200 different trend videos that demonstrated at least a minimum level of virality, excluding any video that did not provoke at least one instance of imitation. Our data collection method focused on identifying trend videos by examining hashtags that were recognized as current daily trends by TikTok at the time of collection (fourth quarter of 2023). This approach allowed us to capture a snapshot of engaging content within the platform and to understand how certain videos capture widespread attention and engagement, particularly those created by companies like the #EyesLipsFace challenge by Elf Cosmetics, the #GuacDance Challenge by Chipotle, or the #PlayNew campaign by Nike, which have gained significant visibility on social media. Table 1 shows an overview of the variables.

TABLE 1 - Descriptions of variables of Study 1

Variable	Description (at the time of data collection)	Measurement	with regard to
<i>Dependent variable</i>			
Views of the trend video	Total number of views the original trend video received.	interval	Djafarova & Bowes (2021), Wies et al. (2023)
<i>Key factor innovation</i>			
Category lip-sync	Whether or not it was the respective category (1 = yes, 0 otherwise)	dummy	Tellis et al. (2019), Blut et al. (2023)
Category dance	Whether or not it was the respective category (1 = yes, 0 otherwise)	dummy	
Category music	Whether or not it was the respective category (1 = yes, 0 otherwise)	dummy	
Category other (serves as a base category)	Whether or not it was the respective category (1 = yes, 0 otherwise)	dummy	
<i>Key factor communication channels</i>			
Likes	Total number of likes the original trend video received.	interval	Liu et al. (2021), Djafarova & Bowes (2021), Wies et al. (2023)
Comments	Total number of comments the original trend video received.	interval	
Shares	Total number of shares of the original trend video received.	interval	
Saves-for-later	Total number of saves-for-later the original trend video received.	interval	
<i>Key factor social system</i>			
Imitations	Total number of imitations the original trend video received.	interval	Hughes et al. (2019), Swaminathan et al. (2020), Leung et al. (2022)
Follower count trend video	Total number of followers from the account that posted the original trend video.	interval	
Follower count first imitator	Total number of followers of the account whose imitation achieved the most views of all imitations.	interval	
Follower count second imitator	Total number of followers of the account whose imitation achieved the second most views of all imitations.	interval	
<i>Key factor time</i>			
Time	The days elapsed between the release date of the video and the date of data collection.	interval	Blut et al. (2023)

Results of Study 1

The empirical findings of our study are presented in Table 2. In our study, we incrementally added independent variables across the four different models. These are based on the respective key factors of the diffusion of innovations theory (Rogers, 1962). This method enables a systematic examination of the contribution of each independent variable to the explanatory power of the model. By introducing variables regarding the key factor step by step, we were able to monitor changes in the regression coefficients, determine the significance of each predictor and assess the overall fit of the model at every stage. This strategy helps in pinpointing the most impactful variables while adjusting for the influence of others, thus improving the comprehension of the relationships present in the data (Kutner *et al.*, 2005). Again, the VIF values for all independent variables in our models were below 5, thus suggesting a low risk of multicollinearity in our estimations (Daoud, 2017).

Model 1 incorporates variables specifically related to content, employing dummy variables that represent the first factor of the diffusion of innovations theory (Rogers, 1962), namely innovation. These variables distinguish among three primary types of trend videos: lip-sync, dance and music. The initial inclusion of the dummy variable category dance, which was significant only in the first model, presents an intriguing insight into the dynamics of our data set. The variable's significance in the initial model suggests that dance, as a category, had a distinct impact on the dependent variable when considered in isolation. However, its loss of significance in subsequent models, as other independent variables were introduced, indicates that the initial effect attributed to dance might be confounded or overshadowed by these additional factors.

Model 2 extends the analysis by incorporating additional independent variables, such as the number of likes, comments, shares and saves-for-later, thereby addressing the second factor of the diffusion of innovations theory (Rogers, 1962), namely communication channels. This finding demonstrates a significant influence only from shares and saves-for-later. This result is particularly intriguing as many companies design their videos to prompt the community to like or comment, typically aiming to manipulate the social media platform's algorithm to increase visibility to new potential viewers (Djafarova & Bowes, 2021). Nevertheless, our results suggest that each share leads to wider exposure. Furthermore, bookmarking videos for future viewing (or here saves-for-later) can also lead to a rise in views, as individuals may repeatedly watch a video if it holds particular relevance or interest to them.

Model 3 incorporates variables related to the social system factor of the diffusion of innovations theory (Rogers, 1962), including the total number of imitations a video had at the time of data collection and the follower count of the most successful imitation. This model builds on the results of Study 1 and demonstrates the effects of imitation, conditioned by the respective participation intentions, on the success of the trend videos, embedded in the context of the diffusion of innovations theory (Rogers, 1962). We closely examined accounts from influencers that were particularly successful in imitating the original content. In doing so, we documented the follower count of these accounts. The purpose of this approach was to investigate the potential cascading effect of viewers discovering imitation videos first, prompting them to seek out for the original trend video subsequently. Here, we observed consistently significant positive effects. Both the follower count of the two most successful imitations and the total number of imitations had a significant effect on the overall view count of the original videos.

Model 4 finally includes the variable time, considering that longer online presence might increase the likelihood of accumulating views, a common phenomenon in other media forms such as movies (Elberse & Eliashberg, 2003; Basuroy *et al.*, 2006). However, this premise does not seem to apply to trends in social media, as the effect was not significant in our model.

TABLE 2 - Regression results views of the trend video

Variable	Model 1	Model 2	Model 3	Model 4
Category lip-sync	-.01 (-669246)	-.04 (-1922825)	-.05 (-2223716)	-.05 (-2438369)
Category dance	.07** (3450145)	.02 (1203230)	-.01 (-35147)	-.01 (-86314)
Category music	.21 (16063706)	.09 (7188369)	.06 (4416109)	.06 (4556489)
Likes		.04 (.03)	-.01 (-.01)	-.01 (-.01)
Comments		-.03 (-.28)	-.02 (-.15)	-.02 (-.14)
Shares		.11* (19)	.10* (16)	.10* (17)
Saves-for-later		.66** (89)	.58** (77)	.58** (77)
Imitations			-.10* (-.03)	-.10* (-.03)
Follower count trend video			.26** (.29)	.26** (.29)
Follower count first imitator			.10* (.14)	.10* (.14)
Follower count second imitator			.19** (.28)	.19** (.28)
Time				.02 (1285)
cons.	10311498	-547205	-1100278	-1414369
N	200	200	200	200
Adjusted R-squared	.03	.53	.72	0.72
F	3.06	32.89	46.99	42.90

Note(s): beta (b-values in brackets) * $p < 0.05$; ** $p < 0.01$

Discussion of Study 1

To some extent, our findings diverge from prior research that has emphasized the importance of content characteristics in shaping consumer behavior and enhancing brand engagement on social media. Unlike the conclusions drawn by de Vries *et al.* (2012), who highlighted the relevance of vivid and interactive content and further studies by Kumar *et al.* (2016) and Tellis *et al.* (2019), which underscored the impact of persuasive, informational and emotionally charged content, our analysis indicates that the specific nature of trend content (e.g., lip-sync, dance, or music) does not significantly affect consumer engagement or viewership overall. However, our findings support existing research on social media engagement dynamics, particularly in emphasizing the greater relevance of shares and saves-for-later compared to likes and comments from the perspective of content creators. In line with earlier studies (Kumar *et al.*, 2016; Djafarova & Bowes, 2021), we confirm that active engagement (especially sharing) substantially increases a trend video's visibility and reach. Moreover, our results, particularly in Model 3, align with and extend the literature on innovation diffusion and influencer roles in driving virality. Consistent with the insights of Swaminathan *et al.* (2020), Wies *et al.* (2023) and Leung *et al.* (2022), our study underscores the role of influencers as key

amplifiers of social media trends. By engaging with trends, whether through direct imitation or creative adaptation, influencers not only endorse content but also significantly expand its reach within their networks. Interestingly, we find that a high number of imitations can have a negative effect: oversaturation may overwhelm users, obscure the original source, or reduce interest in the trend. Conversely, a well-followed influencer producing a successful imitation can effectively guide viewers to the original video. This suggests that the dynamics of imitation are complex and multidirectional, while a few strong influencer imitations can trigger viral cascades, excessive mimicry across the community may become counterproductive.

Hypotheses development of Study 2 und Study 3

Effects of emotion and attitude on consumer engagement

Based on the theoretical framing and research direction of study 2 and study 3, a set of hypotheses emerges that seeks to examine the psychological mechanisms underlying consumer engagement with social media trends. Building upon the relationship between emotional responses and consumer engagement on social media platforms as defined by Ki *et al.* (2020), we argue that positive emotional reactions to trending videos foster a willingness to participate and share such trends. However, not all emotional responses are positive. Kozyreva *et al.* (2023) emphasize that low-quality, misleading information often hijacks attention by evoking curiosity, outrage, or anger. Nonetheless, content that elicits strong positive emotions is more likely to be shared, remembered and acted upon by viewers (Berger & Milkman, 2012, Moore & McFerran, 2017). This principle is especially relevant in the context of TikTok, a platform characterized by its dynamic content, where trends often gain momentum through the emotional connections they establish (Tellis *et al.*, 2019). When consumers experience positive emotions such as joy or amusement upon viewing a trend video, these emotions can enhance their inclination to contribute to the trend. Positive emotions are rewarding and can motivate individuals to take action, such as becoming part of a trending movement by creating and sharing related content. Furthermore, positive emotional reactions align with the concept of emotional contagion, where emotions expressed in a video can induce similar feelings in viewers, thereby influencing their behavior (Cao *et al.* 2021). In the digital ecosystem of TikTok, where trends are propagated through visual and auditory stimuli, the capacity of a video to evoke positive emotions plays a crucial role in its virality and the subsequent viewer engagement. Therefore, we hypothesize:

H1: *A more positive emotional reaction to a trend video increases the intention to engage with it.*

Beyond reflective evaluation, consumers' immediate emotional responses to content, particularly the experience of pleasure, play a crucial role in driving engagement. Pleasure, as a core dimension of affective experience, reflects the degree of emotional enjoyment or felt positivity during content consumption (Ki *et al.* 2020). Unlike hedonic evaluation, which is cognitive and reflective, pleasure is affective and moment-based (Berger & Milkman 2012). Due to this distinction, we further propose that a consumer's alignment with a video's content, whether on a thematic or ideological level, plays a crucial role in the transition from passive viewership to active participation and sharing. This premise is based on the idea that when consumers encounter a trending video that aligns with their personal values, interests, or preferences, this alignment fosters a positive attitude towards the video, significantly influencing their likelihood of engaging with the trend through content creation or other forms of active involvement, like sharing and commenting (Cao *et al.* 2021). Content that is congruent with an individual's personal ethos is more likely to elicit a favorable response (Tellis *et al.* 2019). The formation of a positive attitude towards a trend video can thus be seen as an intermediary that bridges the gap between the viewer's self-concept and their decision to take participatory action. This implies that trends which reflect an individual's self-image or aspirational identity are more likely to encourage active participation, underscoring the significance of personal relevance in the engagement process (Kumar *et al.* 2016). By emphasizing the critical role of thematic resonance and self-

concept clarity in consumer engagement, we argue that for a trend to inspire widespread participation among viewers, it must not only captivate through its popularity, but also resonate with viewers' attitudinal predispositions towards its content. Moreover, Cao *et al.* (2021) state that engagement on social media, notably platforms like TikTok is largely motivated by consumers' quest for enjoyment and entertainment. Furthermore, the acknowledgment of pleasure as a primary emotional reaction (Mehrabian & Russell, 1974; Graciya & Viswam, 2021) serves as a pivotal indicator of the hedonic worth consumers find in their content interactions. Hence, we propose:

H2: *A more positive hedonic attitude to a trend video increases the intention to engage with it.*

The moderating role of pursuit benefits

The uses and gratifications theory (Katz *et al.*, 1974) emphasizes three dimensions of benefits that generally moderate consumer behavior: a pursuit of hedonic content as well as utilitarian benefits (both egoistic motives) and social exchange (an altruistic motive), each serving as a foundation for identifying relevant moderating variables. The hedonic dimension focuses on the pleasure consumers derive from engaging with media. In social media trends, this dimension explains why individuals participate in trends that entertain them or provide an escape from their daily routine (Swaminathan *et al.*, 2020). Variables related to the hedonic dimension, such as entertainment seeking, might moderate the relationship between observing a trend and deciding to participate, as consumers engage with content satisfying their hedonic needs (Berger & Milkman 2012). Entertainment seeking encompasses the desire to entertain, amuse and experience positive emotions through media (Berger & Milkman, 2012). This drive is a fundamental aspect of human behavior, particularly in the context of digital media, where consumers often engage with content primarily for its entertainment value (Noguti & Waller, 2020). Integrating entertainment seeking as a moderator acknowledges that the allure of emotions and attitude formation on trend videos is not solely based on social validation or community belonging but also on the videos' ability to satisfy consumers' entertainment needs. Consequently, the motivation to participate in a trend may be significantly influenced by the perceived entertainment value. This suggests that consumers who highly value entertainment are more likely to be drawn to trends that trigger positive emotion. Therefore, we assume:

H3: *Entertainment seeking positively moderates the relationship between a) emotions as well as b) hedonic attitude and the intention to engage with the trend.*

The utilitarian dimension of the uses and gratifications theory (Katz *et al.*, 1974) encompasses the practical and functional benefits consumers gain from engaging with social media. This dimension helps moderating variables that influence the usefulness of participating in a trend, such as shaping personal identity (Cao *et al.*, 2021). This perspective suggests that individuals use social media as a platform to curate and project their desired self-images to the external world. From this point of view, participation in trends is not merely about joining a collective movement but is driven by personal, egoistic motives such as crafting a unique identity, generating likes, gaining visibility and acquiring more followers (Wolny & Mueller, 2013). This inclination to use social media for identity formation and self-promotion suggests that consumers with a stronger desire to shape their personal identity through external validation are more likely to engage in trends that they perceive as aligning with or enhancing their self-concept (Cao *et al.*, 2021). Therefore, we argue:

H4: *Shaping personal identity positively moderates the relationship between a) emotions as well as b) hedonic attitude and the intention to engage with the trend.*

The third moderating variable in our model is the motivation for social interaction, which represents a community-oriented motive for engaging with social media trends. This variable emphasizes the desire to connect, exchange and network with others within the community. Consumers motivated by social

interaction view participation in trends not as a means of self-promotion but as an opportunity to foster connections, contribute to communal narratives and engage in meaningful exchanges (Onofrei *et al.*, 2022; Pradhan *et al.*, 2023). This stands in contrast to the self-focused motives, suggesting that consumers with a higher predisposition towards seeking social interaction are more likely to participate in trends for the purpose of enhancing community bonds and engaging in collective experiences. Based on this discussion, we propose the following research model (Figure 3) and hypothesize the following:

H5: *Intention for social interaction positively moderates the relationship between a) emotions as well as b) hedonic attitude and the intention to engage with the trend.*

Effects of authenticity and fit on consumer engagement

One possible audience reaction might be the perception that influencers are merely imitating trends to capitalize on visibility, engagement, or virality, without genuine interest or connection to the content (Tellis *et al.*, 2019). This perceived instrumentalization can lead to psychological resistance (Brehm, 1966). Reactance in this context arises from a perceived lack of authenticity behind the influencer's behavior. When audiences suspect that an influencer simply wants to gain attention, they may disengage or actively reject the content (Kay *et al.*, 2020). By contrast, if the influencer's imitation is perceived as authentic, this perception can counteract reactance. Therefore, authenticity may foster trust and reduce the impression of strategic manipulation (Hudders & Lou, 2023). As a result, users may be more open to the content and more inclined to engage with it. One central behavioral outcome of reduced resistance and increased positive evaluation is sharing intention (Pradhan *et al.*, 2023). Therefore, we assume:

H6: *A more positive perceived authenticity to a trend video increases the intention to engage with it.*

In addition to perceived authenticity, the degree of fit between an influencer and the trend they imitate can significantly shape audience reactions. Fit refers to the extent to which the content aligns with the influencer's established persona, values, or typical communication style (Hudders & Lou, 2023). When a trend appears to suit the influencer (either thematically, aesthetically, or emotionally) audiences are more likely to perceive the imitation as appropriate, genuine and purposeful (Pradhan *et al.*, 2023).

By contrast, a low fit may be interpreted as opportunistic or out of character, triggering skepticism or even rejection. Such misalignment might lead to resistance, as audiences may perceive the imitation as a strategic attempt to gain visibility rather than as a meaningful engagement with the trend and audience itself. A high fit, on the other hand, can help mitigate such resistance by reinforcing message consistency and perceived relevance. This in turn increases the likelihood that users respond positively, especially through social sharing, which implies a level of endorsement and alignment. Hence, we assume:

H7: *The higher the perceived fit between the influencer and the imitated trend, the greater the consumer's intention to engage with the video.*

We used established scales from the literature to measure these variables for our studies as can be seen in Table 3 and used semantic differential with a 7-point scale and 7-point likert scales. To avoid potential bias due to order effects, we randomized the scales and items in the online questionnaire. Participants' responses were averaged and the aggregated measures were used as variables in upcoming the data analysis. The items for pleasure and hedonic attitude were identical to those used in study 2 and study 3 to ensure consistency and comparability across studies.

TABLE 3 - Variables and items addressed in Study 2 and 3

Variable	Items	Cronbachs α
<i>Emotion Pleasure</i> adapted by Mehrabian and Russell (1974)	<i>How do you feel after watching the video?</i> unhappy / happy unsatisfied / satisfied bored / relaxed melancholic / contented annoyed / pleased	Study 2 ($\alpha=.92$) Study 3 ($\alpha=.85$)
<i>Hedonic Attitude</i> adapted by Voss et al. (2003)	<i>What was your attitude towards the video you just watched? It was ...</i> not fun / fun dull / exciting not delightful / delightful not thrilling / thrilling	Study 2 ($\alpha=.89$) Study 3 ($\alpha=.94$)
<i>Entertainment Seeking</i> adapted by Ganesh et al. (2010)	<i>To what extent do you agree with the following statements?</i> I enjoy interacting with social media content that captures my interest. I like discovering engaging social media posts while browsing. I enjoy exploring social media platforms for interesting content.	Study 2 ($\alpha=.87$)
<i>Shaping Personal Identity</i> adapted by Bearden & Randall (1990)	<i>To what extent do you agree with the following statements?</i> I'm concerned about my style of doing things. I'm concerned about the way I present myself. I'm concerned about what other people think of me. I'm usually aware of my appearance.	Study 2 ($\alpha=.80$)
<i>Intention for Social Interactions</i> adapted by Adjei et al. (2010)	<i>The relationships that I have through Social Media are...</i> ...something I am very committed to. ... very important to me. ... very much like being family. ... something I really care about.	Study 2 ($\alpha=.88$)
<i>Authenticity</i> adapted by Moulard et al. (2015)	<i>To what extent do you agree with the following statements?</i> The influencer appears genuine and not staged. The influencer comes across as credible and not forced. The influencer presents themselves as authentic and honest.	Study 3 ($\alpha=.73$)
<i>Fit</i> adapted by Roehm & Roehm (2011)	<i>How well does the content of the trend video fit the influencer's personal style?</i> poor fit / good fit inconsistent / consistent not well aligned / well aligned	Study 3 ($\alpha=.88$)
<i>Participation Intention</i> adapted by Folse et al. (2010)	<i>To what extent do you agree with the following statements?</i> I would be willing to create my own video in this style to participate in this online trend. I would consider taking active steps to support the dissemination of this online trend. It is likely that I will participate in this online trend in some form. I think it is a good idea to join in this online trend	Study 2 ($\alpha=.97$)
<i>Sharing Intention</i> adapted by Folse et al. (2010)	<i>To what extent do you agree with the following statements?</i> I would be willing to share this video via my own social media channel. I would consider taking active steps to share this video. It is likely that I will share this video in some form. I think it is a good idea to share this video.	Study 3 ($\alpha=.90$)

FIGURE 3 - Research model of Study 2

Study 2

Based on the social proof theory (Cialdini, 1984), participating in trending challenges or imitating popular content provides consumers with a sense of validation that their contributions will be accepted, as they participate in behaviors already validated by others. Moreover, platforms like TikTok, Instagram and Twitter prominently showcase trending content, thus amplifying these trends' visibility and impact (Li *et al.*, 2021). As more people participate, the social proof strengthens, fostering more engagement and perpetuating the trend's cycle. This can lead to a snowball effect, where the trend's popularity escalates as it gains more participants, reinforcing the notion that joining the trend is the appropriate or desirable action (Cialdini, 1984; Zhou, 2011). As previously outlined in H1 and H2, we examine the psychological mechanisms that contribute to influencer participation as a form of engagement. Specifically, we investigate how emotional reactions and the formation of individual attitudes impact the intention to participate. This relationship might be moderated by perceived personal benefits, as elaborated in Hypotheses 3 to 5. We deliberately excluded the variables authenticity and fit from the model in study 2 (figure 3), as the focus lies on the idea of the trend itself rather than the content creator (a company or influencer) who posted the original trend video. Whether the content creator appears authentic or whether the video fits their typical style is considered negligible for this specific purpose.

Method of Study 2

For the empirical investigation, we designed a questionnaire to explore the dynamics of consumer participation intention with trending videos on social media. The questionnaire was structured around a carefully curated selection of 40 trending videos on the social media platform TikTok, ensuring a diverse representation of content types with a similar variance in likes, comments, shares, saves for later, views and number of imitations. To conduct the experiment, one of the 40 videos was randomly assigned to be viewed by a pool of 196 participants (65% female, 2% non-binary, with a mean age of 25 years and a standard deviation of 8 years). Upon viewing the assigned video, participants were asked to report their emotional reactions, their attitude towards the content and their intentions to participate in the trend. Furthermore, we sought to understand whether participants were inclined to create and upload a mimicry or imitation of the original trend video, featuring themselves, to their own social media channels. This measure of participation intention served as our dependent variable, aiming to capture the likelihood of active engagement with the trend beyond mere viewership. Before respondents saw the trend video, we also assessed the three moderating variables of interest: entertainment seeking, shaping personal identity and intention for social interaction. The specific items for each variable are, as previously noted, listed in table 1 and assigned to the corresponding study. Finally, we collected socio-demographic variables.

Results of Study 2

We strategically focused on the emotion of pleasure and the hedonic dimension of attitude. This targeted approach is underpinned by the recognition that social media engagement, particularly on platforms like TikTok, is predominantly driven by consumers' pursuit of enjoyment and entertainment (Cao *et al.*, 2021). Using pleasure as a core emotional response (Mehrabian & Russell, 1974, Graciyal & Viswam, 2021), it serves as a fundamental indicator of the hedonic value that consumers derive from their interactions with content. Similarly, by focusing on the hedonic dimension of attitudes (Voss *et al.*, 2003), we aim to capture the intrinsic pleasure and satisfaction that consumers seek in the content they view. Given the anticipated interaction effects between both emotion pleasure and hedonic attitude with each moderator, we mean-centered all variables to reduce multicollinearity and enhance the interpretability of interaction effects in our regression models (Kutner *et al.*, 2005), ensuring our analysis accurately reflects moderated relationships and remains free from multicollinearity concerns (VIF values were below 5). The empirical findings of our study are presented in Table 4.

TABLE 4 - Regression results of participation intention

Variable (all mean centered)	Model 1	Model 2	Model 3	Model 4	Model 5
emotion pleasure	.36** (.29)	.37** (.30)	.39** (.32)	.39** (.31)	.37** (.30)
hedonic attitude	.14 (.10)	.14 (.10)	.11 (.08)	.11 (.08)	.14 (.10)
entertainment seeking		-.03 (-.02)	-.01 (-.01)	-.01 (-.01)	-.01 (-.01)
shaping personal identity		.02 (.02)	.03 (.02)	.03 (.02)	.01 (.01)
intention for social interaction		-.02 (-.01)	-.01 (-.01)	-.01 (-.01)	-.01 (-.01)
emotion pleasure x entertainment seeking			.20* (.11)		
hedonic attitude x entertainment seeking			-.07 (-.04)		
emotion pleasure x shaping personal identity				.20* (.12)	
hedonic attitude x shaping personal identity				-.15 (-.08)	
emotion pleasure x intention for social interaction					.11 (.05)
hedonic attitude x intention for social interaction					.02 (.01)
<i>cons.</i>	1.477	1.47	1.45	1.47	1.45
<i>N</i>	196	196	196	196	196
adjusted R-squared	.21	.20	.22	.21	.21
<i>F</i>	27.08	10.71	8.66	8.46	8.18

Note(s): Beta (b-values in brackets), * $p < 0.05$; ** $p < 0.01$

Model 1 address the main effects, specifically the impact of the emotion pleasure and hedonic attitude formation on the trend participation. The results from this model revealed that only emotions have a significant effect on the intention to participate, thereby confirming H1. Conversely, H2 (which related to the impact of the hedonic attitude on the participation intention) could not be supported by our findings. This outcome suggests that while emotional responses to content significantly influence a consumer's willingness to engage in social media trends, attitudes towards the content do not have a statistically significant effect on their participation intention within the context of this model.

Model 2 expand our analysis by including the three moderating variables entertainment seeking, shaping personal identity and intention for social interaction, as main effects alongside the previously examined factors of emotions and attitudes. The findings from this model reinforced the significance of emotions in influencing participation intention, underscoring the robustness of this impact. However, all three moderating variables did not show significant effects as main effects. This outcome is not particularly surprising given that we had explicitly posited these variables as moderators rather than direct influencers, in essence, we had not formulated hypotheses predicting direct effects from these moderators on participation intention; instead, their role was hypothesized to modify the relationship between our primary

variables (emotions and attitudes) and participation intention. By analyzing these moderators separately in the subsequent models (models 3, 4 and 5), each focusing on one moderating variable at a time, we aimed to isolate and understand the specific conditions under which emotions and attitudes might more strongly or weakly predict participation intention.

Model 3 observed a significant interaction effect between emotion pleasure and entertainment seeking on participation intention. This finding confirms H3a and rejects H3b, indicating that the moderating effect of entertainment seeking is specifically evident in relation to emotions, rather than attitudes. The significance of this interaction effect suggests that individuals with a high propensity for seeking entertainment are more influenced by their emotional responses when deciding to participate in a trend.

Model 4 reveals a significant interaction between emotions and shaping personal identity, influencing participation in social media trends. We confirm H4a and reject H4b, indicating that individuals with a strong online presence are more likely to engage in trends when experiencing positive emotions.

Model 5 shows that only the emotion of pleasure remains a significant predictor, leading to the rejection of H5a and H5b. The lack of a significant interaction with the intention for social interaction indicates that, within the confines of this study, the motivation to engage in social media trends is not significantly influenced by an individual's desire for social interaction.

Discussion of Study 2

Consistent with the work of Ki *et al.* (2020), Berger & Milkman (2012), Tellis *et al.* (2019) and Cao *et al.* (2021), our study confirms that positive emotional reactions to trend videos play a pivotal role in driving participation behavior. These findings are in line with prior research by Berger & Milkman (2012) and Noguti & Waller (2020), which highlight the power of emotionally evocative content in stimulating engagement. However, contrary to the assumptions of Cao *et al.* (2021), Tellis *et al.* (2019) and Kumar *et al.* (2016), our findings reveal that attitudes do not significantly impact the intention to participate in trends. Interestingly, the absence of a significant moderating effect of entertainment-seeking tendencies on the relationship between attitudes and participation intention suggests that cognitive evaluations or beliefs about the content are not reinforced by a user's desire for entertainment.

This distinction is particularly relevant for content creators and marketers: it implies that strategies aiming to provoke strong positive emotional responses may be more effective among individuals with high entertainment-seeking tendencies than strategies based purely on message alignment or rational appeal. This interpretation aligns with previous insights from Wolny & Mueller (2013) and Cao *et al.* (2021). For influencers who strategically shape their personal identity, in line with Li *et al.* (2021), positive emotional responses to trend content enhance their willingness to engage, particularly when the trend aligns with their own brand narrative (Hughes *et al.* 2019).

This finding is highly relevant for brands collaborating with influencers, underscoring the importance of crafting emotionally resonant campaigns that simultaneously reinforce the influencer's identity and public image. Finally, our findings challenge the community-oriented motivations highlighted by Onofrei *et al.* (2022) as well as Pradhan *et al.* (2023), who describe social interaction and communal contribution as key drivers of trend participation. In contrast, we find that participation is primarily driven by egocentric motives (such as self-promotion and personal gratification) rather than a desire to connect with or contribute to a broader community. This suggests that engagement with trends on social media is more about individual identity expression and emotional resonance than about fostering social bonds.

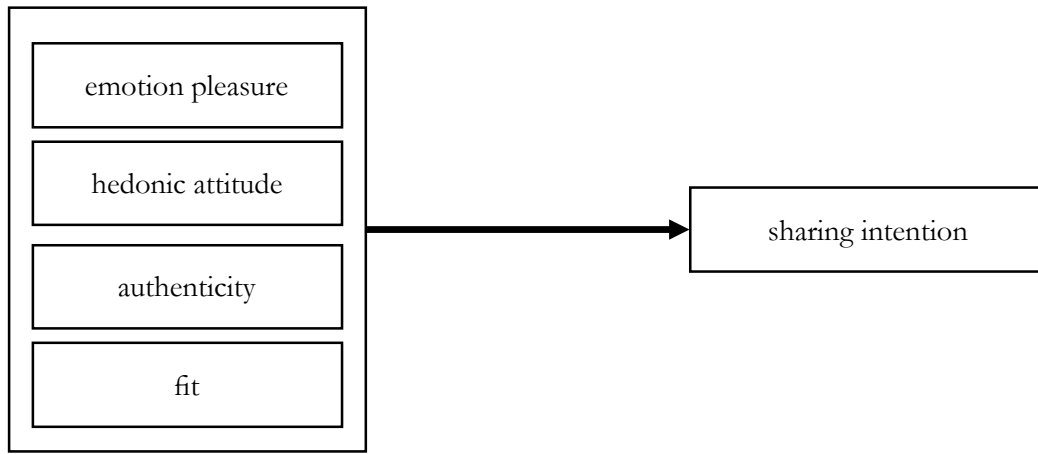


FIGURE 4 - Research model of Study 3

Study 3

In study 3, we shift our focus to how imitations of trend videos, particularly those reproduced by other influencers, are perceived by viewers. Especially, we focus on sharing as another criterion for virality, as sharing enables trend content to spread beyond the original network (Wies *et al.*, 2023). Building on the Theory of Psychological Reactance (Brehm, 1966), we assume that affective states, particularly those associated with pleasure and hedonic motivation, can lower internal resistance by weakening critical or defensive cognitive processes, in emotionally charged environments such as social media, positive affect may foster a receptive mindset and a sense of spontaneity, thereby encouraging engagement behaviors such as content sharing (Kay *et al.*, 2020). As outlined in H1 and H2, we propose that sharing intentions are often emotionally driven and shaped by hedonic orientations.

Extending this perspective and consistent with the framework of Psychological Reactance Theory, we incorporate the dimensions of content authenticity and content fit into the model for study 3 (see H6 and H7). These factors may influence whether imitations of trend videos are perceived as authentic and appropriate, which in turn affects the likelihood of sharing, in contrast to study 2, which focused on participation intentions and included the moderating role of perceived personal benefits (e.g., self-promotion or identity signaling), we argue that sharing is primarily motivated by the desire to emotionally connect with others, especially close social contacts such as friends or family members (Cao *et al.*, 2021). Accordingly, we exclude perceived personal benefits from the model in study 3. To sum up, these theoretical considerations form the conceptual foundation for study 3, as visualized in Figure 4.

Method of Study 3

To examine the influence of trend characteristics on audience perception under controlled conditions, we conducted an online experiment. A female actor was recorded performing several popular social media trends, including lip-sync videos, filter-based clips and dance routines, in all recordings, she wore the same outfit and maintained the same hairstyle in the same room setting. This strict standardization intended to minimize potential distractions or confounding influences stemming from background variation or presentation style, in contrast to study 2, which involved a broad range of different trend videos, this study aimed to isolate the effect of the trend imitation itself, independent of interpersonal cues such as attractiveness or perceived popularity of the performer. This approach allowed us to reduce person-related biases and focus on the variation in audience reactions to the content and the perceived fit of the trend. The final sample comprised 214 participants (49% female, <1% non-binary), with an average age of 25.5 years ($SD = 9.5$). Each participant was randomly assigned to view one of the pre-recorded trend imitation videos. Following the video, participants completed a structured online questionnaire.

TABLE 5 - Regression results of sharing intention

Variable	Model 1	Model 2
emotion pleasure	.52** (.47)	.46** (.42)
hedonic attitude	-.02 (-.03)	<.00 (-.01)
authenticity		.19** (.17)
fit		.02 (.02)
cons.	0.68	.12
N	214	214
adjusted R-squared	.25	.28
F	36.04	21.25

Note(s): Beta (b-values in brackets), * $p < 0.05$, ** $p < 0.01$

Results of Study 3

We conducted a regression analysis to isolate the main effects. The analysis was divided into two models. Model 1 focused on the effects of the emotion pleasure and hedonic attitude formation, aiming to replicate the main effects observed in study 2, in Model 2, the effects of perceived authenticity and fit on sharing intention (as a key dimension of engagement) were tested, as hypothesized in H6 and H7. The empirical findings are presented in Table 5. All variables were tested for multicollinearity without any issues; VIF values were all below 5.

Model 1 addresses the main effects, specifically the impact of the emotion pleasure and hedonic attitude formation on sharing intention. As in study 2, we found a highly significant effect of pleasure, but not of attitude formation. Thus, H1 can be confirmed, while H2 has to be rejected again. Given that pleasure and hedonic attitude are conceptually distinct and show no indication of multicollinearity, the results further support the notion of an emotionally driven mechanism by the consumers in this context. Sharing behavior on social media seems to be often spontaneous and affectively guided, rather than based on deliberate evaluations.

Model 2 becomes particularly insightful through the inclusion of perceived authenticity and fit. The analysis reveals a significant effect for authenticity, allowing us to confirm H6. However, the effect of fit was not significant, leading to the rejection of H7. Importantly, the previously observed effect of pleasure remains robust in this extended model. This suggests that authenticity and fit contribute additional explanatory variance beyond emotional responses. While authenticity adds a meaningful dimension to how users perceive and engage with imitated trends, fit does not appear to play a significant role in shaping sharing intentions within this experimental setting.

Discussion of Study 3

These findings are important for several reasons. First, they reinforce the idea that sharing intention is a spontaneous and emotionally driven behavior, aligning with previous work that emphasizes the affective nature of social media engagement (Kay et al., 2020). More interestingly, is the role of perceived authenticity, which proves to be an important factor in this context. Contrary to what might be expected, it is not the

degree of fit between the influencer and the trend that determines sharing intention be the consumers, but rather how authentically the trend is interpreted and presented. These findings are in line with previous studies highlighting authenticity as a key driver of credibility and engagement in influencer marketing (Hudders & Lou, 2023). This has important practical implications: for instance, an influencer who adapts a dance trend (but is clearly not a skilled dancer, nor known for dance content within their community) can still leverage the trend to attract attention, as long as the performance feels authentic. This might be achieved by intentionally framing the performance as humorous, ironic, or self-deprecating, if the audience perceives the behavior as genuine and consistent with the influencer's persona, a lack of fit does not appear to be problematic. This insight is particularly relevant for brand collaborations, where influencers often act as faces of campaigns. It suggests that a low thematic fit between influencer and trend or product does not necessarily harm engagement if the influencer maintains a credible and authentic presence.

Conclusions

Across three complementary studies, we examined the potential factors that influence the engagement and perception of social media trends. The findings contribute to a more nuanced understanding of trend virality by integrating perspectives from innovation diffusion, social proof and psychological reactance theory. First, our results demonstrate that the specific format or category of a trend (e.g., lip-sync, dance, filter-based content) plays a surprisingly limited role in driving audience engagement. These finding challenges earlier research that emphasized the importance of content vividness, interactivity, or informational richness (e.g., de Vries *et al.*, 2012; Kumar *et al.*, 2016; Tellis *et al.*, 2019). Instead, our data suggest that social media trend's function more as abstract, adaptable formats that gain momentum through user reinterpretation rather than through their intrinsic content features.

Second, we find consistent evidence for the central role of emotional responses (particularly the emotion pleasure) in predicting engagement behavior, especially participation and sharing intention. This aligns with research on emotionally evocative content (Berger & Milkman, 2012) and confirms that users are more likely to engage with trend videos when they experience immediate, positive affect, suggesting that affective reactions outweigh cognitive judgments.

Third, our findings shed light on the role of influencers in amplifying trends. While influencer involvement generally increases visibility and reach, its effectiveness depends heavily on how audiences perceive the influencer's engagement. Perceived authenticity emerged as a decisive factor across contexts. Whether an influencer is an expert in the trend domain or not, their imitation is more likely to be shared and positively evaluated if it feels genuine and consistent with their public persona. This insight challenges the assumption that fit between influencer and content is critical. In our study, fit did not significantly affect sharing intention, whereas authenticity did, highlighting the primacy of credible self-expression over thematic congruence. This distinction is particularly relevant in strategic communication and influencer marketing. An influencer may adopt a trend that falls outside their typical domain (as long as the presentation remains authentic) the perceived mismatch does not necessarily harm engagement. This opens new avenues for brands and influencers to experiment with broader creative content, provided that the tone, motivation and self-presentation align with audience expectations of authenticity.

Finally, our findings offer a fresh perspective on the motivations behind user participation in trends. Contrary to research approaches that emphasize community-oriented or altruistic drivers (Onofrei *et al.*, 2022; Pradhan *et al.*, 2023), we find that participation is largely shaped by individual-level factors, including emotional gratification and self-expression. This highlights the need to reconceptualize social media trend engagement not as a purely collective phenomenon, but as a personalized, emotionally driven act of identity performance.

Practical implications

Considering our findings, companies should reassess their strategies for initiating social media trends. The effectiveness of a trend is not only about conveying a clear message or presenting a product in a traditional manner (Liu *et al.*, 2021; Onofrei *et al.*, 2022; Liadeli *et al.*, 2023). Our research highlights the critical roles of emotional engagement and entertainment value in promoting viral content, especially on platforms like TikTok that thrive on emotional triggers (Berger & Milkman, 2012). For brands, creating content that is fun and elicits strong emotional responses is key to virality (Tellis *et al.*, 2019). This could include catchy slogans, unique dance challenges, or innovative product showcases that encourage participation and sharing (Wies *et al.*, 2023). Brands should aim to craft content that resonates emotionally, enhancing the likelihood of broad engagement (Hughes *et al.*, 2019, Ki *et al.*, 2020). We recommend that brands develop content that is both communicative and enjoyable, facilitating trendsetting and virality. This approach encourages consumers to actively engage with and propagate the trend, creating memorable, shared experiences. Additionally, our study suggests using influencers in a novel collaboration framework to participate in trends without direct product references, leveraging their influence to boost virality and ultimately lead consumers back to the brand (Leung *et al.*, 2022). Furthermore, social media platforms should enhance functionalities to promote consumer engagement and content discoverability, optimizing algorithms to connect consumers more efficiently with trending content and its adaptations (Liu *et al.*, 2021; Onofrei *et al.*, 2022). Simplifying content imitation and encouraging broad participation can enrich the platform's trend ecosystem, fostering a dynamic and engaging environment for all consumers.

Limitation and future research

Our study synthesizes insights specifically related to the engagement and perception of trend videos on social media, highlighting the distinct roles of influencers and ego-centric motivations compared to general social media posting (Liadeli *et al.*, 2023; Wies *et al.*, 2023). While it illuminates the mechanisms behind trend virality and individual motivations, it does not cover broader motivations for general social media use, unlike the research by Blut *et al.* (2023) and Leung *et al.* (2022). Our findings, primarily focused on the cascade effect of influencers and personal gratification in trend participation, provide valuable insights for those aiming to leverage or understand trend dynamics (Djafarova & Bowes, 2022). However, they do not encompass motivations for non-trend-related social media engagement, which are influenced by diverse psychological, social and cultural factors, as explored by Onofrei *et al.* (2022) and Pradhan *et al.* (2023). Future research could expand on our findings to include these broader motivations, enhancing our understanding of overall social media behavior.

Our study, predominantly based on TikTok, may not fully represent the dynamics on other platforms like Instagram, Twitter, or Facebook, each with unique engagement patterns (Cao *et al.*, 2021), it would be of interest to compare the dynamics of trends on different social media platforms in order to ascertain the differences in engagement patterns and mechanisms across these platforms. This could also provide insights into the effectiveness of trending strategies on different platforms and assist companies in optimizing their social media strategies. Our study also focuses solely on video content, not addressing how consumers engage with text, images, or stories, which could elicit different consumer responses (Cascio Rizzo *et al.*, 2023). Additionally, it would be valuable to investigate the long-term effects that participation in trends can have on individual consumer behavior and attitudes. This could include an investigation of the long-term effects of participation in trends on consumers' self-concept, social relationships and brand preferences.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

AI across ages: how emotional intelligence and anthropomorphism shape consumer interactions with ChatGPT

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Abstract. This study investigates generational differences in the perception of ChatGPT's emotional intelligence, focusing on its audio feature. Analyzing responses from 15 participants aged 16 to 69, the study explores whether age influences perceptions of AI. The results show that older adults tend to perceive ChatGPT as more human-like and emotionally intelligent, while younger consumers recognize its empathatic capabilities as simulated. Furthermore, the study reveals that the uncanny valley effect is perceived differently across age groups, with older participants more likely to experience discomfort. In addition, the findings highlight how anthropomorphism and social presence influence consumers' perceptions, with older adults more prone to anthropomorphize the AI. The findings demonstrate the necessity of balancing emotional intelligence in AI with ethical considerations to optimize the consumer experience.

Keywords : conversational AI; emotional intelligence; anthropomorphism; social presence; uncanny valley

Introduction

The rising importance of digital voice assistants (DVAs) and the rapid advancement of artificial intelligence (AI) have a significant impact on daily life. A prominent example is ChatGPT, a large language model developed by OpenAI, designed to generate human-like text based on deep learning algorithms, which gained substantial traction since its launch in November 2022. By February 2024, ChatGPT had amassed over 1.67 billion visits (Similarweb, 2024), underscoring its growing influence. While ChatGPT is primarily used for handling cognitive and utilitarian tasks, the question remains about its emotional capabilities like the AI's emotional intelligence. Emotional intelligence, defined as the ability to recognize, understand and regulate emotions, is essential in human interactions (Lane & Schwartz, 1987; Salovey & Mayer, 1990). At the same time, the anthropomorphic qualities of DVAs, such as a human-like voice and behaviour, can boost consumer acceptance and trust, encouraging consumers to share personal information (Wagner & Schramm-Klein, 2019).

This need for enhanced consumer engagement is further highlighted by a recent development in ChatGPT's capabilities: in September 2023, OpenAI introduced an audio feature, enabling spoken conversations with

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ChatGPT (OpenAI, 2023). This enhancement makes interactions with AI more natural and accessible (Tadeusiewicz, 2010), raising the question as to whether consumers perceive ChatGPT's emotional responses as authentic or empathic. The relevance of this study is underscored by the increasing presence of DVAs in everyday life, as they facilitate more emotionally resonant interactions with consumers (Hernández Ortega & Lucia-Palacios, 2023; Mo *et al.*, 2024). This shift is further reflected in the rising demand for AI applications explicitly designed for social connection. For instance, Replika functions as a virtual AI companion, providing emotional support and companionship, while HereAfter AI and Project December enable consumers to interact with AI-driven simulations of loved ones, preserving voices and memories. These applications illustrate how AI is increasingly integrated into interpersonal relationships, emphasizing its role in sustaining emotional bonds over time.

Given this trend, the ability of systems like ChatGPT to respond to emotional cues becomes increasingly critical. As consumers spend more time engaging with AI in contexts that require empathy and support, the ability of systems like ChatGPT to respond to emotional cues can significantly impact consumer satisfaction and acceptance. Hence, as AI becomes more prevalent in everyday life and tasks for a growing number of consumers, it's crucial to understand whether generational differences exist in how various age groups interpret and engage with the emotional aspects of AI and if so, what these differences entail. A lack of emotional intelligence in AI could lead to negative consumer experiences, particularly given the diverse expectations and needs among different age groups when it comes to new technologies (Mitzner *et al.*, 2019). For instance, research shows that older adults often face challenges with new technologies, finding them complex and unintuitive (Vaportzis *et al.*, 2017). However, as the elderly face increasing social isolation, AI systems that offer not only functional support but also the potential for interpersonal interaction could be particularly beneficial (Yang *et al.*, 2025).

This highlights the need to investigate whether and how different age groups engage with AI that offers emotional intelligence, which could potentially serve as an important tool in mitigating loneliness. Moreover, the research gap concerning the existence and nature of age-related differences in interpreting and responding to emotional intelligence in AI is notable because these interpretations may have significant technological and theoretical implications. From a technological standpoint, understanding whether older adults perceive emotional intelligence in AI differently from younger consumers can inform the design of adaptive AI systems that dynamically adjust to varying levels of digital literacy and social expectations. This ensures the development of AI solutions that are not only more intuitive and accessible but also capable of fostering meaningful interactions across diverse consumer groups. Additionally, insights into potential age-related differences can drive innovation in natural language processing (NLP) and affective computing, enabling AI to tailor emotional responses based on consumer demographics and communication styles.

From a theoretical perspective, these insights contribute to discussions on anthropomorphism and social presence theory, which explore how individuals attribute human-like characteristics to AI. Traditional models of human-computer interaction assume that anthropomorphism in AI fosters engagement, but this research challenges whether these assumptions hold true across all age groups. For instance, younger consumers, accustomed to interacting with digital agents in everyday life, may develop different expectations for AI-mediated social presence compared to older adults, who may rely more on traditional interpersonal cues. Although previous studies have examined consumer experiences with AI (e.g., Guzman, 2019; Tubin *et al.*, 2022), few have focused on whether and how age affects interpretations of emotional intelligence and the quality of interactions with conversational AI. This research gap is increasingly relevant as AI technology advances, underscoring the need for deeper insights into its impact on consumers across different age demographics. This insight may contribute to a nuanced understanding of how social cognition processes shape trust and emotional connection with AI.

This is particularly relevant given the differing levels of technology integration across generations. Recent research highlights that younger generations integrate technology more seamlessly into their daily lives compared to older age groups. A study by the Pew Research Center (2023) found that 75% of individuals aged 18 to 29 recognized AI applications in customer service chatbots, whereas only 45% of those over 65 did, indicating a generational gap in AI awareness and integration. Similarly, research by the Consumer Technology Association (2024) revealed that 86% of Generation Z considers technology an essential part of their lives, a significantly higher percentage than in older generations, highlighting the stronger integration of digital tools in their daily interactions. As a result, younger generations often engage in interpersonal communication differently, giving the strong integration of technology and social media into their daily lives from an early age, which can influence how they build and maintain relationships but also express emotions (Downs, 2019; Siagian & Yuliana, 2023). Consequently, AI systems need to account for potential generational differences by developing context-aware interaction models that balance efficiency with social engagement. These findings reinforce the importance of designing AI that adapts its communication style based on consumer expectations, ultimately enhancing usability and emotional resonance across different age groups.

Therefore, the objective of this study is to address the gap in knowledge regarding the role of emotional intelligence in AI interactions, focusing on whether there are differences across demographic groups and if so, what these differences look like. The core issue this study addresses is whether there is a disparity in consumer experiences by age when interacting with AI systems like ChatGPT. Younger consumers may more easily navigate these technologies, while older adults often encounter barriers due to skepticism or unfamiliarity with digital platforms (Mick & Fournier, 1998; Smith, 2014). These interactions can be further complicated by the nuanced aspects of emotional intelligence, as older consumers may have differing expectations about AI's emotional responses, ignoring potential differences could lead to negative experiences, especially for older consumers who might otherwise benefit from supportive AI interactions (Prensky, 2001; Fast & Horvitz, 2017). Thus, this study aims to examine whether various age groups interact differently with ChatGPT's audio feature, particularly focusing on how they perceive emotional intelligence and anthropomorphism. By exploring whether social presence and emotional responses are interpreted differently across age groups and if so, how, the study provides actionable insights for academic researchers and practitioners alike. Ultimately, these insights can inform the design of AI systems that better cater to the needs of diverse consumer groups, enhancing overall consumer experience and promoting broader acceptance of AI technologies in daily life. Furthermore, examining emotional intelligence in AI addresses challenges like technology inertia by focusing on how AI's simulated emotional responses can alter consumer perceptions and reduce resistance to new technologies. Consumers often resist adopting new systems due to their attachment to existing ones, influenced by habitual behaviors and the perceived effort required to switch (Polites & Karahanna, 2012). This anxiety, as a barrier to adopting new technologies or innovations, is often pronounced among older consumers (Kim *et al.*, 2023). By embedding emotional intelligence into AI systems, such as demonstrating empathy and understanding, AI can foster a more personalized and emotionally engaging experience, which may reduce resistance to change. This emotional connection can make the transition to new technology feel more natural and enjoyable, increasing consumer comfort and trust. Moreover, by embedding emotional intelligence into AI systems, such as demonstrating empathy and understanding, resistance may be reduced, by intensifying consumer experience and usage (Agarwal & Karahanna, 2006).

To achieve this, the current research examines consumer interactions with ChatGPT's audio feature, focusing on consumer experience, interaction quality and the perception of ChatGPT's emotional responses across different age groups. The study also evaluates the influence of social presence, anthropomorphism and emotional intelligence on interaction quality, providing comprehensive insights into these dynamics. Building on this, the following research question will be examined:

RQ: *Do different age groups perceive ChatGPT's emotional intelligence in audio interactions differently and if so, how do anthropomorphism and social presence influence the quality of these interactions?*

Literature review and theoretical background

The concept of AI was first introduced in 1956 (Patel *et al.*, 2009) and has since evolved to encompass technologies capable of performing tasks that typically require human intelligence, such as problem-solving and decision-making (Muhsen *et al.*, 2018). While definitions of AI vary, with some emphasising human-like intelligence and others focusing on rational intelligence (Russell *et al.*, 2022), the underlying objective remains consistent: to create systems that can replicate or exceed human cognitive functions. A significant milestone in the development of AI was the introduction of the Turing Test, which assesses the capacity of a machine to generate responses that are indistinguishable from those of a human (Turing, 1950). A significant factor contributing to the advancement of AI is machine learning, which enables systems to learn from data and enhance their capabilities over time. The combination of machine learning and neural networks provides the basis for deep learning, which has enabled AI systems to achieve notable advancements in tasks such as image, video, speech and audio recognition (Khurana *et al.*, 2023; LeCun *et al.*, 2015). These developments are particularly evident in DVAs, such as Siri, Alexa and Google Assistant, which employ natural language processing to interpret human language and respond appropriately (Hoy, 2018).

The term conversational AI is therefore used to describe AI systems that have been designed with the specific intention of engaging in human-like dialogue. Such systems facilitate machine communication with humans using natural language, whether spoken or written (Sammut & Webb, 2017). Examples of conversational AI include chatbots, virtual assistants such as Apple's Siri, Microsoft's Cortana and Amazon's Alexa, which are primarily available on smartphones or as speaker units for use as smart speakers and AI systems such as ChatGPT (Hoy, 2018). Conversational AI incorporates several key technologies that enable it to interact effectively with humans. One of the foundational technologies is natural language processing, which enables AI to understand, interpret and generate human language. By analysing the structure and meaning of text, natural language processing helps AI understand consumer input and generate appropriate responses (Khurana *et al.*, 2023). Another essential component is machine learning, which enables the AI to learn and improve over time through its interactions. As the AI engages with consumers, it continually refines its responses and becomes more adept at handling different scenarios (Bishop, 2006). Speech recognition and text-to-speech technology play a critical role in voice-based interactions. Speech recognition converts spoken language to text, enabling AI to process verbal input, while text-to-speech synthesises responses in spoken form, making communication more natural and accessible (Hinton *et al.*, 2012), in addition, advanced conversational AI systems use contextual understanding, which allows them to remember previous interactions and maintain context throughout a conversation (Serban *et al.*, 2016). This ensures that the AI's responses are more coherent and relevant, particularly in longer dialogues. Furthermore, the design of vocal attributes, such as accent, has been shown to influence consumer perceptions and responses to conversational AI (Torre & White, 2021). The tone and quality of a robot's voice can also impact trust and social engagement, particularly in customer service interactions (Zierau *et al.*, 2023). Furthermore, voice accentedness can significantly affect social responses to conversational AI, influencing consumer engagement and perceptions of competence in educational or service-based contexts (Jones & Zellou, 2024). These technologies are widely used in industries ranging from customer service and virtual assistants to healthcare, where they automate tasks and improve the consumer experience.

By integrating these capabilities, conversational AI is changing the way people interact with technology, making it more intuitive and efficient (McTear, 2022). In this context, the concept of anthropomorphism is employed to describe the attribution of human characteristics, such as motivation, intention, or emotion, to non-human entities (De Visser *et al.*, 2016). In their study, Epley *et al.* (2007) identify three factors influencing

anthropomorphism: The concept of elicited agent knowledge explains how people apply their understanding of human behaviour to non-human entities, leading them to attribute human traits to those entities. Effectance motivation entails comprehending one's surroundings to respond to unforeseen occurrences, frequently resulting in the attribution of human-like explanations for non-human phenomena to foster a sense of security. Lastly, the concept of sociality motivation reflects the fundamental human need for social connections, in the absence of social interaction, isolated individuals may often attribute human characteristics to non-human entities to fill the emotional gap left by limited human contact. When a consumer expresses an emotional request and receives an empathatic, understanding response from an AI, this interaction may be perceived as genuine human empathy, even though the response is algorithmically generated (Salles *et al.*, 2020). This is an example of anthropomorphism in action—consumers ascribe human traits to AI, even though it lacks real emotional understanding.

However, while anthropomorphism explains why consumers perceive AI as human-like, it does not fully account for the feeling of being socially engaged during interactions with AI. This is where the concept of social presence becomes relevant. Social presence theory refers to the extent to which a communication medium creates the perception that an interaction partner is present, engaged and responsive (Cui *et al.*, 2013). Unlike anthropomorphism, which describes the attribution of human traits, social presence focuses on the consumer's experience of connectedness during interaction. Social presence is conveyed through both verbal and non-verbal cues, with the strength of the latter varying depending on the medium used (Short *et al.*, 1976). Although ChatGPT is unable to convey non-verbal cues such as facial expressions, the meticulous selection of words and structured responses may nevertheless evoke a profound sense of social presence, rendering it comparable to more interactive communication media (Short *et al.*, 1976). This can make interactions with ChatGPT feel engaging and reciprocal, similar to human conversation. Consumers who experience a high level of social presence during AI interactions may treat the system as a conversational partner, increasing engagement and trust.

However, social presence does not imply that the AI understands emotions—this relates to the concept of emotional intelligence. Emotional intelligence traditionally refers to an individual's ability to express, assess and regulate emotions, both in themselves and in others (Salovey & Mayer, 1990). In human interactions, emotional intelligence plays a pivotal role in influencing cognitive processes and social behavior. It has been extensively studied in various academic disciplines, particularly in psychology, management & education, where it is linked to leadership effectiveness (Goleman, 1998), workplace performance (Joseph *et al.*, 2015) and mental well-being (Mikolajczak *et al.*, 2007). Research suggests that individuals with high emotional intelligence tend to exhibit better conflict resolution skills, higher job satisfaction & greater resilience to stress (Zeidner *et al.*, 2004). In educational settings, emotional intelligence is associated with improved learning outcomes and social adaptation (MacCann *et al.*, 2020). More recently, scholars have begun to explore the role of emotional intelligence in human-AI interactions, investigating how consumers respond to AI that mimics emotional competence (Das & Mitra, 2024; Votintseva *et al.*, 2024). In AI, emotional intelligence is not an inherent capability but a simulated effect. Systems like ChatGPT use advanced natural language processing to mimic emotional understanding, selecting responses that appear empathatic and contextually appropriate (Pietikäinen & Silvén, 2022). This ability can enhance consumer experience by making interactions feel more natural and emotionally supportive. However, the perception of AI as emotionally intelligent is largely shaped by consumers themselves, individuals assess emotional intelligence in AI based on linguistic cues, response appropriateness & the AI's ability to recognize and adapt to emotional expressions (Feine *et al.*, 2019). This perceived empathy not only influences consumer trust and engagement but also has tangible effects on consumer behavior. Studies suggest that the more empathatic the AI appears, the higher the (re)purchase intention in the service sector (Fota, 2022). When AI agents display emotional congruence - meaning their responses match the emotional tone of the consumer - people are more likely to trust and form emotional bonds with them (Huang & Rust, 2021). This tendency is closely

related to anthropomorphism, where consumers ascribe human traits, such as empathy and decision-making abilities, to AI systems. If consumers perceive AI as emotionally intelligent, they may engage with it in ways similar to human relationships. This can lead to increased trust and even the sharing of personal information, despite the algorithmic nature of AI responses (Salles *et al.*, 2020). Moreover, the effort to understand and anticipate responses from AI such as ChatGPT may also result in consumers ascribing human-like intelligence and decision-making capabilities to it. Such interactions may foster trust and a sense of security, with consumers interpreting unpredictable responses as intentional human-like behaviour, in addition, individuals who are socially isolated may employ AI to satisfy their social requirements, perceiving a social connection through interaction. The context of interaction, like in customer service settings, plays a crucial role in shaping how emotional intelligence in AI is perceived, as consumers expect conversational agents to not only provide accurate information but also engage in cooperative and socially responsive communication (Gnewuch *et al.*, 2017).

To better understand emotional intelligence—whether in humans or AI—researchers employ standardized assessment methods. These measures can be broadly categorized into performance-based and self-report tools. The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) assesses emotional intelligence as an ability, using tasks that measure emotional perception, facilitation, understanding and regulation (Mayer *et al.*, 2002). Self-report instruments such as the Emotional Quotient Inventory (EQ-i) (Bar-On, 1997) and the Trait Emotional Intelligence Questionnaire (TEIQue) (Petrides & Furnham, 2001) rely on individuals' subjective evaluations of their own emotional competencies. While these models are primarily designed to measure human emotional intelligence, this study focuses on a different aspect: the perception of emotional intelligence in AI. Unlike human emotional intelligence, which involves genuine emotional processing, AI systems such as ChatGPT simulate emotional intelligence through linguistic patterns and response strategies. This shift in perspective highlights the importance of distinguishing between anthropomorphism, social presence and emotional intelligence when examining consumer engagement with conversational AI. While anthropomorphism explains why consumers attribute human traits to AI, social presence describes the feeling of connection during interaction and emotional intelligence refers to the ability (real or simulated) to understand and express emotions. The interplay of these concepts shapes how consumers perceive and interact with AI, ultimately influencing trust, engagement and emotional investment in conversational systems (e.g., Wagner & Schramm-Klein, 2019; McDuff & Czerwinski, 2018).

However, while AI can create the illusion of emotional understanding, consumers often remain aware of its limitations. This can lead to mixed reactions—some appreciate AI's ability to provide emotionally supportive interactions, while others may experience discomfort if responses seem overly anthropomorphic without actual emotional comprehension (Seeger *et al.*, 2021). In particular, the risk arises when AI exhibits highly human-like qualities without perfectly replicating human behavior. This phenomenon, known as the uncanny valley effect (Mori *et al.*, 2012), highlights the fine line between enhancing consumer engagement through anthropomorphic features and triggering discomfort among consumers. Striking the right balance between human-like responsiveness and transparency about AI's artificial nature is therefore crucial in designing emotionally intelligent AI systems. Beyond consumer perception, the rapid advancement of AI technologies also raises significant privacy and ethical concerns. A key feature of most AI systems is that the internal decision-making processes within the AI are not visible to the developers and consumers. This lack of transparency not only affects trust but also complicates accountability. Another question is how the creative outputs of AI should be handled in terms of copyright and the legal debates that follow (Franzoni, 2023). For example, as ChatGPT and similar models continue to evolve, the potential risks associated with their use also increase. AI can be used to generate convincing phishing emails and websites and despite the implementation of security measures, it is difficult to predict and mitigate all possible forms of misuse. Comments, blog posts and product reviews could be included in the training data without the real consent of the authors (Wu *et al.*, 2023). Additionally, since AI training data is not always objective or free of personal

biases, the resulting outputs may unintentionally reflect and perpetuate discriminatory perspectives (Wu *et al.*, 2023; Zhou *et al.*, 2023).

Method

Despite significant advancements in conversational AI and its increasing presence in daily life, there is a noticeable gap in the literature regarding how different age groups perceive and evaluate the emotional intelligence of AI systems like ChatGPT during audio interactions. Therefore, a total of 15 participants (IP=interviewed participant) were recruited for our study, with ages ranging from 16 to 69 years. Of the participants, six were female and nine were male. The mean age of the participants was 39.4 years ($SD = 18.7$). This study divides participants into younger and older generations, with younger participants being aged 16-38 and participants aged 51-69 being referred to as the older generation. This division is based on generations Y and Z for younger consumers and generations X and baby boomers for older consumers.

The objective of the study was to analyse the interaction with and emotional intelligence of ChatGPT. Following the introduction of the research project and an explanation of DVAs and ChatGPT, to ensure that all participants had the same knowledge base, demographic data were collected prior to the commencement of the interaction. Additionally, participants were queried as to whether they possessed a DVA and whether they had previously engaged with ChatGPT, if they had previously interacted with the system in question, the nature of this interaction was recorded, specifying whether it was in written and/or spoken (see Table 1).

In the initial phase of data collection, an observational study was conducted in which participants interacted with ChatGPT using the iOS app (version 1.2024.1XX) in a tranquil setting, exclusively using GPT-4, with the interviews taking place in June and July 2024. To enhance the validity and reliability of the study, elements from experimental design were incorporated into the setup. A standardized interaction setting was maintained, ensuring similar conditions for all participants.

Additionally, while the study was conducted in a naturalistic environment (e.g., participants' homes) and a comfortable atmosphere was maintained, structured observational methods were employed to systematically assess participants' reactions during their interaction with ChatGPT (Bryman, 2016). These methods involved predefined categories and criteria to ensure consistency and reliability in the observations. Specifically, the observed behaviors included facial expressions/gestures, tonality/communication with the DVA, speech speed and the participant's body interaction (e.g., whether they were turned towards or away from the DVA and whether they made eye contact with the DVA).

All participants were native German speakers or spoke German fluently as their primary language. The interaction with ChatGPT took place in German, with a German voice selected. Prior to the study, a test phase ensured that the German voice met quality standards for smooth performance. The participants were required to respond to a series of structured questions, which comprised a 'warm-up phase,' a 'social interaction phase,' and an 'emotional reaction phase.' The sequence permitted participants to respond individually to prompts, such as identifying a song that corresponded to their current mood or recalling a childhood memory.

This structure ensured the elicitation of diverse yet measurable responses pertaining to social interaction and emotional reactions, in accordance with the study's theoretical framework of anthropomorphism and social presence theory. During the observational study, the interviewer documented observable behaviours, including facial expressions, body language, tone of voice, communication style with ChatGPT, speech speed and reactions. After 12 interviews, a saturation point was reached, meaning that no new insights could be gained from additional interviews (Francis *et al.*, 2010; Guest *et al.*, 2006).

TABLE 1 - Overview of the participants

No.	Gender	Age	Profession	Owning a DVA	Experience with ChatGPT
1	Male	16	Student	Siri	Written
2	Female	16	Student	Siri	Written, spoken
3	Male	19	Apprentice	Siri	Written
4	Male	19	Student	None	Written
5	Male	25	Controller	Siri, Alexa	Written
6	Male	26	Engineer	Siri	Written
7	Female	31	Real Estate Agent	None	Written
8	Male	38	Vendor	None	None
9	Male	51	Industrial mechanic	Alexa	Written
10	Female	52	Housewife	Siri	None
11	Male	53	Car Dealer Manager	None	None
12	Male	54	Warehouse specialist	None	None
13	Female	59	Housewife	None	None
14	Female	63	Self-employed	None	None
15	Female	69	Pensioner	None	None

The interaction phase respectively the observational study with ChatGPT was structured into three distinct phases. The first phase, referred to as the warm-up phase, allowed participants to familiarize themselves with ChatGPT's features and establish a basic level of interaction. The interaction in this phase were deliberately simple, aiming to reduce any initial inhibitions the participants might have had. These included queries about the weather, the current date and a math problem, like Ask the AI to report on the weather. Or Let the AI solve a simple math problem, such as What is 7 times 8?. This initial experience of the observational study was designed to enhance familiarity and comfort with the AI, while also enabling the participants to evaluate the anthropomorphization of ChatGPT due to its conversational style.

The second phase focused on social interaction, simulating everyday conversations to assess how ChatGPT processes social contexts and how participants perceive and absorb these interactions. The fluid nature of this interaction was to enhance the participant's sense of social presence. As participants engaged in conversations that included asking ChatGPT about events, solving personal problems and recalling childhood stories, like Tell the AI about your plans for next week and ask what it thinks about them. or Tell the AI about a current personal problem and ask how you can solve it., these prompts were designed to simulate realistic conversational scenarios where individuals might share personal experiences, even in a non-human interaction. While such interactions may not reflect typical everyday exchanges with a machine, these prompts were specifically chosen to explore how ChatGPT can simulate the dynamics of real-life conversations, since conversations with AI that go beyond merely handling functional tasks to include personal interactions become more accessible and engaging through the anthropomorphization of these systems like with the AI applications Replika or HereAfter. This phase was therefore designed in alignment with social presence theory, as it aimed to strengthen the connection between the participant and ChatGPT, fostering a more engaging and interactive experience that mimics real-life communication. The social interaction was facilitated by the fact that the AI expressed its own opinions and assisted participants with problems, much like a real interpersonal relationship.

In the third and final phase, the focus shifted to ChatGPT's emotional sensibility and response. In this phase, it was investigated whether ChatGPT can demonstrate emotional intelligence by responding to the emotional states of the participants and by expressing emotional content itself, e.g., joy, compassion, or sadness. Supported by the concept of anthropomorphism, the ability of the AI to respond to human emotions could make it appear more human to the participants, potentially fostering emotional attachment. Also, by social presence theory, positive and entertaining exchanges were expected to enhance the feeling of connection between participants and the AI, which can lead to greater emotional engagement and connection. In this context, when ChatGPT responded in an empathic manner, participants might have felt

a stronger connection to the AI, similar to how they would feel in a social interaction with another human. This interaction, akin to a social exchange with another human, could deepen the bond and the quality of the conversation, further influencing the perceived ability of the AI to simulate emotional intelligence, whether real or simulated. In this phase, participants asked ChatGPT for a joke, a song that matched their emotional state and shared a story that reflected their feelings, such as recounting a positive memory involving a friend, to which the AI was expected to respond. These tasks were prompted like for example: Tell the AI how you are feeling and ask which song it would recommend based on your mood or Describe a very personal event and ask the AI how this event could be put into words to express the emotions that accompanied it. Throughout all phases, participants were also encouraged to ask follow-up questions and continue the conversation, allowing the interaction to evolve organically based on individual preferences and responses. Such a phased approach is effective to gradually acclimate participants to the interaction environment, enhancing their comfort and engagement for more authentic responses (Corbin & Strauss, 2008). Subsequently, in-depth interviews were conducted with the participants to gather their subjective experiences and evaluations. The interviews focused on the social and emotional dynamics of the interaction. The participants were asked questions such as, How would you describe the AI's ability to recognize and interpret emotions correctly and respond to them?, How did you feel during the interaction?. In what ways do you think an 'interpersonal relationship' could be established with the AI?, or Can you recall a moment when you felt as though you were no longer aware that you were interacting with a machine? Please explain your experience. The interviews were recorded and transcribed using f4 software and the data were subsequently analysed thematically using MAXQDA. Thematic analysis commenced with two coders examining the transcripts sentence by sentence. This approach was adopted to ensure diverse perspectives, foster creativity and minimise errors (Corbin & Strauss, 2008). To ensure the reliability of the coding process, inter-rater reliability was assessed, as it is a crucial measure for consistency and objectivity in qualitative research (McDonald *et al.*, 2019). Subsequently, a structured qualitative content analysis was conducted in accordance with the guidelines set by Schreier (2012). The objective was to identify categories by comparing individual encodings related to the research questions. The upper category (UC) was formed inductively and subsequently subdivided into subcategories (SC). This method permitted the allocation of pertinent textual passages to corresponding categories, thereby facilitating a comprehensive, category-based overview.

Results

Results of the observational study

WARM-UP PHASE: In the initial phase of the experiment, participants were introduced to ChatGPT through a series of three preliminary queries focused on meteorological, temporal and/or calendrical references and mathematical calculations. These queries served two purposes: firstly, they aimed to familiarise participants with the AI's functionalities and capabilities and secondly, they established a baseline for assessing the quality of interaction in straightforward communication scenarios. By initiating the interaction with straightforward questions, the researchers were able to ascertain the participants' level of comfort and ease of engagement with the technology, thereby reducing any potential apprehension that might arise from interacting with an AI system. In this phase, participants were invited to also pose more complex queries, including requests for specific recipes, information on traffic conditions or directions to a particular location and questions about current news events or sports results. Allowing participants to construct their own questions fostered a sense of autonomy and ownership over the interaction, thereby encouraging more meaningful engagement with the AI. This design choice yielded valuable insights into the navigation and utilisation of AI by consumers from different age groups in various contexts. It is noteworthy that communication with the AI was observed to remain uninterrupted across all age groups, suggesting that participants, irrespective of their familiarity with technology or age, were able to interact with ChatGPT with ease.

SOCIAL INTERACTION PHASE: The questions posed to participants were carefully crafted with the objective of evaluating their capacity to engage in social interaction, particularly in the context of mimicking conversations that one might typically have with friends, family, or colleagues. These interactions were designed to resemble everyday exchanges, allowing participants to experience the social capabilities of ChatGPT firsthand. When participants were prompted about leisure activities, such as holidays, educational excursions, social events, or visits, ChatGPT responded with detailed and personalized replies that demonstrated its ability to engage meaningfully with consumers. In some instances, ChatGPT posed follow-up questions to facilitate a more nuanced interaction, effectively steering the conversation toward greater depth and connection. For example, when participant IP08 was asked about a recent barbecue event, ChatGPT inquired about the specific type of food that had been grilled, thereby encouraging a more engaging dialogue. This level of inquiry not only made the conversation feel more natural but also highlighted ChatGPT's ability to adapt its responses based on the flow of conversation, strengthening social presence. Furthermore, ChatGPT demonstrated its capacity to respond accurately to specific scenarios. When IP12 mentioned purchasing tickets for a horse show, ChatGPT responded with a detailed and enthusiastic remark: 'That is an excellent suggestion. The CHIO is an excellent event for those with an interest in horse sports.' The responses provided by ChatGPT were characterized by a high level of interaction and a consistently positive outlook, which contributed to creating a comfortable conversational atmosphere. Furthermore, participants reported a variety of issues, ranging from concerns regarding academic performance to worries about smartphone damage. In each case, ChatGPT offered logical solutions and even practical advice, such as guidance on vehicle maintenance for IP09, with a response like: 'Here are a few things you can check: 1. Transmission fluid level [...]'. In addition, participants' sharing of childhood memories led to reflective conversations in which ChatGPT encouraged further dialogue and provided thoughtful feedback. This exchange not only enhanced the participants' interactive engagement with the AI but also allowed them to explore personal narratives in a supportive environment.

EMOTIONAL REACTION PHASE: The final phase of the observational study was designed to assess the emotional responses demonstrated by ChatGPT, thereby providing a rich context for understanding the nuances of AI interaction. To assess the AI's ability to connect emotionally with consumers, participants were first asked to share their emotional states. Following this, ChatGPT was tasked with suggesting musical recommendations that were tailored to those feelings. This approach was designed to examine the extent to which the AI could respond to and reflect human emotions in its outputs, which it did effectively by selecting music that most consumers perceived as fitting. Subsequently, participants were requested to describe a personal experience that had a deep emotional impact, thereby facilitating a more profound engagement with the AI. For example, participant IP14 recounted a pleasant experience of cycling through the countryside the previous day, emphasising their appreciation of the warm weather. In response, ChatGPT provided a range of answers that exhibited considerable variability, even when the initial query was only slightly altered. It is noteworthy that the AI frequently generated highly detailed, vivid and creative descriptions, which contributed significantly to the richness of the interaction and enhanced the participant's engagement. Such responses indicated the AI's capacity to adapt to the nuances of individual experiences, thereby demonstrating its potential for personalised interaction. Similarly, when participants recounted encounters with former acquaintances, including friends, schoolmates, or colleagues, ChatGPT responded with individualized and empathic answers that addressed the importance of social connections and the nostalgia associated with those memories. The responses generated by the AI not only reflected the specifics of the encounters described but also resonated with the emotional undertones present in the participants' narratives. This reinforces the relational aspect of the interaction. Throughout this phase of the observational study, a considerable number of participants displayed positive emotional responses, including smiling, laughing and exhibiting signs of astonishment and surprise at the AI's capacity for empathatic engagement. These reactions highlighted the potential of AI to facilitate meaningful connections and promote emotional well-being among consumers. However, it was also observed that some participants

expressed dissatisfaction with specific song recommendations, noting inaccuracies that detracted from their overall experience. This feedback highlighted the necessity for continued refinement of AI algorithms to ensure that they meet consumers' emotional expectations and preferences with greater accuracy. The combination of positive engagement and constructive criticism highlights the necessity of continued research into emotional intelligence in AI, emphasising the importance of a balanced approach to consumer experience design.

Results of the in-depth interviews

The results of the structured qualitative content analysis are presented in Table 2, which shows the two upper categories and five subcategories that emerged from the analysis. The two main categories will be used to evaluate the participants' interaction with the AI, as well as to assess how conversational AI might be used in the future and what problems might arise in its future use. Furthermore, each subcategory is accompanied by the number of references (N) provided by the participants for that category. The results thus provide an assessment of the current situation based on existing theoretical concepts, as well as requests and suggested improvements that are relevant to practice.

UC1: ASSESSMENT OF INTERACTION

SC1.1: General experience

In terms of the general experience gained, 13 of the 15 participants provided a positive evaluation of their interactions with ChatGPT. This considerable positivity suggests a favorable response to the AI's capabilities. One participant, iP04, provided the following observation: 'It is noteworthy that the AI was able to respond to each question posed.' This acknowledgement reflects a broader consensus among participants regarding the AI's responsiveness and engagement. It was observed by several participants that the AI demonstrated a comprehensive understanding of specific details, which significantly enhanced the interaction. For example, iP03 noted the AI's capacity to accurately identify a specific video game and provide a detailed explanation of its gameplay mechanics, which demonstrated not only its knowledge but also its ability to respond in a contextually relevant manner. Furthermore, iP06 emphasised the AI's capacity to recommend films within the Marvel Cinematic Universe, accompanied by comprehensive character profiles, exemplifying its profound understanding and aptitude for meaningful discourse. Such precise references were particularly noteworthy to the participants, as they demonstrated the AI's ability to navigate intricate cultural references with precision. Additionally, some participants reported that their expectations were surpassed, as they had not anticipated such meticulous and pragmatic responses to their inquiries (e.g., iP12). The level of detail and relevance in the AI's answers exceeded expectations, as evidenced by the positive feedback from multiple participants. Moreover, participants expressed astonishment at the AI's capacity to revisit previously discussed topics once the interaction had concluded. For example, iP07 observed that the AI referred to her vacation plans and extended wishes for a pleasant time away, thereby demonstrating its capacity to recall and retain information previously shared. This memory feature not only fostered a sense of continuity and engagement but also contributed to the perception of the AI as more human-like and relatable. The participants' favorable evaluations highlight the potential of ChatGPT to facilitate meaningful and enjoyable interactions in a range of contexts.

TABLE 2 - Category system of the in-depth interviews

Upper categories		Subcategories	
UC1	Assessment of interaction	SC 1.1	General Experience (N=30)
		SC 1.2	Anthropomorphism (N=36)
		SC 1.3	Emotional intelligence (N=33)
UC2	Assessment of future usage	SC2.1	Distrust in data security (N=18)
		SC2.2	Future support in everyday life (N=16)

SC 1.2: Anthropomorphism

Some participants expressed genuine surprise at the extent to which the AI displayed human-like characteristics, like the humanising effect of the voice, the speaking style and tonality and the quality of the sentence formulation, a sentiment that was particularly prevalent among older participants aged 50 and above. This observation serves to illustrate the increasing sophistication of AI systems and their capacity to emulate human interactions in a convincing manner. Many of these older consumers observed that the AI's responses often evoked a sense of relatability and emotional resonance, facilitating engagement in a manner that felt more authentic than they had anticipated. The fluctuations in voice and tone served to further enhance this experience, creating the impression of conversing with a friend who had recently spoken on the telephone (IP14). Such nuances in vocal delivery contributed to the perception of warmth and familiarity often associated with human conversation. Furthermore, one participant made a noteworthy observation there was no 'difference in the experience of conversing with a person or a machine' (IP05). This statement highlights a crucial aspect of AI interaction: the growing capacity of consumers to relate to AI systems on a personal level, which serves to diminish the perceived gap between human and machine.

SC 1.3: Emotional intelligence

The younger participants, specifically those aged 16 to 25 years, acknowledged that while the AI appears to possess the ability to empathise with feelings, they believed this capacity is primarily a product of its design and programming. One participant observed that while 'the AI is unable to empathise with feelings on an emotional level, it is nevertheless capable of simulating that it has identified them (IP03).' This perspective underscores a pivotal point of skepticism among younger consumers regarding the veracity of the AI's emotional responses. Another participant expressed a similar viewpoint, suggesting that the responses appeared to be derived from a pre-established answer catalogue, which could indicate a more mechanical and less genuine interaction (IP02). In contrast, it is noteworthy that the AI demonstrated proficiency in addressing childhood experiences through its emotional responses, as indicated by another participant (IP09). This capacity may resonate more profoundly with consumers seeking validation or comprehension of their past experiences, indicating that even simulated empathy can be meaningful for certain consumers. Conversely, older participants (aged 50 and above) frequently adopted a markedly divergent perspective. The participants perceived ChatGPT to exhibit qualities that were perceived as being human-like, IP15 highlighted that the experience was akin to engaging in discourse with a genuine individual, indicating the potential for a more profound emotional bond to be established during such interactions. Another older participant (IP10) noted that the AI responded positively, offering encouragement for a personal problem, which led the participant to consider adopting the AI's suggested solution. This suggests that older consumers may derive reassurance and guidance from the AI's responses, thereby enhancing their overall experience.

UC2: ASSESSMENT OF FUTURE USAGE

SC1.1: Distrust in data security

Although the participants engaged in social and emotional conversations with the AI, trust in the data security of ChatGPT and thus OpenAI was denied by almost all the younger participants. This was justified by the fact that the transparency of data processing is not or only incompletely given or assumed (IP2: '[...] you don't know one hundred percent if and how and to what extent information and data are stored'), IP06 also criticises the fact that it is not transparent who is behind the AI or the software and to whom the data is made available. Another participant criticised the fact that consumer information is used to further develop conversational AI (IP01: '[...] the digital voice assistant is built from the information we give it and that's why I don't want to say that my data is safe'). Older participants were also concerned about data security, although less so than younger participants (IP14: 'I don't know if the personal data that I put here can really be kept absolutely safe or if it can be passed on elsewhere, i'm quite skeptical about that').

SC1.1: Future support in everyday life

IP13 expressed concern that the widespread use of conversational AI could lead to a decline in consumers' cognitive abilities, stating 'the downside is that people stop thinking', implying that the ease and convenience of such technology could discourage critical thinking and problem solving in everyday life. This concern echoes a wider concern that increasing reliance on AI systems could reduce the need for human mental engagement, leading to potential cognitive atrophy over time. Conversely, another participant (IP07) was more optimistic, praising the interaction with ChatGPT and stating that she would be inclined to use it regularly: 'I really liked it, i would use it more often'. This participant's positive experience points to the potential for conversational AI to integrate seamlessly into daily routines, offering practical solutions and convenience. Participants also suggested various scenarios where ChatGPT could provide meaningful support, particularly in professional and caring environments. Some envisioned its use in pharmacies, nursing homes, or as a tool to assist people with disabilities. In addition, conversational AI was suggested as a helpful companion for those travelling in vehicles (IP04, IP09, IP11), where it could provide navigation or hands-free assistance. The potential for AI to simplify and improve everyday life was also a common theme. Several participants saw value in using ChatGPT for household tasks, research or even as a social companion for lonely or elderly people (IP02, IP07, IP08, IP10, IP12). These findings suggest that conversational AI such as ChatGPT could play a versatile role in improving not only the efficiency of everyday tasks, but also the emotional well-being of consumers, particularly those who are isolated or in need of assistance.

Discussion

The study highlights the capacity of ChatGPT to simulate human interaction, particularly in addressing personal matters with empathy (Salles *et al.*, 2020). Older participants frequently perceived ChatGPT as more human-like and were astonished by its depth and accuracy. This finding corroborates Bickmore & Picard's (2005) assertion that perceived empathy, even if simulated, markedly influences consumer experience. Furthermore, the study considers the phenomenon of the uncanny valley effect, whereby artificially intelligent entities that are excessively human-like can evoke feelings of unease (Mori *et al.*, 2012). Some older participants found the interaction to be strange or unsettling, which may account for their reluctance to engage regularly with an AI like ChatGPT. This suggests that although ChatGPT displays notable emotional intelligence, it may occasionally evoke unease due to its overly human-like characteristics. The results of this study provide new insights into the uncanny valley effect by revealing that this unease is not just a generic response to humanoid AI, but rather varies across demographic groups, particularly age.

The findings are in accordance with the observations made by Sufyan *et al.* (2024), who asserted that ChatGPT displays robust social intelligence, potentially outperforming human psychologists in specific interactions. The provision of personalized responses, particularly in the context of sensitive topics such as childhood memories, served to reinforce this perspective. The younger participants found the interactions entertaining, which may be attributed to their familiarity with digital technologies (Vaportzis *et al.*, 2017). In contrast, the older participants demonstrated a combination of skepticism and fascination, which may be attributed to their comparatively limited experience with such technologies. Interestingly, this generational divide suggests that the uncanny valley effect is more pronounced in older users, whose limited experience with advanced AI makes them more sensitive to its exaggerated human-like features. This duality—appreciation of ChatGPT's perceived intelligence alongside discomfort due to its near-human responses by the older participants—further supports the existence of the uncanny valley effect (Mori *et al.*, 2012). However, the study introduces a new element by highlighting that younger participants, who have a greater exposure to digital assistants and AI-driven technologies, appear less susceptible to this effect, suggesting that familiarity with AI may reduce the discomfort typically associated with overly human-like features.

Moreover, the participants put forth several potential applications for ChatGPT, including its use in pharmacies, nursing homes, for individuals with disabilities, or even as a driving assistant. Moreover, it was suggested that ChatGPT could assist in the completion of routine tasks, provide companionship to individuals who are isolated and support older adults (IP02, IP07, IP08, IP09, IP10, IP11, IP12). This finding is consistent with the results of previous studies that have indicated the potential of ChatGPT to be utilised in a variety of domains (e.g., Bagde *et al.*, 2023; Raj *et al.*, 2023). However, the study reveals a significant barrier to such applications: the uncanny valley effect may hinder the adoption of AI in sensitive contexts, if older users feel discomfort rather than trust in AI companions, its potential as a tool for mitigating loneliness or providing emotional support could be compromised.

Also, ethical considerations pertaining to data privacy and trust emerged. However, despite these reservations, participants shared personal information, influenced by their positive interactions with the AI, as documented by Zehnder *et al.* (2021). This raises the question of whether consumers possess an adequate understanding of data privacy when interacting with AI that they may perceive as anthropomorphic. The semblance of a personal bond, particularly among individuals who are more isolated or reserved, serves to accentuate the capacity of AI to foster a sense of social presence (Epley *et al.*, 2007). However, if consumers feel insecure about how their data is handled, this undermines the very goal of fostering trust and emotional connection. The transparency of data processing, therefore, becomes integral to enhancing the emotional intelligence of AI systems. Without such transparency, even the most advanced empathatic responses may fall short, as consumers are less likely to fully engage or disclose personal information if they fear it might be misused. This hesitation can limit the depth of interaction, thus impeding the AI's ability to effectively simulate and respond to emotions, which is a core aspect of emotional intelligence in conversational AI.

In response to the first part of the research question, the study revealed that individuals from different age groups indeed perceive and evaluate ChatGPT's emotional intelligence in varying ways, with their responses influenced by several factors, including technological familiarity and expectations of human-like interaction. Older participants, who are generally less accustomed to digital interactions (see Table 1), typically perceived the emotional intelligence of ChatGPT higher, reflecting a more favorable impression of the AI's ability to engage with them empathatically. This aligns with findings on human-like and robot-like chatbot avatars in complaint management, which suggest that human-like attributes in AI can enhance consumer satisfaction through perceived empathy (Fota *et al.*, 2022). They also found the overall experience to be more enjoyable and fulfilling, indicating that their interactions with the AI provided them with a sense of connection that they valued. However, older participants also exhibited a greater tendency toward skepticism, frequently expressing unease due to the uncanny valley effect, which refers to the discomfort felt when a robotic entity closely resembles a human but is not quite convincing. This goes along with research on anthropomorphism that has shown that identity cues in conversational agents can enhance perceptions of humanness, though sometimes this may lead to discomfort if the AI's responses appear exaggerated or overly human-like (Go & Sundar, 2019). In contrast, younger participants, who are more familiar with digital technologies and interactions, perceived the interaction as more scripted, suggesting that they recognized the limitations of ChatGPT's emotional responses as being algorithmically driven rather than genuinely human. This generational divide in perception reveals a crucial insight for uncanny valley research: familiarity with digital assistants seems to blunt the uncanny valley effect, with younger participants more capable of recognizing and accepting AI limitations, while older participants, encountering this technology at a more advanced stage, show greater susceptibility to discomfort from its human-like attributes.

These findings add a new dimension to the uncanny valley theory by showing that older consumers may not only recognize AI as human-like but also experience greater cognitive dissonance when it falls short of their expectations of human interaction. This phenomenon highlights the nuanced relationship older consumers have with AI, wherein their appreciation for its empathatic capabilities is tempered by their

wariness of its overly human-like characteristics, in relation to the second part of the research question, the study demonstrated that the quality of interactions between age groups was significantly influenced by the concepts of anthropomorphism and social presence. Older consumers were notably more inclined to anthropomorphize ChatGPT, attributing human-like traits and emotions to the AI. This tendency not only increased their engagement with the AI but also enhanced the overall quality of their interactions, as evidenced by longer and more in-depth conversations compared to those held with younger participants. This is supported by previous research on the humanization of chatbots, where conversational cues and human-like identity elements contribute to stronger perceptions of social presence (Go & Sundar, 2019). However, excessive anthropomorphic characteristics in ChatGPT lead sometimes to feelings of detachment and discomfort among older consumers, especially when responses appear overly human-like yet lack realistic interaction patterns, demonstrating again the uncanny valley effect (Mori *et al.*, 2012). This underscores a critical contribution to the uncanny valley research: while anthropomorphism increases engagement, it also introduces the risk of discomfort when AI responses become too human, particularly for older users. Nevertheless, this age group was more likely to recognize and appreciate the social presence of the AI, especially in situations involving loneliness or emotional support. Their acknowledgment of the AI as a companion in such contexts underscores the potential for AI to serve as a valuable tool for enhancing social interaction and emotional connection among older adults.

Implications

The findings indicate that ChatGPT and conversational AI systems have the potential to make a substantial contribution to enhancing healthcare, elderly care and daily support (McTear, 2022). For example, in healthcare settings, AI-driven DVAs could be utilised to assist patients with routine check-ins, medication reminders and emotional support, particularly for those experiencing isolation or anxiety, in elderly care, ChatGPT can serve as a companion, facilitating conversational interaction and thereby reducing feelings of loneliness among older adults. Furthermore, it can assist with tasks such as organising appointments, providing medication reminders, or offering tailored advice based on the consumer's health condition. Similarly, AI systems could assist individuals with disabilities by facilitating task management or acting as virtual assistants in performing daily activities. However, the study's findings on the uncanny valley effect provide crucial insights into how AI should be integrated into these sensitive domains. While AI's human-like qualities can help create social presence and reduce isolation, they can also induce discomfort, particularly for older adults who are less familiar with advanced technologies, if AI appears too human-like, it may generate feelings of unease, undermining its potential as a companion in settings like elderly care. This suggests that the success of AI in such applications hinges on the balance between human-like traits and comfort, which can be age-dependent.

In order to guarantee the successful integration of ChatGPT in these sensitive domains, it is critical to address ethical considerations such as privacy and trust, as prior studies highlight the need for privacy-preserving features in AI systems to protect consumer data and support ethical deployment (Reddy *et al.*, 2017). The perception of AI as an empathatic or human-like entity can engender a strong sense of social presence. However, this may also result in consumers disclosing personal information without a full appreciation of the privacy implications. Therefore, practitioners have to develop privacy-preserving features that protect sensitive data and ensure that consumers are fully aware of how their data is being processed and used.

The study's results address the phenomenon of the uncanny valley effect and its varying perceptions depending on age, it reveals that while AI's human-like qualities can enhance interaction and foster social presence, they can also induce discomfort, particularly among older adults. These findings offer new implications for the design of AI systems in elderly care and healthcare: practitioners must take care to avoid overly human-like characteristics that might exacerbate the uncanny valley effect. The phenomenon of the

uncanny valley becomes a significant issue when AI appears to be too human-like, causing consumers to experience feelings of unease or discomfort (Mori *et al.*, 2012). This phenomenon is particularly pronounced among older participants, who may be less familiar with digital technologies and thus exhibit a stronger reaction to the perceived human-like qualities of AI (Broadbent *et al.*, 2009). To address this issue, it is essential that practitioners adopt a cautious approach, striving to achieve a harmonious equilibrium between the anthropomorphic characteristics of AI and the consumer's sense of comfort. For example, the creation of AI systems that maintain a clear distinction between human and machine behaviours may help to alleviate discomfort (Duffy, 2003). This finding directly informs how AI systems should be developed for elderly care: a clearer distinction between human-like and machine-like behaviours might be crucial to avoid triggering discomfort, especially for older users who are more sensitive to such traits. Furthermore, cultural variations in the perception of AI's empathy and human-likeness must be considered when developing AI systems for diverse demographic groups. Research by Li *et al.* (2010) suggests that some cultures may be more amenable to the concept of anthropomorphic AI, whereas others may find it disconcerting. It is recommended that AI systems be designed with the flexibility to adapt their level of human-likeness based on consumer preferences. This would allow consumers to choose the degree of anthropomorphism they prefer, including the option of less anthropomorphic interactions for those who prefer it.

The study highlights the necessity for the development of explainable AI and privacy-preserving machine learning. Explainable AI refers to systems that can provide transparent and understandable explanations for their actions and decisions (Doshi-Velez & Kim (2017). In healthcare and elderly care, it's crucial that AI systems are explainable because consumers and caregivers need to trust the AI's recommendations and understand why these decisions are made. In addition, making AI systems more transparent can help reduce anxiety or skepticism among consumers, especially older adults who may feel uncomfortable with the complex nature of AI. Clear explanations about AI's empathic traits. Its limitations and its machine-driven nature are essential for older users to feel comfortable and trust AI, thereby reducing the uncanny valley effect that may arise from unclear AI behaviours. Furthermore, incorporating privacy-preserving machine learning is essential to ensure that consumer data is handled securely (Dwork & Roth, 2014). Techniques such as differential privacy, which protects the confidentiality of individual consumer data, can be used to safeguard sensitive health and personal information (Abadi *et al.*, 2016). Building trust in AI systems relies on reassuring consumers that their data is secure and that the AI is acting in their best interests. As AI systems are increasingly used in areas involving sensitive data, such as healthcare and elder care, implementing privacy safeguards is necessary.

Furthermore, the study offers crucial insights into the ways in which different age groups interact with AI. It demonstrates that older adults are more prone to anthropomorphise AI and perceive it as more empathatic, whereas younger consumers are more inclined to view its responses as algorithmically driven. This provides a direct implication for AI design in healthcare and elderly care: older consumers may benefit from AI systems that emphasize emotional intelligence and empathy. However, designers must be mindful to avoid overhumanizing AI, which may provoke discomfort or the uncanny valley effect, particularly among older adults less familiar with digital technologies. This indicates that those responsible for the creation of AI systems should consider the necessity for differentiated design approaches when developing systems for use by various demographic groups. For older consumers, who may find comfort in the empathatic qualities of AI, it would be advisable to emphasise emotional intelligence and social presence in the design. Conversely, younger consumers, who are more skeptical of AI's human-like traits, may prefer a more functional and transparent approach. This would entail a clear communication of the AI's capabilities and limitations, without an excessive emphasis on human-like qualities. The design of AI systems that can modify their interaction style in accordance with the consumer's age, experience with technology and cultural background has the potential to result in more personalised and comfortable consumer experiences. AI systems that can adjust their interaction style based on age and technological familiarity may be crucial for

overcoming the uncanny valley effect and creating more comfortable and personalized experiences across diverse demographic groups.

Conclusions

The research illuminates the complex and subtle ways in which emotional intelligence is interpreted and experienced across demographic groups. The findings indicate that older adults are more likely to perceive AI as human-like and empathatic, whereas younger consumers tend to be more skeptical, recognizing the responses as algorithmically driven. This finding contributes to the growing body of literature on the uncanny valley effect, suggesting that while AI's human-like qualities can enhance interaction, they may also induce discomfort, especially among older consumers. Furthermore, the study emphasizes the importance of ongoing research into the ethical implications of AI, particularly regarding data privacy and the anthropomorphizing process of AI systems (Kwon *et al.*, 2020). Understanding the adoption intention of AI through the ethics lens, the findings suggest a need for further research to elucidate the impact of these perceptions on usage and long-term acceptance of AI technologies.

The research indicates that integrating emotional intelligence into AI has the potential to markedly enhance consumer engagement, which aligns with social presence theory and the concept of anthropomorphism. However, the study also identifies potential challenges, including the risk of consumer discomfort due to the creation of AI that is perceived as overly human-like, it is recommended that these factors be considered by those engaged in the design of AI systems, with a view to ensuring that emotional responses are carefully calibrated in order to avoid the occurrence of the uncanny valley effect. The study prompts the consideration of significant inquiries pertaining to the impact of perceptions of AI's emotional intelligence on its long-term acceptance and utilization. For older consumers, the favorable perception of AI's empathy may encourage sustained interaction, but only if the phenomenon known as the uncanny valley is avoided (Mori *et al.*, 2012). Nevertheless, younger consumers may be more inclined to disengage if they perceive AI as overly scripted or lacking in authenticity.

Limitation and future research

However, it is important to note that the study has some limitations. The sample size of 15 participants, though appropriate for qualitative analysis, limits the ability to generalize the findings to the broader population. Future research could build upon these insights by employing larger and more diverse samples to enhance the robustness of the data. Focusing primarily on age allowed us to delve into generational differences; however, it may have overlooked other significant variables such as gender, cultural background and technological experience that shape and moderate perceptions of ChatGPT. A focus on age alone may result in the omission of other significant variables, such as familiarity with technology and educational level. Moreover, the study could not examine how perceptions may change over time as consumers become more acquainted with AI. Additionally, as the study concentrated on the audio feature of ChatGPT, it may not fully capture the experiences of consumers who engage with the platform through text-based communication. Exploring multiple interaction modalities could enrich the findings.

Furthermore, the study does not consider the potential influence of cultural differences on perceptions of AI's emotional characteristics. Cross-cultural studies could facilitate a more profound understanding of the way diverse cultural contexts shape the perception and acceptance of AI (Li *et al.*, 2010). Such research would be of great value to those working to develop AI systems that can cater to a global audience with varying cultural sensitivities towards emotional intelligence, empathy and the human-likeness of AI interactions. An expansion of the study would allow for a more in-depth investigation of the ethical implications of AI, particularly in relation to cultural differences such as those according to Hofstede (2009),

focusing, for example, on privacy expectations and social norms. In some cultures, the disclosure of personal data to AI systems may be viewed as more acceptable than in others, with the potential for such actions to be perceived as a violation of privacy, it is of the utmost importance to gain an understanding of these differences to develop ethical AI systems that align with local values and legal frameworks. Moreover, cultural variations in the perception of empathy and emotional intelligence may influence the social role of AI in different societies, in some cultures, AI may be regarded as a beneficial instrument for mitigating loneliness and augmenting social presence. Conversely, in other cultures, it may be perceived as an inadequate substitute for genuine human interaction. It is, therefore, imperative that these cultural perceptions are addressed to guarantee the ethical design and social acceptance of AI systems in a multitude of contexts. Furthermore, comparing ChatGPT with other AI models like Google Gemini or Llama could also yield deeper insights into anthropomorphism and emotional intelligence across different platforms. These limitations highlight the necessity for a quantitative approach (with a larger and more diverse sample) to gain a more comprehensive understanding of perceptions of AI.

Additionally, one further limitation of this study is the uniformity in the emotional tone of the responses provided by ChatGPT. The AI consistently presented positive, harmonious and empathatic responses, which may not fully reflect the complexities of human interactions. While some people naturally lean towards using positive emotions in their communications, it is rare for interactions to remain entirely positive or harmonious, as they may also include negative emotions or disagreements. Future research could explore the effects of interacting with an AI that always presents positive and supportive responses versus one that challenges users or presents more controversial opinions, investigating how consumers react to such varied emotional tones from AI—whether they feel more engaged, more skeptical, or even uncomfortable—could provide insights into how AI systems should be designed to handle complex emotional exchanges and offer more dynamic, less one-sided interactions. Understanding how different user groups (e.g., older adults, younger consumers) respond to such AI behaviour could further refine AI's role in sensitive domains like healthcare and elderly care. Also, further research is required to investigate the way these initial perceptions of AI's emotional intelligence change over time, it would be interesting to ascertain whether older adults are more likely to rely on AI for emotional support in the long term, or whether the initial fascination with the technology wears off as the uncanny valley effect becomes more pronounced. Similarly, it would be beneficial to ascertain how the expectations of younger consumers of AI evolve over time and what role these expectations play in the sustained use of AI systems (Prensky, 2001)

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

The relationship between trust and loyalty, and example from the banking sector

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Abstract. In business, trust between parties is important. Each party must be able to trust others, as business relationships would likely suffer otherwise. The main goal of this study is to explore the current state of trust in Icelandic banks, the impact of the 2008 banking collapse, and how changes in trust have affected customer loyalty to banks. This research is based on 16 quantitative surveys that evaluated banks' images, with trust being one of the key attributes assessed. The surveys were conducted annually from 2006 to 2019 and then again in 2021 and 2023. In total, 10,245 responses (640 per year on average) were gathered. The results show that before the banking collapse in the fall of 2008, banks were perceived as having positive attributes, such as trust and social responsibility, and the association between banks and negative attributes, such as corruption, was weak. However, this trend shifted after the collapse as banks became more closely associated with corruption, and trust in banks decreased. The findings also indicate a strong relationship between trust and loyalty, indicating that trust is a complex phenomenon and that rebuilding lost trust takes time.

Keywords: Image; reputation; quality, performance; banks

Introduction

In the first decade of this century, the Icelandic banking system grew rapidly, reaching 10 times the Iceland's GDP by the end of 2007 (The Icelandic National Audit Office, 2009). In the fall of 2008, a major change occurred, as the three largest banks – Íslandsbanki (at that time, Glitnir), Arion Banki (at the time, Kaupthing), and Landsbankinn – had gone bankrupt in just a few days. Together, these banks held the most savings and loans in Iceland and were responsible for around 85% of all assets in the banking system (The Icelandic National Audit Office, 2009). The remaining 15% was largely held by small savings and loan firms, which later also went bankrupt and were taken over by the restored state-owned banks. Therefore, following the banking collapse, almost the entire financial system came under state ownership. The consequences were serious for the public and the economic system (Páll Hreinsson *et al.*, 2008), but the banks faced especially severe consequences, for example, in terms of trust. After the bank collapse respondents strongly associated banks with the image attribute corruption. Despite this negative trend in trust, the proportion of people who switched banks after the collapse compared to before the collapse remained stable, at 5–8%. The most common explanation for this was that banking services were homogeneous, and that the entire

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banking system had gone bankrupt. However, research suggests that customers are likely to associate “their” banks more strongly with trust than others, which could also explain the reluctance to switch banks (Gudlaugsson, 2017).

Trust

Much of human interaction is based on trust, which can be based on many factors, such as confidence, credibility, individual actions, and uncertainty (Robbins, 2016). Despite its importance in everyday life, it took some time for academia to focus on it. Initially, trust had a narrow definition and was often cited as a behavior (Deutsch, 1958, 1960) or personality trait (Rotter, 1967, 1980). Later, research began focusing on linking risk and trust (Freudenburg, 1993) while examining trust in the context of risk and management (Earle & Cvetkovich, 1997; Earle, 2010; Earle & Sigrist, 2008). Trusting another person or organization always involves some risk; therefore, it is natural to view trust and risk as related phenomena (Mayer *et al.*, 1995). Similarly, distrust can involve risks, as it can signal the existence of business opportunities that have not been taken advantage of, and the effort to ensure that an individual or organization is worthy of trust can entail costs for the person who bears the distrust (Hardin, 1998; Mayer *et al.*, 1995). Research shows a strong relationship between trust and convictions or assurance (Earle & Siegrist, 2006; Siegrist *et al.*, 2003). However, it is important to distinguish between these concepts, as trust relates to individuals and their actions and intentions, while conviction or assurance relates to organizations that do not intend to act or not act. Trust is directed at the individuals responsible for the organization and, therefore, is not inherently trust (Siegrist, 2021).

Trust and banks

Trust in banks and financial institutions is generally considered important for efficiency, although Fungáčová *et al.* (2019) point out that little is known about what determines trust in banks. They state that women appear to have more trust in banks than men, with trust increasing with increasing income but decreasing with increasing age and higher education. Boatright (2011) identified that almost nobody questions the importance of trust and integrity for financial activities and that there is no consensus on what these concepts mean. Jarvinen (2014) examined trust in banks in 29 European countries and found that the banking collapse shed particular light on the importance of trust in banks, but it is important to remember that trust is also important at other times. However, Gritten (2011) points out that in this context, the banking collapse caused a fundamental reversal in the aftermath of the collapse, which had adverse consequences; thus, trust is even more important for managers than before. Armstrong (2012) argues that trust in financial transactions is important when various commercial agreements are pending and negotiation costs are too high.

Thus, trust is a party's belief that another party will not exploit its position to achieve its interests at the expense of the other. This is a fundamental issue for those who rely on banking transactions, and the banking collapse has created turmoil. In this context, Eysteinnsson and Gudlaugsson (2013) examined factors that could predict forgiveness, while previous research by Xie & Peng (2009) indicated that forgiveness was one of the most important prerequisites for building trust after it had been lost (also see Gudlaugsson & Eysteinnsson, 2013). Results have shown that six factors explained almost 80% of the variance in forgiveness, with the “belief that the bank will meet customers' expectations” having the greatest weight ($\beta = 0.31$). Therefore, as Xie & Peng (2009) found, the key concepts in gaining forgiveness are expectation management, honesty, and respect.

Trust, loyalty and banks

Loyalty is an important marketing concept, especially when the goal is to build a strong brand (Helgesen & Nasset, 2007; Zeithaml *et al.*, 2024; Zinkham, 2002). The importance lies in the fact that loyal customers represent value and that it is usually cheaper to retain existing customers than to acquire new ones (Kotler

et al., 2022; Zeithaml *et al.*, 2024). Loyalty can be defined in various ways, such as behaviorally (Keiningham *et al.*, 2008) or attitudinally (Boulding *et al.*, 1993; Helgesen & Nasset, 2007). Behavioral loyalty focuses on repeat purchases of a product or service, but the problem with this concept is that the reason for repeat purchases may be that other options are unavailable (Ozimek, 2003; Reichheld, 2003). In other words, customers are “stuck” in doing business with certain parties and are not truly loyal. Attitude-based loyalty considers an individual’s willingness to recommend a product or service to others when asked how well or poorly the person likes the brand and how likely or unlikely the person believes he or she will discontinue or continue business in the future (see, for example, Akhgary *et al.*, 2018). A common method to assess attitude-based loyalty is the Net Promoter Score (NPS), introduced by Reichheld (2003), but this method has been criticized by academics. For example, Hayes (1998, 2008, 2013) criticized the NPS based on Reichheld’s (2003) argument that a single question can be a good measure of loyalty and growth. Furthermore, Keiningham *et al.* (2008) point out that the NPS is too simple for assessing the complex relationship between loyalty and growth. However, the NPS is widely used in various organizations due to its simplicity. Fungáčová *et al.* (2019) argue that various demographic factors, such as gender, age, and education, can explain variations in bank loyalty. This relates to behavior-based loyalty (i.e., whether people switch banks). Research shows that mobility between service providers is lower than in contexts involving tangible products (Zeithaml *et al.*, 2024), and therefore, it is more useful to examine attitudinal loyalty than behavioral loyalty in services (Haeys, 1998, 2008, 2013).

Research questions

This study examines how trust in banks has developed since 2006 and whether there is a connection between trust and loyalty. The following research questions were posed: (i) How have the image attributes of trust and corruption developed from 2006 to 2023?; (ii) What is the relationship between trust and loyalty (measured as the likelihood of switching banks in the next six months)?

Methodology

This chapter explains how the research was conducted and how the data was processed and presented in the results section.

Preparation and implementation

The study is based on 16 online surveys conducted in the same manner in February and March each year. The surveys were conducted annually from 2006 to 2019 and every other year thereafter. Data from 2021 and 2023 is also used in the study. The differences between the surveys were insignificant, but all of them examined the images of the banks being assessed. The same basic attributes were used in all years. In 2021 and 2023, attitudes towards service quality were also measured, and the number of image attributes was reduced. Respondents were also asked throughout the years how likely they were to change banks in the next six months. This question was used as a measure of loyalty. Convenience sampling was employed in all cases, with the data weighted based on the gender and age of the population.

Population, sample, and data analysis

The population in this study are bank customers in Iceland. Table 1 shows the total number of valid responses from the sample.

TABLE 1 - The total number of valid responses

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2021	2023
Number of responses	661	916	512	572	541	533	800	564	368	889	611	816	821	521	480	640
Proportion of women	72,0%	69,0%	68,4%	71,6%	72,4%	69,2%	66,5%	63,3%	59,8%	60,6%	48,3%	46,9%	51,3%	69,5%	64,6%	57,5%
Proportion of < 30 years old	63,7%	61,9%	55,9%	56,4%	50,1%	48,5%	49,2%	35,7%	56,9%	29,5%	23,6%	18,6%	25,6%	58,2%	23,3%	42,5%

TABLE 2 - An example of how weighting factors were calculated

	Population		Sample		Weighting factors	
	Male (1)	Female (2)	Male (1)	Female (2)	Male (1)	Female (2)
18-24 years old (1)	7,8%	7,4%	10,3%	26,7%	0,75	0,28
25-29 years old (2)	5,8%	5,5%	9,7%	17,0%	0,59	0,32
30-39 years old (3)	11,2%	10,3%	4,6%	17,5%	2,44	0,59
40-70 years old (4)	26,7%	25,4%	3,3%	10,8%	8,09	2,35

Table 1 shows that the number of valid responses varies years, between 368 and 916. The total number of valid responses was 10,245. Table 1 also shows that in most cases, the sample was skewed compared to the population in terms of age and gender. This was addressed by weighting the data based on gender and age, assuming that the sample reflected the gender and age of the population aged 18–70 at the time of the measurement (Statistics Iceland, ed.). Table 2 shows an example of how weighting factors were calculated and used based on these assumptions for one year. The calculation is different for each year, as this ensures that no single group (e.g., young women) skews the results based on the population’s attitude. In all cases, weighted data was used in statistical processing as needed.

The results for the development of the image attributes trust (and corruption) from 2006–2023 are highlighted based on the average score of each image attribute for the years in which the measurement was taken. The relationship between trust and loyalty (based on how likely or unlikely a respondent thought they were to switch banks in the next six months) was assessed based on responses on a 5-point scale, with 1 representing “very unlikely” and 5 indicating “very likely.” Specifically, we assessed the development of the proportion of respondents who gave responses of 4 or 5.

Results

This chapter starts by outlining how trust and corruption developed. It then analyzes the relationship between trust and loyalty. Figure 1 shows how perceived trust and corruption developed from 2006 to 2023. The vertical line represents October 2008 and marks the economic collapse that occurred when the banks went bankrupt.

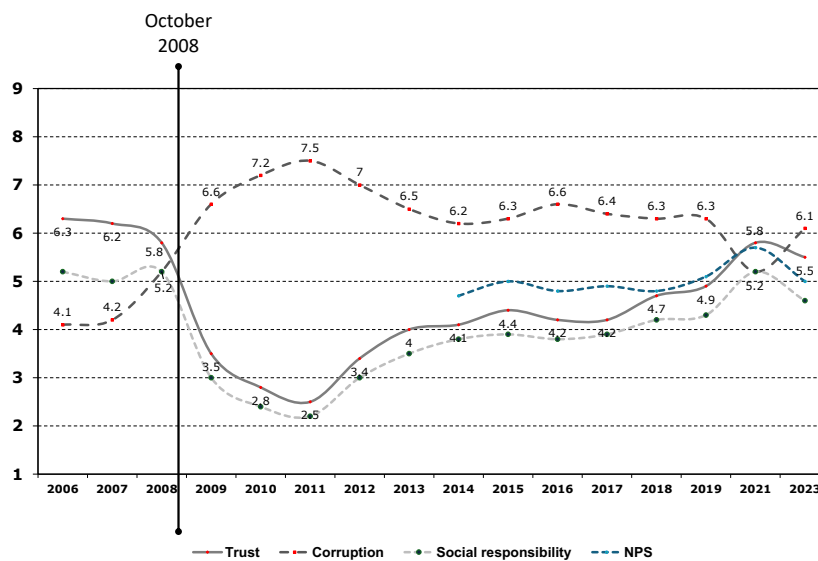


FIGURE 1 - Development of trust from 2006 to 2023

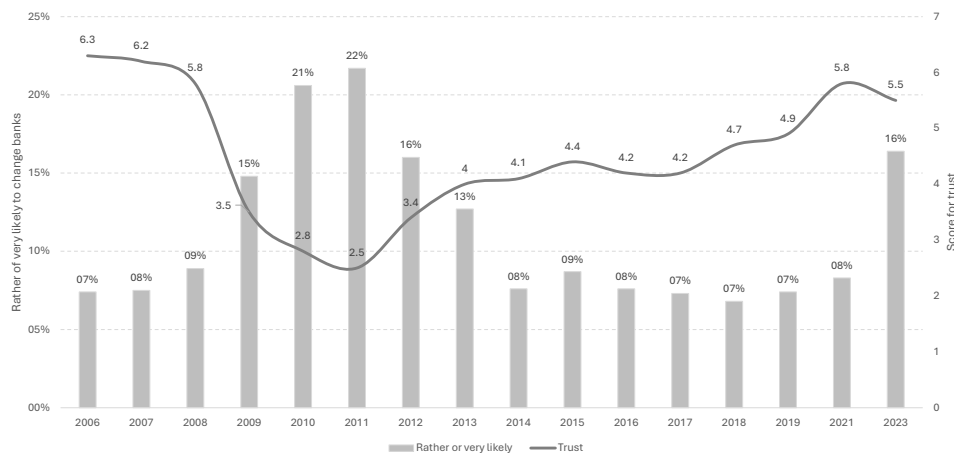


FIGURE 2 - Development trust and the proportion of non-loyal customers

Before the economic collapse, banks were associated with trust and had a weak connection to corruption. In February 2009, the connection with trust weakened significantly and continued to do so in 2010 and 2011 before beginning to strengthen. In 2021, banks' connection with trust was stronger than the connection with corruption for the first time since the collapse. However, the numerical value was lower than before the crash, and in 2023, trust in banks weakened again.

Figure 2 shows the development of trust and the proportion of non-loyal customers (i.e., those who believe they are likely or very likely to change banks in the next six months). In 2006 and 2007, before the economic collapse, 7.4–8.9% of respondents were non-loyal customers. In the same years, trust was measured as high (5.8–6.3 on a 9-point scale).

In 2009, the year immediately following the collapse, the ratio of non-loyal customers rose to 14.8%, and the average trust score dropped to 3.5. This trend essentially remained the same throughout the rest of the study period. That is, as trust in banks weakened, the proportion of non-loyal customers increased, and vice versa. Pearson correlation calculations show a strong (Pallant, 2020) and negative correlation ($r = -0.67$) between trust and non-loyal bank customers.

Discussion and conclusions

This study sought to explain the development of the image attribute trust from 2006 to 2023 and explore the relationship between trust and loyalty. Research shows that the relationship between these factors is generally strong (Zeithaml *et al.*, 2024). The current findings show that before the economic collapse in 2008, banks enjoyed trust, while their connection to corruption was weak (see Figure 1). Immediately after the collapse, trust in banks weakened and perceptions of corruption strengthened. Correlation calculations show an almost perfect negative relationship between trust and corruption ($r = -0.93$). This is unsurprising and corroborates the results of Toader *et al.* (2018). However, they examined the relationship in Eastern European banks, whereas the present study examined this relationship in the Icelandic banking industry.

The results also show a strong negative relationship between trust and the likelihood of switching banks. This finding is consistent with existing research (e.g., Albarq, 2023; Chai *et al.*, 2015; Mosavi *et al.*, 2012). The results indicate that although relatively few people switch banks annually, many people do consider it, suggesting that as it becomes easier to switch banks, people will become more likely to do so. The main theoretical contribution of this study is that it demonstrates a strong negative relationship between trust and perceptions of corruption among banking customers. The results also show a strong positive relationship between trust and loyalty.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Retailer strategies and suboptimal food: a systematic literature review on the impact on food waste reduction

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Abstract. Worldwide, approximately one-third of the food produced for human consumption is wasted every year. Although reducing this unnecessary waste of food represents a crucial step towards overcoming global issues of food waste, hunger and climate change, academic and societal awareness of the problem has only developed during the last years. Despite generating only a small fraction of total food waste, retailers are in a strong position to influence food waste management across the entire supply chain. Huang *et al.*, (2021) found that most reported food waste management practices focus on ‘reuse’. Food unsold in store is reused in a variety of ways, including donating to charities, resell through specialist platforms/stores and reusing for staff. We focus on the commercialization of suboptimal food. i.e. products with cosmetic defects but still safe to consume (Ascherman-Witzel *et al.*, 2015). Next to several strategies in-store (such as selling products close to the expiry date with a discount), online options to reposition the product offering and achieve true sustainable value are gaining traction, including food waste-reducing platforms, click-and-collect services selling safe food gathered from supermarkets and subscription box services. Although these initiatives constitute a promising lever to tackle food waste, more research is needed to understand the main barriers and challenges to their adoption and implementation and, most importantly, the actual effects they exert on the reduction of food waste. Therefore, this study employs a systematic literature review to answer the following questions: (1) What are the main strategies of retailers to deal with suboptimal food?, (2) what are consumers’ responses to these initiatives? and (3) how do these approaches impact the amount of food waste in households?

Keywords : suboptimal food; food waste; retailer strategies; systematic literature review

Introduction

In 2015, the United Nations established 17 Sustainable Development Goals (SDGs), including SDG12.3, which aims to halve per capita global food waste at the retail and consumer levels by 2030 and reduce food losses along the production and supply chain (United Nations Development Programme, 2015). Despite this global commitment, food waste remains a critical issue. In 2022, approximately 1 billion meals of edible food are wasted daily, while 783 million people face hunger. Of this wasted food, 19% occurs at the retail stage and 60% at the household level (United Nations, 2024). In the literature, consumer reluctance to

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purchase suboptimal food (SF) is acknowledged as a major contributor to food waste. SF refers to edible food that does not meet cosmetic standards (e.g. irregular shape, size, or color), is close to or past its best-before date, or has damaged packaging (Aschemann-Witzel *et al.*, 2015; Bunn *et al.*, 1990; de Hooge *et al.*, 2017; White *et al.*, 2016). Without intervention, such food is often discarded despite being safe for consumption. To combat food loss and waste, increasing the accessibility of SF and enhancing consumers' adoption is vital. In this respect, both monetary and non-monetary strategies are used. Non-monetary approaches include donating SF to charities, while monetary strategies involve remarketing SF at discounted prices (Sedlmeier *et al.*, 2019). This study focuses on the monetary approach, as B2C retailers play a crucial role in influencing consumer behavior (Aschemann-Witzel *et al.*, 2020). Additionally, monetizing SF benefits farmers and food producers by reducing waste while increasing profitability (Hezarkhani *et al.*, 2023). The promotion of SF has the potential to trigger consumers' awareness to reduce household food waste and eventually mitigate climate change. However, there is a lack of a holistic understanding of the commercialization of SF and its impact on waste behavior (Hartmann *et al.*, 2021). To fill the gap, this study aims to carry out a systematic literature review to answer four research questions: (1) What are the strategies that retailers (can) use to commercialize SF? (2) How do these strategies impact food waste? (3) What methods have been used to study the relationship between SF commercialization and food waste? (4) What are the current research gaps in commercializing SF and the impact on food waste?

Methodology

This study employs a systematic literature review (SLR) to address the research questions, as it offers a rigorous, transparent and replicable approach that helps minimize bias and error (Tranfield *et al.*, 2003). The review process follows the guidelines outlined by Tranfield *et al.* (2003), encompassing three key stages: planning the review, conducting the review and reporting and disseminating the findings. Additionally, the PRISMA 2020 Statement Flow Diagram is utilized to ensure a structured and detailed examination of the review process (Page *et al.*, 2021). To identify relevant academic literature, we employed Scopus as the primary database, given its comprehensive coverage of the business and social sciences domains. Scopus was selected for its breadth and for its regular evaluation of indexed journals, which helps ensure consistent quality standards (e.g., annual journal reviews). To enhance the completeness of our search and avoid missing relevant contributions, we also replicated the search in the Web of Science (WoS) database. We applied filters to include only English-language documents and restricted the scope to peer-reviewed journal articles to ensure academic rigor. No restrictions were placed on the year of publication, as our goal was to capture contributions across all time periods relevant to the topic. The search was based on a set of principal keywords – suboptimal food, food waste and retail – combined with relevant synonyms. The final query returned 1,669 results from Scopus and 119 from WoS†. The selection of studies followed a two-stage screening process (see Figure 1). In the first stage, we removed 107 duplicate records, followed by the exclusion of 481 documents that did not meet our initial screening criteria. The remaining 1200 articles were then screened based on title, keywords and abstract, resulting in the exclusion of an additional 976 papers that were outside the scope of this review, based on predefined inclusion and exclusion criteria. In the second stage, we conducted a full-text review of the remaining 219 studies, of which 106 were excluded due to lack of relevance (Figure 1).

To ensure the reliability of the selection process, the second author reviewed 10% of the articles at each stage. Cohen's Kappa was calculated to assess inter-rater agreement and validate the consistency of the screening process.

† (((suboptimal OR ugly OR imperfect) AND (food OR product* OR produce)) AND (retail* OR supermarket OR supply chain OR shop OR sell* OR store OR market OR commerce OR grocer*)) AND (food wast* reduc* OR food wast* prevent* OR food surplus* OR food loss OR food wast* OR save food))

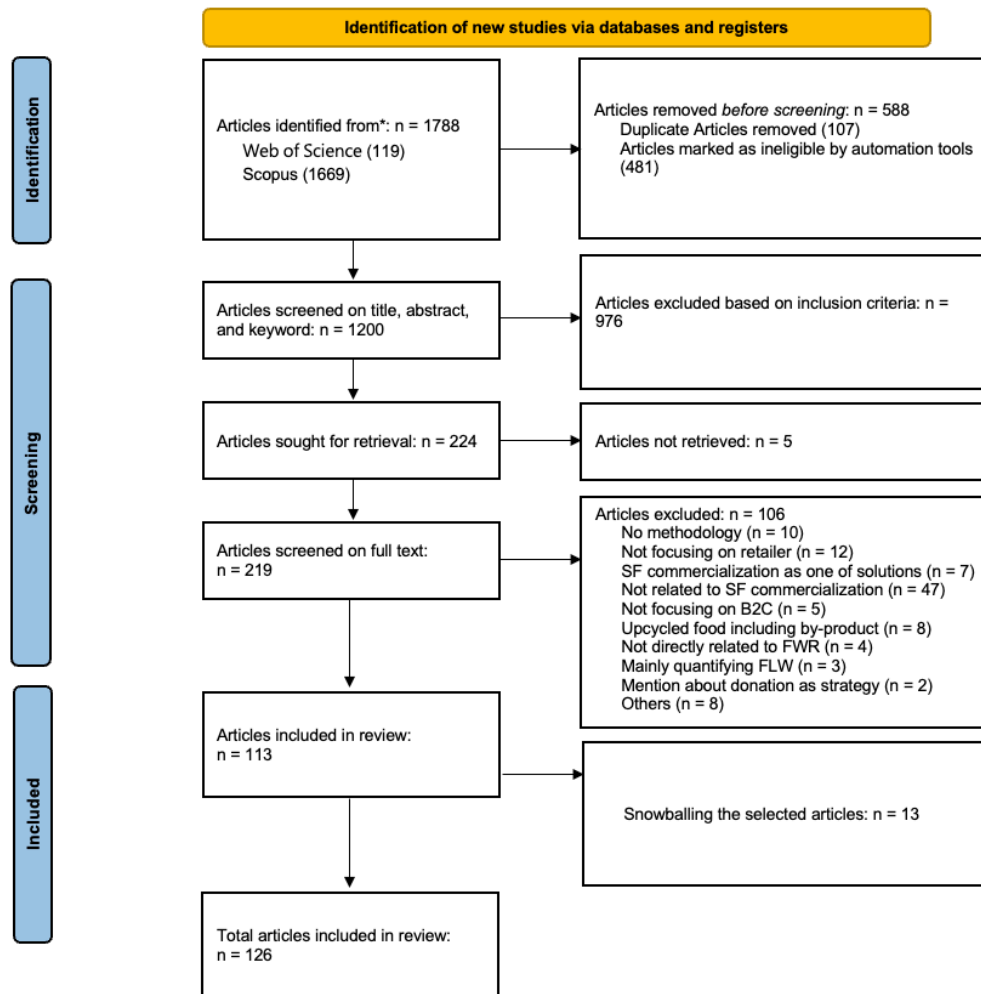


FIGURE 1 – PRISMA figure of the conducted review. Source: own compilation

Finally, a snowballing technique was applied to the reference lists of the remaining 113 articles, yielding 13 additional relevant papers. The final dataset comprised 126 articles, which were analyzed using NVivo 14. An inductive thematic analysis was conducted to identify strategies for promoting SF and the research methods employed. Additionally, a deductive thematic analysis was used to determine whether the articles assessed the impact of SF commercialization on food waste (FW), specifically on the retail or household level. Descriptive information – such as year of publication, Journal name and geographical focus – was also categorized.

Results

Characteristics of the reviewed papers

The reviewed publications span from 2005 to 2025, though there is a ten-year gap following the initial publication in 2005. A continuous stream of publications only begins in 2015, with a notable peak between 2021 to 2024. More than half of the included studies were published in the last four years, indicating growing scholarly attention towards the commercialization of SF and food waste. Of the journals represented in the selected articles, *Food Quality* and *Preference* had the highest number of publications, with 22 articles selected.

In terms of research methods, quantitative approaches dominate the literature, followed by qualitative methods, multi-method studies incorporating quantitative techniques and mixed-method designs. Within the quantitative category, experiments are the most frequently employed method, followed by surveys. In

qualitative research, case studies, focus groups and systematic literature reviews are most used. Regarding the geographical context of data collection, cross-country studies are the most prevalent, followed by research conducted in the United States, China and Taiwan. In contrast, there is a notable absence of studies focusing on Africa and Eastern Europe.

Strategies to promote SF

The SLR identified several key strategies retailers use to promote the commercialization of SF. These strategies are presented in order of prominence in the literature, reflecting the frequency with which they are addressed across the analyzed studies. Most extensively discussed is the role of communication, particularly in raising consumer awareness about the environmental impact of food waste and the safety and edibility of SF (Ammann *et al.*, 2025; de Hooge *et al.*, 2022; Tufail *et al.*, 2022). Educational storytelling, positive framing (e.g., emphasizing healthiness or naturalness) and practical guidance such as storage tips or recipes have been shown to increase consumer acceptance (Aschemann-Witzel, 2018; Yuan *et al.*, 2019). In-store visual cues – like anthropomorphic packaging and humanized labels – can further enhance purchase intentions, even without price incentives (Ammann *et al.*, 2025; Koo *et al.*, 2019).

Pricing strategies are also widely recognized as effective in improving SF uptake, especially when targeted at price-sensitive consumers or larger households (Aschemann-Witzel *et al.*, 2020; Giordano *et al.*, 2019; Gustavo *et al.*, 2021; Su *et al.*, 2023). However, the level of discount should align with the severity of product imperfections to avoid triggering negative quality perceptions. Some studies also point to the potential of dynamic pricing to reduce food waste (Adenso-Díaz *et al.*, 2017; Kayikci *et al.*, 2022).

Sales channels play an important role in normalizing SF (Adel *et al.*, 2021). Visibility in mainstream retail spaces, integration with communication tactics and dedicated SF outlets all help reduce the negative perception of SF and increase willingness to pay (Adel *et al.*, 2022; Cooremans & Geuens, 2019; Makhal *et al.*, 2020). Diversifying the form in which SF is sold also contributes to overcoming visual or quality concerns. SF can be transformed into processed items like soups or juices, sold via subscription or blind boxes, bundled with standard items, or presented in visually appealing packaging – all of which help reduce the salience of suboptimality (Bolos *et al.*, 2021; Cooremans & Geuens, 2019; de Hooge *et al.*, 2018; Spielmann *et al.*, 2024). Tailoring strategies to specific consumer segments – such as environmentally conscious individuals, younger shoppers, or families – can enhance the effectiveness (Bolos *et al.*, 2022; Lim *et al.*, 2023; Makhal *et al.*, 2020). Finally, leveraging technology and digital platforms enables wider outreach, with online communities, user-friendly apps and influencer marketing on social media serving as promising tools (Corsini *et al.*, 2023; Ma & Chang, 2024).

Impact on food waste

Among the 126 studies reviewed, only 10 empirically examined the impact of SF promotion on actual food waste. With regard to household food waste a review by Tsalis *et al.* (2021) found no scientific consensus on the assumption that price promotions lead to increased waste. Only four studies specifically measure household food waste: three relied on self-reported survey data (Aschemann-Witzel *et al.*, 2017; 2018; Zhang *et al.*, 2023), while one employed a more direct method, combining a food diary with a balance scale to quantify waste (Giordano *et al.*, 2019). Across these studies, there was no evidence supporting the assumption that the promotion or purchase of SF leads to lower household food waste.

In terms of retail food waste, five articles investigated the impact of SF strategies. One study analyzed real-world data (Ribeiro *et al.*, 2018), reporting that sales of imperfect fruits and vegetables helped avoid 600 tonnes of waste in Lisbon and Porto over a four-year period. The remaining four studies used simulation models to assess the effects of dynamic pricing (Adenso-Díaz *et al.*, 2017; Kayikci *et al.*, 2022) and two-stage

pricing strategies (Lin & Januardi, 2023; Wu & Honhon, 2023). These modelling studies consistently found that such pricing mechanism can reduce retail food waste while maintaining financial outcomes for retailers.

Research gaps

From the findings of our SLR, we can identify two key observations: (1) The large majority of studies focus on selling ugly fruits and vegetables at reduced prices or labeling food waste information. Circular business models specializing in rescuing and reselling SF, however, have been largely neglected. In such models, consumers can purchase SF items individually or through subscription-based boxes, with orders fulfilled via digital platforms and collected through click-and-collect services or home delivery, such as Happy Hours Market from Belgium or No Waste Army from the Netherlands. (2) The main outcome variables under study are consumers' perceived quality of SF and their willingness to buy such products. Research that measures the impact of SF consumption on household food waste is scarce. These observations reveal three main research gaps that could be addressed by future research.

First, research on SF business models highlights stakeholder collaboration as a key success factor in combating FW. Effective collaboration includes engaging consumers through transparency and a commitment to waste reduction (Ribeiro *et al.*, 2018), fostering broader partnerships across the supply chain and securing government support for FW regulations (Sedlmeier *et al.*, 2019). However, existing studies on stakeholder management in FW mitigation primarily focus on traditional supply chains (Bhattacharya & Fayezi, 2021; Surucu-Balci & Tuna, 2022). There is a gap in understanding how SF business sellers navigate stakeholder relationships to collectively tackle FW.

Second, given the importance of stakeholder collaboration in SF commercialization, innovative business models have emerged to enhance accessibility and consumer adoption of SF. Among these, SF subscription boxes offer a structured way to rescue and redistribute food that would otherwise go to waste. The global subscription box market is rapidly expanding, with a valuation of \$37.5 billion in 2024 and a projected growth of \$116.2 billion by 2033 (IMARC, 2025). Despite the potential of SF subscription boxes, research in this area remains limited. To date, only one study in the US has examined consumer purchase intentions (Suher *et al.*, 2021). A critical gap exists in understanding how to optimize SF box design to enhance consumer adoption.

Third, although SF promotion and consumption are expected to reduce FW, research on their impact at the household level remains scarce, largely due to challenges in accurately measuring FW (van Herpen & van der Lans, 2019). As outlined in Section 3.3, the few studies that measure FW rely on self-reported data, with only one study in Italy using the balance scale method for direct measurement. In addition, buying food – including SF purchases – can be considered a social practice embedded in everyday life (Berg & Henriksson, 2020). According to social practice theory (Shove *et al.*, 2012), behaviors are better explained by people's social, economic and spatial conditions rather than solely by individual attitudes or intentions. This theory is widely applied in sustainability research (Berg & Henriksson, 2020; Larsen, 2017). However, no study has yet applied social practice theory to explore the relationship between SF platform use, consumers' food-related routines and FW behaviors, revealing a critical gap in current research.

Conclusion

This SLR advances understanding of the relationship between the commercialization of SF and its impact on food waste – a connection that remains underexplored in the existing literature. By addressing the research questions, the paper offers a comprehensive overview of the strategies retailers employ (or can adopt) to commercialize SF, examines their effects on food waste at the household and retail levels and

highlights key directions for future research. These insights are valuable for business practitioners, marketers & policymakers seeking to develop effective food waste reduction initiatives.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Insects on the menu: how changing food consumption behavior can enhance sustainability

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Abstract. The COVID-19 pandemic and geopolitical conflicts have disrupted food systems, reshaping consumer behaviour and increasing interest in sustainable alternatives. Insect-based foods, though highly sustainable and nutritious, face significant acceptance barriers, particularly in Western markets. This study examines how familiarity, disgust and social status influence purchase intention. Findings indicate that familiarity enhances positive attitudes and reduces disgust, thereby increasing willingness to adopt insect-based foods. Moreover, social status moderates disgust's effect, with status-conscious consumers showing greater acceptance. These insights inform marketing and policy strategies aimed at normalizing insect consumption.

Keywords : insect-based foods; consumer acceptance; sustainable food consumption

Introduction

The global impact of the COVID-19 pandemic and the Ukraine-Russia conflict has profoundly affected economies and transformed business practices. The food sector, in particular, has faced significant challenges, including disrupted food categories (Wallnoefer & Riefler, 2022), restricted access due to safety regulations (Hobbs, 2020) and strains on food production, distribution and supply chain resilience (Alabi & Ngwenyama, 2023). These disruptions have also influenced consumer behavior, driven by concerns over price hikes, food waste, stockpiling, safety and packaging (Güney & Sangün, 2021). As these challenges persist, consumers are increasingly prioritizing sustainability and health in their food choices (Sharma *et al.*, 2022; Chen, 2024). This shift reflects a growing awareness of environmental impact and a stronger preference for health and sustainable consumption (Ahn & Shamim, 2022; Gil *et al.*, 2024). The urgency to transition to sustainable food alternatives is heightened by the environmental impact of the meat industry, which contributes significantly to greenhouse gas emissions, deforestation and excessive water use (Poore & Nemecek, 2018). Additionally, climate change continues to exacerbate agricultural vulnerabilities, highlighting the need for more resilient and sustainable food sources (Springmann *et al.*, 2018).

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Onwezen *et al.* (2021) highlight that a key solution for global health and sustainable diets is replacing meat with alternatives such as algae, plant-based and insect-based foods. These alternatives are nutritious, sustainable and environmentally beneficial (da Cunha *et al.*, 2022). Among these alternatives, insect-based food stands out as one of the most promising. It has a minimal environmental footprint, is rich in protein and requires significantly fewer resources than conventional livestock (van Huis, 2020; van Huis & Rumpold, 2023). Also, insects transform what they eat themselves very efficiently in energy, making them a cost-effective choice for improving food security (Dobermann *et al.*, 2017; Niyonsaba *et al.*, 2023). Insect-based foods therefore represent a promising strategy for enhancing sustainability within (global) supply chains, both from a product and process perspective (Lambrechts, 2021). The integration of insect-based foods into global supply chains will have significant consequences for future purchasing and supply management. As demand for sustainable and alternative protein sources grows, procurement strategies and business models will need to change to include insect farming networks, which may require new supplier relationships and regulatory compliance frameworks (Donkor *et al.*, 2023; Van Huis *et al.*, 2021). Therefore, purchasing and supply management must evolve to address the emerging challenges associated with integrating insect-based foods into the supply chain.

Despite the above-mentioned benefits, in Western countries acceptance of insect-based food among consumers remains low and is hindered by reluctance and prejudice (Moruzzo *et al.*, 2021). Research indicates that disgust, negative cultural associations and unfamiliarity play significant roles in rejection (Rozin *et al.*, 2008). However, previous studies also suggest that increasing awareness and familiarity could shift consumer perceptions over time (Koch *et al.*, 2021). While significant research has explored consumer attitudes toward plant-based and lab-grown alternatives (Siegrist & Hartmann, 2020), little is known about how cognitive and emotional barriers influence perceptions of edible insects, particularly in Western markets. Given the urgency of transitioning to sustainable protein sources, a more comprehensive understanding of consumer resistance and acceptance is needed to inform future marketing and supply chain strategies. Therefore, this study seeks to answer the following research questions: How does familiarity with insect-based foods influence consumers' purchase intention? What role do cognitive and emotional barriers play and does social status moderate this effect?

By addressing these questions, the study contributes to the literature on sustainable consumer behavior and provides insights into overcoming psychological barriers to insect consumption. The study aligns with the broader objectives of global sustainability efforts, such as the UN Sustainable Development Goals (UN SDGs, 2022), by promoting food diversity and enhancing sustainable consumption patterns. Understanding the determinants of insect-based food acceptance is crucial for informing public policies, food marketing strategies and educational initiatives aimed at reducing environmental impacts and ensuring global food security (da Cunha *et al.*, 2022).

Literature review and hypotheses

Consumers' willingness to adopt sustainable dietary alternatives is strongly influenced by their awareness and familiarity with such options. Research suggests that individuals are more inclined to try novel foods when they have been exposed to information, highlighting its benefits, including sustainability, nutritional value and ethical considerations (Siegrist & Hartmann, 2020). The food industry has successfully leveraged informational campaigns and product positioning to encourage the adoption of alternative proteins, such as plant-based and lab-grown meats, indicating that similar strategies could be effective in promoting insect-based foods (de Boer & Aiking, 2021). One psychological mechanism that may help explain this phenomenon is the Mere Exposure Effect, which posits that repeated exposure to a stimulus increases familiarity and fosters a more favorable evaluation (Zajonc, 1968). Consistent with this psychological principle, studies have shown that consumers who frequently encounter insect-based foods in retail settings,

media, or restaurant menus become more receptive to the idea of consuming them (La Barbera *et al.*, 2020). Accordingly, this leads to the following hypothesis:

H1: *Familiarity with insect-based foods positively influences purchase intention.*

Consumer attitudes toward novel foods are shaped by a combination of knowledge, social influence and ethical considerations. Attitudes act as a crucial predictor of behavioral intention, as outlined in the Theory of Planned Behavior (Ajzen & Fishbein, 1980). Previous research has consistently shown that positive attitudes toward sustainable food options significantly enhance purchase intention (Wang *et al.*, 2019). Building on this, Cognitive Dissonance Theory (Festinger, 1957) suggests that when consumers are repeatedly exposed to messages highlighting the sustainability and nutritional benefits of insect-based foods, they may experience an internal conflict. To resolve this dissonance, individuals adjust their attitudes to align with their environmental values. Educational interventions and awareness campaigns play a key role in shaping these attitudes, particularly when sustainability is framed as a social responsibility (Verneau *et al.*, 2016). In addition to knowledge and ethical considerations, social norms and peer influence further contribute to shaping consumer attitude. As societal acceptance of insect-based foods grows, normative pressure may encourage individuals to adopt these alternatives, reinforcing the notion that widespread public acceptance can gradually shift consumer behavior (Siegrist & Hartmann, 2020). This results in the following hypothesis:

H2: *Attitude positively mediates the relationship between familiarity with insect-based foods and purchase intention.*

One of the most prominent barriers to the adoption of insect-based foods is the psychological reaction of disgust, which is often culturally ingrained (Rozin *et al.*, 2008). The notion of food-related disgust is linked to perceptions of contamination, uncleanness and lack of familiarity (La Barbera *et al.*, 2020). Studies suggest that these negative emotions are among the strongest deterrents to novel food acceptance, particularly in Western societies, where insect consumption is not traditionally part of the diet (Siegrist & Hartmann, 2020). However, psychological barriers can be overcome through targeted exposure and cognitive reframing. Sensory exposure, such as product sampling, has been shown to reduce disgust over time by normalizing unfamiliar food textures and flavors (Tan *et al.*, 2016). Furthermore, marketing strategies that emphasize cleanliness, culinary sophistication and high nutritional value can help reshape consumer perceptions (House, 2018). Research further indicates that presenting insect-based foods in processed forms (e.g., protein powders, insect flour) rather than as whole insects leads to higher consumer acceptance by minimizing the visual triggers associated with disgust (Gmuer *et al.*, 2016). Additionally, social modeling is important in overcoming psychological resistance. Observing others consuming insect-based foods, has been found to positively influence willingness to try such products (Tan *et al.*, 2016). This gives rise to the following hypothesis:

H3: *Disgust negatively mediates the relationship between familiarity with insect-based foods and purchase intention.*

Social status plays a critical role in the adoption of new food products, as individuals often use consumption choices to signal identity and belonging to a group (Veblen, 1899). Research suggests that individuals who value a higher social status are more likely to engage in behaviors that align with social prestige and perceived moral responsibility, including the adoption of new products (Griskevicius *et al.*, 2010). In line with this, Social Identity Theory (Scheepers & Ellemers, 2019) postulates that consumers actively seek products that reinforce their identity and differentiate them from the general population. For high-status seeking consumers, insect-based foods may symbolize a progressive and environmentally conscious choice, increasing their willingness to overcome initial feelings of disgust (Pozharliev *et al.*, 2023). Consequently, the negative relationship between disgust and willingness to purchase insect-based foods may be weaker for

consumers who highly value social status, as consuming such products allows them to stand out and potentially enhance their social standing. This leads to the following hypothesis:

H4: *Social status negatively moderates (buffers) the negative relationship between disgust and purchase intention, such that the negative association between disgust and purchase intention is weaker for consumers who highly value social status.*

In addition to moderating disgust-related barriers, social status influences the formation of attitudes toward sustainable diets. Research shows that consumers sensitive to higher socio-economic status tend to adopt pro-environmental behaviors at a higher rate than others (Siegrist & Hartmann, 2020). These individuals are often trendsetters in consumption of novel products, particularly when sustainability is positioned as a luxury or ethical issue (Hammad et al., 2019). Marketing studies further highlight the role of exclusivity in shaping consumer preferences, as high-status seeking consumers gravitate toward products that signal innovation and sophistication (Pozharliev et al., 2023). By positioning insect-based foods as a sustainable and forward-thinking choice, brands can appeal to consumers who seek to reinforce their social distinction through purchasing decisions. This results in the following hypothesis:

H5: *Social status positively moderates (strengthens) the positive relationship between attitude and purchase intention, such that the positive association between attitude and purchase intention is stronger for consumers who highly value social status.*

These hypotheses lead to the following conceptual model (Figure 1):

Methodology

Research design

In order to thoroughly investigate the proposed dynamics, a comprehensive survey was conducted in September 2024. Validated scales were used to measure the key constructs of the study. These included disgust toward insect-based foods (La Barbera et al., 2020), attitude toward insect-based foods (Wang et al., 2019), purchase intention (Yazdanpanah & Forouzani, 2015) and social status (Eastman et al., 1999). Each of these constructs has been widely used in previous consumer behavior research, ensuring the robustness and validity of the measures. Disgust toward insect-based foods was assessed through a set of items that capture emotional and cognitive responses, whereas attitude was measured through items reflecting individuals' overall perceptions and evaluations of insect-based foods. Purchase intention was measured by asking respondents to indicate their likelihood of purchasing insect-based products in various contexts.

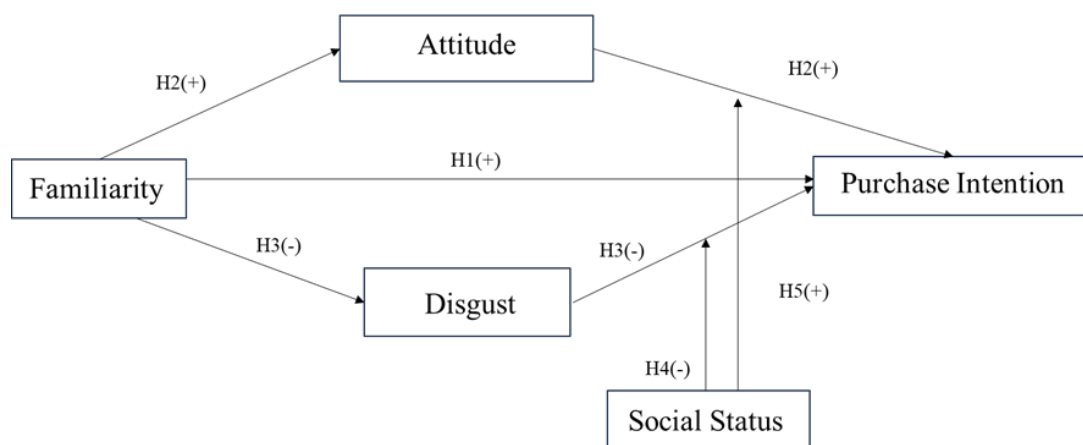


FIGURE 1 – Conceptual model

Additionally, social status was evaluated using a scale that considers both subjective and objective measures of perceived status within society. Awareness of the existence of insect-based foods was assessed using a single-item question that asked respondents to rate their level of familiarity with such foods. All items were rated on a 5-point Likert scale, allowing for a nuanced understanding of respondents' attitudes and perceptions. The higher scores indicated more positive evaluations and lower scores reflected negative responses. Prior to the main study, a small-scale pilot study was conducted with ten respondents who were not included in the final survey. The purpose of this pretest was to ensure that the online questionnaire was clear, user-friendly and free from ambiguities that could compromise the reliability of the data. Feedback from the pretest was used to refine the questionnaire and make necessary adjustments before the final survey was launched.

Sample

The large-scale survey targeted a diverse group of 1,000 Dutch participants, aiming to capture a broad spectrum of perspectives across various demographic segments. A total of 491 male and 509 female respondents, aged between 18 and 88 years, were carefully recruited through a reputable market research agency. This approach ensured that the sample represented a balanced cross-section of the Dutch population, with participants coming from all 12 provinces of the Netherlands. Potential respondents were contacted via email, where they were informed about the purpose of the research and assured that their responses would remain anonymous. This recruitment method helped secure a diverse and representative sample, thereby enhancing the generalizability of the findings.

Results

Familiarity emerged as a critical factor in promoting the acceptance of insect-based foods. Specifically, familiarity indirectly influenced purchase intention through two key psychological pathways: attitude and disgust. Participants who were more aware of the existence and potential benefits of insect-based foods tended to have a more positive attitude towards these products ($b = 0.26, p < .001$), which in turn enhanced their purchase intention ($b = 0.54, p < .001$). These findings align with previous studies indicating that exposure to novel food items and information about their benefits can shape consumer attitudes and reduce hesitancy in adopting new dietary practices (Verbeke, 2015). In addition, respondents with greater awareness of insect-based foods reported lower levels of disgust ($b = -0.44, p < .001$), supporting the idea that education and exposure can mitigate psychological barriers such as neophobia and food disgust sensitivity. Importantly, lower levels of disgust were significantly associated with higher purchase intention ($b = -0.17, p < .001$). This result suggests that disgust is a major psychological barrier to insect consumption, as previously indicated by Rozin *et al.* (2008) and that increasing awareness can help overcome this aversion. However, it is noteworthy that awareness - through both pathways - did not have a direct effect on purchase intention, meaning that its influence was fully mediated through attitude and disgust. The results also indicated that social status moderates the relationship between disgust and purchase intention ($CI[-0.04, -0.002], p < .05$). Specifically, for individuals who highly value social status, the negative impact of disgust on purchase intention was weaker. This suggests that status-oriented consumers may be more willing to overlook their initial feelings of disgust in favor of embracing insect-based foods as a trendy, innovative, or environmentally conscious choice. Research in consumer behavior supports this finding, suggesting that status-seeking individuals are more likely to adopt novel products when they provide an opportunity for differentiation and signaling social distinction (Griskevicius *et al.*, 2010).

Conclusions and discussion

These findings show that consumer value preferences towards insect-based foods can bring important changes to our food systems and supply chains. As insect-based foods offer substantial advantages in terms

of sustainability, resource efficiency and protein availability, their acceptance could contribute to addressing global challenges such as food security and environmental sustainability (van Huis, 2020). Strategies aimed at highlighting the environmental and health benefits of insect-based foods - such as their lower greenhouse gas emissions, reduced water and land usage and high nutritional value - can build positive attitudes and reduce resistance of both producers and consumers, increasing the visibility and normalization of insect-based foods can facilitate greater consumer acceptance. This can be achieved by featuring them more in the media, incorporating them into familiar recipes and having trusted figures like chefs or health experts promote them. These strategies help reduce hesitation and enhance consumers' willingness to try insect-based foods. Additionally, presenting insect consumption as an innovative and status-enhancing choice can appeal to those who want to stand out or demonstrate their commitment to sustainability. As early adopters and influencers embrace these products, they can inspire broader societal acceptance, paving the way for mainstream adoption.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Food banks, food waste and retail: food disposal systems using Germany as an example

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Abstract. At the heart of the rescue of food are so-called food banks, which have developed into an indispensable addition to social security with their nationwide distribution points for needy households. In fact, the food banks are not the end of the food chain. Not only do they have to deal with various sources of donations from retailers and wholesalers, product peculiarities and the acceptance of product issues by their customers, but also with food that is no longer suitable for human consumption. Food banks are part of a complex network consisting of donors and incoming food as well as food bank users and outgoing food. Food bank users act not only as recipients of donations within the food bank complex but also as private households that can demonstrate a conspicuous approach to food in the form of purchasing behavior, attitudes, expertise, interest and practices in the use and preparation of food. What sources of donors and users are associated with food banks in a network and what are the consequences of this? What structural problems from food production and marketing are reflected in these donations? What problems do food banks themselves and their customers have in using donated goods? What solutions do donors pursue in order to minimize their own write-offs and their donations? Expert interviews, the evaluation of video transcripts on the topic of retail – food waste – food donations and standardized surveys with food bank users serve to analyze the dark side of food waste, its causes, solutions and consequences. The paper not only expands the system of relevant stakeholders who influence the (grocery) retail trade and its self-portrayal but also questions when and for whom food becomes food waste. The conflict between acquiring food donations for socially disadvantaged people on the one hand and minimizing food waste through innovative marketing and sustainable production on the other becomes clear.

Keywords : food banks; food waste; food chain; behaviour; food donation logistics

Introduction

Food waste and crisis-discourse

In the sustainable use of natural resources, the discussion about food losses and food waste has been the focus of national and supranational politics, NGOs, food production and even private households for around 15 years (Schmidt *et al.*, 2019; UNEP 2021, 2024). The basic aim of various surveys and estimates was initially to determine the quantitative extent of this phenomenon and its various sources of origin in the food supply and disposal chain (Geislar, 2020). From this, the relevance, the economic and environmental consequences and, in further steps, the causes, the responsibility of different stakeholder groups and the

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potential for intervention to minimize food waste are derived (Principato, 2018; Reynolds *et al.*, 2020; Harvey *et al.*, 2021). For Germany alone, the volume of food waste varies between 11 and 18 million tonnes per year based on different surveys and calculations (Biehl, 2021; Umweltbundesamt, 2024).

Food waste includes those goods that are marketable and edible (avoidable food waste) but are sorted out of the recycling chain before human consumption, which means that not all (e.g. inedible, rotten) food waste can be classified as food waste (possibly avoidable food waste and unavoidable food loss; Richter & Bokelmann, 2016, p. 425). When does an originally edible good become a food that is no longer edible (Blichfeldt *et al.*, 2015)? Evans (2012, p. 42) characterizes this transition as the passage of food into waste, which is dependent on long-term or short-term attitudes, perceptions, moods, experiences and biographical changes, especially in the private sphere, so that the distinction between food and food waste is not an exact one but rather one based on the realities of life. Losses occur in production, retail and gastronomy because the goods do not (or no longer) meet qualitative and visual requirements (Runge & Lang, 2016). On the other hand, there is so-called food loss, the quantitative shrinkage or qualitative loss of which occurs even before the processing and consumption level in the form of inefficient agricultural techniques, incorrect storage or transportation deficiencies (World Bank 2020, p. 11).

Since then, various scientific disciplines have addressed the topic of food waste and contributed their subject-specific perspectives, e.g., from waste science, marketing research or sociology (Reynolds *et al.*, 2020) to investigate the extent and causes of food waste and to develop solutions for waste minimization. Whether and why the extent, the causes or the solutions offered also vary spatially in front of different indicators has so far played only a subordinate role in the relevant scientific work on food waste (Jürgens, 2022). At least in more general waste research, there are studies that intersect the topic with (social) spatial anomalies (Kopytziok, 2011; Moore, 2012). Metaphors such as passage of food into waste (Evans 2012, p. 42) or paths travelled by food (Bemmel & Parizeau, 2020, p. 217) make it clear that food not only undergoes product-specific changes over time in terms of quality, taste or appearance but also overcomes spatial distances on a global, national or micro level. Food is transported within food supply chains on the one hand and within food waste chains on the other, constantly changing its economic market value and cultural appreciation in this space-time process (Arnold, 2021, p. 20). In the case of food waste, this means that food waste can mean marketing potential for one group of actors and life support for another group of actors. The fluid and non-objectifiable character of the transition from food-to-food waste is expressed (Evans, 2012, p. 42).

How do these food waste chains function, what spatial network do they develop and what motives and positions of power influence the various actors within this chain in their actions? This approach is well known from the discussion on supply chains (MacCarthy *et al.*, 2016; Kalchschmidt *et al.*, 2020) and is also applied to waste disposal chains. Examples of these experiences have been systematically described for institutions from the retail sector (Brancoli *et al.*, 2017; Ghosh & Eriksson. 2019; Steiger, 2021; Riesenegger & Hübner, 2022), the catering industry (Filimonau *et al.*, 2020; Kaman *et al.*, 2024) and tourist facilities (Papargyropoulou *et al.* 2016; Cardenas *et al.* 2024), from which solutions for minimizing food losses have been derived.

The public debate on food waste has become highly politicized in recent years and has entered the waters of various crises, which are also described as multiple crises (LZ, 2023a, p. 43). This includes not only the omnipresent discussion on the climate impact of misused resources for the production of wasted food (Read *et al.*, 2020) but also the ongoing socio-political division between rich and poor, supply justice, securing resilient supply chains and trends towards deglobalization, affordability and food security. Long-term slow-burn crises, or catastrophe in slow motion (Pierrehumbert, 2006) of climate change and related sustainability issues exist in parallel with fast-burn crises (Seabrooke & Tsingou, 2019), such as price inflation and energy

shortages, to which policymakers must find both prospective and ad hoc responses for and together with very different interest groups.

This mixture of slow-burn and fast-burn crises also includes the issue of food waste, which one or two decades ago still occupied a niche in the public eye. Since then, supranational structures such as the UN, FAO, UNEP and the EU have adopted the fight against food waste as a sustainability goal of global importance and have put halving food waste by 2030 on their agenda (United Nations, 2015; EU, 2019). Originally characterized as a slow-burn crisis, which is driven by a variety of actors, economic sectors, demands, attitudes and behavior, which cannot be controlled by political instruments alone, the seemingly unsolvable food waste puzzle (Roodhuyzen *et al.*, 2017) has recently been reinterpreted by various actors as a fast-burn crisis. Protest campaigns for a food rescue law in Germany (LZ, 2022a, p. 24), the discussion about the legalization of so-called containerization regarding the removal of disposed food from retail waste containers (LZ, 2020b, p. 26), the creation of (EU) targets for the reduction of food waste (LZ, 2020a, p. 16), the measurement of food waste over time as part of the EU's Waste Framework Directive (LZ, 2022c, p. 39) or the use of logistics technology (air humidification of fruit and vegetables using ultrasound or automated ordering processes; LZ, 2022b, p. 46; LZ, 2022e, p. 40) aim to show that food waste can be solved ad hoc in the form of legislation and minimized in the form of technology. These measures are primarily aimed at production, processing and manufacturing, retail and gastronomy, which are much easier to control via laws and bureaucratic regulations than the black box of private households and their invisible disposal practices. In Germany, the latter alone accounts for 59% of food waste (Statistisches Bundesamt 2022) compared to 7% in retail, 15% in processing and manufacturing, 2% in primary production and 17% in the food service industry.

The dependencies that politics and society have entered, that food waste does not only mean economic loss, but to use the still consumable food waste as a social good, remain unresolved. Food waste from retail and gastronomy is not only waste but has also become a decisive instrument of welfare in Germany via the so-called food bank system, in which socially marginalized population groups receive their supplementary basic food supply (Brühl, 2015). In a dialectical contradiction, politicians and interest groups want to reduce food waste without restricting the supply of food donations to the most vulnerable population groups. Food banks want to reduce food waste. However, their activities do not work without the supply of food waste:

If companies operate more effective goods management and change sales strategies, this naturally has an impact on donated food quantities. However, if there is less surplus, this also means that less is thrown away. This means that an important goal of the food bank – namely to save food – is achieved to a certain extent. (Jochen Brühl, Chairman of the Bundesverband Deutsche Tafeln e.V. in LZ, 2015, p. 37)

Food banks see themselves as an organization that will eventually make itself superfluous, provided that the vulnerable groups in a just social order generate sufficient income and no longer have to be at the end of the food (waste) recycling chain. However, this does not solve the fast-burn crisis of social exclusion due to low living incomes, old age and migration. In recent times, the number of food bank customers in Germany has risen rapidly due to the refugee crisis (around 50% more people have come to us since the beginning of the year [2022]; LZ, 2022d, p. 41), meaning that various food bank branches have reached the limits of their capacity in terms of manpower, internal infrastructure and donations. Where the amount of usable food waste is shrinking, the donation and distribution problems of food banks and similar organizations are increasing. This makes it all the more relevant that the logistics efficiency of retailers and the like changes in order to minimize food waste, but also how the logistics of food banks must adapt to stretch food waste susceptibility in their own processes and improve educational measures for their customers in dealing with food (Chapnik *et al.*, 2019). Various authors have addressed the topic of food banks and supply chain management in order to identify categories such as reliability, uncertainty, coordination, voluntariness and

manageable spatial catchment areas in the collection and distribution of donations to optimize processes on this basis (Rivera *et al.*, 2023; Akkerman *et al.*, 2023). The fact that further food waste can result from these donated goods does not play a major role in the literature to date beyond cursory references (Rivera *et al.*, 2023, 17: food banks seek to distribute the greatest quantity of goods while wasting as little as possible; Akkerman *et al.*, 2023, 5: the beneficiaries will not use the products they are given and the food goes to waste).

Author LZ: *Companies in the food industry have a duty to avoid food waste through greater efficiency and more precise planning. Cost pressure is also increasing. Doesn't that inevitably leave less for the food banks? Jochen Brühl (Chairman of Tafel Deutschland): In my opinion, we still have an overproduction of food. And no single person is responsible for this, the system is complex. As long as customers ask for and are offered fresh fruit, vegetables, baked goods, meat or different types of yoghurt almost around the clock, this means that food is left over and not sold. The more precise ordering by retailers can, for example, lead to manufacturers having food left over in the event of cancellations. Or incorrect labels or small errors in production or packaging can lead to food not being sold. (LZ, 2022d, p. 41).*

Our economic system of competition, choice, diversity and security of supply is therefore inherently based on the problem of producing or even having to produce (food) waste (Dietz 2015, p. 32). In terms of probability theory, it can be assumed (Jochen Brühl in LZ, 2022d) that faulty productions occur that become unsaleable due to current legal regulations but nevertheless remain consumable and serve the redistribution between abundance and scarcity (Jochen Brühl in LZ, 2022d, p. 41).

Food bank institution

As the best-known collection and distribution center for surplus food in Germany, the so-called Tafel network has existed since 1995 through the Bundesverband Deutsche Tafel e.V. (Brühl, 2015, p. 19). At the beginning of 2024, it comprised 975 food banks with more than 2,000 distribution points (Statista, 2025; Tafel Deutschland 2022; Becker 2018), whose working methods are subject to local peculiarities (Sedelmeier, 2013; Simmet & Stroebele-Benschop, 2021). The aim is not only to collect surplus food from retail, industry or restaurants that can still be used for human consumption according to legal regulations, but also to provide these products to people in need. Two basic missions of ecologically sustainable rescue of food that would otherwise be destroyed and of existential assistance for needy households through the distribution of food at symbolic prices characterize the service core and the self-image of the food banks (Becker, 2018, p. 102; Dietz, 2025). These do not replace the responsibility of the welfare state or the self-responsible actions of citizens but identify additional willingness to help where the supportive measures of the welfare state to strengthen social participation for needy households are not considered sufficient (Brühl, 2015, p. 20f).

Nevertheless, the aid system cannot function without established sources of donations (Tafel Deutschland 2021b), whose geographical distribution within Germany is very uneven. Of the 12-15 million food bank users who tend to be eligible, only around 1.5 million people receive food bank services (Brühl, 2015, p. 22), because neither the reach of the food banks nor the food offered from donations is sufficient. Food banks are therefore part of a complex network consisting of donors and incoming food as well as food bank users and outgoing food. Food bank users not only act as recipients of donations within the food bank complex but also as private households that may exhibit a conspicuous approach to food in the form of purchasing behavior, attitudes, expertise, interest and practices in the use and preparation of food (Akkerman *et al.*, 2023): the beneficiaries might not always be familiar with the food items and the ways to prepare meals with them). A typification of households in their different ways of dealing with food and food waste can be found in various analyses (Chen & House 2022). Previous food bank literature has so far shown little interest in this topic of how food bank customers deal with food in general and with food from food banks in

particular. Schoneville (2023,) provides some insights into this in the form of biographical interviews with food bank customers.

This flow model (from production to retail to food banks) follows the basic public understanding that any form of food waste is eliminated. For example, food donations from discounters or supermarkets (or so-called organized food retailers) that are transferred to food banks in Germany are by definition not counted as food waste. They are not to be assessed as losses, as they fulfil their intended purpose of human nutrition, which is 210,000 tonnes per year (Handelsforum, 2021, p. 2). Why these donations are made and what retailers are doing to minimize these write-offs are existential questions for the food banks' security of supply, as is the handling of the donated products in the food banks themselves and in customer households.

Aims and methodology

The following questions arise: (i) What sources of donors and users are associated with food banks in a network and what are the consequences of this? (ii) Which products are donated? What structural problems from food production and marketing are reflected in these donations? (iii) What problems do food banks themselves and their customers have in using donated goods? (iv) What solutions do donors pursue in order to minimize their own write-offs and their donations?

The study is based on expert interviews conducted between 2020 and 2024 using case studies on the topic of food waste in the federal state of Schleswig-Holstein, Germany. Eight interviews were conducted with food banks in the cities and municipalities of Kiel, Preetz, Brunsbüttel, Bordesholm and Schleswig and were carried out in person by visiting the food banks, their premises and product ranges. The spatial distribution in the overall network of all municipalities is shown in Fig. 1. The interviews, some of which were conducted several times, took place with the management bodies of the food banks and lasted between one and four hours. Further expert interviews were conducted with representatives from retail, primary production and gastronomy who were able to provide relevant assessments on the topic of food disposal and food donations. With a few exceptions, these interviews were conducted digitally and partially structured with open dialogue options. In some cases, the results were digitally saved and transcribed; in other cases, they were recorded in the form of minutes. As a rule, these interviews lasted between 45 and 90 minutes.

With the support of the food bank Brunsbüttel, a standardized survey of food bank customers was conducted, the implementation of which had a one-year lead time due to the second and third COVID-19 waves in 2021. Social or language problems among the food bank households, as well as educational measures taken by the food bank to encourage its customers to take part in such a survey, resulted in a response rate of 123 questionnaires, or approx. 20% of all food bank cards issued. This is explicitly a convenience sample because members of the various branches of the Brunsbüttel food bank were only able to distribute questionnaires to those people who were present during the food distribution time slots. The questionnaires were completed anonymously on site by the respondents themselves. Help with the content was provided by food bank employees at the respective branches.

The survey ran for four weeks. The content of the questionnaire was discussed with the board management and their assistants, who also acted as test subjects, on three occasions. The questionnaire comprises 31 questions on a double-sided sheet, which covers shopping habits, food handling and experiences of food disposal in the form of a Likert scale between 1 (does not apply at all) and 5 (applies completely/very often). Socio-demographic indicators such as age, gender, household size, number of children under 13 in the household, employment status and the amount of time spent visiting the food bank were included as filter questions. Statistical representativeness cannot be derived from the sample size alone, but trends, anomalies and research perspectives can be derived from the results and methods presented.



FIGURE 1 – Case studies in the study area of Schleswig-Holstein, Germany (source: Jürgens)

In addition, two further types of sources were tapped in order to expand the basis of the statements presented here beyond our own regional case studies. On the one hand, the *Lebensmittel Zeitung* and its archive, were systematically evaluated as a weekly specialist newspaper on the topics of retail and wholesale (see literature under newspaper articles). On the other hand, selected journalistic video sources were used (see literature under videos), which were transcribed and could therefore be used as a text template.

From these, statements from experts as well as from citizens and food bank customers can be taken, which could not be carried out by the author himself, but nevertheless make evaluations, assessments and personal experiences from secondary sources quotable. Selected long quotations from TV documentaries, newspapers and parliamentary minutes are used below. This also makes sources accessible that are not included in review journals (Harvey *et al.*, 2021) but which document small-scale peculiarities due to their topicality and the use of original voices from expert interviews and conversations with passers-by. The following analysis is therefore based on an elaborate mixed-methods approach that goes beyond secondary literature and media transcripts and combines quantitative and qualitative primary sources in a balanced manner in order to reveal food waste realities in the system of food banks.

Results and discussion

Origin of food in the food banks

There are various analyses of food banks in Germany (Selke, 2009, 2011; Lorenz 2012; Dietz *et al.* 2021) and food banks in Anglo-American countries (Booth & Whelan, 2014; Miroso *et al.*, 2016; Cloke *et al.*, 2017; An *et al.*, 2019), whose main interests focus on the emergence, organization and functions of food banks and the security of food supply (Depa *et al.*, 2018) as a reflection of social structures. In contrast to food banks in the USA or Australia, which act as central collection points (warehouse model) for goods for redistribution to other aid organizations, the German food banks follow the front line model, which involves direct customer contact between the food bank and its visitors.

The origin and condition of food, spatial and personal networking of food banks with their donors, or the use of donated food in the food banks themselves or by their customers have only been rudimentarily addressed in the discussion to date (Normann, 2011, p. 103; Hartig, 2018, p. 199f.). Figure 2 uses the Brunsbüttel food bank and its branches in Marne, Friedrichskoog and Michaelisdonn as an example to show how a collection system was structured in terms of space and time at the end of 2020 (Hoelp, 2020). Both well-known supermarket and discount store chains in Germany as well as bakery branches dominate the schedules of the food bank vehicles, originally collecting fresh products such as bread and baked goods, dairy products, fruit and vegetables and sausage (rarely meat), which are made available at the ramps of the drop-off points. In its 2021 Sustainability Report, the discount chain Aldi Nord explicitly states that 97.4% of its German stores participate in donation activities for charitable organizations (Aldi Nord, 2022, p. 37), in the case of Brunsbüttel, the products are already sorted for their recyclability at the collection point; i.e., the products that are not recyclable in terms of appearance and quality are disposed of in containers so that the food banks do not become disposers for supermarkets or discounters. Otherwise, biodegradable and unpackaged products are disposed of in the organic waste garbage cans at the food banks, which are collected free of charge at organic waste disposal sites (at least in the Dithmarschen district, which includes Brunsbüttel; Fig. 1).

Figure 2 depicts this roadmap as a relational network that, in contrast to traditional maps, does not use visual criteria to make quantifying statements but instead focuses on relative weightings (Gephi, 2022). The aim is, therefore, to graphically depict similarities, niche features, diversity and concentration of two-dimensional relationships (e.g., location – retail format; location – time) in order to capture the complexity of a network. This network results from the size of the nodes (or points), the width of the edges (or lines) and the dominance of node-edge relationships in conspicuous clusters (color assignment), which are calculated using a modularity module (Cherven, 2015). The foundations of this approach are based on network theory (Schönhuth *et al.*, 2013). The node sizes in Figure 2 result from the number of so-called outputs, i.e. how many other nodes the output locations are connected to. This expresses the different centrality of individual nodes in the overall network. The edge widths result from the two-dimensional response set of node-node relationships. The more frequently this combination is mentioned, the wider the edges are. For the case study, this means that the four food bank branches cover the southern district of Dithmarschen in Schleswig-Holstein in a decentralized manner in order to serve the food bank customers as closely as possible through the mutual exchange of goods. The food banks in Friedrichskoog and Michaelisdonn would not be able to survive on their donations alone.

The idea of using a mobile food bank to serve other customers eligible for the food bank in peripheral rural areas has so far failed due to a lack of funding (as of 2021) and the low customer density in rural areas. In the Dithmarschen district, 3.59% of all people were served by the food bank in 2017, which is far from all the people who would be entitled to be served, it also requires the political will of the local authorities to contribute to these costs. As a rule, the Tafel has an annual financial deficit of 30,000 to 35,000 euros

(Brunsbüttel Tafel discussion), which can only be refinanced through sales in social department stores and donations. Although all well-known large discounters and supermarkets are participants in the established donor network, this is expressly only a snapshot. The relationship with collection points and food banks is based on personal contacts and trust, which either have to be renegotiated or break down when store managers are replaced (Hoelp, 2020).

If the basic quality of the goods does not appear to be acceptable, the food banks also stop contacting donors. The network is therefore dynamic and vulnerable in terms of the collection points and their donor volumes, which are intended to serve a highly fluctuating number of customers (refugee crisis 2015, Ukraine war 2022). The documentation of such a network thus also reflects the extent of negotiation processes and complex governance with companies willing to donate, the collection logistics of the food banks and the internal redistribution of goods between the food banks. Such an illustration shows not only what can be seen but also which potential donor sources are missing from the network or have left the network over time. Analogous to Figure 2 and its small-town context, the difficulty of finding donor sources becomes clear in Figure 3. In the very rural context around the small town of Kappeln, the number of small donors such as beekeepers, petrol stations or excursion boats, precarious quantities and high logistical effort increase significantly in order to collect donations at longer or irregular intervals.

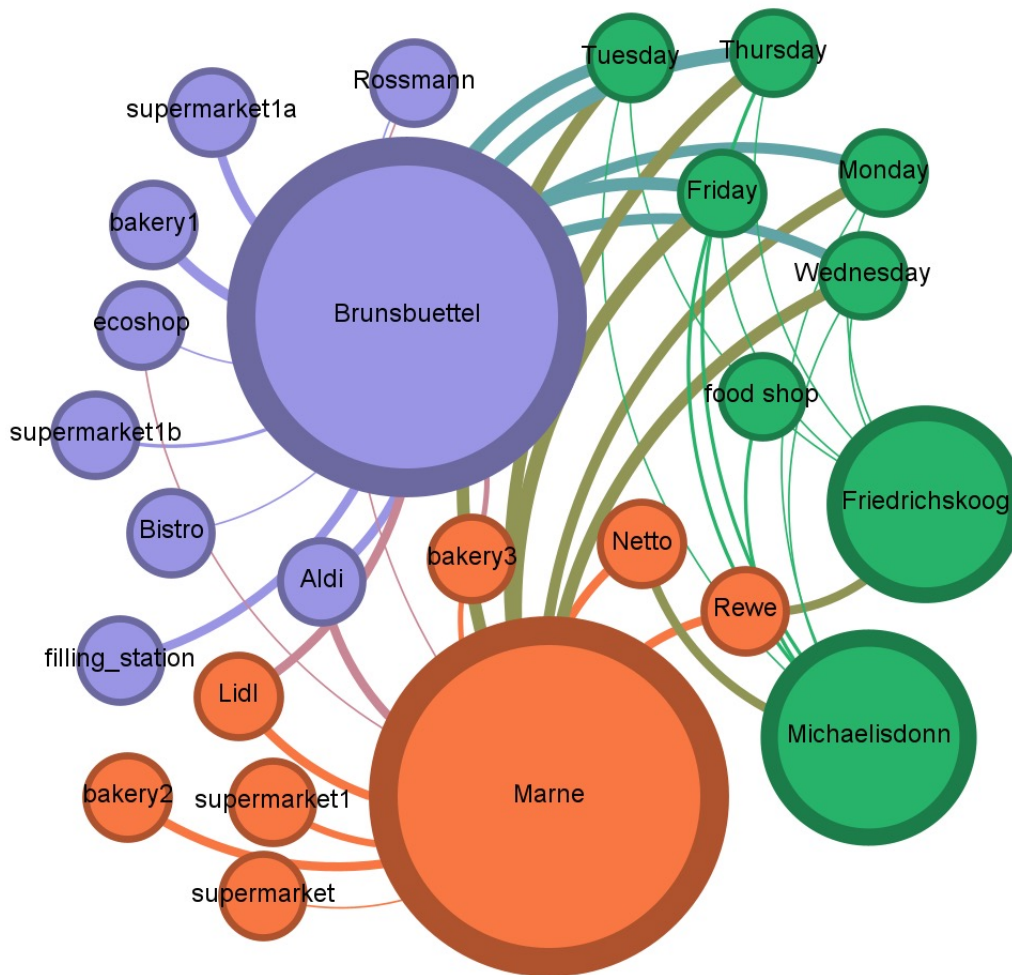


FIGURE 2 – Brunsbüttel food bank donation network; source: Hoelp (2020); implementation Jürgens with the help of the software Gephi010; (technical parameters for the traceability of the network construction: nodes 25; edges 162; modularity 0.266; partitions = 3; edges ranking=weight; edge width max; node ranking=initial degree; node size 25-100; node color=modularity class); place names: Brunsbuettel, Friedrichskoog, Marne, Michaelisdonn

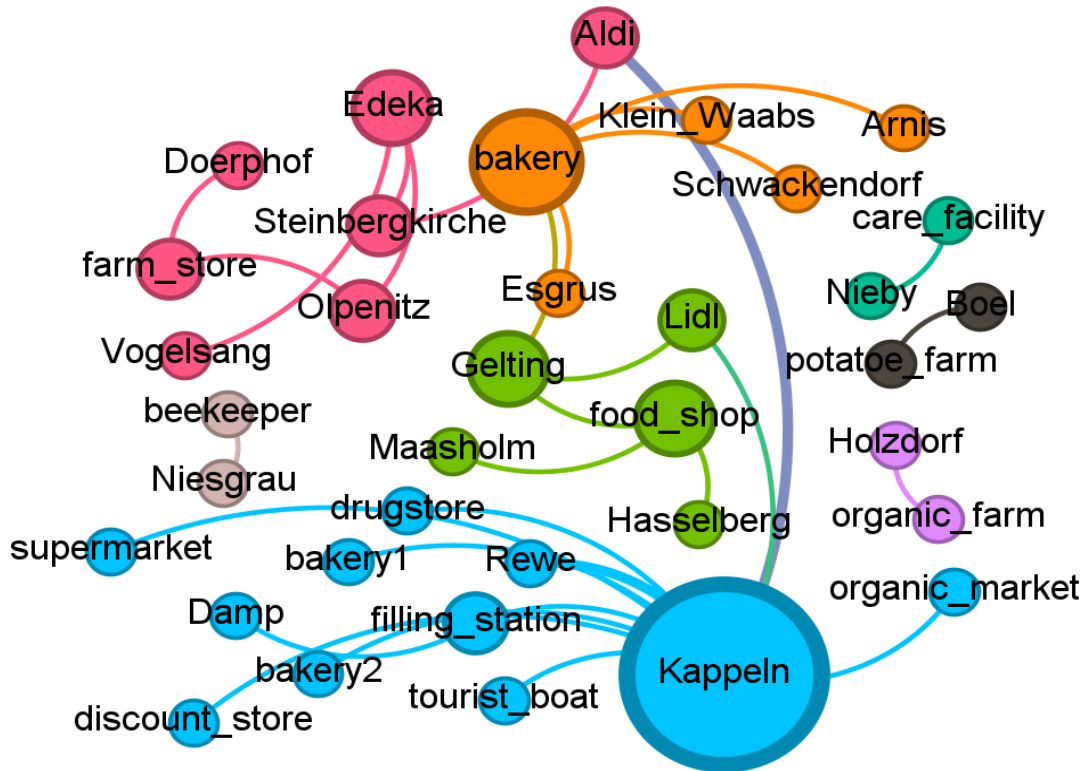


FIGURE 3 – Food distribution network by the food bank in the city of Kappeln; source: <https://www.kappelnertafel.de/sponsoren-spender/lieferanten> (status September 2024); (technical parameters for the traceability of the network construction: nodes 36; edges 31; modularity 0.682; edge ranking=weight; node size 25-100; partitions 8: node color=modularity; node ranking=initial degree); place names: Arnis, Boel, Damp, Doerphof, Esgrus, Gelting, Hasselberg, Holzdorf, Kappeln, Klein Waabs, Maasholm, Nieby, Niesgrau, Olpenitz, Schwackendorf, Steinbergkirche, Vogelsang

The collection points from the retail trade, although the most stable, are only one of many sources of supply for the food bank. There are also surpluses from industry, from insurance claims or from the catering and tourism sectors, such as cruise ships, which have not been able to find sufficient buyers for their goods due to the COVID-19 pandemic. These surpluses are distributed in consultation with Tafelzentrale

Deutschland, which the food banks can apply to receive, or with other friendly food banks. The experiences associated with this beyond the case study are reflected in the following quotes, which are transcribed from various TV documentaries. This not only shows how precariously the collection systems function but also how the quantities of donations received have dwindled in the recent past.

Video1: *Speaker: He now drives the tour twice a week and now knows exactly where the donations are waiting for him. What and how much the supermarkets sort out is a matter of luck. They are not forced to do so. There are no figures on the donations. A law like the one in France is currently neither being demanded by the food bank nor discussed in politics. At the same time, around 550,000 tonnes of food waste are generated in retail every year. Wolfgang Stoppel (driver): There are even more markets and stations where we could theoretically pick up goods for the Tafel that don't provide us with anything. I would guess that all pick-up drivers together collect maybe 15 to 20 percent of what could actually be recycled.* (Video1, Min 10:29)

Video1: *Wolfgang Stoppel (driver): Of course, we always have to make a bit of a fuss with the people who look after it here in the stores. So that they don't immediately throw everything away and say they don't want it or don't look at it properly. That shouldn't be the case.* (Video1, Min 12:06)

Video4: *Claudia Manousek (Tafel Dormagen): What I have seen from my experience after 18 years is that we can no longer exist on the food that the supermarkets give us. We need the producers. And it's now the case that 40-50% of our goods at Tafel Dormagen come via logistics, from the state and the federal government and also from my own logistics, which I acquired myself, if it weren't for that, we wouldn't be able to supply these 160 or 170 families a day.* (Video4, Min 19:49)

Video2: *Speaker: The distribution of food has begun in Berlin. There are hardly any private donations in poor Neukölln. Too bad for the needy. Even the small stores can only give out a little. Uschi Sachs (Tafel Neukölln): It's not because people don't want to; they just can't donate. That's a problem. They can't because they are all struggling to survive themselves. Every retailer or wholesaler who tries to get rid of their stuff first is trying to survive, i can understand that.* (Video2, Min 13:01)

Receipt and distribution of food at the food banks

The collection of food from the donor sources takes place according to tightly timed routes, which are carried out by volunteers and food bank employees on a mini-job basis. This results in routines that are expected from the donor sources in compliance with pick-up times and at the same time give precariously employed food bank employees structure for a possible reintegration into the primary labor market. These routine sources very rarely provide packaged food or even non-food items. The latter usually result from large donations that are delivered directly from the headquarters of supermarkets, discounters or industrial production. These also include XXL packs, which cannot be broken open for hygiene reasons and cannot be distributed to small customers.

Other XXL pallets cannot be accepted by the food bank due to a lack of usability. Other staple foods in packaged form flow to food banks in the form of donation bags from supermarkets (Tafel Deutschland 2021a, p. 39). The aim of the food banks is not to provide a complete basic food supply for their customers but to offer a substantial supplement from surplus production. With a few exceptions, the food banks do not buy their own food. Food is handed out on presentation of a food bank card and for a symbolic amount of 2-3 euros per purchase. As of January 2019, 40.3% of eligible customers at the Brunsbüttel food bank were recipients of unemployment benefit II (so-called Hartz IV), 45.1% were asylum seekers and refugees, 10.5% were pensioners and 4.1% were low-income earners (Hoelp, 2020). The value of goods per week per customer is 25-30 euros, in the case of the Tafel Kiel, this means that 10% of those entitled to the food bank were served (interview Food Bank Kiel 2021), which shows both the extent of precarious households and the limits of the food bank's work in serving all entitled households.

Video3: *Well, I'm relatively bad at calculating. It depends on various factors; there are always kinks in the year and because we basically have large containers, like those from the industry, i can, in principle, bridge these bad times reasonably well. What I can't do is calculate six months in advance that I'll get five tonnes of tomatoes in the summer. So that's not feasible. So you have to organize yourself differently here and see what food donations have just arrived and distribute them accordingly. So it's not helpful for people here to get sweets every week. But if things go really badly, it will have to come down to that if there is nothing else. Because we have access to these large corporations, the big products and the large quantities of goods. I also have the opportunity to divide it up reasonably. For example, we have things like cornflakes up there, or we have peanut butter here, for example, which has a shelf life of up to a year. In principle, these are products that I have to be a bit careful with because I can't put peanut butter in people's bags every week. But thanks to the mix that we basically get such large quantities and have the goods from the markets, you can divide it up to a certain extent.* (Video3, Min 6:58)

Video2: *Norbert Grote (Tafel Harvestehude): Insanely delicious bread. Yes, it really is always like a grab bag. We've just had spaetzle; we've had rice. Frozen pizza, which is now slowly defrosting and will have to go today. We've had lots of peppers. Of course, this is damaged produce, so some of it has to be cut up and some thrown away. We can't offer that to those in need, but a lot of it is still very usable.* (Video2, Min 4:51)

Disposal of food in and from the food banks

Disposal at the food banks takes place at short notice on the basis of self-selected and individualized standards according to appearance and quality by the employees, many of whom are food bank customers themselves. Bread baskets or fruit from delicatessen departments – known in the retail trade as *Schaubrote* (show bread) or *Schaufrüchte* (ruits for exhibition) (Kreutzberger & Thurn 2013, p. 64 f.) – flow into the food banks, which are either no longer fit for consumption because they are dried out and too hard or are unknown to the average food bank customer in terms of their use (ver.di 2013, p. 17). This also applies to products that arrive at short notice as insurance or accident damage, logistics errors, undeliverable goods, out-of-season products and goods with minor or major defects in the packaging or labelling, some of which have exceeded their best-before date. The latter situation is also met with skepticism by food bank customers, in order to minimize customer contact, pre-packed bags were handed out during the COVID-19 phase, which has now helped to dispose of unwanted and unknown goods in the food bank households (interviews with the managers of the Brunsbüttel, Kiel and Preetz food banks).

The extent of direct disposal by the food banks is conveyed by values for which there are otherwise no systematic statistics. Simmet *et al.* (2018, p. 8 f.) recorded the incoming goods by weight for 328 food banks: 49.25% of these food banks collected more than they could dispense in goods. Of these, 13.13% of surplus food banks disposed of goods as waste; a further 21.21% of these food banks turned surplus goods into animal feed. In a dispute, ver.di (2013, p. 11) assumes that an estimated 30-50% of the goods are discarded, another 30-50% after distribution by the food bank users. Although there is no source reference for this statement. It makes the problem of how much food is lost in the food bank cycle itself more than clear. Analogous to other studies on the topic of food waste, without the latter making any reference to food banks (Cicatiello *et al.*, 2017), there is a dark side of developments here that is largely suppressed.

The Tafel Kiel states that in 2014, 100 tonnes of 672 tonnes of donated food had to be disposed of via the farmer (TafelAktiv 2015, p. 9; these figures were no longer published in subsequent years). In 2019, Tafel Neumünster delivered 13.21 tonnes of food or organic material to the organic waste yard (interview Neumünster organic waste yard). Tafel Aschaffenburg states: Of the four tonnes we receive daily, one tonne goes to landfill on the same day. So for many markets, we are actually a cheap disposal option (Fittkau 2019). The Tafel Wedel food bank in Schleswig-Holstein (district of Pinneberg; Fig. 1) refers to 3.5 tonnes of organic waste per week alone, which is generated from a net distribution volume of around 64 tonnes of food-to-food bank customers over the whole of 2016 (SHZ 2017). Other products are given to farmers for composting or to animal parks for feeding (so-called downcycling: Vogt, 2016, p. 58), insufficient storage and refrigeration capacities contribute to the fact that fresh produce in smaller food banks and with limited distribution days per week also continues to ripen in the distribution points themselves, limiting their ability to distribute. Where there is an oversupply of pastries, bread and rolls even in the food banks, goods are sometimes passed on to third-party consumers, such as the food sharing association for individual use (Fittkau, 2019).

Figure 4 captures the delivery and disposal network of food that flows out of the food banks (interviews with food banks). A relational network is depicted with the help of the Gephi010 software, which weights the nodes (points) as initial degree and edges (connecting lines) in the frequency of equal node-node connections. The highlighted colors represent conspicuous features derived from the node-edge relationships. Figure 4 does not provide any information on the volume or composition of outflowing foodstuffs. Corresponding data is not recorded. Regional, seasonal and unplannable surpluses of fresh produce that can no longer be stored or where refrigeration capacity is lacking are the main reasons why food bank products are finally withdrawn from human consumption and downcycled into animal feed, compost or biogas production (interviews with food banks and organic waste yards in Neumünster and

Bargenstedt; Figure 1). In other cases, the products have to be collected by special disposal companies, or they can be made available to social kitchens and other food banks.

Video4: *Speaker: What arrives here does not end up in the supermarket. There is too much produce, or it is mislabeled. But because there is so much, the food first ends up at the food bank distribution centers. These have recently been set up, financed by donations and start-up funding from the state. The normal food banks wouldn't have the space. (Video4, Min 19:30)*

Video3: *Here we store everything at fridge temperature that you would find in your fridge at home, only one size bigger, it's relatively empty today. What's in here is enough for a maximum of 1 to 1 1/2 days and that's about it. For example, we have the goods that are collected from the markets in this area. When they're here, they're not just handed out one-to-one the next day, but we also pack bags in this area. And it's quite possible, for example, that I've just held the sausage in my hand and it has a date on it that has long since passed. You can easily eat it for at least one and a half to two weeks after the best-before date. And the best before date hasn't just been around since yesterday; it's been around for a while, but in the past, people didn't have a best before date. There was visual contact; you did the smell test; in the end, you tasted it. Could you eat it or not? (Video3, Min 3:50)*

Video3: *One part ends up in the food bank and one part does not. There are different rules for fish; there is a so-called consumption date. I'll see if I can see it now, 02 December clearly means for me that it goes straight into the garbage can. So it can't be eaten after that date. As a food bank, we are organized through Tafel Deutschland. Tafel Deutschland has contracts and agreements with many food producers and these are overcapacities that come from the individual companies. We often have the problem that we receive relatively large containers of dairy products, for example, if we can't get rid of them for our customers, we contact other food distribution points here in Bielefeld, ask them if they need them and come and pick up as much as they want. Once the food distribution points have been served, the next step is food sharing. We contact Foodsharing and see if we can get rid of this amount at Foodsharing, it usually works quite well. (Video3, Min 5:00)*

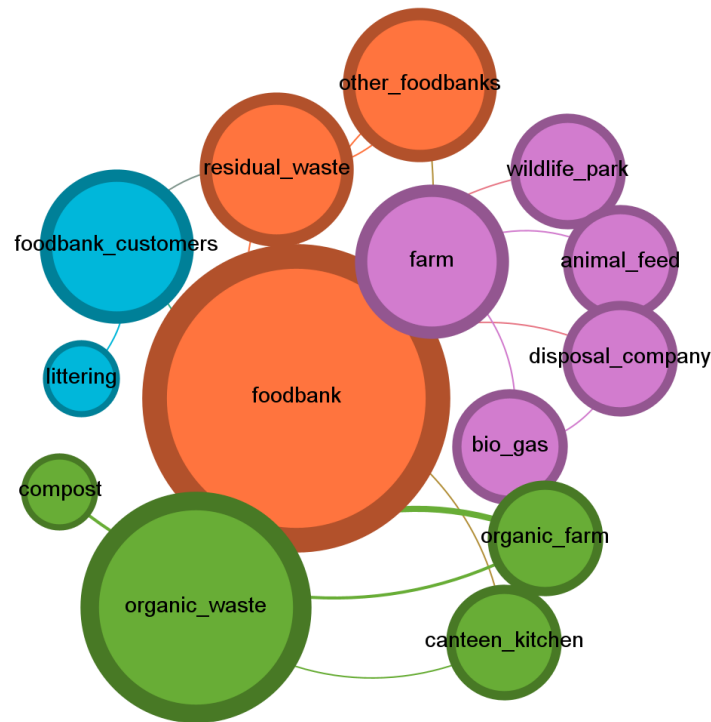


FIGURE 4 – Disposal alternatives of food(waste) in food banks; source: interviews by the author in Schleswig-Holstein 2021-2024; technical parameters for the traceability of the network construction: nodes 14; edges 23; modularity 0.298; partitions 4: node color=modularity; node ranking=initial degree; node size: 25-100.

Food bank households - handling and disposal of food

There are empirical surveys on food bank households that refer to the eating habits, product range of food banks and satisfaction of food bank customers (Sedelmeier, 2011, 2013; Ströbele-Benschop & Depa, 2016; Hartig 2018). Sedelmeier (2011, p. 229) lists various (vegetable) foods that are particularly unpopular with food bank customers. Similar experiences can be seen in Hartig (2018, p. 199), who focuses on the use life of food bank products. This duration is limited due to transportation routes, degree of freshness, weather conditions or the skills of households to process the food (Hartig, 2018, 201; Sedelmeier, 2013, p. 15). Augustin (2020, p. 204) refers to avoiding leftovers in the food bank itself, which occur with perishable goods, so that the distribution points only distribute these products in a targeted manner as opposed to products with a longer shelf life. These studies, as well as Münch *et al.*'s (2011) study of a Düsseldorf distribution point, do not address the further consumption and disposal path of distributed goods in the food bank households themselves.

Our own surveys among food bank customers should provide answers to this question. Due to simultaneous and extensive household surveys in the federal state of Schleswig-Holstein in 2021 on the topic of food waste (Jürgens, 2022), statements between the social mainstream and the under-represented poverty group or food bank customers can be put into perspective. Table 1 shows the special features of both samples, particularly with regard to the allocation to employment relationships. As expected, the number of jobseekers or unemployed people in the food bank sample is significantly higher than in the food waste sample.

TABLE 1 – Structural comparison of the sample of food bank subjects and food waste households

	District of Dithmarschen ¹	Province of Schleswig-Holstein (SH) ²	Sample respondents interviewed in food banks ³	Sample households interviewed about food waste SH ⁴
Male	49.3	49.0	34.6	25.1
Female	50.7	51.0	65.4	74.9
Under 25	7.5	7.4	0,0	3.4
25 to 49	26.6	29.1	43.5	30.1
50 to 64	24.9	23.9	33.0	35.5
65 and older	25.3	23.4	23.5	31.0
Household single person	32.9 ⁶	41.3 ⁵	42.1	26.2
Household two persons	35.8 ⁶	34.9 ⁵	28.9	45.4
Household more than 2 persons	31.5 ⁶	23.9 ⁵	28.9	28.5
Housewife/Househusband	n. a.	n. a.	16.8	7.8
Pupil/student	n. a.	n. a.	1.8	5.6
Pensioner	24.6 ⁶	22.4 ⁷	35.4	33.1
Employed (incl. mini-job)	n. a.	n. a.	17.7	38.0
Jobseeker/not employed	n. a.	n. a.	15.9	1.1
Other status	n. a.	n. a.	12.4	14.4
N	132,930	2,780,980	115	1,422

1 Statistisches Amt Hamburg and Schleswig-Holstein (2022a); 2 Statistisches Amt Hamburg and Schleswig-Holstein (2022b); 3 survey food bank Brunsbüttel 2021; 4 survey communities in Schleswig-Holstein (Jürgens 2022); 5 Statistisches Amt Hamburg and Schleswig-Holstein (2021: 21); 6 Statistisches Amt Hamburg and Schleswig-Holstein (2014a: 32, 38) (2014b)

TABLE 2 – Expertise and satisfaction among food bank customers compared to household surveys in Schleswig-Holstein (SH); mean values according to self-assessment (1=does not apply at all; 2: rarely applies; 3: sometimes applies; 4: often applies; 5=applies completely/very often)

Item	Food bank survey SH (N=123); mean values	Household survey SH (N=1.456); mean values	Significance (2-sided) food bank survey versus household survey; <i>t</i> -test
I go shopping in discount stores (Aldi, Lidl, Penny).	3.7	3.4	.002
I go shopping in supermarkets (Edeka, Sky, Rewe).	3.1	4.1	.000
I go to the store closest to my home.	3.3	3.2	.494
I like to cook for myself and buy my own food.	4.0	4.5	.000
Fresh products are important to me.	4.1	4.5	.000
Leftovers are still on the table the next day.	4.0	4.6	.000
I go shopping with a shopping list.	3.2	4.3	.000
I freeze food to preserve it.	3.9	4.1	.114
The amount of fruit and vegetables on offer at the food bank is sufficient for me; not at all to rarely in % (answer types 1 and 2)	3.9		
	9.2%		
The amount of dairy products offered by the food bank is sufficient for me; not at all to rarely in % (answer types 1 and 2)	3.2		
	27.7%		
The range of bread and baked goods offered by the food bank is sufficient for me in terms of quantity: not at all to rarely in % (answer types 1 and 2)	4.1		
	10.7%		
The range of ready-made products on offer at the food bank is sufficient for me in terms of quantity; not at all to rarely in % (answer types 1 and 2)	3.4		
	21.7%		
I can use and process the products from the food bank well: not at all to rarely in % (answer types 1 and 2)	4.3		
	6.9%		
I or other family members sometimes throw some of the food bank products away because we don't like the taste; sometimes or more often in % (answer types 3 to 5)	2.2		
	34.2%		
because we do not know the product; sometimes or more often in % (response types 3 and 5)	1.8		
	17.6%		
because the packs are too big; sometimes or more often in % (response types 3 to 5)	1.7		
	16.5%		
because we don't like the quality: sometimes or more often in % (response types 3 to 5)	2.0		
	25.6%		

Source: Jürgens 2021 surveys; food bank surveys in collaboration with the Hoelp food bank in Brunsbüttel; household surveys on the topic of food waste Jürgens (2022)

The low financial resources of food bank customers are reflected in the fact that their purchases of goods are significantly more frequently concentrated on discount stores than on average (Table 2). Supplementary products from the food banks are perceived as having limited availability, particularly in the areas of dairy products and convenience goods (Table 2). Fruit, vegetables and bread are available in sufficient quantities. This does not mean that the products always meet the taste, the desired pack size or the product quality of the food bank customers. After all, 16.5-25.6% of respondents stated that they discard products because they do not know them, the pack is too large or they do not like the quality (Table 2).

It was not recorded which products were involved and how large the proportion of disposed goods was in relation to the total proportion. Nevertheless, it is clear that disposal processes take place within food bank households. Reasons for this can be derived from statements made by the food bank volunteers and from assessments made in the expert interviews. Although the interest in cooking or the processing of leftovers

is consistently high, the ratings of food bank customers are significantly lower compared to the mainstream household survey, which is particularly noticeable in the generally more unstructured shopping without a shopping list (Table 2). This may be due to the significantly higher proportion of single-person households compared to the reference sample (Table 1), which makes it easier to plan a household. It may also be due to the fact that necessary basic purchases with limited financial resources do not trigger any further impulse purchases and further basic needs are supplemented with products from the food banks, so that no shopping list planning is required.

The interviews with experts at the food banks also show that ready-made products are particularly popular for distribution due to their longer shelf life. They do not require a great deal of cooking expertise. Ready-made products are rare, come from surplus production from brand producers or insurance claims and are often stored in the food banks as special or seasonal gifts. Conversely, the food bank staff provide information (Brühl, 2015) on how various fresh products can be processed before these goods become waste in the food bank itself, provided there is time for this during the limited distribution times and the food bank staff have expertise. Answers as to whether this information will be taken up by the food bank's customers are still pending. Against the background of fluctuating incoming goods and assigned customer numbers for goods collection, it is impossible for food bank households to plan which items they will receive and whether these are useful for the household. The system of pre-packed bags to minimize customer contact during the COVID-19 pandemic has further reduced the possibility of incorporating individual preferences into the composition of goods (Simmet & Stroebele-Benschop, 2021). The packaging of halal products and appropriately organized dispenser bags to cater to Muslim eating traditions pose further logistical hurdles for food banks. This also affects other customer groups of the food banks, such as Ukrainian refugees, who have specific eating habits when it comes to the demand for and use of food bank products.

Donor base - handling and disposal of food and implications for food banks

Tafel Deutschland (2021, p. 33) calculates it annually rescues 265,000 tonnes of food, based on the summary receipt of donations, internal losses at the food banks due to insufficient quality of the food and external losses because the donor sources themselves want to minimize food waste jeopardize the core of the food bank's work. Prior to fundamentally reducing food waste, the challenges are meeting market and consumer demands by quality, hygiene, trust and satisfaction via best-before dates, appearance and selection. The TV science documentary *Taste the Waste* (2011) captures these problems as for example by the following statements:

Video5: A supermarket like this produces around 500-600 tonnes of waste a year. Unfortunately, many products that have not yet expired also end up in the bin. At the same time, the principle of precaution is becoming increasingly important. Shelf life is getting shorter and shorter. I started working in retail ten years ago, when a mineral water lasted for a year and a half, whereas today it expires after just six months. (Video5, Min 6:07; example France)

Video5: We once conducted a study in the supermarket sector, where we worked with a discounter for ten weeks to determine how much food that would actually still be edible is thrown away for various reasons, for example, because the packaging is so open or because dairy products are discarded just before the best-before date and we found that around 45 kilos of edible food is thrown away per store per day. (Video5, Min 12:31)

Video5: The same old story about the crooked cucumber. The point is the EU Commission had issued the cucumber standard because the trade wanted cucumbers; they are easier to package and sell in the supermarket. Now we have abolished the standard, if someone wants to sell crooked cucumbers, the EU won't say, No, you can't do that. But in practice, the supermarkets don't want them because they don't fit in the crates. (Video5, Min 21:30)

TABLE 3 – Origin, causes, solutions for food waste in/from food banks

Type	Origin of food waste	Causes of food waste	Solutions for food waste from the donor side	Consequences for food banks
Fruit, vegetables	Supermarkets and discounters; original producers	spoiled; sorting out; due to plastic wrapping, some can no longer be used as organic waste; visual defects; exotic and unknown products	Use as animal feed; distribution to agricultural users; disposal via organic waste yards (free organic waste garbage cans for food banks) and energy recovery; just-in-time orders via subscription systems; processing into juices, Jam; customer education; recipe suggestions; marketing of ugly food; sales of loose items	Awareness campaigns for food bank customers on how products can be recycled; handover to food bank employees
Bread and bakery products	From supermarkets, discounters, bakeries and cafés	Show breads until store closure; uncollected orders; bread products too hard	Day-ahead bakeries; savior apps; processing into breadcrumbs; long-life baked goods; agricultural use; organic waste garbage can; systematic avoidance of overproduction in retail, customer education on extended shelf life; selling off goods as an accepted system	Reduced deliveries
Dairy products	Supermarkets; discounters; original producers	Short best-before date; cold chains not always fully guaranteed in food banks	Special sales already in supermarkets and discounters; deposit systems; pre-orders	Necessary cooling capacities in the food banks
Ready-made goods	Supermarkets, discounters; insurance and logistics damage; industry donations from excessively large production lines	XXL packs; incorrect labelling; labels in foreign languages; stranded product pallets, e.g. due to Brexit; best before date almost reached or exceeded; unknown products or products not	Assortment adjustments for small households	Partly suitable for use for feeding the poor; due to high fluctuation and limited availability often as a special gift for food bank customers

		suitable for all age and social generations		
Sausage products	Industry, retail	XXL packs in some cases; cannot be distributed to all customers due to cultural reasons (e.g. halal); cold chains are not always fully guaranteed	Discounted sales already in supermarkets and discounters; pre- orders	Refrigerated vehicles and storage rooms in the food banks
Allocation competition among food bank customers		Customer competition for products	(Multilingual) education on appreciation and handling of food via food bank employees	

Source: Compilation by Jürgens based on expert discussions with representatives of food banks, primary production and the retail trade in Schleswig-Holstein in 2021 and 2022; solutions and consequences are not duplicated as far as possible

Video5: *I know from my own experience, as we once had a so-called pre-checkout store in a supermarket, that the supermarket operators attach great importance to the bread shelf being full until the evening. There are definitely clauses in the rental contracts that say 'full bread shelf until 6.30 pm' and I've also received nasty letters myself with photos of evidence when, for example, before public holidays, which are very difficult to calculate, the bread shelf looks relatively empty at a certain time, with a threat to terminate the rental contract. [...]* (Video5, Min 31:39)

Table 3 documents the causes of food waste for different food product groups from the perspective of the original producers, manufacturers and retailers, even 14 years after Taste the Waste and the solutions the players are pursuing to reduce waste that is no longer donated to food banks. Against the backdrop of a growing social discourse on preventing food waste, product and marketing ideas are being developed to make fresh food last longer, to diversify it, e.g., fruit and vegetables in the form of juices or jam, or to discount it. Traditional sales standards are lowered and promoted via price incentives (Hermsdorf *et al.*, 2017, p. 2533) so that customers can become food savers during the normal shopping process. Other business models (Sedlmeier *et al.*, 2019), such as so-called rescuer apps, even focus exclusively on marketing leftover food (Biehl 2021), just-in-time subscription systems from mobile suppliers for dairy products or so-called green boxes for door-to-door orders of fruit and vegetables aim to minimize surplus production from the outset because they can be based on the number of known orders and customer requests (author's expert interviews 2020-2022). These offers are not always crowned with success.

However, the attempt to sell bread and baked goods from the previous day on a separate shelf in Interspar hypermarkets was unsuccessful. This campaign has since been discontinued because the response from customers was not satisfactory. (LZ, 2016, p. 36 using France as an example)

Many German retailers have been told that customers avoid discounted goods with a short best-before date, it often makes more sense to give the products to the food banks straight away before they spoil in the promotional basket and can then only be disposed of. (LZ, 2016, p. 36)

SparÖsterreich also sees a need to educate customers: Cooking skills have deteriorated. Many people no longer have any idea what they could conjure up with the leftovers from the previous day, it's easier to cook something new and dispose of the old. (LZ, 2016, p. 36)

New technical measures such as the dry-misting process to extend the shelf life of fruit and vegetables using dry mist tubes (LZ, 2022b, p. 46), forecasting systems that partly take into account the weather forecast, automated ordering processes, best-before-date warning systems to improve sales via special conditions, documentation of order and loss histories, daily orders and market-specific optimization of stockpiling aim to minimize food losses (LZ, 2022e, p. 40; LZ, 2025a). 40.8% of a survey panel of the LZ Retail Expert Group (an absolute number of respondents is not available) therefore assume that the volume of donations to food banks will shrink as a result of the use of more efficient goods ordering and the use of artificial intelligence (LZ, 2022g, p. 42). This development is already apparent in 11.8% of responses. A so-called Pact against Food Waste between politicians and representatives of the wholesale and retail trade in Germany in 2023 is intended to help reduce food waste by 30% by 2025 and halve it by 2030, which will increase the pressure on food banks (LZ, 2023b; LZ, 2025b). To this end, annual monitoring will be carried out to measure the success of the reduction in food waste among the companies participating in the Pact against Food Waste (Kuntscher & Schmidt, 2024). Last but not least, there are professional food disposal companies in Germany, such as ReFood and BioCycling GmbH, which collect 550,000 tonnes (ReFood, 2018), and 160,000 tonnes of disposed commercial food per year (Veolia, 2022) for biogas processing. Due to their business model, they are not interested in all food waste flowing into the food bank system. Some retailers do not want to donate to avoid drawing attention to the amount of surplus (Hermsdorf *et al.*, 2017, p. 2535). Against the backdrop of a shrinking donor market, it is all the more important to address the current food losses in the food banks and food bank households themselves and reduce them through improved storage capacities on the one hand and awareness-raising, education, shopping planning and the provision of cooking expertise on the other. In addition, donors should also maintain an appreciation for the products they dispose of and not use their donations to dispose of waste (Lorenz, 2012, p. 391).

Summary and outlook

Food banks are integrated into complex donor networks that guarantee the viability of the food banks. Incoming donations are primarily the result of structural weaknesses such as overproduction, large-scale packaging, best-before dates or varying customer requirements, which lead to company write-offs on the one hand and precarious inflows of donations to the food banks on the other. The inflow of donations from companies are generally emergency solutions. They are increasingly working on minimizing write-offs themselves and marketing items more cost-effectively rather than withdrawing them from their sales system at an early stage. Developments such as COVID-19 or the war in Ukraine are also leading to excessive sales to private customers, gaps in supply and price increases, which have a lasting negative impact on donations to food banks and, conversely, increase the socially desirable appreciation of food along the entire consumption chain (CSCP 2020, 2021). This also includes a change in values in favor of sufficiency, which in its social recognition should be understood less as renunciation but as a transition from quantity-orientated consumption to a new quality awareness (Vogt, 2016, p. 67). This change in values is not yet reflected, at least in the following quotes:

Video5: Many households throw things away before they go bad because they say they simply don't need them anymore. And if they still need it, they buy it again. So these are often the answers we get in the surveys. When you talk to the households concerned, it means that people, first of all, deny that they throw food away, because in our culture it does cause moral discomfort.

Video5: Our fridges are often veritable family graves. So much food dies in them; it's hard to imagine. Fridges are supposed to preserve food, but instead they have become the antechambers of garbage cans. We should buy less and eat it all. We buy unnecessary things far too often. We should learn to buy the right things again and directly from the farmer. That way we can train our good taste. Filling the shopping cart with useless stuff and then throwing it away is a sign of bad taste. We should moderate ourselves. You can also enjoy yourself if you are frugal. (Video5, Min 76:51)

Food banks do not represent the end of the food waste chain because incoming donations cannot be distributed to food bank customers due to a variety of shortcomings. How and whether these donations are used in the food bank households themselves or become food waste there is explicitly a black box that science and the food banks have so far only marginally addressed. Not only is it necessary to optimize the infrastructural equipment of food banks in the form of storage areas and refrigerated vehicles in order to reduce food losses internally (Boeck *et al.*, 2017), but also to further sensitize food bank customers to how the products can contribute to a needs-based diet against the background of nutrition-related experiences and the biographical appropriation of eating habits (Pfeiffer, 2014, p. 9 and 11) (Helping people to help themselves: Brühl, 2015, p. 20). The decline in donations (LZ, 2022f, p. 39), the growing number of customers and the discursive pressure on production, retail and private households to pursue innovative solutions against food waste are placing a triple burden on the food banks. This also includes the marketing of leftovers as premium products in order to serve a specific savior lifestyle.

The company Dörrwerk wants to tackle food waste with childhood memories. The Berlin start-up uses second-class fruit to produce edible paper. The young entrepreneurs puree discarded apples, mangoes or strawberries, spread the fruit pulp on baking trays and leave it to dry. More than 70,000 kilos of fruit are said to have already been processed in this way. However, customers have to be able to afford the edible paper: 100 grams of edible paper costs a hefty 7.50 euros. Food rescue is often more expensive than processing classified goods, says co-founder Jonas Bieber. One example: potatoes that are misshapen would incur up to 40 percent more peeling losses. The young entrepreneurs also rely on more expensive green electricity for production. They also use part of their profits to support the Berlin educational project Gemüseackerdemie, which teaches children in schools about sustainable nutrition. (Tagesspiegel, 16 Jan 2020; <https://www.tagesspiegel.de/verbraucher/18-millionen-tonnen-abfall-hier-bekommen-lebensmittel-eine-zweite-chance/25420730.html>)

Critics characterize the food banks as a disposal system of the food industry (ver.di 2013, p. 20) and question the very existence of food banks, which promote the reduction of the welfare state (ver.di 2013, p. 21). The food banks only exist because state welfare systems are inadequate at finding adequate answers to the basic fight against poverty through minimum wages and minimum pensions (ver.di 2013, p. 20f.) and thus open up a scope for action worth living for even the most vulnerable households. The food security of the latter is characterized by rubber weeks or drawing days (Pfeiffer, 2014, p. 9), during which they have to stretch their food supply and become dependent on (precarious) food banks:

Video6: *Luise Bratland: Only when I've been to the food bank can I say, So I'll do this and this. And then someone else comes later; maybe I'll make cauliflower casserole or something else. (Video6, Min 6:55)*

Video6: *Voiceover: Back with Luise Bratland. Cooking is her great passion, but she can't cook what she wants, only what she gets the ingredients for from the food bank. (Video6, Min 19:45)*

Spatial approaches to the topic presented open up to questions of the location network of food banks and the associated access barriers for potential customers (Sedelmeier, 2013; Pfeiffer, 2014, p. 11), of the spatial distribution of donor sources as a prerequisite for successful food bank work (ver.di 2013, p. 14) and of socio-spatial developments that identify (food) poverty vulnerability at the housing level (Augustin, 2020). The results presented here broaden the perspective on food banks. The approach is largely based on a static one-case study, for which a relational and weighted spatial network of donors and waste disposals could be constructed. This method can be extended in terms of perspective, where the collection boundaries of food banks run in mutual competition for donors, who is missing in this system as a potential donor and how the donor network changes for what reasons and with what consequences.

Acknowledgements

Thanks to the German Research Foundation (DFG) for funding the project under reference number JU332/19-1.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Bridging the skills-transfer gap: edu-influencers in leadership development and mentorship within twitter community dialogue

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Abstract. The skills-transfer gap presents challenges in mentoring and developing students' leadership abilities, making it difficult for academic programs to remain aligned with evolving industry trends. Transformational Leadership (TFL) theory is relevant for understanding this gap due to its focus on visionary leadership, motivation, innovation and personal development. Drawing on TFL theory, this study examines how social discourse on Twitter about leadership and career mentorship in the retail sector is shaped and diffused. Utilizing Social Network Analysis via the NodeXL Pro program, data was collected from the Twitter API, resulting in 1,186 Twitter users and 1,362 connections. Cluster analysis revealed a Community Cluster, where influencers shaped discourse across politics, media, health, technology, venture capital and education sectors, but not prominently within the retail sector itself. Semantic analysis revealed that thematic discourse extended across Twitter communities, reflecting the core dimensions of TFL theory. By applying TFL as a theoretical lens, this study not only identifies the underlying mechanism of the skill-transfer gap but also provides insight into how it may be addressed. In particular, edu-influencers must confront the lack of cross-cluster cohesion and the insufficient understanding of how to inspire, mentor and empower young professionals to exceed their capabilities, particularly within the retail industry. This study offers a valuable TFL framework to guide effective, inclusive and future-ready leadership development initiatives across digital and professional dynamics.

Keywords : career mentorship; edu-influencers; skill-transfer gap; transformational leadership; twitter network; young professionals

Introduction

Edu-influencers (educators and influencers) emphasize that leadership development and mentorship programs are essential for cultivating talent and fostering professional growth among emerging young professionals (McCauley, 2007; Moldoveanu & Narayandas, 2019; Sons, 2016). Despite the widespread implementation of such programs across the academic, industry and professional interest sectors, significant *skill-transfer gaps* persist, particularly for those entering the retail workforce. This disconnect is frequently attributed to the underdevelopment of soft skills including communication, emotional intelligence, problem-solving and team collaboration, which are skills critical to success in a dynamic work environment (Succi & Canovi, 2020). In addition, competencies such as digital literacy, technological proficiency and data analytics are now essential in retail, yet often underrepresented in traditional academic curricula (Deming, 2017).

Most academic programs tend to prioritize theoretical or technical instruction over the practical cultivation of interpersonal and adaptive skills, leaving graduates ill-equipped to manage cross-functional team dynamics or real-time decision-making (Jackson, 2010). Moreover, the pace of technological change outstrips curriculum updates, exacerbating the disconnect between classroom content and real-world demands (Van Laar *et al.*, 2017; Willems *et al.*, 2017). Additionally, there remains a misalignment between academic training and current industry needs, especially in retail, where consumer behavior, digital platforms and supply chain systems evolve rapidly (Skelly & Handrinos, 2023). Many academic programs fail to incorporate sector-specific challenges, such as omnichannel retailing or AI integration, resulting in graduates who are unprepared for the converging demands of the current retail landscape (Ehlers, 2020; Hall *et al.*, 2024). Consequently, young professionals often emerge from academia with outdated or non-transferable knowledge, limiting their capacity to adapt, innovate and lead within an increasingly complex and digitized retail industry.

The skill-transfer gap features the challenges and discrepancies in translating the skills acquired from leadership development programs and mentorship initiatives into real-world workplace settings. This gap underscores the need for an alternative Transformational Leadership (TFL) approach that emphasizes the effectiveness of such programs in equipping individuals with the necessary competencies for leadership success. TFL theory, first introduced by Burns (1978), distinguishes between leaders who establish strong motivational relationships with their followers and those who rely on exchange-based interaction to produce results (Bass & Avolio, 1990). This leadership model represents a conscious, moral and spiritual process, fostering egalitarian power dynamics between leaders and followers to achieve collective goals and genuine transformation (Korejan & Shahbazi, 2016). TFL involves building commitment to organizational goals and empowering individuals to achieve them (Bass & Riggio, 2006). The key attributes of TFL from institutional and organizational contexts may also apply to the social environment, particularly within Twitter's interactive network community. Twitter's social dialogue and user engagement extend leadership functions beyond traditional settings, integrating them into dynamic discourse (Himelboim *et al.*, 2014). This shift reframes leadership from internal organizational interactions to two-way dialogue relationships among network entities. To explore the skill-transfer gap on social media, the purpose of this study is to examine how social discourse about leadership and career development in retail sectors is shaped and diffused through Twitter. Social Network Analysis (SNA) offers a powerful method for examining the complex patterns of communication and relationships within social networks (Wasserman & Faust, 1994). Drawn on the SNA approach, the study aims to identify the top influencers (RQ1), cluster the diffusion structure of the Twitter search network (RQ2) and analyze the Twitter semantic network according to TFL theory (RQ3). To explore these social dynamics and their significance, social network maps of Twitter search and semantic communities were visualized, through cluster and semantic analysis using visualization algorithms from the NodeXL Pro program. As dynamic learning environments continue to evolve in leadership and mentorship, leveraging TFL principles can enhance the impact and efficiency of knowledge transfer within and beyond academia. Edu-influencers, including industry experts, thought leaders and educators, should play a pivotal role in determining whether social media content stimulates retweets, engagement and word-of-mouth dissemination of emerging trends. This, in turn, amplifies their influence across the broader retail community (Boston Consulting Group, 2023).

Transformational leadership (TFL) theory

Individual and organizational leadership is a critical success factor for managers at all levels, primarily due to the increasing need for collaboration to achieve desired outcomes in the evolving retail environment. Regardless of specific job responsibilities, leaders must influence others, motivate them to take action and accept accountability for results. This emphasis brings attention to Transformational Leadership (*i.e.*, TFL), which is widely adopted in innovative and advanced organizations.

TFL concepts provide a viable theoretical lens for understanding the skill-transfer gap by emphasizing visionary leadership, intrinsic motivation, innovation and personal development. For example, Google's Googler-to-Googler (G2G) training program and IBM's Extreme Blue leadership academy exemplify TFL in action. These programs promote peer-driven learning, foster a knowledge-sharing culture and integrate design thinking to support digital transformation, agile leadership development and innovation-led projects. Such organizations believe transformational leaders inspire and challenge individuals to go beyond their perceived limitations and cultivate creativity, autonomy and organizational innovation (Karauri & Kyongo, 2024). These leaders can motivate followers to enhance creativity for self-actualization while prioritizing team, group and organizational goals. They are change agents who shape a shared vision and drive sustainable transformation (Arabiun *et al.*, 2014).

TFL theory (Bass, 1997) posits that transformational leaders enhance motivation and commitment by aligning followers' behavior with a shared vision. The theory distinguishes leaders who develop deep motivational relationships with their followers from those who depend on transactional exchanges to achieve outcomes. TFL is often seen as more effective than pragmatic or transactional leadership, as it represents a conscious, moral and spiritual process that promotes egalitarian power dynamics, ultimately facilitating collective transformation (Korejan & Shahbazi, 2016). By cultivating organizational commitment, TFL empowers individuals to achieve shared goals while fostering creativity and self-actualization. Transformational leaders initiate change and co-create visions that align both managers and employees toward a common direction (Arabiun *et al.*, 2014) in seeking new pathways for organizational growth and resilience. TFL fosters passion, loyalty and commitment across all levels, equipping teams with the tools and guidance needed to reach peak performance (Korejan & Shahbazi, 2016). According to Bass and Riggio (2006), TFL is characterized by four key attributes. First, personal consideration means that leaders recognize the unique needs, aspirations and challenges of their followers, offering mentorship and coaching to support personal growth. Second, intellectual stimulation refers to leaders encouraging innovation by challenging assumptions, promoting creativity and supporting independent thinking. The third attribute is inspirational motivation, in which leaders articulate a compelling vision, motivating followers to commit to shared objectives and take purposeful action. The fourth is an idealized influence in which leaders serve as ethical role models, earning trust and respect through consistent values and behaviors (Kement, *et al.*, 2024). Conchie & Dalton (2025) further developed a realistic TFL competency framework known as 'The Five Talents That Really Matter', based on the analysis of over 58,000 high-level leaders globally. Designed to predict future leadership performance, this framework outlines five core competencies. Setting Direction (using the metaphor of GPS technology to guide strategic vision), Harnessing Energy (inspiring and sustaining momentum within teams), Exerting Pressure (effectively managing tension, debate and dissent within leadership context), increasing Connectivity (candidly communicating with authenticity, even when delivering difficult messages) and Controlling Traffic (executing strategy with structured flexibility, balancing discipline and adaptability). These competencies reflect the traits of transformational leadership and provide a blueprint for bridging the skill-transfer gap. They do so by enhancing knowledge diffusion, improving mentorship effectiveness and strengthening leadership development within both organizational and socially networked communities such as Twitter.

The dynamics of TFL diffusion in leadership development networks

The shifting demands of consumers, the emergence of new technologies and the proliferation of disruptive business models have created substantial challenges for both academic institutions and industry practitioners in adequately preparing and recruiting young professionals for careers in the retail sector (Boston Consulting Group, 2023; Willems *et al.*, 2017). These challenges have exacerbated the skill-transfer gap due to the limited opportunities available for young professionals to build proficiency in digital tools, omnichannel platforms, data analytics and emerging technologies such as artificial intelligence and augmented reality (Hall *et al.*,

2024). In response to these evolving requirements, industry-academic partnerships and peer-to-peer collaborations have emerged as crucial mechanisms for bridging the skill-transfer gap between theory and practice. Such collaboration ensures academic curricula remain aligned with industry trends and evolving workforce competencies. However, this gap remains particularly evident in the underemphasis on TFL attributes and limited public engagement around leadership development initiatives. A lack of open, dynamic conversations that integrate TFL competencies and innovation attributes further reinforces this disconnect. Indicating a pressing need for social media-driven public discourse, particularly led by edu-influencers.

Mentorship programs that connect students with experienced industry professionals provide essential support, guidance and access to networks, enabling young professionals to navigate complex business environments and develop critical leadership skills. Recent years have seen a rise in the use of social media platforms like Twitter and LinkedIn, as tools for educational engagement and TFL diffusion (Antonio, 2022). Prestigious institutions such as Harvard Business School (www.exed.hbs.edu/leadership-development) and the National Retail Federation (www.nrffoundation.org/campus/scholarships/next-generation) offer leadership development programs that blend experiential learning with access to industry insights through various social communication initiatives. However, despite integrating experiential learning and academic curricula, these initiatives often lack transparency and accessibility on social media regarding mentorships, internships, real-world projects and practical industry challenges.

Social media, particularly platforms like Twitter, offers powerful opportunities for leaders and learners alike to engage with broader communities, disseminate knowledge and foster collaborative efforts toward shared leadership goals (Antonio, 2022). The social network approach can explore how public communication surrounds leadership development and mentorship programs. Using new data mining techniques, edu-influencers can uncover how users participate in leadership-related dialogues and visualize their relational network structure (Himmelboim *et al.*, 2014). On Twitter, this methodology allows for the analysis of various dynamics, such as information diffusion, content popularity prediction, hashtag usage, misinformation detection, content virality and user recommendations (Buntain & Golbeck, 2017; Rui *et al.*, 2013). It not only enables the prediction of topical trends in leadership discourse but also facilitates the identification of key social influencers who play a pivotal role in shaping that discourse. Moreover, group segmentation and cluster detection help in understanding the diffusion structure of innovation and the spread of leadership attributes through distinct social discourses (Cano-Marin *et al.*, 2023). Within a Twitter network, users who influence broader discourse can be classified as opinion leaders (i.e., users who can influence others to share or retweet content) or information brokers (i.e., users who can connect different clusters within the network and facilitate knowledge transfer across segmented communities) (Kim & Chakraborty, 2024; Welser, 2007). While information brokers often exert a stronger influence on retweet behavior, their effectiveness is enhanced when influencers are mentioned in the original tweet (Araujo *et al.*, 2017). This interdependence between brokers and influencers forms a strategic communication dynamic that significantly amplifies the spread of leadership messages and values. When opinion leaders initiate interpersonal dialogue within their communities, their credibility and perceived authenticity accelerate the diffusion process, allowing the community at large to engage in knowledge sharing, influence peers (Valente & Davis, 1999; Weimann *et al.*, 2007) and finally reinforce emerging TFL discourse. Thus, understanding these networked dynamics and discourse diffusion is essential for leveraging TFL principles in addressing the persistent skill-transfer gap among emerging professionals.

Methodology

Social network analysis (SNA) using the NodeXL Pro software

Social Network Analysis (SNA) is a methodological approach that focuses on the relationships and structures within social systems (Wasserman & Faust, 1994). The key concepts in SNA are vertices and

edges. Generally, vertices represent entities such as individuals, events, locations, or abstract constructs, while edges denote the connections or interactions between these entities (Hansen *et al.*, 2010). Vertices also referred to as actors, nodes, dots, agents, or points, can signify a wide range of social entities, including teams, companies, organizations, institutions, governments, nations and even non-human constructs such as web pages, keywords, movies, or geolocations. Conversely, edges, labeled as links, ties, arcs, lines, or connections, depict specific types of relationships, such as communication, collaboration, transactions, investments, friendship, or shared features (Wasserman & Faust, 1994). In the context of Twitter, edges frequently represent actions such as tweets, retweets, replies and mentions, highlighting real-time, directional relationships between users.

To analyze these Twitter networks, this study used the NodeXL Pro software, a plug-in for Microsoft Excel specifically designed for non-programmers. NodeXL Pro enables users to perform network computation, graph visualization and content analysis with ease. The software calculates key network metrics such as in/out degree, betweenness centrality and PageRank, while also offering functionality for filtering, clustering and customizing the visual appearance of vertices and edges. These graph metrics are instrumental in understanding network structure, size, influence and the role of individual vertices (Twitter users) within the social system (Welser *et al.*, 2007). The datasets retrieved via the Twitter Application Programming Interface (API) are initially unstructured and noisy, posing challenges in preparing the data for analysis aligned with the study's three research questions.

To address research question 1(RQ1), identifying key influencers, the dataset was analyzed using centrality metrics such as in-degree, out-degree, betweenness centrality and page rank. Betweenness Centrality (BC) is particularly important as it identifies vertices that act as bridges within the network, highlighting individuals who are central to maintaining network coherence and facilitating the flow of information. For RQ2, exploring the diffusion structure, the cluster analysis using the Clauset-Newman-Moore (CNM) algorithm was applied to group vertices based on modularity, allowing for the detection of cohesive sub-communities. The Harel-Koren Fast Multiscale (HKFM) layout algorithm was used to generate visually interpretable graph layouts that depict network topology, inter-cluster relationships and cluster density. Finally, to address RQ3, examining thematic dialogues, semantic network analysis was conducted using word-pair metrics. This allowed the construction of a semantic map that reveals how dialogue flows within the network and how discourse themes relate to TFL theory. The semantic analysis provides insight into conceptual alignment, rhetorical framing and topical clusters based on TFL attributes such as vision, empowerment, motivation and innovations.

Detecting the topic-specific network and data collection from the Twitter platform

In examining online communities engaged in leadership and mentorship discourse, the initial step involves obtaining traceable and thematically relevant data from Twitter networks. To retrieve topic-relevant data from community discourse, a keywords-based search strategy was employed using the Boolean logic, specifically the logical OR operator in a search query. This logical approach ensures the inclusion of dialogue relevant to the topics.

Focusing on TFL in the context of young college professionals entering the retail and business sectors, two institutional programs were designated for in-depth network exploration. The NRF Foundation Student Program, hosted by the National Retail Federation (NRF), aims to prepare students for leadership roles in retail. The HBS Leadership Development Program by Harvard Business School is a globally recognized initiative focused on cultivating future business leaders. Twitter data was imported using the search queries Leadership Development OR Career Mentorship OR Retail OR HBS NRF (LMR). This query was selected to encapsulate diverse, yet interconnected conversations related to educational leadership pathways, career guidance and leadership initiatives in both academic and industry contexts.

TABLE 1 - Overall metrics of the LMR Twitter search network

Graph Metric	Value
Graph type	Directed
Vertices (the number of Twitter accounts)	1,186
Total edges (the number of connections with other Twitter accounts)	1,362
Unique edges	1,011
Edges with duplicates	351
Maximum geodesic distance (diameter)	6
Average geodesic distance	1.677449
Graph density	0.000409133
Modularity	0.612411

Tweets were collected over one year, providing a longitudinal perspective on how topic-related content is generated, amplified and received within Twitter's dynamic social environment. The LMR network comprised a dataset of 1,186 Twitter users whose tweets contained at least one of the keywords or who were replied to, mentioned, retweeted, or quoted in those tweets between April 2023 and April 2024. This activity resulted in a total of 1,362 edges (connections) within the network (see Table 1).

Results

The results are organized into identifying the top influencers (RQ1), clustering the diffusion structure of the LMR Twitter search network (RQ2) and analyzing the semantic network according to TFL theory (RQ3).

Identifying the influencers within the LMR Twitter search network (RQ1)

To identify the top influencers, betweenness centrality (BC) was calculated. It measures how frequently a user appears along the shortest communication paths between others., indicating their control over information flow and potential to influence discourse (Hansen *et al.*, 2020). A BC score reflects a user's leading position. Table 2 presents the top 27 influencers, based on activity metrics (number of followers, followed and Tweets) and their respective cluster affiliation. These influencers are distributed across multiple clusters, each reflecting distinct dialogue dynamics within the cluster discourse. Further details on clustering structure are provided in the RQ2 section. Unexpectedly, group 1 (G1) included high-BC political and media influencers. Notably, the three top influencers among 27 serve as information brokers, given their high BC score. 'rigathi' (Deputy President of Kenya) led 682,713 followers to the LMR network with a BC of 2,391.000, followed by information broker 'mbuma_ke,' (a digital content creator) with a BC of 383.000 and 35,918 Tweets and journalist 'cbs_ke,' (a digital journalist and media strategist) has 188,080 followers and 32,116 followed with a BC of 192.000. Importantly, 'victorkjr32', a social media influencer and 'Augranious', known for youth leadership and empowerment leader, had a direct impact as opinion leaders in shaping the LMR dialogue. Although political figures and social media influencers are not directly engaged in the LMR topic, their roles as information brokers and opinion leaders help broadcast the core LMR topics, roles as information brokers and opinion leaders contribute to amplifying and broadcasting LMR-related content within a broader social and communicative context.

Group 2 (G2) consists of youth and health advocates, such as 'lucas_fondo' (youth empowerment with 2,256 followers and 13,775 tweets) and 'maxwell_karani4' (leadership trainer with strong advocacy for gender equality and youth opportunities). Despite limited followers but a high BC of 44.000, 'maxwell_karani4' demonstrates the opinion leader of niche experts in specific leadership domains. Group 3 (G3) and Group 10 (G10) were composed primarily of medical professionals and institutions, influencers such as 'pooh_vel' (cardiologist) and 'Accintouch'(American College of Cardiology) showed how healthcare experts integrate TFL themes into professional mentorship and education.

TABLE 2 - Top 27 Influencers of the whole LMR Twitter search network.

Vertex Id (Group number): Account description	*B/C	**FER	*** FED	****T W
1. rigathi(G1) Deputy President of the Republic of Kenya.	2391.000	682713	117	3414
2. mbuma_ke (G1) Nonchalant. 'rwanda world real diplomatic unique growth #mlimanews riggyg engagements #rigathionassignment	383.000	11993	1893	35918
3. cbs_ke(G1) Digital Journalist Digital Media Strategist Opinion is Free But Facts are Sacred	192.000	129828	32116	188080
4. pooh_vel(G3) Structural and Interventional #Education Cardiologist; #HRPCI #SHD; Opinions my own	180.000	11562	966	23071
5. victorkjr32 (G1) God Fearing social Media Influencer/ Creating and marketing Digital content/	143.333	2059	228	88351
6. min_waterug (G6) The Ministry is mandated to set national policies and standards, manage and regulate water and environmental resources in Uganda.	132.000	12755	261	6976
7. dolores_mckeen (G4) Newf wife momx3 slow proud @MUNalumni @MUNmed'92 @DeanMUNMed Professor #OBAnes RCPSC #Surveyor #Examiner #EDI MyOpinions NotAfraidToShareEm	132.000	2113	1990	7614
8. Augranious (G1) Drive leaders generation youth cbs_ke empower positive progress mp nspire'forward, #govsimbaarati county, forward nurtured, generation generation, future programs, nurtured equipped, skills emphasis, youth knowledge, drive development, programs.	98.000	80	124	6728
9. Kojiromoriwaka (G5) CEO @SiliconVV /Advisor CV /Venture Partner BE VC 🇺🇸 @CVLabs /Advisor@ArkaVentureLabs Health Ventures@_BE_Health_ 🇺🇸 /@FukuokaGrind @GiftedDaRapper	91.000	8452	3946	41525
10. m_samatar(G9) Supply chain and logistics specialist. views on by Me, Myself and I	90.000	47	739	866
11. puneetsinghal22(G7) #Dyspraxic CDO @NASA @Billionstrong1 Leading @GNYPWD DEI Practitioner Board @thegysrl Member @IUCN #WeAreBillionStrong, #a11y, #SDGs, #AXSChat	84.000	1145	4011	8866
12. m_francis(G5) Chief Product Officer @ForbesTech Cncl member; @ElectronicCare; past: @AWS @Intel @AgeWave Harvard Pitt my tweets are my own	77.000	960	1239	8401
13. Tycoonstoryco (G8) Largest Online Network for #Startups and #Entrepreneurs #shareyourstory #startuplife #entrepreneurship #smallbusiness #finance, career growth training business ideas leadership development self improvement mentorship leadership qualities team development skill building goal setting	72.000	1947	1839	9141
14. trath2017 (G11) Travel enthusiast, chef at heart, a true Oriyaenachak women commsadda barriers madhurimab_1 mou chakravorty fulfill aroraamandeeppk new bhavyachirps	56.000	61	152	161
15. Modeldoc (G12) Cardiologist Professor/ MasterPhysician mentorship sponsorship conflict negotiation @EmorMedicine @EmoryatGrady @UniIbadan@JohnsHopkinsSPH @MSMEDU @VUMC_heart #TheFaceofCardiology	51.000	3002	2214	4233
16. Ersozlusara (G10) Attending Cardiologist University	46.400	465	1203	283

Hospital Zurich  Multimodality Cardiac Imaging Research Heart Failure PCHF24-25 Rare Diseases SCMR SoMe 'community, glad leadership, vicferrarimd glad, part early, career scmr, leadership support, early spread, word scmr, supriyajain efforts,				
17. Tycoontejaswi (G8) Share the challenges of being an entrepreneur and offers a regularly updated resource on entrepreneurship. Women in leadership gender equality empowerment career development mentorship leadership professional development	46.000	203	555	817
18. lucas_fondo (G2) Advocacy&Comms @kilifi_youth •RMNCAH Advocate• Researcher•MalariaYouth Corp @MalariaYouthKE• Youth Advocate @rhnkorg •Defeat #HIV #TB #Malaria investinwomen iwd2024 stopfemicideke	44.154	2256	975	13775
19. maxwell_karani4 (G2) 'training help ambaariu gvrckenya kecosce anindosharlyne genderkilifi implement yowpsud_ opportunities	44.000	8	16	98
20. online_hbs (G8) Wherever you are in your career, Harvard Business School Online offers a unique and highly engaging way to learn vital #business concepts. leadership leadership development hbs online climb elevate your career management training	34.000	31137	677	13912
21. doctor_paz (G13) @The_MRC Clinician Scientist Cons Cardiologist @ImperialNHLI @RBandH Cardiomyopathy and cardiac imaging @royalsociety @BritishCardioSo @RoySocMed	31.000	794	322	574
22. 10scollins (G20) Director of Student Activities CEO 365 Mentoring and Coaching, LLC Guest Speaker, Presenter and Podcast Panelist Teach AD Certification classes VSU Alumni	30.000	1183	948	1913
23. Hphororo (G17) UN Resident Coordinator in Namibia. women who namibia privilege facilitate programme unfpa_namibia best house wfpnamibia unaidsnamibia	30.000	1915	300	2035
24. Hbsalumni (G5) Tweeting about Harvard Business School for the 90K alumni living in 161 countries around the world. This is an official HBS account.	30.000	27084	9922	164863
25. Harvardalumni (G5) Official Harvard Alumni Association. HAA maintains and enhances a highly engaged, vibrant community of alumni and friends worldwide.	30.000	100326	9483	39450
26. Accintouch (G3) Official American College of Cardiology account, Join us to transform Find us: @JACCJournals cardiovascular care and improve heart health. @Cardiology'through mission philanthropic stages based more dr blossom #accpresident cv	26.000	147399	2003	41592
27. Forbes (G14) Forbes' free daily newsletter for unmatched insights and exclusive reporting:	26.000	19970219	4900	567723

*B/C: Betweenness Centrality; **FER (# of Follow-ers); ***# of Followed (FWD); ****# of Tweets (TW)

Group 5 (G5) featured institutional influencers related to technology and business, including 'Kojiromoriwaka'(tech CEO) and 'm_francis' (tech council) and alumni accounts such as 'hbsalumni' and 'harvardalumni', signifying the role of elite institutions in connecting with the tech experts. Group 8 (G8) included entrepreneurship and business education influencers, such as 'Tycoonstoryco' and 'online_hbs', representing platforms that promote leadership skills in business among emerging professionals. Group 11

(G11) and Group 14 (G14) showcased lifestyle and media influencers including ‘trath2017’(lifestyle communicator) and major business outlet ‘Forbes.’ They highlighted how non-academic actors participate in shaping public leadership discourse. Together, these 27 top influencers represented a dynamic discourse of TFL communicators ranging from politicians, youth advocates and medical experts to technology leaders, entrepreneurs, educators and media platforms. Their positions within the LMR network underscore the multi-sectoral diffusion of leadership values and the importance of networked influence in fostering professional development and mentorship online beyond the retail sector.

Clustering the diffusion structure of the LMR search network (RQ2)

On Twitter, social dialogue manifests as networked communication structures, where users engage through replies, mentions and retweets. These relational patterns generate distinct interaction topologies shaped by both topic-specific discourse and the influence of individual users (Kim & Chakraborty, 2024). Smith *et al.* (2014) categorized network interaction structures into six topological patterns: a polarized crowd which consists of two distinct groups with limited connections; a tight crowd, characterized by highly interconnected entities forming a dense network structure; brand clusters composed of numerous disconnected users; community clusters, which include multiple smaller groups along with their respective audiences, influencers and information sources; a broadcast network, centered around a single hub, where a well-connected audience interact with the hub but disconnected from one another; and a support network, where a central hub responds to multiple disconnected participants, creating an outward spokes-like structure (Smith *et al.*, 2014). These structural topologies define network patterns and motifs, providing insights into individual roles and relational characteristics across the network (Himmelboim *et al.*, 2014).

To analyze the structure of the LMR network, cluster analysis was conducted using the Clauset-Newman-Moore (CNM) clustering algorithm in combination with the Harel-Koren Fast Multiscale (HKFM) layout algorithm. These tools enabled the creation of interpretable graph visualizations and the identification of emergent communities. Out of 182 detected clusters, 31 obvious clusters were extracted, excluding isolated vertices that exhibited no engagement beyond passive consumption (i.e., users who read posts but did not interact). The resulting network was organized into 31 distinct subgroups, each structured around central influencer hubs and their associated audiences, contributors and information sources. This decentralized yet cohesive structure resembles a community cluster, as defined by Smith *et al.*, (2014), where multiple smaller groups operate with varying degrees of connectivity, interactivity and thematic focus. Unlike centralized broadcast networks or isolated brand clusters, community clusters reflect a multi-nodal communication dynamic, supporting rich peer-to-peer dialogue and localized influence patterns.

Figure 1 illustrates the clustered diffusion structure of the network., revealing how each influencer is connected to their followers. Each cluster functions like a mini-bazaar, hosting activity centered around key influencers and content vertices. Some clusters revolve around institutions (e.g., HBS and NRF), while others are organized around individual thought leaders, advocacy groups, or niche domains such as healthcare, technology, or education. For example, in G1, key information brokers like rigathi, cbs_ke and mbuma-k generate engagement, forming a dense network centered on political and leadership themes. G2 focuses on youth advocacy and community development, with influencers like lucas-fondo and leadership practitioners like maxwell_karani4, who acted as opinion leaders in fields related to youth empowerment, health and community development. G3 was primarily composed of medical professionals and organizations engaged in training, mentorship and healthcare leadership, influencers included pooh_vel, Ersozklusara and institutional accounts like Accintouch, which focus on cardiology and professional education. G5 featured leaders from TFL-aligned institutions and organizations involved in technology, venture capital and alumni networks. Notable influencers included Kojiromoriwaka, m_francis, as well as institutional accounts such as harvardalumni and hbsalumni, which connect global leadership communities.

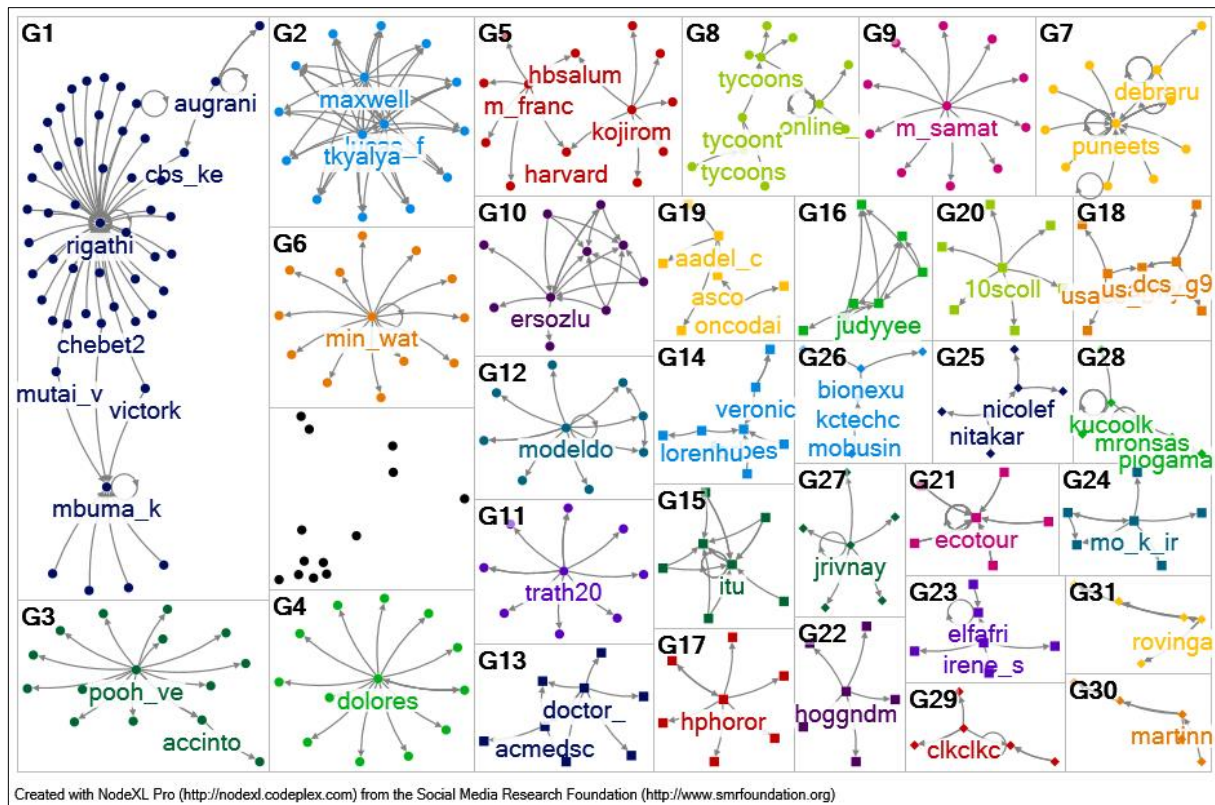


FIGURE 1 – The community clusters of the LMR Twitter search network

G8 represented emerging TFL influencers like Tycoonstoryco, with a focus on entrepreneurship, business education, and professional development. G11 and G14 also included opinion leaders and information brokers, contributing perspectives from lifestyle, communication, and business media sectors. As discussed in the RQ1 section, at least eight notable groups feature prominent opinion leaders and information brokers, playing a pivotal role in facilitating information diffusion across the entire LMR Twitter search network.

The topology as a community cluster illustrated convincing skill-transfer gaps in the LMR network, explaining how compelling topics are disconnected, localized and selectively amplified across different professional and thematic boundaries. Remarkably, HBS in G5 has sought to bridge this gap by leveraging its alumni network to promote ideas about technology and entrepreneurship within its TFL initiatives. Understanding the network's dynamic structure helps map how influence flows, identify where mentorship conversation emerges and explore how edu-influencers embed themselves within leadership networks on Twitter.

Analysing the semantic network based on the transformational leadership theory (RQ3)

The semantic network emphasizes how words are interconnected and how they contribute to the diffusion of the thematic discourse (Himmelboim *et al.*, 2014). Using two metrics, count and salience, the word pairs were assessed for the importance and frequency of words appearing together. The word pairs were then relocated to a new network worksheet and the VLOOKUP formula was applied to compute the corresponding values for both count and salience. The resulting semantic network for the LMR dataset comprised 1,283 vertices (keywords) and 2,285 total edges (dialogue connections), as presented in Table 3.

TABLE 3 - Overall metrics of the LMR Twitter semantic network

Graph Metrics	Value
Graph type	Undirected
Vertices (the number of keywords)	1283
Total edges (the number of connections with other words)	2285
Unique edges	2141
Edges with duplicates	144
Maximum geodesic distance (diameter)	24
Average geodesic distance	4.555555
Graph density	0.002686031
Modularity	0.567783

To analyze and visualize this semantic network as meaningful clusters, the Clauset-Newman-Moore (CNM) clustering algorithm and the Harel-Koren Fast Multiscale (HKFM) layout algorithm were applied (Figure 3). Each cluster was assigned a unique label (e.g., G1, G2) and color to distinguish thematic grouping. The spatial proximity of vertices within clusters reflects conceptual closeness and topical alignment. For instance, Cluster G1 (purple) centered on themes such as mentorships, culture, social, fostering, impact and support, while G2 (blue) contained terms like leadership, president, research, years and program. G3 (dark green) focused on leaders, generations, careers, roles and jobs. Other clusters such as G4 and G5, also exhibited distinctive thematic coherence. Notably, G5 (red) reflected a tech-driven discourse, largely associated with Coruzant, a crowdsourced digital publication built on blockchain technology. Keywords such as #technology, #ai, #emergingtech and #protegy in association with #coruzant illustrated the integration of emerging technologies in leadership and mentoring discourse.

The inter-cluster edges connecting keywords across clusters indicate signified relational discourse between topic communities. For example, the word mentorships created strong red-lined connections across multiple clusters, signaling its central role in bridging dialogue. G4 (green) focuses on success, insights, women and excellence, while G6 (orange) emphasizes themes such as leadership, chance, career and empowerment. G10 (purple) highlights commitment, lead and leadership. Overall, the semantic network's layout suggests that clusters G1 and G2 functioned as the central discourse hub, containing powerful topics from opinion leaders and information brokers, given their numerous inter- and intra-group connections.

To deepen the analysis of the thematic discourse of the LMR semantic network, the top 50 words were extracted based on counts and salient value and analyzed using betweenness/ closeness centrality and measures of word counts and semantic grouping (Appendix 1). The most salient word was leadership, with a BC of 296,348.961 and a word count (WC) of 924, primarily located in G2. This confirms leadership as a pivotal theme, consistently bridging multiple conversational pathways. Other salient terms like mentorship and development lead the social discourse. Other prominent terms included mentorship, development, career, women, program, youth and opportunities, reflecting the core interests and concerns of the network's community clusters. Special attention was also drawn to G5's focus on #technology, #ai, #emergingtech and #protegy in association with Coruzant, indicating a growing emphasis on tech-enabled leadership. These 50 words in the Appendix were then classified according to the four dimensions of TFL theory (Korejan & Shahbazi, 2016), highlighting alignment areas for bridging skill-transfer gaps (Table 4).

PERSONAL CONSIDERATION: Words such as mentorship, youth, students, fostering, support, growth and commitment aligned with TFL's emphasis on individualized encouragement and personal development. This suggests strong discourse around mentorship-driven leadership aimed at long-term engagement and leadership pipeline sustainability.

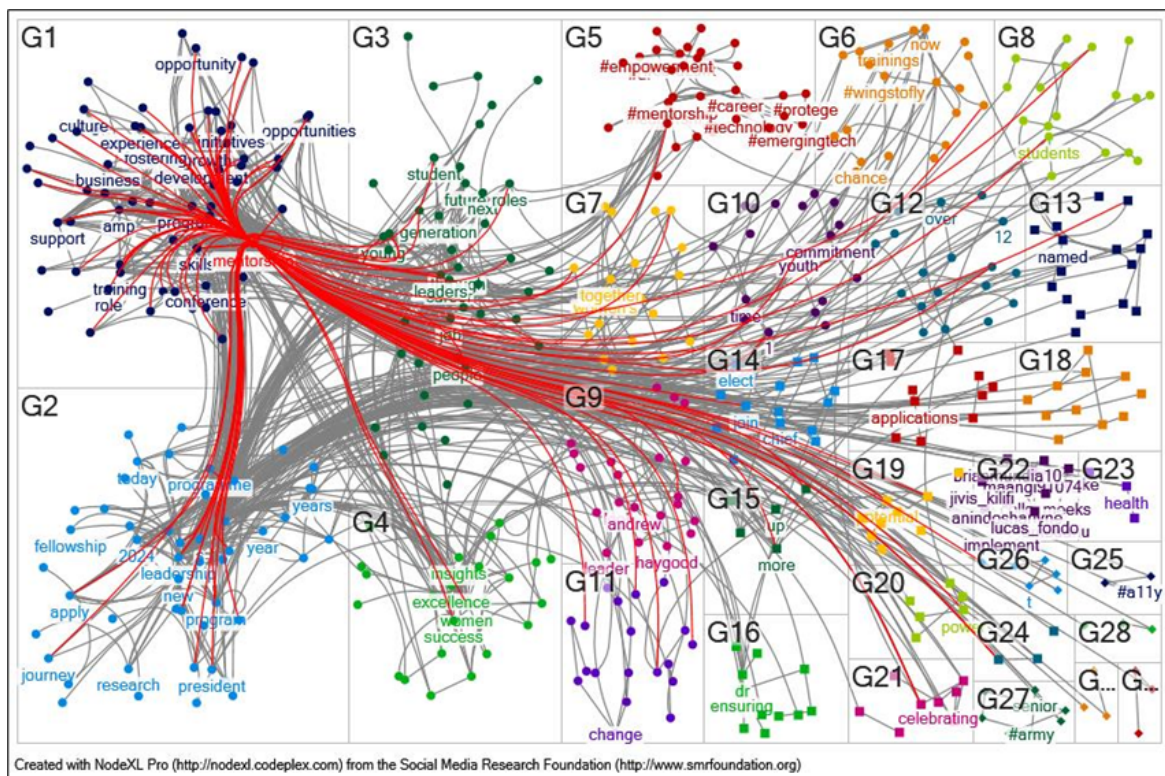


FIGURE 2 - Semantic clusters of the LMR Twitter semantic network

TABLE 4 - Categorization of the top 50 words based on TFL theory*

Dimensions of the TFL Theory	Personal Consideration	Intellectual Stimulation	Inspirational Motivation	Idealized Influence
	- Allocating time for guidance and training - Treating members as a person, not as a member - Considering people with different needs, abilities and creativities - Help others to develop their capabilities	- Careful examination of offers to ensure their suitability. - Considering different perspectives while solving a problem - Requesting for examination of problems from different perspectives - Suggesting new ways of how to do something	- Talking optimistically about the future. - Talking seriously about things that should be done. - Emphasizing the importance of foresight. - Giving hope to members about achievable goals.	- Instilling a sense of pride and honor in members to connect with others. - Showing a sense of power and competence. - Act in a way to raise other's respect. - Sacrificing personal interest for other's interest.
Top 50 words	mentorship/youth students /student /apply personal / support fostering / growth commitment/roles women/women's senior / opportunities	Research/insights training/experience conference/culture change/development Implement / skill opportunity/career #mentorship/training	leadership/leaders future / success power/role/chance next / president/elect training /#wingstofly #protege / name /chief	Andrew / lucas_fondo brianmundial0 maangi91074/#Coruzant leadership /#leadership President/elect #protege / Jon young / #mentorship

*Adapted the four dimensions of TFL theory from the framework of Korejan & Shahbazi (2016)

INTELLECTUAL STIMULATION: The words like research, insights, training, conference, culture, skills and development reflected an emphasis on training/learning, innovation and career readiness. While the data show a focus on critical thinking and capacity-building conversations on disruptive innovation and adaptive leadership, essential for future readiness, substantial conversations were comparatively underrepresented.

INSPIRATIONAL MOTIVATION: The words such as leadership, future, success, power, role, chief, training, elect and next revealed aspirational narratives. These terms underscored leaders' efforts to energize and mobilize others. However, there was limited emphasis on emotional intelligence and resilience-building, which are vital for sustaining authentic transformational leadership.

IDEALIZED INFLUENCE: Names and hashtags such as Coruzant, lucas_fondo, maangi91074, brianmundial0, #leadership and #protege indicated the presence of influential figures and social role models. These entities shaped discussions around leadership credibility, decision-making and social responsibility. Still, the diversity of leadership perspectives appeared limited, highlighting a need for broader inclusion of retail businesses and academia sectors.

In conclusion, the LMR Twittwe semantic Network reflects an active engagement with the key dimensions of TFL theory. Mentorship and individual development support the centrality of Personal Consideration, while Intellectual Stimulation is well represented, though lacking focus on disruptive thinking, inspirational Motivation themes were evident yet underdeveloped in emotional depth, idealized Influence was shaped by influential social actors, though the community cluster network would benefit from a more inclusive and diverse representation of leadership models. These findings emphasize the potential and limitations of current social discourse in addressing skill-transfer gaps within TFL frameworks.

Conclusions and discussion

The social roles of opinion leaders and information brokers

Within the leadership development and career mentorships in the LMR Twitter network, influencers demonstrated distinct social roles and central positions in the network, as identified through their SNA metrics. When associated with specific subclusters, these influencers served as either topical opinion leaders or information brokers, facilitating both intra-group and inter-group connections among cluster participants. The analysis identified the top 27 influencers who represent diverse social roles in their sub-groups, ranging from youth advocates and medical professionals to technology leaders, educators and media platforms. Their positions within the LMR network illustrate the multi-sectoral diffusion of leadership values, emphasizing the role of network influence in advancing professional development and mentorship, extending beyond the retail sector. Each group communicates TFL-related topics by leveraging a distinctive mix of influencers, including young professional advocates, gender equality leaders, lifestyle communicators and industry-specific experts. Their roles as opinion leaders and information brokers enable the diffusion of TFL narratives across various sectors, including politics, medicine, technology, entrepreneurship, media and education. Through their significant presence and active engagement within the LMR Twitter network, these influencers play pivotal social roles in fostering leadership development and addressing skill-transfer challenges in today's retail workforce.

Diffusion structure of the community cluster

Cluster analysis identifies the LMR search network as a community cluster, comprising medium- and small-sized groups. G1 exhibited strong interactions driven primarily by three information brokers and opinion leaders. Despite their influences, G1 also includes several isolates, indicating the presence of inactive participants or niche topics that have failed to attract broader engagement. Although some cross-cluster connections are presented in other groups from G2 through G31, the majority of clusters remain disconnected, underscoring the segregated nature of the community cluster topology. Each cluster tends to operate semi-independently, cultivating its top tweeters, audiences and thematic focuses. This segmentation reflects the diverse audience interests and viewpoints, which contribute to a skill-transfer gap in the social discourse surrounding the leadership development and mentorship program in retail. The community

cluster structure of the LMR network provides insights into the diffusion of leadership discourse, illustrating how leadership values are often localized, disconnected and selectively amplified across various professional and thematic boundaries in the retail sector. Notably, Harvard Business School (HBS) appears to be actively addressing this fragmentation by leveraging its alumni network to promote technology and entrepreneurship within its TFL initiatives.

Understanding the network structure is effective for mapping the flows of influence, identifying where mentorship conversation emerges and exploring how edu-influencers position themselves within the social community. These insights are vital for closing the skill-transfer gap and enhancing the effectiveness of leadership development strategies in the future retail sector (Kement *et al.*, 2024).

Thematic insights from transformational leadership theory

The Semantic LMR Network reveals a dynamic engagement with the core dimensions of TFL theory, highlighting both the strengths and limitations of current social discourse in addressing the skill-transfer gap. The prominence of themes related to mentorship, youth development and personal growth strongly supports the dimension of Personal Consideration, emphasizing the value of individualized support and encouragement in leadership practices (Zhang & Xu, 2024), intellectual Stimulation is also well represented through discussions on learning, career development and professional training. However, there is a noticeable lack of dialogue around disruptive innovation and adaptative strategic leadership, which are critical for preparing future leaders in fast-evolving retail industries, inspirational Motivation, such as success, ambition and visionary leadership, are prevalent, yet the discourse tends to underrepresent elements of emotional intelligence, resilience-building and psychological adaptability, which are essential qualities for TFL in uncertain retail environments (Buil *et al.*, 2019). The dimension of Idealized Influence is reflected through the presence of influencer figures and organizational accounts, demonstrating the role of social actors in shaping leadership narratives. Nonetheless, the lack of diversity in leadership role models across the network points to the need for greater inclusivity and representation of varied leadership voices.

Conclusively, for TFL initiatives to effectively bridge the skill-transfer gap, edu-influencers within these networks must strike a deliberate balance between mentorship, innovation and resilience-building, while also amplifying a diverse spectrum of leadership models for the retail sector. Such an approach would enrich the discourse, foster equitable development and better align leadership communities with the complex demands of the retail workforce.

Contributions, limitations and implications

The leadership development and career mentorships network on Twitter reveals critical factors contributing to the skill-transfer gap in the retail sector. Applying Transformational Leadership theory, this study not only highlights the underlying mechanism behind the gap but also proposes a theoretical lens through which it can be addressed. The findings offer practical implications for both academic institutions and the retail industry in preparing future professionals.

Theoretical contributions and limitations

This study contributes to leadership study by demonstrating how core dimensions of the TFL theory (personal consideration, intellectual stimulation, inspirational motivation and idealized influence) can be applied to analyze variations in leadership and mentorship discourse within the retail environment. By employing SNA and its visualization tools through NodeXL Pro, the study identified the LMR Twitter network as a community cluster, composed of medium- and small-sized groups with dense internal interactions but limited cross-cluster engagement. The novel SNA visualization helps identify the skill-

transfer gap, while the application of TFL theory supports sustained thematic discourse that can inform effective leadership and mentorship initiatives for the evolving retail sector and young professionals.

At the same time, the methodology presents certain limitations. Despite the use of a targeted keyword strategy and extensive data filtering and reduction, the resulting Twitter search network remained only loosely retail-driven, with limited sector-specific engagement. Although five carefully selected keywords were used to import Twitter API data in an effort to capture relevant dialogues, the discourse extended to broader themes such as politics, media, health and technology. This highlights a limitation in mapping and interpreting sector-specific leadership discourse within large-scale, open social media datasets. Future studies may benefit from combining platform-specific data from other social media like LinkedIn with qualitative insights or narrowing the temporal and topical scope to enhance retail relevance and interpretive precision.

Practical implications

The study suggests practical implications for edu-influencers in academic programs and retail industry stakeholders seeking to bridge the skill-transfer gap. First, leadership education should integrate digital literacy, social media strategy and online influence-building to better prepare students for a platform-driven workplace. Social media platforms like LinkedIn should function as mentorship ecosystems, enabling edu-influencers and alumni to share leadership experiences and mentorship ecosystems, enabling edu-influences and alumni to share leadership experiences and connect with aspiring professionals in real time through structured digital mentorship programs, institutions should also activate alumni networks more effectively by involving them in mentorship, project-based learning and real-world leadership coaching.

Embedding TFL principles within real workforce environments aligns with emerging industry expectations. To address the fragmentation identified in the LMR network, leadership initiatives should promote cross-sector and interdisciplinary engagement through public leadership dialogues, alumni panels and mentorship circles that bridge both topical and professional silos. Although inspirational themes are present in the social discourse, leadership training must place greater emphasis on emotional intelligence, resilience and adaptive capacity to better prepare young professionals for uncertain retail environments Boston Consulting Group. 2023). Furthermore, the lack of diverse leadership representation highlights the need to amplify underrepresented voices across gender, national and professional lines to reflect a more inclusive range of leadership models. Finally, edu-influencers can apply a social network approach to identify internal influencers, opinion leaders and information brokers who can lead internal mentorship initiatives and drive leadership development. Collectively, these strategies contribute to building a more inclusive, digitally literate and resilient leadership pipeline equipped to meet the evolving demands of the retail workforce.

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APPENDIX 1 - Top 50-word metrics of the LMR Twitter semantic network

	Vertex	Betweenness Centrality	Closeness Centrality	Word Count	Vertex Group
1.	leadership	296348.961	0.376	924	2
2.	mentorship	187685.655	0.360	873	1
3.	development	133400.176	0.348	692	1
4.	career	101293.651	0.332	375	3
5.	women	55490.508	0.320	184	4
6.	Amp	37614.673	0.318	212	1
7.	#mentorship	35623.465	0.294	184	5
8.	Join	28648.364	0.310	72	14
9.	#leadership	26596.579	0.265	168	5
10.	program	26439.395	0.310	165	2
11.	leaders	25715.416	0.281	132	3
12.	president	22760.761	0.287	20	2
13.	young	19185.103	0.306	72	3
14.	opportunities	18873.749	0.312	133	1
15.	apply	18446.653	0.287	63	2
16.	programs	18434.240	0.310	123	1
17.	youth	17510.761	0.299	110	10
18.	Skills	16527.500	0.314	113	1
19.	implement	15940.233	0.272	17	22
20.	trainings	14709.391	0.258	12	6
21.	future	14186.311	0.284	101	3
22.	growth	13614.841	0.313	103	1
23.	named	13604.928	0.226	12	13
24.	students	13537.288	0.269	54	8
25.	student	12728.297	0.287	30	3
26.	#wingstofly	12283.298	0.205	14	6
27.	#Coruzant	12233.896	0.285	109	5
28.	maangi91074	12170.000	0.148	3	22
29.	research	11611.282	0.277	25	2
30.	leader	11117.201	0.248	22	9
31.	lucas_fondo	10962.000	0.129	2	22
32.	success	10819.015	0.297	49	4
33.	Elect	10756.636	0.222	2	14
34.	women's	10482.122	0.280	31	7
35.	Next	10439.666	0.275	45	3
36.	training	10334.092	0.304	126	1
37.	chief	10087.721	0.182	17	14
38.	andrew	9941.436	0.198	8	9
39.	#protege	9752.000	0.208	55	5
40.	brianmundia10	9752.000	0.114	3	22
41.	fostering	9293.157	0.296	47	1
42.	senior	8594.626	0.240	16	27
43.	#emergingtech	8540.000	0.171	55	5
44.	anindosharlyne	8540.000	0.102	3	22
45.	experience	8439.901	0.300	45	1
46.	potential	8431.399	0.288	49	19

47.	support	8326.633	0.307	99	1
48.	business	7518.366	0.292	44	1
49.	Job	7409.446	0.267	33	3
50.	ensuring	7383.354	0.251	18	16



Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

It's not them, it's the product: bottom-up factors influence detractors' likelihood to buy

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Abstract. Many companies widely adopt Reichheld's (2003) ten-point Net Promoter Scale to indicate their growth potential by identifying the Detractors score at the low end and the Net Promoters score at the high end. How do the Promoters and Detractors of a retailer differ? When shopping, top-down and bottom-up factors influence consumers' word-of-mouth (WOM) behavior, attitudes and future purchase decisions. Internal personal characteristics, such as individual traits, are top-down factors. The shopping environment, promotional efforts and product itself are under the retailer's control and are considered bottom-up factors (Wedel & Pieters, 2008). While top-down and bottom-up factors influence the decision-making process, little is known about what characterizes a retailer's Detractors' vs. Promoters' purchase intention (PI) and intention to recommend. The purpose of our study is to pinpoint top-down and/or bottom-up factors, WOM, purchase outcomes and future PI for Detractors vs. Promoters. The top-down factors included six demographics (e.g., age, gender, education, income). Bottom-up factors included eleven items (e.g., product quality, seller reputation, brand, recommendations). We hypothesized that top-down and bottom-up factors differentiate between Detractors and Promoters and that these two shopper types differ on WOM, purchase satisfaction and future PI. An online survey of $N = 130$ plant purchasers were identified as Detractors, scoring a 0-4 on the Net Promoter Scale for the question "How likely are you to recommend this product to a friend?". Logit analysis showed that the model significantly predicted a subsequent flower/plant purchase. Contrary to our hypotheses, no demographic characteristics differentiated between Detractors and Promoters. Product quality perceptions, positive purchase outcomes and WOM (recommendations from friends, likelihood of writing a positive review separated Detractors from Promoters.

Keywords : dislike; horticulture; like. plant purchasing; recommendation; satisfaction; word of mouth

Introduction

Product satisfaction influences consumers' post-purchase behavior (e.g., repeat purchases, product returns, recommendations). When consumers are dissatisfied with a product purchase, they likely respond negatively

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by returning it, spreading negative word of mouth (WOM), or expressing low future PI or all these behaviors. Consumer product return rates range from 24% for apparel to 6% for DIY and garden products (Statista, 2024). Conversely, satisfied customers are likelier to spread positive WOM and have heightened future PI. To date, research has addressed factors driving customer satisfaction in e-commerce settings (Rihn *et al.*, 2024; Sari *et al.*, 2024; review by Soeyatno *et al.*, 2024), but little is known about how satisfied (Promoters) vs. dissatisfied (Detractors) customers vary by demographics and other purchase behaviors.

This study contributes to the literature in several ways. First, it addresses retail detractors and the top-down and bottom-up factors driving their purchasing behavior. To date, the literature does not delve into the detractors and their characteristics. Understanding promoter behavior is important, given their propensity to spread positive WOM and heightened PI (Eger & Mičák, 2017). Conversely, a deeper understanding of detractors provides valuable insights into why certain customers are dissatisfied. In turn, this could aid in mitigating satisfaction barriers through addressing and correcting problem areas (e.g., better touchpoint interactions). Secondly, this study addresses the top-down (i.e., customer-specific characteristics) of detractors. Bottom-up factors' impact on purchasing behavior has been addressed (Baek *et al.*, 2010; Behe *et al.*, 2016; Chu *et al.*, 2005; Wedel & Pieters, 2008), but very few studies incorporate top-down characteristics for promoters vs. detractors (Pinar *et al.*, 2024). By identifying detractors and their characteristics, there is an opportunity to further justify spending marketing resources on efforts that resonate better with people who will respond rather than trying to bring in customers who will not purchase regardless of the marketing information received.

Promoters vs. detractors

Retailers need committed and loyal customers for their businesses to flourish. One simple way to measure a customer's attitudinal loyalty is the Net Promoter Score (NPS). Reicheld's NPS was designed to measure how organizations generate loyal relationships and is based on the 10-point question: How likely is it that you would recommend this <company> to a friend or colleague? (Reichheld, 2003). Promoters, also known as loyal enthusiasts, score an 8, 9, or 10 and are satisfied customers who share positive WOM (Eger & Mičák, 2017). On the other hand, Detractors who score a 1, 2, 3, or 4 on the NPS scale are dissatisfied customers whose actions can cause damage to a retailer's reputation through negative WOM (Eger & Mičák, 2017). Over half of Fortune 1000 companies from diverse industries implemented the score (Kaplan, 2016). However, despite its popularity, little attention has been given to analyzing consumer NPS profiles and whether their characteristics and behaviors differ (Maubisson *et al.*, 2024). Understanding these factors may offer opportunities to increase the likelihood that detractors may eventually become promoters if appropriate strategies are implemented.

While the literature on analyzing consumer NPS profiles and behavioral outcomes is sparse, we found several studies investigating consumer characteristics, outcomes and their relationship to NPS. Pinar *et al.* (2024) found a higher NPS score for gender (female), age (younger), income (middle), purchase frequency and being a regular customer in a convenience store context. Lucia-Palacios *et al.* (2021) found satisfaction to be a predictor of NPS. Maubisson *et al.* (2024) identified antecedents to forming NPS. The researchers compared Promoters' and Detractors' perceptions of two retail chains' perceived value and found Promoters (vs. Detractors) had more favorable ratings of six dimensions of perceived value (e.g., visual appeal, enjoyment, entertainment) (Maubisson *et al.*, 2024).

Top-down vs. bottom-up factors

When shopping, top-down and bottom-up factors influence purchase decisions, internal personal characteristics, such as individual traits and demographics, are top-down factors. When a consumer has well-defined goals, top-down processes are likely to be employed (Park & Smith, 1989). Characteristics of the stimulus, such as the shopping environment or the product itself, are under the retailer's control and are

considered bottom-up factors (Wedel & Pieters, 2008). These tend to be employed at the point of purchase to motivate buying behavior. Top-down and bottom-up factors influence the decision-making process. However, little is known about how promoters vs. detractors vary by top-down and bottom-up factors.

Past purchase behavior for a particular product category is a top-down factor that may influence future PI (Park & Smith, 1989). Studies have found that past purchase behavior leads to stronger future PI. Van den Poel & Buckinx (2005) used an online wine store context to examine predictors of future PI and found historical purchase behavior to be one of the predictors of future purchase, in the horticulture industry, past purchasing behavior heightens familiarity and confidence in having success with the product, which can heighten future purchasing decisions (Bumgarner *et al.*, 2024). Other top-down factors influence plant purchases and willingness to pay, including age (Rihn *et al.*, 2024; Rihn *et al.*, 2023; Behe *et al.*, 2022; Behe *et al.*, 2019; Behe *et al.*, 2016), gender (Rihn *et al.*, 2024), ethnicity (Rihn *et al.*, 2024; Knuth *et al.*, 2019), education (Knuth *et al.*, 2019) and income (Rihn *et al.*, 2023; Knuth *et al.*, 2019). Older Caucasian women from higher-income households tend to purchase more plants than their counterparts. However, the age and gender gap in plant purchases is closing (Whitinger, 2024). Rihn *et al.* (2024) found that sellers' reputations, the amount spent online and ethnicity affect online purchase intention (increased for Hispanics, decreased for Asians).

Bottom-up factors also impact the horticulture industry's purchasing behavior. One bottom-up factor is brand. In the horticulture industry, branding plants is a relatively new phenomenon and anecdotal evidence suggests that less than half of all live plants sold are branded. Brands can serve as a surrogate for product quality (Baek *et al.*, 2010). One study of branded plants found that individuals who had seen the plant brands before the study had higher PI than participants who had not seen the brands (Behe *et al.*, 2016). In a subsequent study, investigators showed that consumers spent more time looking at hedonic-branded plants than utilitarian-branded plants (Mundel *et al.*, 2017). Other bottom-up factors include seller reputation and product quality. Seller reputation refers to the level of trustworthiness of a business entity based on consumers' interactions with that entity. Seller reputation increases online (Chu *et al.*, 2005) and in-store purchase intention (Calvo-Porrall *et al.*, 2017). Product quality refers to consumers' judgments of overall excellence or superiority (Zeithaml, 1988) and has been linked to purchase intention (Tsotsou, 2006). Based on the literature cited above, we propose these hypotheses:

H1 : *Top-down factors will influence Net Promoter status (Promoter/Detractor):*

H1a : *Demographics will influence NP status*

H1b : *Past purchase behavior will influence NP status*

H2 : *Bottom-up factors will influence NP status*

H2a : *Plant quality will influence NP status*

H2b : *Seller reputation will influence NP status*

H2c : *Plant brand will influence NP status*

Purchase outcomes- satisfaction and delight

When purchasing products or services, consumers have preconceived expectations for outcomes (Oliver & DeSarbo, 1988; Yi, 1990), in situations where these expectations are confirmed (disconfirmed), then satisfaction (dissatisfaction) occurs (Bloemer & Odekerken-Schroeder, 2002). Some purchase situations lead to stronger and more positive customer reactions than satisfaction. Customer delight is a positive emotional reaction to unexpected and surprising service experiences (Schlossberg, 1990; Bartl *et al.*, 2013) and is distinct from customer satisfaction, as user expectations are exceeded (Weinstein, 2024). Further, customer delight, as a more intense emotion compared to satisfaction, significantly increased repurchase intention in a study of plant purchasers (Hicks *et al.*, 2006). Research has linked higher levels of customer satisfaction and delight to highly desired results such as customer loyalty (Oliver *et al.*, 1997), purchase intention and positive WOM (Arnold *et al.*, 2005; Weinstein, 2024). Hicks *et al.* (2006) showed that only delighted consumers (not merely satisfied) were more likely to make repeat plant purchases. However, conflicting findings exist on the impact

of satisfaction and delight on customer outcomes. For example, satisfaction explained only a small variance in future outcomes (e.g., PI, loyalty and retention (García & Curraz-Perez, 2019; Kumar *et al.*, 2013)). But Barnes & Krallman (2019) cite several studies where the impact of satisfaction on purchase intention and loyalty is higher than for delight. Weinstein (2024) suggests integrating NPS with customer delight measures to develop a more robust assessment of customer sentiment.

We assume that Promoters (vs. Detractors) will articulate higher satisfaction and delight levels. However, not every study has found that to be true. For example, in a hospital context, a high NPS did not result in higher satisfaction (Krol *et al.*, 2014), while Kristensen & Eskildsen (2011) had similar findings for the insurance industry in Denmark. Further, Baquero (2022) found, in a hotel setting, that a high NPS did not reflect high satisfaction levels with all hotel factors. These findings suggest that the relationship between NPS and satisfaction may be industry and context specific. Based on the literature cited, we propose:

H3: *Customer satisfaction and delight differentiate Promoters and Detractors.*

Word-of-Mouth (WOM)

WOM refers to customer communication with their personal and social networks (Anderson, 1998) and can be positive or negative. Such communications encompass face-to-face conversations, e-mails and customer reviews. For online purchases, the vast majority of consumers (70%) refer to customer reviews before purchasing a product (Statista, 2023). Early research on the impact of WOM found that dissatisfied customers who experienced low retailer responsiveness were more likely to engage in negative WOM (Richins, 1983). Further, highly dissatisfied (vs. satisfied) customers engage in more negative WOM (Anderson, 1998; Hennig-Thurau *et al.*, 2004; Sánchez-García *et al.*, 2011) and use WOM to express disappointment (Zeelenberg & Pieters, 2004). WOM sources consist of either strong ties (e.g., family and friends) or weaker ties (acquaintances or strangers), with those who have less prior knowledge about a product being more likely to rely on strong tie recommendations (Duhan *et al.*, 1997). When instrumental cues, such as performance-oriented product aspects, are salient, consumers are more likely to rely on weak-tie recommendations (Duhan *et al.*, 1997). For Electronic WOM (eWOM), one study found some weak tie sources to be more influential (Steffes & Burgee, 2009).

A common form of WOM includes a willingness to write a positive review. Research demonstrates that consumers are relying heavily on online reviews when making product decisions (Choi & Maasberg, 2021; Huang *et al.*, 2019). Tata *et al.*, (2012) identified three top-down attributes (personality traits) as predictors of writing a positive review. Dixit *et al.* (2019) identified high ego involvement, seeking vengeance and perceived behavioral control as factors significantly influencing the writing of online reviews. Neither study included demographic characteristics. Our study focuses on eWOM, or the likelihood of writing a positive online review. We propose:

H4: *Positive WOM (willingness to recommend) predictors will vary by NP status.*

Methodology

An online survey was produced and distributed from September to November 2022. This survey instrument and protocol was approved by the Michigan State Institutional Review Board (MSU7913). The survey was produced on Qualtrics (Seattle, WA) survey platform and was distributed through the Qualtrics participant panels. Online surveys are a valid and reliable way to conduct nationally distributed questionnaires by increasing the speed, reach and flexibility of survey branching and lowering the cost of implementation (Ball, 2019; Callegaro *et al.*, 2015). Online surveys can also reduce social desirability bias and the Hawthorne Effect (researcher presence bias) by taking the interviewer out of the equation (Phillips & Clancy, 1972). There can

be disadvantages to online surveys, such as the reach of low-income or remote locations and using virtual and social media communities to recruit participants (Alessi & Martin, 2010; Bernard, 2011). However, these disadvantages were not present in the current survey due to the implementation of robust survey recruitment methods.

Protocol

Qualtrics sent the survey to a sample of panelists that represented the United States in ratio of gender and age. Participants were eligible to take the survey if they were 18 years old or older, were a resident of the United States and had purchased a plant within the past 12 months. Once the participants passed the screening questions of age and plant purchasing, they were invited to participate in the survey and read through the consent form, if they consented, they began the survey. In addition, participants had to pass a quality assurance check question of For Quality Assurance. If they did not pass the quality assurance check, they were eliminated from the survey. A total of 2,010 responses were collected. The survey took approximately 25 minutes to complete. Participants were paid for their responses through the Qualtrics portal.

The survey consisted of Online Purchasing or In-store Purchasing, Online Usage, Delight and Repurchasing and Demographics. Before being directed to any of the survey questions, participants were asked whether their latest plant purchase was made online, in-store, or online order with pick-up in-store. For this analysis, 70 participants who placed an online order with pick-up in-store were removed, producing a total of 1940 complete responses used in the analysis.

Question blocks

The Online Purchasing Block consisted of questions related to time spent (in hours) for leisure or work online, how much money (in USD) in online purchases in the last month was spent online, the percentage of their plant purchasing that was online or in-store, how much money (in USD) was spent total on plants and cut flowers online in the past year, how much money (in USD) was spent total on plants and cut flowers in-store in the past year and what categories of plants were purchased online and categories purchased in-person (or, both were select; all that apply). If participants indicated that their last purchase was made online, they were directed to another question section related to their experiences online; if they selected their last purchase made in-store, they were directed to another question section related to their experiences in-store.

The plant categories that could be selected from included annuals, perennials, vegetable transplants, seeds/bulbs, herbs, flowering shrubs, evergreen shrubs or trees, fruit-producing shrubs or trees, shade trees, ground covers or vines, sod, potted flowering plants, foliage plants-outdoor, indoor houseplants, succulents and cut flowers. These categories align with the U.S. Agriculture Census categories for plants (USDA NASS, 2022).

The participants were then asked a series of questions about a specific purchase they made in the past. These questions consisted of how satisfied they were with the purchase (Hicks *et al.*, 2006). Questions included if this was a first-time purchase from this seller, how much they paid for the specific item, if they did any pre-planning (knowing if they wanted the specific item) before arriving at the location they purchased and how important they found different factors while purchasing. These factors included: the seller's reputation, plant brand, the convenience of buying a plant, plant quality, recommendations from sellers, past experience, price, availability (in stock now), flower/leaf color and leaf shape (Hicks *et al.*, 2006).

The last block of questions was scaled questions from Dennis & Behe (2005) regarding satisfaction and delight. In particular, the questions were: thinking about that one cut flower bouquet or arrangement (or plant) you identified above, choose a number that most closely reflects how you feel about the performance of it (1 = very displeased to 7 = very pleased), thinking about that cut flower arrangement or bouquet (plant)

you identified above, how desirable was the outcome to date with that purchase (1 = very undesirable to 7 = very desirable), how likely are you to buy a cut flower bouquet or arrangement (plant) from that seller again (0 = no/zero chance to 10 = 100% chance), how likely are you to recommend that seller to a friend (0 = nozero chance to 10 = 100% chance) and how likely are you to write a positive review for that seller (0 = no zero chance to 10 = 100% chance).

Lastly, they answered demographic questions about their age, gender, income level, number of people in their household, population density of their community (urban, suburban, or rural), level of education and ethnicity. These variables are used to maintain accuracy with the 2022 U.S. Census and to clarify if the results were because of a particular demographic group (U.S. Census Bureau, 2022).

Promoter vs. detractor identification

Many companies widely adopted Reichheld's (2003) ten-point Net Promoter Scale to indicate their growth potential, identifying Detractors at the low end and Net Promoters at the high end. An online survey of $N = 130$ flower/plant purchasers were identified as Detractors, scoring a 0-4 on the Net Promoter Scale for the question "How likely are you to recommend this product to a friend?". A total of 51.7% from the online sample and 45.38% from the in-store sample were Detractors, indicating that the mode of purchase was not necessarily a predictor of dissatisfaction. Conversely, a total of $N = 1361$ of flower/plant purchasers were identified as Promoters, with 33% of the online sample and 67% of the in-store respondents comprising this group. A total of $N = 1492$ (74.23%) of the total sample were used in this analysis.

To ascertain that collinearity was not a factor in the significance of variables, a Spearman's correlation test was used to compare all participant degree types and income (correlation = 0.0047, $p = 0.8330$) and, specifically, Detractors ($N = 130$) degree types and income (correlation = -0.0471, $p = 0.5939$) as there is common correlation between the two variables in past literature.

Analysis

A series of t -test analyses were conducted to explore differences between Detractors and Promoters (H1-H3). Their mode of buying, impulse versus planned purchasing tendencies, first-time buying experience and perceptions of the performance of their purchases and the desirability of the outcome. To check for collinearity among variables, a series of Spearman's correlations were executed. These analyses were conducted in Stata 18 Software (College Station, TX). Lastly, a logistic regression analysis was performed to compare Detractors (coded as 1) to Promoters (coded as 0) (the dependent variable) (H4). The likelihood function for logit is

$$\ln L = \sum_{j \in S} w_j \ln F(\mathbf{x}_j \mathbf{b}) + \sum_{j \in S} w_j \ln \{1 - F(\mathbf{x}_j \mathbf{b})\}$$

where S is the set of all observations j , such that $\mathbf{y}_j \neq 0$, $F(z) = \exp(z)/(1 + \exp(z))$ and $\mathbf{w}_j$ denotes the optional weights. The independent variables used to estimate the logit were demographic characteristics, plant purchasing behavior and key factors influencing purchasing decisions and satisfaction to determine which factors contribute to being a Detractor or Promoter.

Results

The demographic characteristics of the sample (Table 1) were similar to those the 2022 U.S. Census. The sample had a higher percentage women, Caucasians and urban/suburban residents. Age and income were somewhat greater than Census averages. These results are consistent with the demographic profile of flower and plant purchasers (Whiting, 2024). Few (23%) were first-time plant buyers. The mean number of indoor plants purchased was 1.57 ($SD = 0.94$) and outdoor plants was 3.42 ($SD = 3.04$).

TABLE 1 - Demographic characteristics and comparison to U.S. Census

Question description	Sample				Census
	Mean or %	Std. Dev.	Min	Max	Mean or %
N	1940	-	-	-	333,287,557
Male (%)	0.35	0.48	0	1	0.49
Female (%)	0.64	0.48	0	1	0.51
> Bachelor's degree (%)	0.36	0.48	0	1	0.33
Age (years)	46	15	20	89	39
Income	\$91,267	\$64,503	\$5,000	\$275,000	\$60,021
White = 1, else = 0 (%)	0.87	0.34	0	1	0.758
Black = 1, else = 0 (%)	0.08	0.27	0	1	0.126
Asian = 1, else = 0 (%)	0.01	0.12	0	1	0.061
Hispanic = 1, else = 0 (%)	0.05	0.22	0	1	0.189
Urban dwelling (%)	0.41	0.49	0	1	0.8
Suburban dwelling (%)	0.33	0.47	0	1	
Small town dwelling (%)	0.1	0.29	0	1	0.2
Purchased indoor plants	1.57	0.94	0	3	-
Purchased outdoor plants	3.43	3.04	0	11	-
First time plant purchaser = 1, else = 0 (%)	0.23	0.42	0	1	-

We compared first-time plant buyers with repeat plant buyers and found a higher percentage of Detractors compared to Promoters (Detractors $M = 0.3534$ [$SD = .04$], Promoters $M = 0.2038$ [$SD = 0.01$], $p = 0.0002$) (Table 2). A comparison of the perceived importance (1 = not at all important, 5 = very important) of recommendations from friends showed that Detractors ($M = 3.15$ [$SD = 0.12$]) found them less important compared to Promoters ($M = 3.67$ [$SD = 0.03$], $t = 4.8007$, $p = 0.0000$). Next, we compared impulse and planned (or didn't recall planning) plant purchases to determine if either group had more or fewer Detractors. We found no difference in the number of Detractors and Promoters making planned versus impulse purchases (1 = planned, 2 = impulse, 3 = don't recall): (Detractors $M = 1.50$ [$SD = 0.06$], Promoters $M = 1.42$ [$SD = 0.02$], $p = 0.151$). We then compared the percentage of in-store and online buyers to determine whether they had a similar (or different) percentage of Detractors (and Promoters). We found no significant difference between online and in-store buyers, a similar percentage of each, regardless of purchase location (Detractors $M = 0.45$ [$SD = 0.04$], Promoters $M = 0.51$ [$SD = 0.14$], $p = 0.2573$). The importance of plant quality (1 = not at all important, 5 = very important) was lower for Detractors ($M = 4.22$ [$SD = 0.07$]) compared to Promoters ($M = 4.76$ [$SD = 0.02$], $t = 9.5174$, $p = 0.0000$). Thus, being a first-time buyer with a lower perceived importance of product quality and product recommendations from friends was greater among Detractors than Promoters.

What were the respondents' perceptions of the success of the purchase? Comparing purchase success for Promoters and Detractors, we found Detractors ($M = 6.48$ [$SD = 0.16$]) had a lower purchase success rating (1 = very unsuccessful, 7 = very successful) compared to Promoters ($M = 4.89$ [$SD = 0.02$], $t = 17.8384$, $p = 0.0000$). A t -test of Detractors for their desirability of the outcome (1 = very undesirable, 7 = very desirable) showed that the perceived outcome for Detractors ($M = 4.89$ [$SD = 0.16$]) was less than the perceived outcome for Promoters ($M = 6.48$ [$SD = 0.023$], $t = 17.8384$, $p = 0.000$). Comparing the likelihood of Detractors buying a flower/plant from that seller again (1 = 0 chance in 100 to make a subsequent purchase, 1 = 100% chance to make a subsequent purchase), Detractors ($M = 4.67$ [$SD = 0.25$]) were less likely to make a subsequent purchase compared to Promoters ($M = 10.31$ [$SD = 0.04$], $t = 37.7013$, $p = 0.0000$). Detractors ($M = 4.13$ [$SD = 0.27$]) were also much less likely to write a positive review for the seller compared to Promoters ($M = 9.18$ [$SD = 0.08$], $t = 18.7240$, $p = 0.000$), it was unsurprising that Detractors had a substantially lower purchase success rating and desirability of the purchase outcome. Given those two results, it was also not unexpected that Detractors were not likely to make a subsequent purchase or write a positive review for the seller.

TABLE 2 - *t*-test comparing detractors to promoters in plant purchase behavior
(*N* = 1940)

Variable	Means or %	<i>t</i> -statistic	<i>p</i> -value
First-time plant buyers (0-1)	Detractors = 35.34% Promoters = 20.38%	-3.7709	0.0002
Recommendations <i>from</i> friends (1-7)	Detractors = 3.15 Promoters = 3.67	4.8007	0.0000
Impulse buying (0-1)	Detractors = 1.50 Promoters = 1.42	-1.4368	0.1510
In-store buying (0-1)	Detractors = 45% Promoters = 51%	1.1333	0.2573
Plant quality (1-7)	Detractors = 4.22 Promoters = 4.76	9.5174	0.0000
Pleasure with purchase success (1-7)	Detractors = 4.89 Promoters = 6.48	17.8384	0.0000
Purchase outcome desirability (1-7)	Detractors = 4.93 Promoters = 6.54	19.2344	0.0000
How likely are you to buy a plant from that seller again? (1-10)	Detractors = 4.67 Promoters = 10.31	37.7013	0.0000
How likely are you to write a positive review for that seller? (1-10)	Detractors = 4.13 Promoters = 9.18	18.7240	0.0000
First-time plant buyers (0-1)	Detractors = 35.34% Promoters = 20.38%	-3.7709	0.0002
Recommendations <i>from</i> friends (1-7)	Detractors = 3.15 Promoters = 3.67	4.8007	0.0000
Impulse buying (0-1)	Detractors = 1.50 Promoters = 1.42	-1.4368	0.1510
In-store buying (0-1)	Detractors = 45% Promoters = 51%	1.1333	0.2573
Plant quality (1-7)	Detractors = 4.22 Promoters = 4.76	9.5174	0.0000
Pleasure with purchase success (1-7)	Detractors = 4.89 Promoters = 6.48	17.8384	0.0000
Purchase outcome desirability (1-7)	Detractors = 4.93 Promoters = 6.54	19.2344	0.0000

Logit models predicting recommending this product to a friend

Given that Promoters valued (had higher importance ratings) recommendations *from* friends, we conducted a logit model to better understand factors influencing ratings *to* friends. Table 3 shows the model statistics for the logit model predicting the likelihood of recommending the product to a friend. The model was significant ($\chi^2 = 514.29$, $p = 0.0001$, Pseudo $R^2 = 0.6402$). First, none of the demographic characteristics significantly influenced the likelihood of a purchaser recommending the plant *to* a friend. Thus, there was no difference in demographic characteristics or past purchase behavior between the Detractors and the Promoters. Top-down factors do not influence whether a plant buyer is a Detractor or Promoter and H1 is rejected.

This is a novel understanding of foundational literature, where top-down factors tend to influence plant purchases and willingness to pay (Rihn *et al.*, 2023, 2024; Behe *et al.*, 2022; Knuth *et al.*, 2019; Huddleston & Sage, 2016). However, this is the first comparison of consumers who have lower satisfaction and willingness to buy again after a plant purchase (Detractors) have been studied in conjunction with consumers with higher plant purchase satisfaction (Promoters) (Hicks *et al.*, 2016). Therefore, it is of great interest that top-down attributes about the consumer do not seem to influence the negative perception of the buying experience.

TABLE 3 - Detractors compared to promoters in top-down and bottom-up factors using a logit regression model

Question description	Coeff	Std. Err.	Z	Prob
<i>Demographic characteristics</i>				
Male	12.21	1069.63	0.010	0.9910
Female	12.33	1069.63	0.010	0.9910
> Bachelor's degree	-0.14	0.36	-0.400	0.6880
Age (years)	-0.01	0.01	-0.930	0.3550
Income	0.00	0.00	-0.840	0.4000
White = 1, else = 0	0.10	0.93	0.110	0.9140
Black = 1, else = 0	0.42	1.04	0.400	0.6860
Asian = 1, else = 0	0.82	1.49	0.550	0.5810
Hispanic = 1, else = 0	0.97	0.82	1.180	0.2380
Urban dwelling	-0.49	0.59	-0.830	0.4050
Suburban dwelling	-0.09	0.53	-0.180	0.8590
Small town dwelling	-0.15	0.72	-0.210	0.8320
<i>Plant purchasing behavior</i>				
Monthly online spending in USD	0.00	0.00	1.620	0.1060
Purchased indoor plants	-0.03	0.20	-0.140	0.8860
Purchased outdoor plants	0.09	0.06	1.590	0.1120
<i>Plant purchasing experience</i>				
How likely are you to buy a plant from that seller again	-0.65	0.06	-10.930	0.0000
How likely are you to write a positive review for that seller	-0.41	0.06	-7.410	0.0000
<i>Importance in buying experience</i>				
Seller reputation	-0.10	0.20	-0.530	0.5980
Plant brand	0.31	0.18	1.760	0.0790
Convenience of buying plants	-0.19	0.23	-0.830	0.4050
Plant quality	-0.75	0.24	-3.130	0.0020
Recommendations from seller	-0.25	0.21	-1.180	0.2380
Recommendation from friends	-0.22	0.19	-1.200	0.2310
Past experience	0.00	0.20	0.020	0.9850
Price	0.18	0.22	0.840	0.4020
Availability (i.e. in stock now)	0.03	0.26	0.120	0.9050
Flower/Leaf color	0.11	0.23	0.470	0.6400
Leaf shape	0.00	0.18	-0.020	0.9850
First time plant purchaser = 1, else = 0	0.27	0.38	0.720	0.4730
Constant	-2.53	1069.63	0.000	0.9980
N			1449	
Chi ²			514.290	
Prob			0.000	
Pseudo R ²			0.640	
Log Likelihood			-144.540	
AIC			351.081	
BIC			514.718	

Bottom-up factors have greater variability in their influence on negative perceptions of the buying experience, which are primarily controlled by the seller (Mundel *et al.*, 2017). Monthly spending on plants, prior plant/flower experience and purchasing an indoor plant did not influence the recommendation likelihood. The seller's recommendation, the importance of recommendations *from* friends and the seller's reputation and purchase convenience did not influence product recommendations to a friend and showed no difference in how the Detractors and Promoters perceived these bottom-down perceptions of the seller. Thus, H2 is rejected. Product attributes, including price, plant brand, availability, leaf/flower color and shape, did not influence recommendations to a friend, indicating these seller attributes also did not influence if a person would be a Detractor or a Promoter. This was a surprising finding, as literature from Baek *et al.*

(2010) and Behe *et al.* (2016) both indicated that brands had a higher likelihood to buy for participants and that brand was a proxy for quality. The plant brand and plant quality variables are not collinear when tested (Spearman = 19.7%, $p = 0.000$, aka independent from each other). Interestingly, plant quality within this study was not aligned with Detractors either but with supporters. Therefore, because the dependent variable is recommendations to a friend, not the likelihood to purchase and these consumers have a negative perception of the experience, these bottom-up factors are not associated with the Detractors' perception.

The analyses reflected somewhat contradictory findings. The factors first-time plant buyers, pleasure with purchase success, the desirability of outcome from purchase and recommendations from friends were lower for Detractors to Promoters in the t-tests but not in the regression model and was likely due to the variability in the responses (see Appendix A for histograms). However, it is still important to understand that there were marginal negative feelings for the Detractors among these variables. While being a first-time plant buyer, having pleasure with purchase success and a desirable purchase outcome and not being willing to accept recommendations *from* friends due to the plant purchase not being predictive of a consumer being a Detractor, there is a difference in the attitudes and perceptions of Detractors compared to Promoters for these bottom-up factors.

However, both plant purchase experience variables had a negative influence on product recommendation *to* a friend: likelihood to buy again from the seller and likelihood of writing a positive review for the seller. This means that if a person were a Detractor, i.e. they would not recommend this product to a friend, they would be 65% less likely to buy a plant from that seller again than a Promoter would, in addition, they would be 41% less likely to write a positive review for the seller than a Promoter would, in addition, the importance of plant quality for Detractors was so negatively influential that they were 75% less likely to view plant quality as important than Promoters. These variables are backed by the significant *t*-tests showing that Detractors rated Plant Quality, likelihood to write a positive review and buying from the seller again were much lower than Promoters (Table 2). Perhaps because other bottom-up factors are not significant, but the likelihood to buy again and to write a positive review were influential and predictive of being a Detractor, the experience could be tied to other top-down factors that were not asked in the questionnaire, such as factors tied to ego (Dixit *et al.*, 2019). This study leaves room for other top-down factors like ego and pride to be explored with the Net Promoter status in plant purchasers, as well as environmental factors and whether the plant was a gift or as a self-purchase.

Conclusions and discussion

The wide adoption of the Net Promoter Score indicates its influence on customers' future purchases at both ends of the satisfaction spectrum. The present study sought to better describe the impact Detractors have on future purchase behavior, attitudes about past purchases and perceptions of the experience. What sets Detractors apart from other types of buyers (for example, their direct opposite, Promoters) is that they have strong negative attitudes about buying from the same seller again and writing a positive review of the seller. Future work should focus on their efforts to write a negative review and the impact that may have on persons across the range of the satisfaction scale. Bottom-up factors such as seller reputation, brand and convenience were not predictive, but there were significant differences between Detractors and Promoters, such as being a first-time plant buyer, having pleasure with purchase success and a desirable purchase outcome and not being willing to accept recommendation from friends. Not any bottom-up factor, according to our analysis.

This is one of a few studies that directly compare the profile of Promoters to Detractors in the literature (Reichheld, 2003) and the first to analyze Promoters and Detractors for a perishable, minimally branded product (plants). Specifically, in the Promoter/Detractor space, no published work has focused on

demographic characteristics of Detractors, it was surprising that we did not find differences in demographic characteristics between Detractors to Promoters since demographic characteristics play a role in plant purchases (Rihn et al., 2023, 2024; Behe et al., 2022; Behe et al., 2016, 2019). Being a Detractor and being uninterested in future plant purchasing from the seller is not dependent on a certain gender, age, type of dwelling, ethnicity, or income level. Additionally, the location of purchase (in-store vs. online) made no difference in the percentage of Detractors. Thus, it's not the purchase channel (online or in-person) that matters, but the immediate, real-time situation surrounding the purchase itself and the positive outcome of the experience that dictates whether a person becomes a Promoter or Detractor.

One of the unique attributes of the present study is that the product is a live good (living plant). The perception of plant quality (a bottom-up factor) was a significant factor in the regression model. Do Detractors need to blame someone or something for the bad outcome? Evidently, they blame either the retailer or the product quality (both bottom-up factors). Yet the stated importance of plant quality was lower for Detractors compared to Promoters. A greater percentage of Detractors were first-time plant buyers compared to Promoters. Perhaps Detractors have a lack of expertise or unrealistic expectations. While self-reported plant knowledge did not play a role in plant purchasing (Behe et al., 2015), perhaps actual product knowledge does. Failure can result in the death of the plant, which goes beyond poor fit, fabric shrinkage, or an unflattering color which can occur creating dissatisfaction in a clothing purchase. Product knowledge, involvement and expertise may play a role in future purchase intentions.

These findings should stimulate a challenge for retailers: facilitate the consumers' success to promote a positive experience with a live good and have a positive outcome after the buying experience. Retailers should ensure they provide guarantees as recourse to lessen the loss from a negative outcome and reduce risk (Behe & Fry, 2018). For live goods, educational materials provide additional information to equip the consumer with the necessary knowledge to grow the plant. This may be especially true for the first-time or less knowledgeable buyer. In addition, the buying experience must stay positive (positive association with being a Promoter) and requires managers to train their employees in customer service.

Lastly, a result of having these positive experiences is the positive WOM with friends and family. Recommendations from friends were greater for Promoters than Detractors. Detractors aren't willing to write a positive product review (and hopefully are not more likely to write a negative review), but having great success and becoming a Promoter does. Retailers should encourage customers with positive experiences to write positive reviews to influence other Promoters to make subsequent purchases.

The findings provide interesting results for future research, but several limitations need to be mentioned. First, an online panel was used for the study to capture a geographically diverse audience that is representative of the U.S. Census. However, some consumers may have been excluded due to limited income, remote locations, or recruitment materials (virtual, social media) (Alessi & Martin, 2010; Bernard, 2011). Additionally, the data was stated preference in a hypothetical setting. As such, the data were subject to hypothetical bias and participants ability to remember and accurately report their behaviors. Future research could address both limitations by using revealed preference (scanner data, purchasing data) to test the robustness of results.

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APPENDIX A - Histograms of independent variables

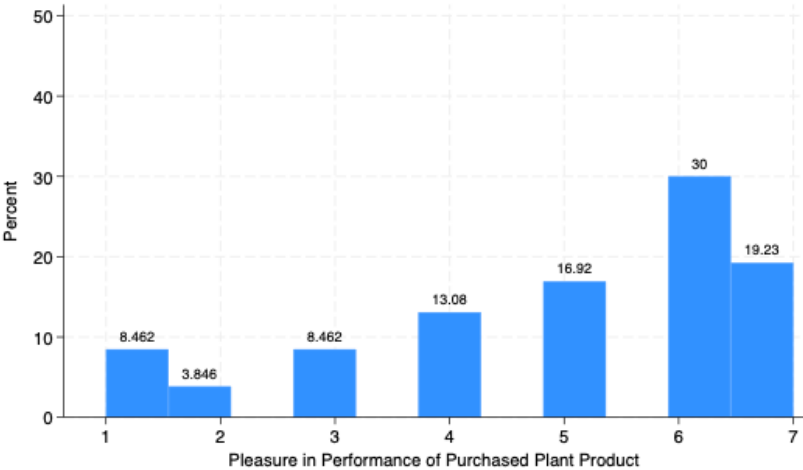


FIGURE A1 - Histogram of pleasure/displeasure in product performance ($N = 130$)

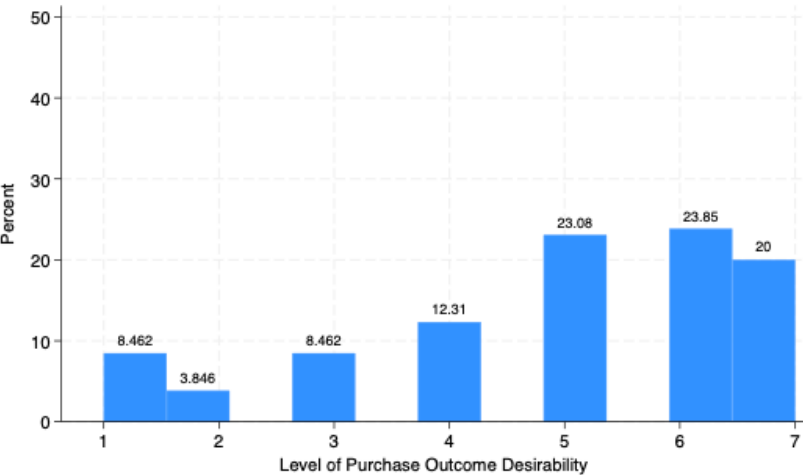


FIGURE A2 - Histogram of desirability of the outcome of the purchase for haters ($N = 130$)

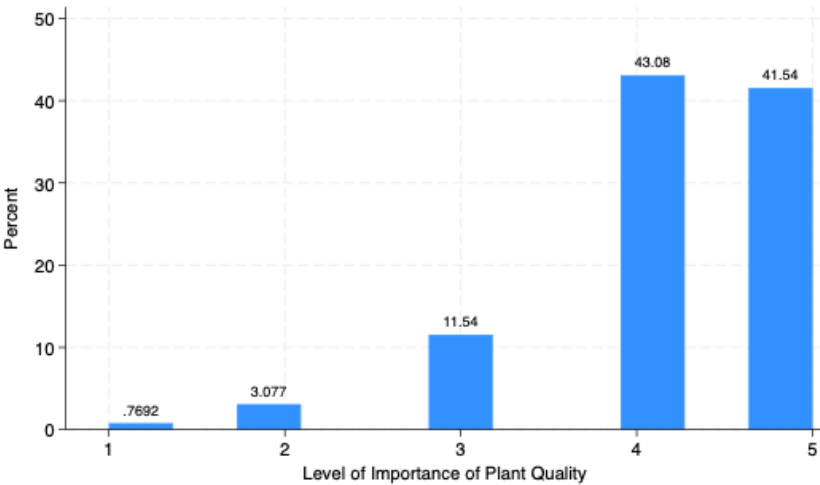


FIGURE A3 - Histogram of plant quality of haters ($N = 130$)

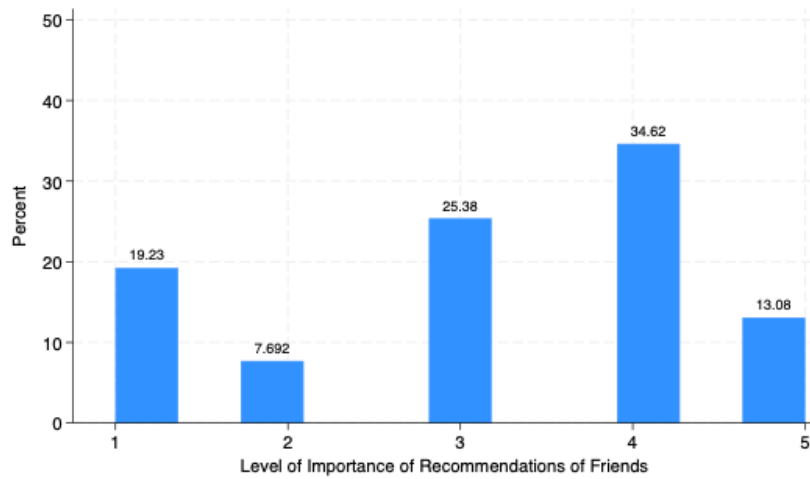


Figure A4 - Histogram of recommendations *from* Friends of Haters ($N = 130$)

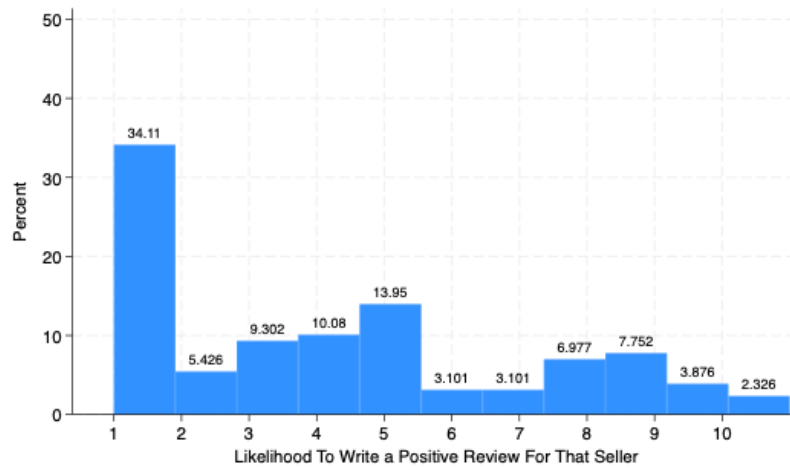


Figure A5 - Histogram of the percentage of haters responding to How likely are you to write a positive review for that seller? ($N = 130$)

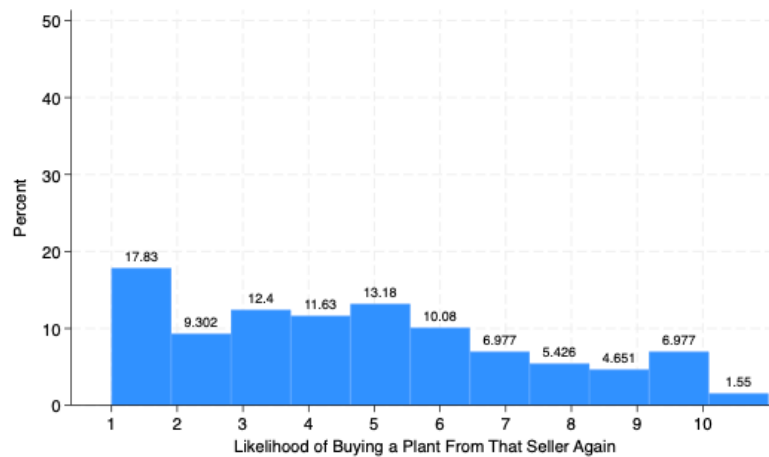


FIGURE A6 - Histogram of the percentage of haters ($N = 130$) responding to How likely are you to buy a plant from that seller again?



*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

From pixels to purchases: high-involvement shopping in the metaverse

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Abstract. The advent of the metaverse poses a novel challenge within the digitalization process of brands and retailers. The proliferation of new technologies, including extended reality, 5G networking and Artificial Intelligence, is laying the groundwork for creating a three-dimensional virtual world where users, through their avatars, can engage in a range of activities, including shopping. By developing digital twins, companies can extend the purchasing process within these touchpoints, thus offering immersive digital interaction with their products. This study provides insights into the factors influencing consumers' intention to use metaverse technologies to support the purchasing process of high-involvement goods. Through a quantitative research approach, using a structured questionnaire, a theoretical framework based on UTAUT was tested using responses from 101 lead buyers of a helicopter industry company. The findings reveal that performance expectancy and effort expectancy significantly impact usage intention. Similarly, a significant effect of perceived interaction quality on performance and effort expectancy was found. Additionally, perceived curiosity was found to have an impact on effort expectancy.

Keywords : metaverse; high-involvement purchases; usage intention; metaverse technologies; PLS-SEM

Introduction

The advent of the Metaverse has introduced new challenges and perspectives regarding the evolution of electronic commerce through virtual worlds (Giang Barrera & Shah, 2023). Although no single definition exists in the current literature, a fully developed Metaverse can facilitate the creation of an interoperable three-dimensional digital space where users, represented by virtual replicas of themselves, interact with a virtual environment (Dwivedi *et al.*, 2022). This environment offers an immersive and seamless experience that effectively blurs the boundaries between the digital and physical worlds (Gleim *et al.*, 2024). Such advancements are made possible by developing and diffusing technologies, including Extended Reality (XR), Blockchain, 5G networks, Artificial Intelligence and the Internet of Things. These Metaverse Technologies (MTs) enable the creation of new platforms, referred to as metaverse realms (Keegan *et al.*, 2024) or transitory metaverses (Yoo *et al.*, 2023), which have found applications across various industries (Mancuso *et al.*, 2023). The potential for development within the metaverse and its associated technologies lies in their capacity to deliver innovative customer experiences, supporting consumers throughout the purchasing process (Park & Kim, 2022; Kozinets, 2023). According to Statista (2024), the metaverse is expected to

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impact several industries, with e-commerce anticipated to be the most significant segment within a global market projected to reach 507.8 billion USD by the end of 2030, with over 1.2 billion users. Furthermore, various reports highlight growing interest in the innovative features of virtual environments and digital platforms, with 79% of consumers expressing a preference for purchasing both physical and virtual goods in virtual spaces (McKinsey & Company, 2022). Research by the Osservatorio Extended Reality and Metaverse (2023) also indicates that the retail and entertainment sectors are currently the main sources of investment in this area.

In the purchasing process, consumer behavior is strongly influenced by the level of involvement attributed to a product (Bauer *et al.*, 2006). This level determines the extent of effort, information-seeking behavior, decision-making strategies and the emotional or symbolic value assigned to the product (Laurent & Kapferer, 1985; Kotler & Armstrong, 2018). In response, marketers may implement targeted strategies to engage consumers during high-involvement purchases by leveraging MTs. These technologies enable product interaction, exploration of features, direct remote engagement with vendors during the trial phase, post-purchase assistance and even the inclusion of others in the shopping experience, allowing them to participate in the decision-making process.

Despite optimistic forecasts about the metaverse and its potential to transform daily life, its development path remains uncertain (Park & Kim, 2022; Yoo *et al.*, 2023). The adoption phase must be streamlined through a better understanding of the motivations and reasoning behind consumer use and deeper insight into how the uptake of enabling technologies may influence its eventual establishment. Although scholars have begun to examine the implications and drivers of metaverse adoption across industries (Kumari *et al.*, 2024) and to explore the impact of immersive shopping on product involvement (Zhang *et al.*, 2024; Cowan *et al.*, 2019), there remains a gap in understanding the factors influencing consumer intentions to adopt MTs in the purchasing process of high-involvement products.

To address this gap, this paper proposes a theoretical framework grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh *et al.*, 2003), a widely recognized approach to understanding consumer adoption of emerging technologies. The proposed framework is tested using a PLS-SEM approach. This study makes two key contributions by identifying and empirically evaluating the factors affecting consumer intention to use MTs when purchasing high-involvement goods. First, it advances research on consumer technology acceptance by offering insights into the determinants of MTs adoption. Second, it provides practical guidance for marketers, supporting them in optimizing strategies and investments in metaverse innovations.

Theoretical background and hypotheses development

High-involvement purchases

Consumers are influenced by a multitude of internal and external factors when making purchasing decisions (Kotler & Armstrong, 2018). One such factor is the level of product involvement, defined as a person's perceived relevance of the object based on inherent needs, values and interests (Zaichkowsky, 1985, p. 342). As outlined by Laurent & Kapferer (1985), product involvement is shaped by four key dimensions: (1) the personal significance or intrinsic value of the product to the individual; (2) perceived risk, encompassing both the potential negative consequences of a poor choice and the likelihood of making a mistake; (3) the symbolic or sign value associated with the product, its purchase, or its consumption; and (4) hedonic value, referring to the product's emotional appeal and capacity to provide pleasure. The degree of product involvement has been shown to significantly influence consumers' decision-making styles (Bauer *et al.*, 2006), in low-involvement purchases, the search for information is generally limited. These purchases often

involve low-value, low-risk products bought repeatedly (Kotler & Armstrong, 2018). Conversely, the decision-making process for high-involvement products involves a complex sequence of problem-solving stages, including problem recognition, information search, brand evaluation and selection, purchase and post-purchase assessment. Consumers engage in a learning process based on detailed information, extensive research, comparison and reflection to reduce the likelihood of making a suboptimal choice (Grewal *et al.*, 2003; Nayeem & Casidy, 2013). The role of digital technologies in supporting high-involvement purchases has been examined in several studies (e.g., Sihi, 2018; Shen *et al.*, 2021). For instance, Sihi (2018) explored the impact of XR on home-buying decisions, highlighting their potential to assist consumers in searching for and evaluating purchase options, significantly influencing information search, evaluation of alternatives and the function of sales agents in high-involvement contexts. Building on this line of research, the present study posits that MTs can further enhance the consumer experience within increasingly immersive virtual environments, where high-involvement purchasing processes may benefit from broader access to informative resources and remote connections.

Framework for high-involvement purchasing in the metaverse

The proposed framework (Figure 1) is based on the original UTAUT model (Venkatesh *et al.*, 2003), which has proven effective in explaining consumers' acceptance of new technologies. The model includes three core constructs from the UTAUT framework: Performance Expectancy (PE), Effort Expectancy (EE) and social influence (SI). In addition, it incorporates further variables relevant to the Metaverse context, namely consumer innovativeness (CI), perceived interaction quality (PIQ) and perceived curiosity (PC). PE is the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh *et al.*, 2003, p. 447). This study investigates how consumers believe that using MTs can support their decision-making process *when purchasing high-involvement products*. *EE refers to the degree of ease associated with using the system* (Venkatesh *et al.*, 2003, p. 449). Given its potential to act as a barrier to adoption, assessing the perceived ease of use of MTs is essential. For instance, consumers may be required to use devices such as Head-Mounted Displays (HMDs) to engage in immersive virtual environments.

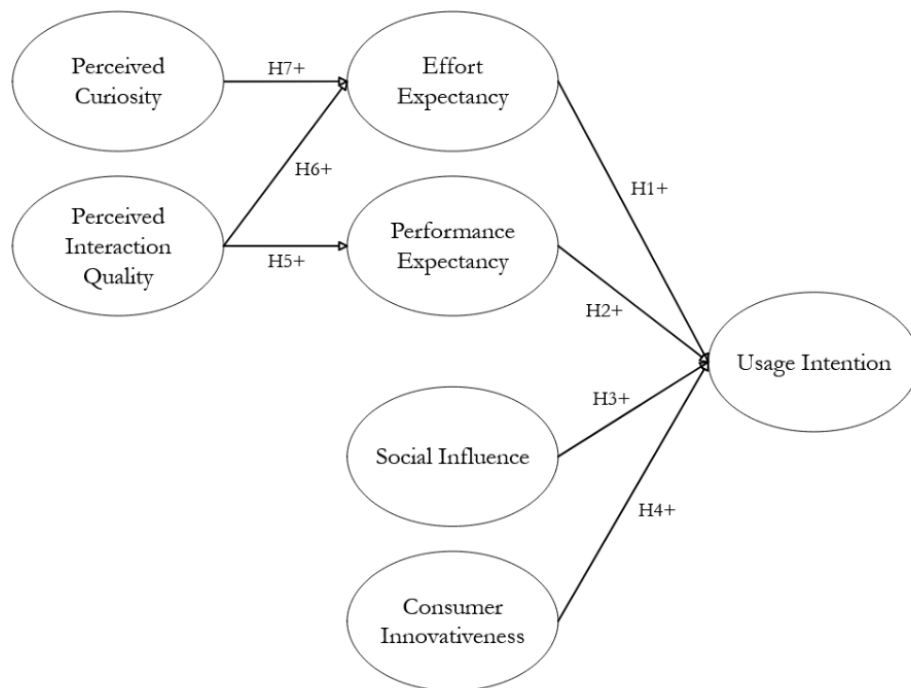


FIGURE 1 – Framework for high-involvement purchasing in the metaverse

SI is the degree to which an individual perceives that important others believe he/she should use the new system (Venkatesh *et al.*, 2003). When technology adoption is mandatory, social norms may influence behavior through conformity and social pressure. In voluntary adoption cases, social norms may shape perceptions of the technology through processes such as internalization and identification. This is particularly relevant in adopting MTs to support high-involvement purchase decisions. The existing literature suggests that PE, EE and SI positively affect the intention to adopt new technologies (Venkatesh *et al.*, 2012; Williams *et al.*, 2015). Accordingly, the following hypotheses are proposed:

H1: *EE positively affects the intention to use MTs during the high-involvement product purchasing process*

H2: *PE positively affects the intention to use MTs during the high-involvement product purchasing process*

H3: *SI positively affects the intention to use MTs during the high-involvement product purchasing process*

Consumer innovativeness

Consumer innovativeness is defined as the tendency of individuals to try innovative and different products, often positioning them as early adopters (Roehrich, 2004). The marketing literature has widely explored the importance of an individual's receptivity to innovation in adopting novel technologies (Shanmugavel & Micheal, 2022). MTs can potentially transform the consumer purchasing process, particularly among those inclined to adopt new and innovative products and services. This may make highly pioneering individuals more willing to experiment with such technologies. Accordingly, the following hypothesis is proposed:

H4: *CI positively affects the intention to use MTs during the high-involvement product purchasing process*

Perceived interaction quality

The variable of PIQ refers to a user's belief about the ability of a computer system to enable effective interaction with the digital environment. In the context of high-involvement products, such interaction is essential for gathering the information required for evaluation. Previous studies have highlighted the role of PIQ in influencing the utilitarian dimension of consumer behavior (Kang *et al.*, 2015; Nandi *et al.*, 2021). It is, therefore, considered a suitable predictor of the utilitarian variables in our model, namely PE and EE. Based on this, the following hypotheses are proposed:

H5: *PIQ positively affects PE*

H6: *PIQ positively affects EE*

Perceived curiosity

Perceived curiosity is a desire to obtain and learn new information and knowledge that stimulates human behaviour to explore novel ideas (Alkhwaldi, 2023, p. 12). Several authors have examined this variable in the context of the metaverse, where it is often considered an antecedent of effort expectancy (Aburbeian *et al.*, 2022;). Specifically, Alkhwaldi (2023) suggests that individuals driven by curiosity may be less inclined to perceive acquiring new technological skills as effortful. Accordingly, a consumer motivated by curiosity may be more likely to use the technology, perceiving it as easy to operate. Based on this, we hypothesize:

H7: *PC positively affects EE*

Methodology

Measures

An online survey was conducted to assess the variables within the proposed framework, using established and reliable scales drawn from the extant literature. The survey design was aligned with previous research on technology adoption (Venkatesh *et al.*, 2012; Shukla & Sharma, 2018; Aiolfi, 2023) to ensure reliability

and validity. In doing so, it followed specific protocols and guidelines (e.g., Evan & Miller, 1969; Kountur, 2011). Variable measurement was based on multiple-item scales derived from prior studies in consumer behavior, technology adoption, psychology and marketing theory, with adaptations made to reflect the dimensions of the present study. PE was measured using the 4-item scale developed by Escobar-Rodríguez & Carvajal-Trujillo (2014). EE was assessed using a 4-item scale from Venkatesh *et al.* (2003), while SI was measured using the 3-item scale proposed by Venkatesh *et al.* (2012). The construct of CI was measured using the 4-item scale developed by Parasuraman & Colby (2014). PC and PIQ were assessed with 3-item scales derived from Agarwal & Karahanna (2000) and Kim & Ko (2019), respectively. Usage intention was measured using a 4-item scale adopted from Ramos-de-Luna *et al.* (2016). Participants responded using 7-point self-anchoring scales, ranging from Strongly Disagree (coded as 1) to Strongly Agree (coded as 7), to indicate their level of agreement with each statement.

Data collection and sample

The helicopter industry was selected as the focus of this study to target consumers of an exclusive, high-priced asset featuring advanced technological and technical characteristics – traits that correspond to a high-involvement purchasing process and align with the objectives of this research. A company operating in the helicopter industry provided a dataset of lead buyers who had expressed interest in acquiring a specific helicopter model, either at trade fairs or through the company's website contact form. The survey was distributed via direct email, which included a hyperlink redirecting recipients to the online questionnaire. The survey began with a scenario inviting participants to imagine being interested in purchasing a specific helicopter of the company, with the opportunity to explore a highly realistic digital replica of the aircraft within a Metaverse-based virtual environment. This included features such as virtual test drives, detailed visual inspection and real-time support from an industry expert represented by an avatar, all accessible remotely without visiting the company in person. Data collection took place between January and February 2024. A total of 411 potential purchasers were identified in the company's database and contacted. In total, 101 valid responses were obtained. The sample characteristics are presented in Table 1.

Results

The study employed the PLS-SEM approach, using SmartPLS 4.0.9.6 software to assess the proposed framework (Ringle *et al.*, 2024). PLS-SEM was chosen for its ability to evaluate complex structural equation models and to analyze relationships between variables (Hair *et al.*, 2020). It has been widely adopted in previous research for model testing, including studies with relatively small sample sizes (Sarstedt *et al.*, 2022).

TABLE 1 – Sample characteristics

Characteristic	Categories	Frequency	%
Gender	Man	91	90.10
	Woman	9	8.91
	n/c	1	0.99
Age	<26	1	0.99
	26-35	9	8.91
	36-45	19	18.81
	46-55	32	31.68
	56-65	28	27.72
	>65	12	11.88
Education	High school or below	10	9.90
	Bachelor's degree	34	33.66
	Master's degree or above	57	56.44

TABLE 2 – Means, standard deviation, reliability, convergent validity and discriminant validity

	Mean	S.D.	A	rho_A	AVE	CI	EE	PC	PE	PIQ	SI	UI
CI	4.488	1.445	0.914	0.917	0.797	0.893	0.821	0.612	0.624	0.546	0.725	0.618
EE	4.344	1.407	0.939	0.945	0.847	0.761	0.920	0.719	0.804	0.769	0.828	0.846
PC	5.195	1.471	0.965	0.966	0.936	0.575	0.687	0.967	0.777	0.819	0.663	0.859
PE	4.500	1.452	0.953	0.954	0.877	0.584	0.767	0.746	0.936	0.810	0.804	0.911
PIQ	5.191	1.342	0.916	0.923	0.856	0.499	0.717	0.770	0.757	0.925	0.733	0.839
SI	3.479	1.526	0.939	0.941	0.892	0.673	0.781	0.631	0.762	0.681	0.944	0.774
UI	4.619	1.640	0.978	0.978	0.939	0.585	0.815	0.835	0.880	0.794	0.742	0.969

Note 1. The square roots of AVEs are in the main diagonal. The Fornell-Larcker criterion is depicted below the diagonal. The HTMT ratio values are above the main diagonal.

Assessment of the measurement model

As shown in Table 2, the measurement model evaluation produced satisfactory results. Cronbach's α and rho_A exceeded the established threshold of 0.70, indicating internal consistency reliability (Dijkstra & Henseler, 2015; Hair *et al.*, 2022). Furthermore, the Average Variance Extracted (AVE) values were above 0.50, confirming acceptable convergent validity (Sarstedt *et al.*, 2022). Discriminant validity was assessed using two methods. First, the square root of the AVE for each construct was verified to be greater than its correlations with other constructs (Fornell & Larcker, 1981). Second, the Heterotrait-Monotrait (HTMT) ratio values were examined. Except for two cases, all values were below the 0.85 threshold (Henseler *et al.*, 2015). As shown in Table 2, these results confirm the overall discriminant validity.

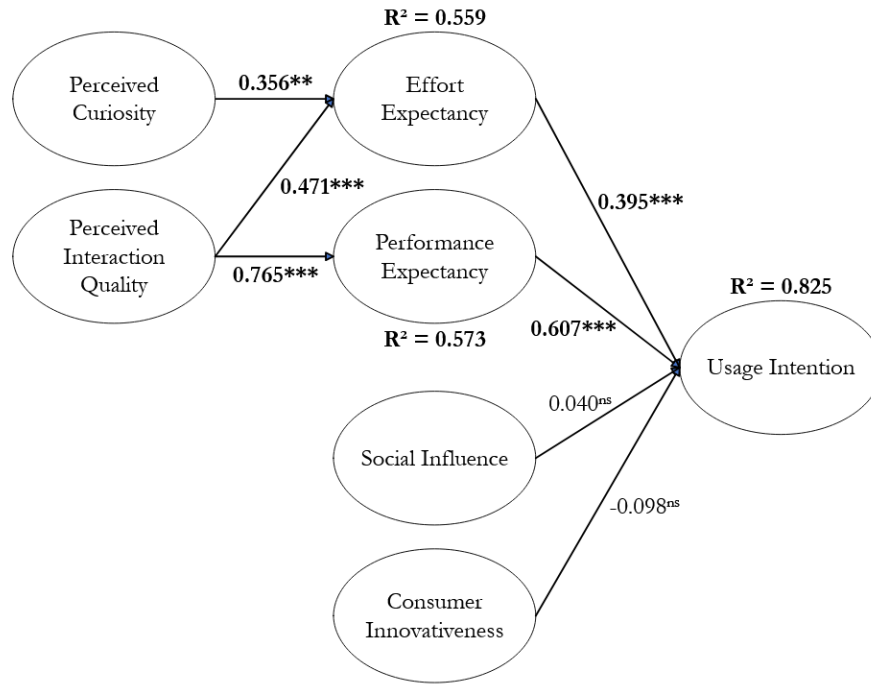
Structural model

To evaluate the proposed framework, the R^2 values of the dependent constructs were first assessed. All values were below 0.9, indicating no issues with overfitting (Sarstedt *et al.*, 2022). The standardized root mean square residual (SRMR) was 0.042, below the threshold of 0.05 (Hair *et al.*, 2022). In addition, the variance inflation factor (VIF) values for all predictor sets in the structural model were below the critical threshold of 5, indicating the absence of multicollinearity (Sarstedt *et al.*, 2022). These results suggest that the model demonstrates an adequate fit. A bootstrap procedure was then conducted with 5,000 bootstrap samples. The model was analyzed using a bias-corrected and accelerated bootstrap method with a 95% confidence interval. Figure 2 presents a summary of the main effects. The results support hypotheses H1 and H2, showing that EE ($\beta = 0.395, p < 0.001$) and PE ($\beta = 0.607, p < 0.001$) have positive and significant effects on usage intention, together explaining 82.5% of its variance ($R^2 = 0.825$). Conversely, SI ($\beta = 0.040, p > 0.05$) and CI ($\beta = -0.098, p > 0.05$) were not statistically significant, thus failing to support H3 and H4. PIQ was found to significantly influence both PE ($\beta = 0.765, p < 0.001$) and EE ($\beta = 0.471, p < 0.001$), supporting H5 and H6. PC ($\beta = 0.356, p < 0.008$) was positively associated with EE, supporting H7. PIQ explains 57.3% of the variance in performance expectancy ($R^2 = 0.573$), while the combination of PIQ and PC accounts for 55.9% of the variance in effort expectancy ($R^2 = 0.559$).

Research findings and implications

Theoretical contributions

From a theoretical perspective, the significance of EE and PE in explaining usage intention supports previous findings in the literature, emphasizing the importance of the utilitarian dimension in consumers' technology adoption. The other UTAUT variable included in the model (SI) was not found to have a significant relationship with usage intention. This result is consistent with prior studies on the role of SI within the UTAUT model. As suggested by Erjavec & Manfreda (2022), there may be a need to re-evaluate the role of SI, because consumers' online activity may alter the sources from which influence is derived.



Note. ***: $p < 0.001$; **: $p < 0.01$; ns: not significant

FIGURE 2 – Results of hypothesis testing

Moreover, CI did not emerge as a significant factor in this context. Further research could provide deeper insight into this relationship and clarify the role of this variable in technology adoption during the purchasing process of high-involvement products. One possible explanation for this finding is that even innovative consumers may be reluctant to take risks when purchasing high-value and technologically complex products. As a result, they may prefer to rely on established sources of information to gather the necessary product knowledge. The results also indicate that PIQ is a highly significant predictor of the utilitarian consumer dimension. This finding aligns with earlier research (Kang *et al.*, 2015; Nandi *et al.*, 2021), suggesting that this variable plays a crucial role in shaping consumers' evaluations of the usefulness and ease of use of specific technologies. Further investigation is needed to explore the importance of this dimension in consumer perceptions and evaluations within the virtual environment of the metaverse and its associated technologies, as shown in recent contributions to the field (Chakraborty *et al.*, 2023; Kim *et al.*, 2023). Finally, PC was found to significantly influence EE. This highlights curiosity as a key antecedent of perceived ease of use, illustrating its potential as a driver of learning and engagement with new technologies (Alkhwaldi, 2023).

Managerial implications

The present research offers valuable insights that may inform the strategies of businesses seeking to extend the sale of high-involvement goods into the Metaverse through its associated technologies, thereby guiding sales management within this emerging digital landscape. The findings indicate the importance of carefully evaluating the user experience within virtual environments to ensure ease of use and functionality in supporting the purchasing process. To effectively reduce the effort required to purchase high-involvement goods, delivering a virtual experience with an appropriate level of immersion is essential. This involves assessing whether XR technologies can meet such requirements or whether a two-dimensional virtual environment accessible via a standard screen may be more suitable. Furthermore, companies may capitalize on the enhanced quality of interaction it enables to strengthen service relationships within the Metaverse. Seamless engagement in the digital realm should extend beyond product interaction to include access to sales representatives, enhancing the Metaverse's utility during pre- and post-purchase stages. For example,

immersive interaction could be demonstrated through product testing opportunities at trade shows or other physical exhibitions. Finally, it is possible to pilot these technologies with customers who demonstrate a higher level of curiosity. Expressions of interest may be collected through a company's digital platforms, such as its website or social media channels. This would allow for trial experiences accompanied by guidance on their use, either remotely or in person.

Research limitations and future directions

This research offers valuable insights into the adoption of the metaverse theme, but it also presents certain limitations. First, the still-emerging nature of the metaverse may require further exploration. Qualitative research could help identify new and relevant dimensions and variables that may further explain consumers' intentions to engage with the metaverse. Moreover, this study focused on high-involvement goods by examining the helicopter company market. Expanding the investigation to other sectors (e.g., automobiles, yachts) could improve the generalizability of the model's variables and enable comparisons across different industries, supported by a more diverse and extensive sample. Finally, while this study examined usage intention, future research could incorporate actual use behavior, as proposed in the original UTAUT framework (Venkatesh *et al.*, 2003). This would allow for a more comprehensive model by focusing on sectors and consumers already using MTs to support their purchasing processes.

Acknowledgements

This work was supported by the University of Parma under the University's Call for Research 2023 - Action A (R.D. No. 438/2024) and the action Bando di Ateneo 2023 per la ricerca. It was co-funded by the European Union - PON Research and Innovation 2014-2020 (M.D. no. 1062/2021). Additional funding was provided under the National Recovery and Resilience Plan (D.M. 118/2023, CUP D92J23000160006) funded by the European Union – NextGenerationEU. The authors wish to thank Dr. Irene Ottaviano for her valuable contribution in identifying the sample and collecting data.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

An exploratory investigation into the development of a bodily attitude scale: item collection and factor analysis

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Abstract. This study investigates the role of embodiment in consumer behaviour by developing a scale to measure bodily attitudes, unconscious bodily reactions that signal favourable or unfavourable responses to products and services. While prior research on perceived affordance has linked embodiment to consumer decision-making, direct bodily responses during product or service interaction remain insufficiently explored. To address this gap, a two-stage online survey was conducted in Japan. In the first phase (July 2024), 1,470 participants described their bodily reactions to highly positive product or service experiences, yielding 40 preliminary items. In the second phase (September 2024), 929 participants evaluated these items and an exploratory factor analysis revealed four distinct dimensions of bodily attitudes: Stability, Good Condition, Activation and Integration. Recognizing the limitations of conventional latent attitude measurement, this study aimed to capture automatically activated attitudinal responses by focusing on cross-loading items in the factor structure. Three such items were identified and all appeared to reflect unconscious, automatic bodily responses triggered upon interacting with a product or service. Theoretically, these items were interpreted as indicative of automaticity in attitude activation and thus were considered to represent a distinct factor, labelled ‘Automaticity’. These items are posited to reflect immediate, unconscious bodily reactions that occur without deliberate cognitive processing. This research contributes to the fields of consumer psychology and design by proposing a novel measurement approach grounded in embodied interaction. The findings advance understanding of how bodily experience shapes consumer perceptions and brand experience, offering theoretical and practical implications.

Keywords : bodily attitude; embodiment; brand experience; exploratory factor analysis; scale development

Introduction

Focusing on embodiment, this study collected data through a two-phase survey on common bodily reactions when using good products and services, and conducted factor analysis to develop a scale of bodily attitudes. Embodiment entails perception and interaction through the body and that is an interpretation of human cognition from the perspective of embodied cognition (Clark, 1998). In this study, bodily reactions are defined as bodily changes and movements that occur unconsciously when consumers encounter a product or service. For example, glassware produced by Baccarat, a heritage brand renowned for exceptional clarity and refined form, stands out as being substantially heavier than similar products. This physical characteristic

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naturally encourages slower, more graceful movements when using the product. Combining a captivating lustre, delicately cut surface that fits comfortably in the hand and a pleasant, resonant sound when ice is added, the glassware enables consumers to enjoy a sense of luxury. This illustrates how certain product features can elicit spontaneous bodily responses. As different products and services may elicit distinct reactions, this study collects and aggregates consumers' bodily reactions when encountering multiple good products and services.

Background

Perceived affordance

Prior studies have developed a measurement scale of perceived affordance by focusing on the relationship between consumer purchasing behaviour and embodiment (Abhari *et al.*, 2017; El Amri & Akrou, 2020). However, the bodily behaviour of consumers when they perceive affordance has not been researched. Perceived affordance focus on responses directly resulting from human interactions with stimuli from the environment, whereas sensory marketing research focuses on cognitive interpretations or evaluations (e.g. it is important) and subsequent psychological intentions (e.g. purchase, recommend) to stimuli from the environment (e.g. it is heavy) (Jostmann *et al.*, 2009; Krishna & Schwarz, 2014).

Embodiment in sensory brand experience

In this respect, sensory marketing research is founded on indirect perceptual cognitivism. Drawing on embodied cognition theory, this research highlights how sensory stimuli acquired through bodily experiences can become associated with abstract concepts, thereby influencing consumer decision-making. Zha *et al.* (2020) focused on sensory brand experience and reviewed its connections with the accumulated research in sensory marketing. Within the embodiment approach, expressions involving embodied sensory cues are emphasized as a means to deepen understanding of brand meaning communication. Embodied meanings derived from sensory organs are recognized as important shapers of brand experiences. Zha *et al.* (2020) also highlight the need for future research to consider the influence on brand experience of unconscious sensations, emotions and bodily responses, those aligned with System 1 in dual-process theory. They argue that the perspective of embodiment is essential for advancing understanding of how consumers experience brands.

Unconscious consumer response

Direct bodily reactions and behaviours resulting from interactions between the body and products or services have not been investigated, pointing to the need to analyse consumer reactions at a more automatic level (Pleyers, 2021). Therefore, this study attempts to measure bodily attitudes, which it defines as bodily reactions while interacting with a product or service that indicate a favourable or unfavourable bodily tendency towards it. Attitudes towards a product or service are key to predicting consumer behaviour. In this context, attitude can be understood as a consumer's favourable or unfavourable mental disposition or evaluative association towards a given object (Fazio, 2007). The more positively consumers perceive a product or service, the more likely they are to purchase or continue using it. Attitudes are generally understood to comprise explicit and implicit components. Explicit attitudes are typically measured using self-report instruments, such as Likert-type or semantic differential scales, which assess respondents' evaluative judgments of a given object (Czellar & Luna, 2010). While explicit attitudes have been shown to reliably predict behaviour, research on environmentally conscious (e.g. green) consumption has identified a gap between attitudes and actual behaviour (Chou *et al.*, 2020; ElHaffar *et al.*, 2020). Implicit attitudes refer to unconscious, automatically activated evaluations of a target and so are not accessible through direct self-report measures (Greenwald & Banaji, 1995). The Implicit Association Test is a widely recognized indirect measure of implicit attitudes (Greenwald *et al.*, 1998). It requires participants to sort stimuli into categories displayed on the left and right sides of a screen. The speed of their responses is used to infer unconscious

attitudes towards the stimuli. For example, if participants are presented with the stimuli 'Coca-Cola' and 'Pepsi-Cola' and their response times are faster when 'Coca-Cola' is paired with 'pleasant' than when it is paired with 'unpleasant', this suggests a stronger implicit preference for Coca-Cola.

Limitations of explicit and implicit attitude measures

Both explicit and implicit attitude measures have respective limitations. Retrospective self-reporting of explicit attitudes is susceptible to recall bias, where individuals unintentionally reconstruct or idealize past experiences (Fazio & Olson, 2003). In socially desirable domains such as green consumption, there is also a tendency for respondents to provide favorable answers, leading to discrepancies between reported attitudes and actual behaviour (Chou *et al.*, 2020; ElHaffar *et al.*, 2020). For implicit attitudes, measuring procedures are often complex, requiring substantial time and financial resources to collect data (Ackermann & Palmer, 2014). Additionally, implicit attitude measures are sensitive to the quality of presented stimuli and because they assess attitudes in a relative (often binary) format. It can be difficult to draw interpretations applicable to real-world consumer behaviours.

Challenges of combining explicit and implicit measures

Although some studies have attempted to measure both explicit and implicit attitudes simultaneously (e.g. Belboula & Ackermann, 2021), thereby improving measurement accuracy, this approach entails higher research costs and can only feasibly be applied in a limited range of contexts. There is growing interest in measuring attitudes that are automatically activated by products and services during consumer experiences (Pleyers, 2021). However, implicit attitude measures are often constrained by high research costs and limited applicability across contexts. In light of these limitations, the present study seeks to develop a method for measuring bodily attitudes.

Leveraging self-report methods to measure bodily attitudes

Traditional measures of explicit attitudes rely on retrospective self-reports of mental dispositions. These methods are relatively simple to administer, low in procedural cost and well-suited for examining relationships with other psychological constructs. Building on these advantages, we seek to measure bodily attitudes by asking individuals to retrospectively evaluate their bodily reactions when interacting with a product or service. Bodily reactions are automatically activated physical changes or states and may therefore be more difficult to recall than conscious cognitive judgments. However, bodily reactions offer a degree of objectivity as they are based on actual physical experiences and may be less susceptible to social desirability bias. To enhance the ease and reliability of retrospective reporting, it is essential to develop an appropriate scale measuring bodily responses that are commonly experienced and easily remembered by the general consumer population. To this end, the present study implemented a two-phase online survey to extract and assess potential items of a scale to measure bodily attitudes.

Study 1

Procedures

In the first phase of the study, an online survey was administered in July 2024 through a crowdsourcing platform. The 1,470 paid participants were asked to recall and identify the most favorable product and service they had used in the past, specifying the brand name in each case. They were then instructed to reflect on the context in which they used the product or service and to describe the physical reactions and changes they experienced during that usage.

The response format was open-ended and based on the scale-development procedure outlined by Tajdini *et al.* (2022). Specifically, participants were asked to describe their physical reactions to the use of both tangible and intangible products using prompts such as: 'When I saw [product name]. I felt/became/did...';

‘Additionally, when I used [product name], my body felt/became/did...’; ‘Moreover. I found myself automatically feeling/becoming/doing... without realizing it’; ‘Furthermore. I also automatically felt/became/did...’; ‘And finally, after using [product name], my body felt/became/did...’. These expressions were designed to capture embodied responses elicited through product experiences.

Results

Responses with extremely short completion times were excluded from the analysis. From the remaining responses that adhered to the required format, 40 preliminary items were extracted as candidates for measuring bodily attitudes.

Study 2

Procedures

In the study’s second phase, a follow-up survey was conducted to develop a scale capable of capturing common embodied responses across various products and services, based on items extracted in the first phase. This online survey was conducted in September 2024 and recruited 929 participants through the crowdsourcing platform used in the first phase. Participants were first asked to recall the most favorable named product and service they had used in the past. They were then instructed to respond to all 40 items of the newly developed scale for measuring bodily attitudes.

Results

The mean and standard deviation were calculated for each item to examine potential floor and ceiling effects. A floor effect was observed in one item (“Tears naturally came to my eyes”), which was handled carefully in subsequent processes. An exploratory factor analysis was then conducted using IBM SPSS Statistics version 29, employing the maximum likelihood method with Promax rotation. This analysis identified four factors representing bodily attitudes: ‘Stability’, ‘Good Condition’, ‘Activation’ and ‘Integration’. Aiming to address the limitations inherent in conventional latent attitude measurement, we sought to capture attitudes automatically activated in response to products and services by focusing on the cross-loading items that emerged during extraction of the four primary factors. Three such items were identified and all appeared to reflect unconscious, automatic bodily responses triggered upon interacting with a product or service. Theoretically, these items were interpreted as indicative of automaticity in attitude activation and thus were considered to represent a distinct factor, labelled ‘Automaticity’.

Based on the scree plot and the pattern of eigenvalue attenuation, a two-factor structure was deemed appropriate. Accordingly, a further exploratory factor analysis was conducted assuming two factors, again using the maximum likelihood method with Promax rotation. Aiming for a manageable number of items and high convergent validity. Items with factor loadings of .70 or higher were retained and the analysis repeated. A final two-factor solution emerged, comprising ‘Stability’ and ‘Activation’.

Conclusions and discussion

This study contributes to the literature by developing a suitable scale to measure bodily attitudes in consumers. It focuses on the interaction between the body and products or services based on direct perception. Since a focus on embodiment is essential for understanding brand experiences (Zha *et al.*, 2020), the results of this study should help academics and practitioners to better understand the relationship between consumers and brands.

In future research, we plan to follow standard procedures for scale development and examine the discriminant validity of the proposed construct in relation to conceptually related constructs (e.g. Brakus *et al.*, 2009). Specifically, we will conduct investigations using two approaches: one based on the two-factor

structure ('Stability' and 'Activation') extracted through exploratory factor analysis and the other based on the factor labelled 'Automaticity', which emerged from cross-loading items, in measuring bodily attitudes, the aim is to capture bodily responses occurring when individuals engage with products or services, responses that are retrospective and unconscious in nature. The scale is thus positioned as an intermediate measure between explicit and implicit attitude assessments. Rather than relying solely on the overt factors derived through traditional exploratory factor analysis, we therefore aim to develop a scale focused on items that remained latent as cross-loadings, reflecting subtle and potentially more automatic aspects of bodily attitudes. By using this bodily attitude scale, it is possible to conduct research that may provide insight into unconscious consumption, which has been overlooked until now and the discrepancy between psychological attitudes and behavior.

The limitation is this scale needs to examine the correlation with other scales. By examining the relationship between cognitive attitudes, behavioral intentions and contributing variables in various situations. It is possible to deepen our understanding of the differences between psychological and physical attitudes and the circumstances under which they occur.

Acknowledgements

This work was supported by JSPS KAKENHI (grant number JP24K05164)

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Boosting retailers' resilience to natural disasters: the role of hazard experience learning in a dynamic capability perspective

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Abstract. Exogenous negative events, like natural disasters, are increasing in frequency and magnitude, causing important threats to business economic performance. These events make damages to businesses, not only to plants, equipment, infrastructure, but also have indirect negative effects related to problems with suppliers or decreased sales due to customer income losses. To cope and continue to generate profits, businesses must engage in dynamic adaptive strategies, building resilience to realign their activities and find opportunities of renewal. In addition, to make retailers prepared in advance to face the impact of threats. It is paramount to develop their dynamic capabilities (DCs), so that allowing adaptive strategies and reconfiguration of existing resources and capabilities to recover and continue to generate revenues. Nevertheless, is there also a hazard experience learning effect that can play a role? Our study intends to shed light on the learning (dynamic) capability that retailers should develop and/or enhance when being exposed to different natural disasters (first an earthquake and then the COVID-19 pandemic) to reduce the side-effects of external shocks and develop resilience, thus keeping generating revenues. In doing so, we employ a PLS-SEM to investigate the mediation process of learning between business resilience and economic performance. Results show the importance of dynamic capabilities – and specifically learning - to enhance adaptive processes aimed at a resilient-type of response to adverse effects. More specifically, dynamic capabilities result as effective in enhancing business resilience that is. In turn, positively impacting business economic performance. Our results can advise not only managerial strategies to be adopted by retailers, but also public policies.

Keywords : natural disasters; business resilience; dynamic capabilities, learning; business economic performance.

Introduction

Natural disasters (e.g., floods, earthquakes, but also biological pandemics) are increasingly hitting the world, seriously affecting people, destroying territories and damaging businesses. Scholars demonstrated that retailers, especially the small ones, are among the most affected enterprises by the occurrence of a natural disaster (e.g., Chang & Falit-Baltimonte 2002; Dietch & Corey 2011; Kroll *et al.*, 1990). In addition, retailing is a key sector in terms of economic and societal effects: it displays the highest number of enterprises and employees (Eurostat, 2024) and it has proven to strongly contribute to the building of a new normality in a hazard's aftermath, providing the affected community with crucial goods and services (Peterson *et al.*, 2010;

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Liu *et al.*, 2012). This key role is especially performed by micro and small retail enterprises (Ballantine *et al.*, 2014), who usually are highly responsive during the emergency phase of a natural disaster, but show difficulties in surviving in the long run (Pearson *et al.*, 2011).

The concept of resilience has garnered significant scholarly interest and attention (van der Vegt *et al.*, 2015; Linnenlueke, 2017). It has been identified as a crucial element, with growing evidence indicating its role in achieving successful results (Bullough *et al.*, 2014; Corner *et al.*, 2017; Linnenluecke, 2017). Extant literature then advises on the importance of developing enterprises' resilience, conceived as the ability to effectively absorb, develop situation-specific responses to and ultimately engage in transformative activities to capitalize on disruptive surprises that potentially threaten organization survival (Lengnick-Hall *et al.*, 2011, p. 244). Business resilience (BR) is identified as the ability not only to survive, but also to thrive through times of adversity (McManus *et al.*, 2008): resilient businesses can even prosper after a natural disaster (Sabatino, 2016). We consider resilience in a bouncing forward perspective (Manyena *et al.*, 2011), strictly related to adaptive capacity and resistance to change (Limnios *et al.*, 2014) and does not only look at the business recovery, but also at the opportunities of renewal (Kantur & İşeri-Say, 2012), ultimately sustaining business performance (Tognazzo *et al.*, 2016; de Vries & Hamilton, 2021).

Even if the dynamic and processual nature of resilience is corroborated in extant literature, consensus lacks on an overarching framework for exploring individual elements sustaining the development of business resilience (Duchek, 2020), such as Dynamic Capabilities (DCs). In fact, DCs play a key role in firms, allowing adaptive strategies and reconfiguration of existing resources and capabilities to recover and continue to generate revenues (Teece *et al.*, 1997). DCs help organizations to develop the evolutionary fitness and to ensure long-term sustainability when facing unforeseen environmental shifts (Helfat *et al.*, 2009), then satisfying those traits of preparedness and proactive action before the occurrence of an unexpected event (Duchek, 2020). In cases of unpredictable and unexpected events, the DCs perspective allows the reconfiguration of existing resources and competencies and firms can indeed maintain a competitive advantage (Helfat & Peteraf, 2009). DCs can then be considered within the process-oriented perspective of resilience as necessary in order to activate a resilient response (Martinelli *et al.*, 2018). To this concern, organizational learning is considered fundamental to develop all other capabilities (Makkonen *et al.*, 2015), if exogenous shocks can be considered as competence destroying in lower levels of DCs, organizational learning may. In contrast, boost the creation and modification of adaptive responses and even new capacities (Winter, 2003). Because of this characteristic, learning can be considered as a pillar capability (Collis, 1994), building on the experience of past challenges, integrated within the organization as know-how-to-face new challenges. Even if some studies explored the effects of DCs on enterprises' resilience (Martinelli *et al.*, 2018; Tagliazucchi *et al.*, 2023), the role of the learning experience matured in facing a previous natural disaster remains unclear.

We explore the role of learning in the face of natural disasters (Comfort, 1994) and specifically the role of previous hazard experience in building a subsequent resilient response. Therefore, our research question is the following: Is the previous learning experience with a natural disaster (in this case, an earthquake) able to render retailers better capable to face another kind of natural disaster (in this case, a biological pandemic)?

Methodology

We performed a survey based on a structured questionnaire which was administered to a sample of 260 Italian retailers who experienced both natural disasters (an earthquake and the COVID-19 pandemic). The survey took place in the period Winter 2023-Spring 2024 and was administered F2F.

TABLE 1 – Indicators for each latent construct

Items for Learning (LRN)	
LRN1	I always search for new opportunities to develop new abilities and competencies.
LRN2	I am able to change my usual way of working to face crisis.
LRN3	I regularly make improvements to my products/services.
Items for Business Resilience (BR)	
BR1 Robustness	My business goes straight and preserves its competitive advantage.
BR2 Robustness	My business is successful in generating diverse solutions.
BR3 Robustness	My business does not give up and follows its pathway.
BR4 Agility	My business rapidly takes actions when needed.
BR5 Agility	My business can generate opportunities also from unfavourable circumstances.
BR6 Agility	My business can rapidly take adequate actions when needed.
Items for Business Economic Performance (BEP) pre- and post-Covid-19 comparison	
BEP1	- Revenues with respect to the situation prior the lockdown.
BEP2	- Sales volume with respect to the situation prior the lockdown.

Seven-point Likert-scale ranging from 1 (very much lower) to 7 (very much higher).
Source: authors' elaboration.

TABLE 2 – Structural model (PLS-SEM)

Standardized path coefficients	Business Economic Performance (BEP)	Learning (LRN)
Business Resilience (BR)		H ₁ : 0.568*** BR → LRN (supported)
Learning (LRN)	H ₂ : 0.215*** LRN → BEP (supported)	
Mediation analysis (LRN mediator)		H ₃ : 0.122*** BR → LRN → BEP (supported)

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: authors' elaboration.

Starting from the construct on learning (dynamic) capability, we employ this latent variable by analysing three main indicators about the ability to search new opportunity for developing competencies, to make regular improvements in products/services and to change the way of working to face crises and adverse situations. Business resilience was measured employing the dimensions of Robustness and Agility (Kantur and İşeri-Say, 2015). Robustness is defined as the hardiness of the entrepreneurial project and of those resources and competences employed in developing the business; and Agility is defined as the adaptation capacity and flexibility of entrepreneurial pathways. Finally, the concept on business economic performance deals with revenues and sales volume with respect to the situation prior the lockdown. All variables included in the questionnaire and employed in the empirical model are listed in Table 1. Therefore, we postulate the following hypotheses:

H₁: *Business Resilience (BR) exerts a positive and direct effect on Learning (LRN).*

H₂: *Learning (LRN) exerts a positive and direct effect on post-pandemic Business Economic Performance (BEP).*

H₃: *Learning (LRN) acts as a mediator between Business Resilience (BR) and Business Economic Performance (BEP).*

Then, Partial Least Squares Structural Equation Model (PLS-SEM) was employed for the empirical analysis as it is a distribution-free method that relies on the nonparametric bootstrap (Venturini and Mehmetoglu, 2019).

Results

Measurement model

Starting from the analysis of the measurement model results and focusing on the measures of internal consistency reliability, Cronbach's alpha exceeds the threshold of 0.6 denoting a very good level of internal consistency of the chosen indicators. In addition, Composite Reliability is above 0.7 confirming satisfactory to good reliability levels (Hair *et al.*, 2017a), as well as the reliability coefficient. Standardized factor loadings are all higher than 0.7. For the BR construct the one with the highest score (0.854) is BR2 (Robustness), followed by BR7 on Agility with a loading of 0.840. Switching to the latent variable on Learning, the indicator LRN1 counts more in explaining the latent concept with a standardized factor loading of 0.764. Finally, the two indicators for BEP display both a loading higher than 0.9 as they are very similar in definition and probably slightly redundant.

Structural model

As concern the structural part of the model, for all the three latent constructs the convergence validity is assessed by the Average Variance Extracted (AVE) across all items associated with a latent construct. The AVE is higher than the recommendation of 0.5 for the three latent variables, meaning that they explain more than 50% of the variance of their items (Hair *et al.*, 2017a, 2017b).

Results of the structural model

Table 2 shows the structural model evaluation and hypotheses testing. BR have a positive and significant role in enhancing LRN, moreover, the higher the LRN capacity of small retail businesses, the higher the economic performance with respect to the situation prior to the lockdown. Moreover, the mediating role of LRN is confirmed and highly statistically significant. With a mediation analysis, we gain insight and acquire deep understanding about the mechanism of action of Business Resilience toward Business Economic Performance.

Discussion and conclusions

The increasing exposure of firms to unexpected events calls for further analysis on the actions and behaviours that can help in facing unpredictable outcomes. To survive and develop, dynamic and adaptive strategies are essential to businesses. However, there is a need of further studies on the preparedness of businesses' activities to major external shocks, in relation to competence-based approach to the study of resilience. In particular, the definition of resilience as the ability to adapt, extend the analysis towards a dichotomy between adaptation and adaptability (Linnenluecke, 2017), the first looking at the capacity to move towards a pre-conceived development paths in order to reproduce existing structures, whilst the second focusing on the capacity to bounce forward by stimulating and creating new trajectories of development through different resources with respect to existing pathways. This paper analyses a sample of Italian small retailers that have been exposed to an earthquake first and the Covid-19 pandemic after. The study focuses on their responsive actions, in terms of business resilience, in order to assess if a hazard experience learning effect is occurring.

Results clearly show the importance of developing adaptive processes aimed at boosting a resilient-type of response to negative exogenous events. Those businesses who displayed higher levels of resilience also reported a better business performance, in line with those studies on the development of resilience over time and new opportunities of growth. This implies the existence of a trade-off between the short-term capacity to reinforce existing structures and the long-term ability to explore new trajectories. In order to reach a positive performance in terms of revenues and increasing sales volume (i.e., BEP), retailers should invest in different adaptive strategies related to resilience, confirming the approach that a negative event can represent an opportunity to change towards the better. Resilience can also be developed and grown through

time (Lengnick-Hall & Beck, 2005; Sabatino, 2016). The recovery period after unpredictable and negative events, such as an earthquake or a global pandemic, can be interpreted as a real learning process. Therefore, adverse economic consequences derived from a negative shock can be prevented through a dynamic adaptive strategy and the positive effect of a previous hazard experience could effectively leverage the skills and competencies within an organization in a learning process that helps in facing future disruptive events. The theoretical implication of our results is in line with a bouncing-forward approach to resilience (Lengnick-Hall & Beck, 2005; Manyena *et al.* 2011), confirming that it is not only about persistency, but it also opens up new opportunities, also in terms of economic sustainability. However, the main contribution lies in the academic debate on the antecedents of resilience and on the role of learning in building a resilient response over time and in case of multiple exogenous shocks.

As concerns managerial and practical implications, our results can give further support to business owners on the importance of enhancing resilience at the business level in order to face the negative effects of shocks and gaining back economic sustainability. Key is the emphasis on the nature of learning as DCs, which come into play in building competitive advantage within exogenous shock conditions. Suggestions for policy makers can be derived too: to minimize the negative implications of natural hazards, policy makers should not only fund the hit businesses with subsidies - in any case essential - but also support the organization of specific training and experience-sharing programmes among small businesses, aimed at initiating and developing learning mechanisms in order to let resilience displays its positive role.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

The role of ability, motivation and opportunity in retail employee performance: a configurational approach

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Abstract. The retail sector faces unprecedented challenges driven by digitalisation, shifting consumer expectations and crises like the COVID-19 pandemic. While the Ability, Motivation and Opportunity (AMO) framework has been widely used to analyse employee performance, critical gaps persist in its application to crisis contexts, its neglect of employee resilience and its reliance on symmetrical analytical methods. This study addresses these gaps by integrating resilience into the AMO framework and employing fuzzy-set Qualitative Comparative Analysis (fsQCA) to explore configurations of factors driving retail employee performance during crises. Drawing on data from 1,350 frontline employees in Italian retail firms during the pandemic, the research identifies equifinal pathways to high and low job performance. Key findings reveal resilience as both a compensatory mechanism (offsetting skill gaps) and a necessity (preventing performance declines), with high-performance configurations combining ability (customer rapport, digital competence), motivation (including resilience) and opportunity (organisational support or technology). Low performance emerged from deficits in AMO factors and resilience. Methodologically, the study demonstrates fsQCA's value in capturing complex interdependencies, challenging traditional linear models. Theoretically, it advances AMO literature by contextualising it within crisis settings and positioning resilience as a dynamic motivator. Practically, the findings offer managers actionable strategies to sustain workforce effectiveness in volatile environments. This research contributes to the international state of the art by bridging AMO theory with resilience literature and advocating configurational approaches for nuanced insights into retail performance dynamics.

Keywords : employee performance; AMO framework; resilience; fsQCA; retail sector; crisis management

Introduction

The retail sector faces unprecedented challenges driven by rapid digitalisation, shifting consumer expectations and crises like the COVID-19 pandemic. These changes create an environment rife with uncertainty, making it essential for retailers to adopt innovative frameworks that enable adaptation and growth. One such framework, the AMO model, has shown significant promise in addressing workforce dynamics. Originally conceptualised by Appelbaum *et al.* (2000), the AMO framework has since been applied across diverse sectors—from SMEs to healthcare and logistics—reflecting its versatility in explaining not just employee performance but also outcomes like innovation and adaptability in volatile markets. Yet

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critical gaps persist in AMO-based research. First, while the model has been widely used to analyse employee performance in stable environments (Appelbaum *et al.*, 2000; Marin-Garcia & Martinez Tomas, 2016), its application to retail contexts during crises remains sparse. This oversight is striking, given the retail sector's unique pressures, where rapid innovation and customer-centric agility are vital for survival. Recent studies emphasise that empowering employees during crises can mean the difference between organisational collapse and success (Liu *et al.*, 2021). While the AMO framework's flexibility positions it as a powerful tool for tackling these challenges, its application to crisis context—such as the one created by the COVID-19 pandemic—remains underexplored.

Second, while existing AMO research has examined a plethora of factors within the framework (Duke *et al.*, 2024; Kusa *et al.*, 2021; Li & Long, 2025), it has overlooked employee resilience—the capacity to sustain performance under adversity. This omission is even more striking if we consider the retail sector, which is much vulnerable to disruptions like pandemics or supply chain breakdowns. A growing body of literature underscores resilience as a critical buffer against crises (Cooper *et al.*, 2020; Näswall *et al.*, 2019). Resilient employees adapt creatively, generating solutions that bolster organisational performance (Rodríguez-Sánchez & Vera Perea, 2015; Vakilzadeh & Haase, 2021).

Finally, traditional AMO studies rely on symmetrical methods like structural equation modelling (e.g., SEM), which focuses on the net effects of isolated variables. As Hanu and Khumalo (2023) argue, no single AMO component (ability, motivation, or opportunity) can independently explain complex outcomes like performance or agility. To address this, scholars have begun applying fsQCA to the AMO framework (e.g., Kusa *et al.*, 2021; Li & Long, 2025; Liu *et al.*, 2024), a method that identifies combinations of conditions leading to outcomes (Ragin, 2008; Vis, 2012). Unlike SEM, fsQCA uncovers recipes of interacting factors—such as high motivation paired with organisational support—that jointly explain outcomes, it also accounts for equifinality, where multiple pathways lead to the same result (e.g., high performance through different AMO-resilience configurations). This approach may offer actionable insights that managers can promptly integrate within firms (Pappas & Woodside, 2021).

This study addresses these gaps by integrating resilience into the AMO framework and adopting fsQCA to analyse data collected during the COVID-19 pandemic in collaboration with retail firms. The dataset comprises responses from 1,350 Italian frontline employees, capturing their experiences under unprecedented crisis conditions. Focusing on frontline employees is critical, as their flexibility, resilience and initiative (Sok *et al.*, 2021) are central to delivering the human touch that distinguishes brick-and-mortar retail from online alternatives (Mao, 2022). Frontline employees create unique relational and emotional value (Solnet *et al.*, 2019), adapt to shifting customer needs and foster brand-customer connections through personalised interactions (Coelho *et al.*, 2011; Sirianni *et al.*, 2013). Hence, they are central in explaining retail firms' performance. Our findings reveal resilience as both a compensatory mechanism (offsetting skill gaps) and a necessity (preventing performance declines), bridging AMO theory with resilience literature. By identifying pathways to high and low performance, we advance a more comprehensive view of how to sustain workforce effectiveness in volatile retail environments.

The AMO framework

The AMO framework posits that employee performance emerges from the interplay of three core components: ability, motivation and opportunity (Appelbaum *et al.*, 2000). Each component represents a distinct yet interconnected dimension of workplace effectiveness, shaping how employees navigate challenges and contribute to organisational goals.

Ability refers to the skills, knowledge and competencies employees bring to their roles. This encompasses both technical expertise—such as proficiency in digital tools like customer relationship management (CRM) systems—and soft skills, including problem-solving and communication. Employees with strong abilities are better equipped to handle complex tasks, adapt to technological shifts and maintain customer satisfaction, all of which are critical in the fast-paced retail sector. In this study, we operationalised ability through two key factors: employee-customer rapport and digital competence. The former captures the quality of interpersonal interactions between employees and customers, emphasising relational harmony and trust (Delcourt *et al.*, 2013; Fatima *et al.*, 2020). The latter regards employees' ease and proficiency in using digital technologies to enhance service delivery (Li & Long, 2025; Twining, 1995).

Motivation, the second pillar, involves the internal and external drivers that influence employee engagement, intrinsic rewards are personal satisfaction, alignment with values, or professional growth; extrinsic rewards include recognition or career advancement, collectively fueling employees' commitment to their work. Highly motivated employees tend to exhibit resilience, proactively addressing challenges rather than disengaging during adversity. Our study expands this dimension by integrating resilience as a motivational component. Following Näswall *et al.* (2019), resilience reflects the capacity to recover from setbacks, adapt to change and sustain performance under pressure. This inclusion aligns with recent literature emphasising resilience as a dynamic force that complements traditional motivation, particularly in crisis contexts like the COVID-19 pandemic. Alongside resilience, we measured intrinsic employee motivation (Gagné *et al.*, 2010, 2015), which evaluates the job-related motivations deriving from the inherent satisfaction rather than the desire for a reward or specific outcome, namely the salary.

Opportunity, the final pillar, represents the organisational conditions and resources that enable employees to leverage their abilities and motivation effectively. Without adequate opportunities—such as training programs, supportive leadership, or access to technology—even skilled and driven employees may struggle to perform optimally. In retail, opportunity-enhancing factors like digital infrastructure or workplace support are especially vital during disruptions, as they empower employees to adapt to rapid changes. Our study operationalised opportunity through three variables: perceived organisational support, organisational training and availability of in-store technologies. Perceived organisational support measures employees' belief that their well-being and contributions are valued by the organisation (Rhoades *et al.*, 2001). Organisational training assesses access to skill-development programs (Bulut & Culha, 2010), while in-store technologies evaluate the tools provided to streamline service processes and enhance customer interactions (Sin *et al.*, 2005). By classifying these variables within the AMO framework, our study advances a nuanced understanding of how ability, motivation and opportunity interact. This approach not only addresses gaps in traditional AMO literature but also provides a configurational lens to explore how combinations of these factors drive performance in volatile retail environments.

Methodology

Sample

Data collection was conducted with the support of multiple firms all monobrand retailers. These retailers covered various sectors, including fashion, accessories, sports, beauty, Jewellery, consumer electronics, media, entertainment, furniture design and automobiles, operating as stand-alone branded stores in city centres, outlet villages and shopping malls. From a retail perspective, such stores represent the forefront of brand experience (Shahid *et al.*, 2022). Moreover, these retailers were among the most severely affected by the financial repercussions of the COVID-19 pandemic and were significantly exposed to the accelerated digital transformation that followed.

A total of ten retail companies ($N = 10$) participated in this research, distributing the questionnaire within their Italian stores and inviting their employees to take part in the study. Participants were assured anonymity

and the questionnaire itself was designed in two parts following a thorough review of existing literature. The first section collected sociodemographic details such as age, gender, professional role and regional location, while the second section utilised validated five-point Likert scales (ranging from 1 = strongly disagree to 5 = strongly agree) to measure key variables aligned with the AMO framework.

Job performance was the outcome variable. Under the ability dimension, we assessed employees' interpersonal and technical skills through adapted scales for employee–customer rapport (Delcourt *et al.*, 2013) and digital competence (Twining, 1995). The motivation dimension incorporated both traditional drivers of engagement—measured via employee motivation (Gagné *et al.*, 2010)—and the novel addition of employee resilience (Näswall *et al.*, 2019), which reflects adaptability under pressure. Finally, the opportunity dimension evaluated organisational enablers, including perceived organisational support (Rhoades *et al.*, 2001), training accessibility (Bulut & Culha, 2010) and in-store technology availability (Sin *et al.*, 2005).

Data collection took place between September 2021 and August 2022, yielding a total of 2,158 responses. Incomplete responses and those from participants who failed at least one of the three attention checks embedded in the questionnaire were excluded from the analysis. The final sample consisted of 1,350 respondents, with a majority being female (76.72%), followed by male participants (21.42%) and a small proportion who preferred not to disclose their gender (1.85%). In terms of age distribution, the largest group fell within the 26–35 age range (37.51%), followed by those aged 36–45 (30.62%), 46–55 (15.20%) and 18–25 (12.38%). Geographically, the sample was predominantly composed of individuals from Lombardia (30.24%) and Toscana (27.80%), followed by Piemonte (5.63%), Puglia (5.11%) and Emilia-Romagna (4.45%). Other regions, such as Veneto (3.26%), Lazio (3.41%) and Sicilia (3.04%), were also represented, albeit to a lesser extent. The remaining respondents were distributed across various Italian regions, with each contributing less than 3% to the total sample. Regarding professional roles, the majority of participants were sales assistants (63.75%), while store managers comprised 36.03% of the sample. In terms of employment contracts, 70.87% held permanent positions, whereas 21.05% were employed on fixed-term contracts. All analyses were performed using R (R Core Team, 2022).

Measures validity

We conducted a confirmatory factor analysis to assess the validity and reliability of our measures, utilising the Lavaan and semTools packages (Jorgensen *et al.*, 2023; Rosseel, 2012). Given that the data were ordinal, we employed diagonally weighted least squares estimation with polychoric correlations (Li, 2016). The measurement model demonstrated an acceptable fit to the data ($\chi^2 = 2402.563$, $df = 322$, $RMSEA = 0.069$ [90% CI: 0.067; 0.072], $CFI = 0.947$, $TLI = 0.938$, $SRMR = 0.051$; see Table 2). Convergent validity was evaluated by examining composite reliability (CR), average variance extracted (AVE) and standardised factor loadings, with recommended thresholds of 0.700, 0.500 and 0.500, respectively. As presented in Tables 1 and 2, all indices exceeded these minimum criteria, thereby supporting the convergent validity of the constructs (Hair *et al.*, 2018).

To evaluate discriminant validity, we implemented two established methods. First, we applied the Fornell-Larcker criterion (Fornell & Larcker, 1981), ensuring that the square root of the average variance extracted (AVE) for each construct exceeded its correlations with all other constructs. Second, we verified that all heterotrait-monotrait (HTMT) ratios of correlations fell below the 0.85 threshold (Henseler *et al.*, 2015). The results confirmed discriminant validity, as both criteria were satisfied: the AVE square roots surpassed inter-construct correlations and all HTMT ratios remained under 0.85. These findings indicate that each construct was sufficiently distinct from the others (see Table 2).

TABLE 1 – CFA with factor loadings, AVE and CR

Construct	Measurement items	λ	AVE	CR
Employee-customer rapport			0.587	0.781
	I enjoy interacting with customers.	0.718		
	Interacting with customers creates a feeling of warmth.	0.834		
	I have a harmonious relationship with customers.	0.811		
	The store's customers relate well to me.	0.691		
Employee digital competence			0.782	0.863
	I use digital technologies with ease in my daily work.	0.885		
	I can interact properly with the technologies inside the store.	0.907		
	I find it easy to interact with new technologies at work.	0.860		
Employee motivation			0.656	0.862
	I enjoy this work very much.	0.871		
	I have fun doing my job.	0.847		
	This job brings me moments of pleasure.	0.732		
	This job fits my personal values.	0.782		
Employee resilience			0.710	0.845
	I successfully manage a high workload for long periods.	0.890		
	I effectively collaborate with others to handle challenges at work.	0.864		
	I use change at work as an opportunity for growth.	0.770		
Perceived organisation support			0.674	0.876
	My firm really cares about my well-being.	0.870		
	My firm is willing to help me if I am in need.	0.867		
	My firm cares about my opinions.	0.733		
	My firm strongly considers my goals and values.	0.806		
Organisational training			0.758	0.880
	My organisation has stated policies on the amount of training the employees can expect to receive.	0.858		
	I am aware of the amount and type of training that my organisation is planning for me in the coming year.	0.820		
	This organisation provides access to training.	0.931		
Availability of in-store technologies			0.558	0.833
	My organisation has the right technical personnel to provide technical support for the utilisation of computer technology in building customer relationships.	0.679		
	Individual customer information is available at every point of contact.	0.770		
	My organisation has the right software to serve our customers.	0.730		
	My organisation has the right hardware to serve our customers.	0.803		
Job performance			0.660	0.827
	I adequately complete assigned duties.	0.836		
	I fulfil the responsibilities specified in the job description.	0.788		
	I perform tasks that are expected of me.	0.813		

TABLE 2 – Discriminant validity: tests based on correlations, AVE and HTMT values

	1	2	3	4	5	6	7	8
ECR (1)	0.766	0.237	0.696	0.514	0.402	0.229	0.324	0.557
DC (2)	0.291	0.884	0.256	0.482	0.151	0.117	0.273	0.520
EM (3)	0.700	0.285	0.810	0.534	0.708	0.471	0.403	0.598
ER (4)	0.536	0.502	0.545	0.843	0.368	0.218	0.256	0.585
POS (5)	0.435	0.186	0.706	0.390	0.821	0.767	0.422	0.380
TRA (6)	0.257	0.141	0.472	0.238	0.768	0.871	0.470	0.185
AST (7)	0.353	0.300	0.398	0.270	0.420	0.457	0.747	0.171
JP (8)	0.578	0.538	0.633	0.566	0.401	0.222	0.217	0.813

Note 1. The square root of AVE on the diagonal and the inter-construct correlation under the diagonal; HTMT correlations are above the diagonal.

Note 2. ECR stands for Employee-Customer Rapport, DC stands for Digital Competence, EM stands for Employee Motivation, ER stands for Employee Resilience, POS stands for Perceived Organisational Support, TRA stands for Organisational Training, AST stands for Availability of In-Store Technologies and JP stands for Job Performance.

TABLE 3 – Calibration thresholds, descriptive statistics and analysis of necessity

	Calibration						Analysis of necessity			
	Calibration thresholds			Descriptive statistics						
	Fully-out	Cross-over	Fully-in	$\bar{x}$	SD	MED	SKW	KRT	Consistency	Coverage
ECR	3,467	4,309	4,898	0.526	0.316	0.503	-0.039	-1.496	0.790 (0.486)	0.824 (0.563)
DC	3,068	4,029	4,948	0.546	0.308	0.500	-0.143	-1.243	0.803 (0.478)	0.807 (0.579)
EM	2,706	3,901	4,794	0.519	0.299	0.501	-0.054	-1.281	0.778 (0.516)	0.823 (0.589)
ER	2,724	3,899	4,825	0.479	0.284	0.501	0.113	-1.105	0.743 (0.561)	0.851 (0.592)
POS	2,106	3,659	4,720	0.506	0.291	0.501	-0.052	-1.247	0.712 (0.581)	0.773 (0.646)
TRA	1,457	3,574	4,725	0.514	0.289	0.504	-0.057	-1.241	0.689 (0.594)	0.736 (0.671)
AST	1,958	3,441	4,525	0.499	0.299	0.503	-0.026	-1.325	0.663 (0.608)	0.730 (0.666)
JP	3,482	4,205	4,873	0.549	0.312	0.500	-0.062	-1.470	-	-

Note 1. The results in parentheses for the analysis of necessity refer to the absence of the causal condition

Note 2. ECR stands for Employee-Customer Rapport, DC stands for Digital Competence, EM stands for Employee Motivation, ER stands for Employee Resilience, POS stands for Perceived Organisational Support, TRA stands for Organisational Training, AST stands for Availability of In-Store Technologies and JP stands for Job Performance.

Finally, to assess the presence of common method variance, we employed the marker variable technique (Podsakoff *et al.*, 2003), selecting attitude toward the colour blue - a theoretically unrelated construct - as the marker variable (Miller & Simmering, 2023). We specified a model in which all measurement items loaded onto their respective theoretical constructs and the marker variable, with the marker's loadings constrained to equality and its variance uncorrelated with other variables. This model was compared to a baseline model containing only the marker variable without cross-loadings. A likelihood ratio test revealed that the baseline model fit the data significantly better than the constrained cross-loading model (robust $\Delta\chi^2 = 575.531$, $\Delta df = 8$, $p < 0.01$). These results suggest no significant evidence of common method bias, indicating that CMV does not substantially threaten the validity of our findings.

fsQCA calibration

The first step in conducting fsQCA is calibrating all relevant constructs into fuzzy sets with values ranging from 0 to 1 (Duşa, 2019; Ragin, 2008). To achieve this, we calibrated the factor scores derived from our measurement model. However, before extraction, we re-estimated the measurement model using the effects-coding method for identification. This approach ensures that the estimated latent variances and means align with the observed item metrics, optimally weighted based on the extent to which each indicator represents the underlying construct (Little *et al.*, 2006). In essence, our factor scores maintained the same metric as the items. The calibration process was carried out directly using three key thresholds: full membership, the cross-over point and non-membership (Duşa, 2019; Ragin, 2008). While calibration involves both empirical and theoretical considerations (Greckhamer *et al.*, 2018), there was no prior theoretical framework available to define precise thresholds, such as fully-in or fully-out cases, for the constructs examined. As a result, we based our calibration on the quantile distribution of the factor scores. Specifically, the full-membership threshold corresponded to the 95th percentile, the non-membership threshold to the 5th percentile and the cross-over point to the median value for each construct (Pappas & Woodside, 2021). Further details are provided in Table 3.

Results

We initially conducted a necessity analysis to assess whether specific causal conditions - namely, employee-customer rapport, employee digital competence, employee motivation, employee resilience, perceived organisational support, organisational training and the availability of in-store technologies - were essential for the occurrence of a particular outcome, in this case, job performance. A condition is classified as 'necessary' if its consistency score exceeds 0.900 (Schneider *et al.*, 2010). When considering attitudinal and

behavioural loyalty as outcome variables, the consistency scores for the presence and absence (denoted as '~' in fsQCA jargon) of configurational antecedents ranged from 0.412 to 0.884. Consequently, none of the examined conditions met the threshold for necessity (Table 3). Subsequently, a sufficiency analysis was conducted using the fuzzy-set algorithm to identify configurations of conditions that were adequate to produce the specified outcomes. The truth tables were refined by discarding configurations with a frequency lower than three, and solution consistency scores below 0.800. To ensure logical and theoretical coherence, we followed Duşa (2019, 2022), excluding contradictory remainders from the minimisation process.

The fsQCA results for job performance and ~job performance revealed robust solutions with strong consistency and coverage. For the presence of job performance, solution consistency was 0.887 and solution coverage was 0.753, indicating a reliable and empirically significant model. For the absence of job performance, solution consistency (0.885) and coverage (0.770) were similarly robust, underscoring the validity of the asymmetric configurations. All individual configurations demonstrated consistency scores above 0.910, exceeding the recommended threshold of 0.75 (Pappas & Woodside, 2021; Ragin, 2008).

In analysing the presence of job performance, S1 highlighted employee-customer rapport and digital competence as core conditions. S2 featured the presence of employee-customer rapport, employee motivation and employee resilience as core elements. Finally, S3a and S3b were two neutral permutations of the same core conditions, namely digital competence, employee motivation and employee resilience. Nonetheless, in S3a, the availability of in-store technologies was deemed a peripheral condition, while perceived organisational support and organisational training played the same role in S3b. Notably, S1 had the largest unique coverage, underscoring its empirical relevance and the importance of employee abilities. For the absence of job performance, S4 featured ~ employee-customer rapport, ~ digital competence and ~ employee motivation as core conditions. S5 presented similar core conditions but substituted ~ employee motivation with ~ employee resilience.

Finally, in S6, the absence of ~ employee-customer rapport, ~ employee motivation, ~ employee resilience and ~ availability of in-store technologies were deemed core conditions, while the peripheral elements were ~ perceived organisational support and ~ organisational training (Table 4).

TABLE 4 – FsQCA results for attitudinal loyalty

	Job Performance				~ Job Performance		
	S1	S2	S3a	S3b	S4	S5	S6
ECR	●	●			⊗	⊗	⊗
DC	●		●	●	⊗	⊗	
EM		●	●	●	⊗		⊗
ER		●	●	●		⊗	⊗
POS				●			⊗
TRA				●			⊗
AST			●				⊗
Consistency	0.915	0.922	0.937	0.944	0.924	0.912	0.918
Raw coverage	0.655	0.605	0.470	0.470	0.585	0.602	0.374
Unique coverage	0.118	0.068	0.005	0.005	0.019	0.036	0.036
Solution consistency		0.887				0.885	
Solution coverage		0.753				0.770	

Note 1. Crossed circles (⊗) represent the absence of a causal condition and black circles (●) indicate the presence of a causal antecedent. Large circles identify core conditions and small circles identify peripheral aspects. Blank spaces represent the do not care situations (Fiss, 2011).

Note 2. ECR stands for Employee-Customer Rapport, DC stands for Digital Competence, EM stands for Employee Motivation, ER stands for Employee Resilience, POS stands for Perceived Organisational Support, TRA stands for Organisational Training and AST stands for Availability of In-Store Technologies.

Conclusions and discussion

The fsQCA findings reveal nuanced pathways to high and low job performance, underscoring the complex interplay of AMO factors in retail contexts. Three high-performance configurations emerged, each highlighting resilience's dual role as both a compensatory mechanism and a necessity. Configuration S1, driven by strong employee-customer rapport and digital competence, aligns with prior research emphasising the centrality of interpersonal and technical skills in frontline roles (Delcourt *et al.*, 2013; Li & Long, 2025; Solnet *et al.*, 2019). This echoes Sirianni *et al.* (2013): human-centric skills differentiate brick-and-mortar retail in an increasingly automated world. However, Configuration S2 demonstrates that even with lower digital competence, high motivation and resilience can sustain performance. Resilience here acts as a resource caravan, enabling employees to conserve motivation and adapt to crises, consistent with many studies (Bardoel *et al.*, 2014; Cooper *et al.*, 2020; Huang & Farboudi Jahromi, 2021; Näswall *et al.*, 2019; Robinson *et al.*, 2024), positioning resilience as a buffer against resource depletion.

The third pathway (S3a/S3b) integrates digital competence, motivation and resilience, with opportunity factors (technology or organisational support) acting as enablers. Crucially, these configurations challenge the traditional AMO hierarchy, suggesting resilience dynamically interacts with all three pillars—a novel contribution to crisis management literature. Conversely, low-performance configurations (S4–S6) expose vulnerabilities when AMO factors and resilience are deficient. S4 and S5 highlight that deficits in rapport, digital skills, or resilience cripple performance, even when other factors are present. Finally, configuration S6, marked by systemic deficiencies across all dimensions, underscores the compounding effects of inadequate ability, motivation and opportunity—a scenario exacerbated during crises like COVID-19 (Pantano *et al.*, 2020).

From a theoretical standpoint, this study extends previous work on the AMO framework in several important ways. By anchoring data collection during the COVID-19 pandemic, the research explicitly examines AMO dynamics under crisis conditions. Using fsQCA uncovers how ability, exemplified by digital competence and motivation, represented by resilience, interact to sustain performance when traditional opportunity factors, such as in-store technologies, are disrupted. This approach is in line with Smith and Lee's (2022) call for crisis-responsive frameworks, offering empirical evidence of AMO's adaptability in turbulent retail environments. Furthermore, by integrating resilience as a motivational component, the study broadens the theoretical boundaries of the AMO framework. The configuration where high motivation and resilience compensate for low digital competence highlights resilience's dual role as both a compensatory mechanism and a stabiliser. This finding reinforces the perspective on resilience as a resource caravan that sustains motivation amid resource depletion. The methodological approach of adopting fsQCA allows the identification of multiple recipes for both high and low performance. This method acknowledges the principles of equifinality—where multiple pathways can lead to the same outcome—and asymmetry, where different conditions may lead to performance declines. Such insights support the practical utility of fsQCA for deriving actionable strategies, as advocated by Pappas & Woodside (2021). Overall, the study challenges traditional hierarchies within the AMO framework by demonstrating that resilience interacts dynamically with ability, motivation and opportunity. This dynamic interaction is particularly critical during crises, offering a more comprehensive and flexible understanding of performance drivers in retail contexts.

Limitations and future research

This investigation has several limitations. First, we did not consider differences across retail industries (*e.g.*, electronics, automotive, fashion). Future investigations can focus on analysing the differences between retail categories. This will help practitioners better understand the critical issues related to their employees' performance in light of the industry where they operate. Second, this study does not claim to have exhausted all possible factors influencing employee performance; identifying factors other than those studied in this

investigation is crucial. In addition, the sample included participants from a single country and mono-brand stores; a more diverse sample could provide additional insights. Finally, we used self-report questionnaires, which may introduce some bias.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Bring it back: factors influencing participation in retailer take-back programs

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Abstract. The growing amount of fashion textiles discarded in landfills each year has become a pressing issue for both practitioners and researchers. In response, some fashion retailers are developing closed-loop supply chain strategies, such as take-back programs. However, the success of these strategies depends on consumer participation, which remains low. Retailing literature has increasingly explored this issue, yet further research is needed to understand how to enhance consumer participation in take-back programs. Accordingly, this study employs experimental designs to explore the impact of disclosing different take-back product destination strategies (resale, recycling or donation) on consumers' intentions to participate. Consumers' perceived effort in participating is examined as a mediator, while channel convenience (digital vs. physical) is analyzed as a moderator. This research contributes to the understanding of retailer closed-loop supply chain strategies and offers practical guidance for designing effective circular initiatives

Keywords : take-back; closed-loop supply chain; perceived effort; channel convenience

Introduction

The growing number of textiles ending up in landfills every year calls for urgent action from institutions, companies and consumers to find solutions to reduce pollution and emissions associated with discarded clothing. On average, individuals in Europe dispose of roughly 12 kilograms of textiles per year, contributing to a staggering 5.8 million tonnes of waste. While some of this waste is shipped outside the EU, the majority—approximately 87%—is either incinerated or sent to landfills (European Commission, 2023). The EU has prioritized reducing textile waste, extending product lifespans and increasing textile recycling to establish a circular economy by 2050. Moreover, the EU encourages companies to develop circular business models, specifically in the fashion industry, designing more easily reused and recycled products and fostering sustainable consumer habits (European Parliament, 2024). In response, a growing number of fashion retailers are integrating circular economy practices (Bhattacharya *et al.*, 2024), including closed-loop supply chain strategies (Denizel & Schumm, 2023) and product recovery initiatives (Geissdoerfer *et al.*, 2020), such as garment recycling and reuse. Among the others, take-back programs refer to this set of retailers' initiatives to minimize landfill waste and raw material extraction. Take-back programs encourage consumers to return used clothing for repurposing (McKinsey, 2022). However, the success of these programs largely depends

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on consumer participation, as their willingness to return used garments is essential for efficient product recovery initiatives. Despite advancements in circular economy practices and product recovery initiatives, the rate at which consumers return textiles remains low. Less than half of discarded garments are collected for reuse or recycling and only 1% are successfully recycled into new textiles (European Commission, 2023). Low return rates reduce collection volumes, leading to inefficiencies and higher costs in reverse logistics for closed-loop supply chains (Agrawal *et al.*, 2019). Consequently, limited consumer engagement challenges the effectiveness of take-back programs.

To encourage greater participation, retailers can leverage multiple strategies simultaneously (Simpson *et al.*, 2019), such as improving communication about take-back programs and offering financial incentives (McKie *et al.*, 2023). Despite recent advancements in the retail and supply chain literature to foster consumer participation, it remains uncertain how to design these initiatives adopting a consumer-centric approach. Particularly, there is still debate whether specifying the intended use of returned garments (i.e., the destination of the products)—such as resale, donation, or recycling—affects consumer willingness to participate in take-back programs. Similarly, literature on the role of channel convenience (e.g., in-store drop-offs versus return-by-mail options) in fostering consumer engagement in take-back programs remains limited (Esenduran *et al.*, 2020).

This study aims to address these gaps by focusing on the design of retailers' closed-loop supply chain strategies to activate consumers' participation in take-back programs (McKie *et al.*, 2023). Accordingly, this paper wants to address the following research question: How can retailers increase consumer engagement in take-back programs? As the paper adopts a consumer-centric approach (Esper *et al.*, 2020) for the effective design of closed-loop supply chain strategies (i.e., take-back program initiatives for product recovery), we tackle our research question by drawing on Stimulus-Organism-Response (S-O-R; Mehrabian & Russell, 1974; Jacoby, 2002) to develop our conceptual model. This theory states that the stimulus (S) is related to environmental elements present in the retail context, such as communication; the organism (O), such as the consumer, receives the stimulus, causing internal reactions such as cognitive or affective responses; finally, the response (R) refers to the behavioral reaction of the consumer to the stimulus (Pereira *et al.*, 2023). Several retail studies have used this theory to explain how retail elements impact on consumers (e.g., Barros *et al.*, 2019; Shankar *et al.*, 2021; Pereira *et al.*, 2023). Recently, a growing body of supply chain and logistics studies have used this framework to explain how supply chain and logistics elements impact B2B customers and final consumers (e.g., Qiao *et al.*, 2024; Ngah *et al.*, 2023).

In our context, we consider the information disclosure regarding the destination of the product returned through take-back as the stimulus. The response is the behavioral intention to participate in the take-back program. The consumer's perceived effort in participating in the take-back program is the organism (i.e., the internal reaction). Varying disclosure on take-back product destination strategies has different effects on consumer responses, particularly in shaping their intention to participate in the program. Specifically, when comparing generic purpose information with no information disclosure, consumers are more likely to participate in the program (McKie *et al.*, 2023).

Closed-loop supply chain strategies are strongly intertwined with sustainability challenges (Pesce *et al.*, 2024). When adopting the triple-bottom-line perspective to sustainability, we can consider the different dimensions involved and impacted by the take-back product destination strategies. Specifically, product recycling destinations can be related to the environmental sustainability dimension, donations can be linked to the social dimension and resale can be associated with the economic dimension.

According to the sustainability dimensions evoked by take-back product destination strategies, we can anticipate different effects. Recycling and donations should incentivize consumer participation in the take-

back program as they benefit the environment and society respectively. In contrast, resale may reduce consumers' intention to participate in the take-back program, as it highlights the retailer's economic benefit from reselling the products. Building on this reasoning, we assume the following:

H1. *Consumers' intention to participate in the take-back program will be higher when the information disclosed about the product destination is recycling and donation rather than resale.*

The S-O-R framework is particularly useful for explaining the psychological mechanism (i.e., organism or internal reaction) that drives such hypothesized consumer response. Participating in take-back programs embeds an effort for consumers, as they are required to make the first move by collecting their garments and bringing them to the retailer. Their intention to participate in the program depends on whether their perceived effort (i.e., cost) is overcome by perceived benefits. When consumers believe their effort benefits others (such as other consumers in the case of donations and the environment in the case of recycling), they are more likely to participate. However, in the case of resale, consumers may perceive the retailer as the primary beneficiary of the initiative, viewing it as a retailer's opportunistic behavior (McKie et al., 2023). This perception would increase their sense of effort, as they see their actions of bringing back clothes serving only the retailer's economic gain. In this study, we consider consumers' emotional effort (Cook et al. 2022), which refers to the effort associated with meeting the emotional requirements of the job (Quiñones-García et al., 2013, p. 363). In other words, it refers to the management and expression of emotions (Cook et al. 2022, p. 299) and it is usually framed as negatively valenced – in terms of anger, frustration, anxiety and nervousness emotions. In our context, drawing on the S-O-R framework, we propose that the positive effect of recycling or donating on consumers' intentions to participate is driven by a lower perceived effort in returning clothes. This can be seen as an organism response that anticipates a positive behavioral reaction. The reduced negative emotions associated with the emotional effort are triggered by the belief that either other consumers or the environment will benefit from their actions, which ultimately encourages greater participation in the take-back program. Thus, we expect the following:

H2. *The consumer's perceived effort mediates the relationship between the destination of the products returned through the take-back program and the consumer's intention to participate in the take-back program.*

As resale implies the reuse and life extension of a product, such a recovery strategy can be more beneficial than recycling from an environmental perspective because of the assumed avoidance of production of new products (Sandin & Peters, 2018). It might be important to foster this strategy by finding factors that help mitigate the negative effects of this product recovery strategy. The S-O-R framework is useful for identifying the factors that might reduce the negative impact of resale as a reuse recovery strategy on consumer's intention to participate in the program. Accordingly, channel convenience may represent another stimulus affecting the relationship. Channel convenience, from a shopping experience perspective, refers to consumers' perception of how much time and effort they can avoid during the shopping process (Xu & Jackson, 2019). In our context, it relates to the convenience of returning used garments due to greater time savings and the possibility of planning these returns 24/7 (Goraya et al., 2022). Take-back programs typically require consumers to bring products back to the retailer's store, which involves effort on their part. While this effort is reduced when the program benefits other consumers or the environment. It still remains a factor. Retailers, on their part, to enhance consumer engagement in take-back programs can offer more convenient solutions to the consumer by, for example, introducing a digital channel for returning clothing, such as the possibility to mail the clothes to the retailer's service center. Thus, channel convenience, combined with the purpose of the take-back program, works as a stimulus. The presence of a digital channel for returns mitigates consumers' perceived effort (organism), increasing the intention to participate in the take-back program (response). Based on this reasoning, we expect the following:

H3. *Channel convenience moderates the relationship between the destination of the products returned through the take-back program and the perceived effort. Specifically, the presence of a digital channel for returns will reduce the perceived effort.*

Methodology

We test our hypotheses across three experimental designs. In the first experiment, we test the direct effect of the take-back product destination strategy (resale vs. recycling vs. donations) on the consumer intention to participate in take-back programs (H1). In the second experiment, we test the mediating role of the consumer-perceived effort (H2). In the third experiment, we test the moderating role of channel convenience on the relationship between the destination of the products returned through the take-back program and the perceived effort (H3). We have already conducted the first two experiments and plan to conduct the third experiment in the upcoming months before the conference.

Study 1

We developed our experiment on Qualtrics and we recruited our participants on Prolific Academic (ProA). After an introductory section, like McKie *et al.* (2023), we asked participants to imagine realizing they had some clothes they no longer wore. In this context, they had to imagine discovering on a familiar retailer's website that it offered a take-back program. Then, participants were shown a mock-up webpage of the fashion retailer disclosing the take-back product destination strategy (similar to McKie *et al.*, 2023). Depending on the experimental condition, the take-back product destination strategy was framed as follows: Instead of throwing your used clothes away, leave them with us! Our take-back program collects unwanted garments that will be resold [resale product destination strategy condition] / recycled [recycling product destination strategy condition] / donated [donation product destination strategy condition]. The scenarios and the questionnaire were pre-tested on a sample of 50 participants to check for any inconsistency across the manipulations and potential questions. Regardless of the product destination strategy condition used, participants were asked to rate their intention to participate in the take-back program (adapted from Chiu *et al.*, 2012) as the dependent variable. Relevant shopping factors like the previous participation in the take-back program were collected. Finally, questions regarding social desirability (Fisher & Fick, 1993), the realism of the shopping scenario (Dabholkar, 1994) and the credibility of the retailer communication (Nichols *et al.*, 2023) were also collected, as well as socio-demographic variables (i.e., age, gender, education, income). The data collection was performed in November 2024.

Study 2

As for Study 1, we developed our experiment on Qualtrics and then recruited our participants on ProA. To test the mediating effect of the consumer's perceived effort in participating in the take-back program, the experiment followed the same structure and scenarios outlined in Study 1. Questions regarding the consumer's perceived effort were also collected (adapted from Cook *et al.*, 2022). We collected the same variables as in Study 1. Data collection was performed in January 2025.

Study 3

Data for Study 3 will be collected in the upcoming months. Accordingly, we will develop a 2 (take-back product destination strategy: recycling vs. resale) X 2 (channel convenience: digital channel vs. physical channel) between-subject experimental design. Participants in Study 3 will be recruited on ProA and invited to participate in a survey following the same structure outlined in Study 1 and Study 2. Study 3 seeks to extend findings from Study 1 and Study 2 by testing the boundary condition of the channel convenience for product returns in take-back programs (digital vs physical). The channel convenience will be displayed as the following: Drop your used clothes off at our retail store most convenient for you [physical channel condition] / Mail your used clothes to our service centers [digital channel condition].

Results

This section presents the results of Study 1 and Study 2. Study 3 is still in progress.

Study 1

We conducted Study 1 to test the direct effect of the take-back product destination strategy (recycling vs. resale vs. donations) on the consumer intention to participate in the take-back program. The intention to participate in the take-back program is greater when the recycling destination is disclosed compared to other conditions, including resale and donations. We conducted a pre-test to avoid any inconsistencies in manipulations or questions. The pre-test involved 50 participants (80% female; $M_{age} = 37.3$) who participated in a single factor (take-back product destination strategy: resale vs recycling vs donations) between-subjects experimental design. Participants were recruited from the ProA crowdsourcing platform in exchange for a small reward. We filtered participants for their country (UK) and approval rate (higher than 90%). No inconsistencies were found in this pre-launch; thus, we collected data for Study 1.

For Study 1, we collected 215 responses (59% female; $M_{age} = 41.4$) from the ProA crowdsourcing platform in exchange for a small reward to participants. Participants were filtered according to their Country (UK), approval rate (higher than 90%) and participation in the pre-test. The G*Power 3.1 software (Faul *et al.*, 2009) was used to identify the optimal sample size. Participants who failed attention checks or screening questions were discarded. The direct effect of the destination of the product returned through the take-back program on the intention to participate in the initiative (H1) was tested using a one-way ANOVA. Results confirm that there is an effect of the take-back product destination strategy on the intention to participate in the take-back ($F = 5.18; p < 0.05$). Post-hoc tests using LSD test confirm that the recycling and donations conditions perform better in terms of consumer intention to participate compared to the resale condition. Particularly, consumer intention to participate in the take-back program in the recycling condition ($M_{rec} = 5.36; p < 0.05$) is significantly greater compared to the resale condition ($M_{res} = 4.52$). Similarly, the donation condition ($M_{don} = 5.05; p < 0.05$) is significantly greater than the resale condition. Thus, H1 is confirmed.

Study 2

Mediation analysis via the PROCESS macro (Model 4; 5000 bootstrapped samples), developed by Hayes (2017), tested the indirect effect of the take-back product destination strategy (recycling vs. resale vs. donations) on consumer intention to participate in the take-back program via perceived effort. For Study 2, we collected 221 responses (60% female; $M_{age} = 41.4$) from the ProA crowdsourcing platform in exchange for a small reward to participants. We used the same filters as for Study 1. The take-back product destination strategy was the multi-categorical independent variable and perceived effort was the mediator. The resale condition was coded as 0, the recycling condition was coded as 1 and the donation condition was coded as 2, in support of this mediation process model ($R^2 = 0.02$, $MSE = 1.05$, $F(2,218) = 2.11$, $p < .05$, $\beta = 2.08$, $SE = 0.12$, $CI\ 95\% [1.84, 2.31]$), the results reveal a significant and negative effect of the take-back product destination strategy in the recycling condition on perceived effort (mediator; $\beta = -0.35$, $SE = 0.17$, $t(221) = -2.04$, $p < .05$, $CI\ 95\% [-0.68, -0.012]$), which in turn has a significant negative effect on consumers' intention to participate to take-back ($\beta = -0.65$, $SE = 0.099$, $t(221) = -6.58$, $p < .01$, $CI\ 95\% [-.85, -.46]$). The direct effect of the recycling product destination strategy of the take-back on the dependent variable is significant when the mediator is not considered ($\beta = 0.658$, $SE = 0.27$, $t(221) = 2.43$, $p < .05$, $CI\ 95\% [.12, 1.19]$). It is no more significant when the mediator is considered ($\beta = .432$, $SE = 0.25$, $t(221) = 1.73$, $p = .09$, $CI\ 95\% [-0.06, .925]$). Thus, H2 is confirmed.

Conclusions and discussion

The paper extends the retail and supply chain management literature on closed-loop supply chain strategies, providing evidence on specific levers that may foster the effectiveness of take-back product destination

strategies (e.g., McKie *et al.*, 2023). As these practices rely on the participation of consumers, this study explains the effect of the take-back product destination strategy on the consumer's intention to participate in it, it also tests the psychological mechanism that leads to such a relationship and the role of channel convenience as a potential driver mitigating the negative effect of resale as a useful product destination strategy both for the economic and environmental sustainability of closed-loop supply chain initiatives.

From a managerial perspective, this research provides actionable insights for retailers seeking to design and implement effective take-back programs. Preliminary findings and expected results aim to guide retailers in designing their closed-loop supply chain strategies and identifying the most effective take-back channels to offer. We suggest retailers adopt take-back programs whose product destination strategy includes recycling and donations, if resale is part of the retailer's objectives both for economic and environmental sustainability, we suggest increasing channel convenience, introducing a digital channel for returns to participate in the take-back will reduce the perceived effort of the consumers associated with resale, boosting consumer engagement in the take-back program. These practical insights will empower retailers to foster greater consumer engagement in their closed-loop supply chain operations.

This study has some limitations that allow for insightful future research directions. First, the study considers only consumers' intentions (i.e., intention to participate in take-back programs) measured through self-reported scales. To overcome the potential intention-behavior gap (Viglia *et al.*, 2024), we suggest that future research considers real behaviors, conducting field studies that extend the external validity of this study. Second, this study does not consider the role of incentives in fostering consumer participation in take-back. However, monetary and non-monetary incentives represent important elements affecting the relationships under investigation (McKie *et al.*, 2023). Particularly, future research should consider how different types of non-monetary incentives boost consumer engagement in take-back programs. Third, this study does not consider the role of communication framing in determining consumer intentions to participate in take-back. Adopting different communication strategies related to the disclosure of the environmental impact of each scope of the take-back may affect the consumer's willingness to participate in the take-back.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Member perceptions of chatbot integration in online brand communities

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Abstract. The proposed research aims to contribute novel insights into technology acceptance within online brand communities, with a specific focus on chatbot integration. By investigating individual member attitudes towards chatbots, this study will provide actionable insights for brands and community managers on effectively introducing chatbots in a manner that aligns with member expectations and enhances the user experience. Additionally, the research will demonstrate the effectiveness of survey-based methods in capturing valuable feedback for digital innovation strategies. This study proposes a conceptual model grounded in Innovation Resistance Theory, examining key barriers to chatbot adoption within online brand communities. The model includes traditional resistance barriers (tradition, usage, image, value), perceived risk, chatbot quality and openness to innovation as antecedents to chatbot adoption. Critically, online brand community engagement is positioned as a moderator of the relationship between these antecedents and chatbot adoption. The findings will guide marketing managers in leveraging chatbots to improve community engagement and support, ultimately enabling more informed decision-making in digital community management.

Keywords : chatbot; online brand community; technology adoption; innovation resistance theory

Introduction

Online branding communities (OBCs) provide valuable insights into consumer perceptions of products and brands, helping businesses strengthen customer relationships. Meanwhile, OBCs are a powerful mechanism for fostering consumer engagement, building brand loyalty and generating reliable marketing intelligence (Meek *et al.*, 2019). As the number and significance of OBCs continue to grow, businesses are increasingly exploring innovative strategies to enhance user engagement and streamline interactions within these communities. One such innovation is the integration of chatbots. A chatbot is a conversational agent that interacts with users using natural language (e.g., text or voice). Since the introduction of ELIZA in 1966 at MIT, the first chatbot system designed to simulate a computer-based therapist (Weizenbaum, 1966), chatbots have been widely adopted across various industries, including customer service, healthcare, human resources, legal services, education and e-commerce, among many other fields. Compared to human agents, chatbots offer 24/7 availability, consistent and accurate responses, greater efficiency and cost-effectiveness, in an OBC, these characteristics have the potential to help reduce the response time of the OBC services

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and ensure that community members receive timely support, fostering a more dynamic and engaging environment.

While rule-based chatbots remain mainstream, advances in artificial intelligence, natural language processing and large language models (LLMs) continuously shape chatbot design, making interactions more natural and enhancing user engagement and experience (Nicolescu & Tudorache, 2022). By leveraging AI techniques, chatbots can analyze conversations within OBCs to identify dynamic patterns, like emerging discussions and consuming trends, sentiment shifts and product feedback. Like other application scenarios, designing and adapting chatbots for specific OBCs is potentially challenging, as the diverse needs, preferences and expectations vary significantly across different users. To provide meaningful value to both users and businesses, chatbots designed for a specific community typically require a preliminary study to help tailor the system to the community's unique characteristics, such as communication styles, information needs, interaction patterns and even ethical implications and user privacy. (Al-Shafei, 2025; Gilbert *et al.*, 2023; Huang & Gursoy, 2024).

The integration of chatbots in OBCs is still in its early stages and remains an emerging area of exploration. Furthermore, research on chatbot adoption and its impact within this context is mainly theoretical. Consequently, this study aims to lay the groundwork by designing a foundational investigation into chatbot adoption among OBC members. Specifically, we seek to address the following questions: *How do members of OBCs perceive the introduction of chatbots? What factors influence their acceptance or resistance?* These questions are of paramount importance to marketing professionals as they explore the intersection of technology and community engagement, vital components in modern digital marketing strategies. Understanding member attitudes toward chatbot integration can reveal insights into enhancing customer experience, fostering loyalty and driving the community's long-term value creation and sustainable development. By identifying chatbots' perceived benefits and drawbacks, brands can tailor their strategies to meet member expectations, thereby improving the efficacy of their digital interactions and engagement efforts.

Overview of chatbots in online communities

Recent statistics from leading chatbots indicate that over 987 million people use chatbots today. Meanwhile, the global chatbot market has grown significantly, reaching approximately \$15.57 billion in 2024, up from just \$2.47 billion in 2021 (Cardillo, 2024). Chatbot users range from everyday individuals, such as ChatGPT users, as well as members of specialized online communities seeking targeted support, like customers in brand forums. As chatbots gain popularity, user expectations continue to rise, making their design and adaptation to specific scenarios a complex challenge. In this section, we will summarize the development of chatbot design and its adoption in online communities.

AI and chatbots

After the development of the first chatbot in 1966, a major design evolution occurred in the 1990s with the introduction of Artificial Intelligence Markup Language (AIML), which laid the foundation for rule-based chatbots. A famous implement AIML was A.L.I.C.E. (Artificial Linguistic Internet Computer Entity) in 1995, leveraging the technology for pattern matching and mapping user inputs to pre-programmed responses in its knowledge base (Marietto *et al.*, 2013). A.L.I.C.E. and other rule-based chatbots require manual development of their knowledge base, which remains suited for creating simple and structured assistant systems, such as FAQ chatbots that enhance students' learning experiences (Singh *et al.*, 2019) and banking process chatbots for improving communication efficiency (Shah *et al.*, 2017). However, creating new rules to handle diverse user inputs was time-consuming and limited the chatbot's ability to adapt to new or complex domains.

Since the early 2000s, rule-based chatbots have been enhanced by retrieval-based methods. In 2001, SmarterChild was integrated into Windows Messenger (MSN) as an instant message chatbot. It is an

Information Retrieval-based model, which was designed so that given a dataset of textual information, the algorithm will be capable of retrieving the information needed based on the user's input (Caldarini *et al.*, 2022). SmarterChild attracted 30 million users, who added SmarterChild to their MSN buddy lists to chat, receive stock information, or get updates on sports events, all retrieved on-site from its database rather than being predefined as rules.[†] Retrieval-based chatbots gained popularity with the rise of Web 2.0, harnessing the increasing availability of textual data from social media, forums and chat interactions alongside advancements in artificial intelligence and growing computational power (Bhayana, 2024). While SmarterChild was far less advanced than ChatGPT. Its success caught investors' attention, which paved the way for the development of virtual assistant chatbots like Apple Siri, Amazon Alexa, Google Assistant. IBM Watson and others.

Today, the significant development of deep learning and natural language processing is continuously driving the design of chatbots to be more humanlike and user-friendly. In addition, advancements in reinforcement learning and large language model (LLM) architecture are making chatbot design more context-aware and emotionally responsive. Sentiment analysis techniques enhance user engagement by tailoring responses to emotional cues, while personalized dialogue systems adapt to individual user preferences. These innovations are transforming chatbots into more empathetic and reliable digital companions. For example, the Convolutional Neural Network model is used to classify emotional-support and informational-support inquiry categories for online healthcare communities (Wang *et al.*, 2021); a multi-agent mechanism is adopted to enhance the smoothness of conversations in household, work and healthcare communities (Jiang *et al.*, 2023). Furthermore, LLMs are adapted to develop medical chatbots and virtual assistants that prioritize clinical accuracy (Liu *et al.*, 2024).

Adoption of chatbots in online communities

While chatbots have been integrated into various online communities, determining whether they are a valuable addition to a specific community remains a complex challenge. Human evaluation plays a crucial role in assessing chatbot effectiveness alongside automated evaluation metrics (Caldarini *et al.*, 2022). Brandtzaeg & Følstad (2017) conducted a questionnaire to learn why people use chatbots. Their results indicated that among U.S. chatbot users, the top motivations include productivity, entertainment, social and relational purposes and novelty, with productivity standing out as having striking importance. Seering *et al.* (2019) explored various chatbot designs to evaluate their role as a community member, aiming to answer interesting questions about what chatbots can bring to the community. One key question addressed was, *Does the chatbot contribute meaningfully to the development of the community?* A comparison among various chatbots reflected that chatbots can enhance users' capabilities but do not inherently shape community identity. For meaningful impact, the design of online community chatbots must engage in social interactions that help communities grow by fostering relationships and improving social dynamics.

Beyond functionality and value, the fast evolution of intelligent chatbots also raises ethical and privacy concerns. Studies show that users of human-like chatbots tend to disclose personal information more easily compared to machine-like chatbots because the more anthropomorphic or human-like the chatbots are, the more they reduce users' privacy concerns, making users more comfortable with disclosing information and more likely to follow recommendations given by the chatbot (Ischen *et al.*, 2020). The ethical implications of chatbot utilization in education and healthcare are also hot topics (Garcia Valencia *et al.*, 2023; Kooli, 2023). For example, LLM-powered chatbots used in patient care are regulated as medical devices, challenging their approval process (Gilbert *et al.*, 2023).

Theoretical background

[†] <https://en.wikipedia.org/wiki/SmarterChild>

Innovation Resistance Theory (IRT), initially developed by Ram (1987), examines consumer behaviour by focusing on resistance rather than adoption. It postulates that resistance arises when innovations threaten to disrupt consumers' established habits or conflict with their beliefs and perceived satisfaction with the current situation (Alghamdi & Alhasawi, 2024; Chen *et al.*, 2022; Ram & Sheth, 1989). IRT categorizes resistance barriers into functional and psychological aspects. Functional barriers include usage, value and risk barriers, reflecting practical concerns such as complexity or potential losses associated with adopting a new technology (Mani & Chouk, 2018; Talwar *et al.*, 2020). Psychological barriers encompass tradition and image barriers, representing conflicts with existing norms and perceptions of how adopting the innovation might affect personal or social identity (Alghamdi & Alhasawi, 2024; Kaur *et al.*, 2020; Chang & Hsiao, 2024). Recent research utilizing IRT has effectively explored resistance to digital innovations, such as mobile payments (Kaur *et al.*, 2020), electric vehicle adoption (Xue *et al.*, 2024) and customer service chatbots (Chang & Hsiao, 2024). Chang and Hsiao (2024), specifically investigating chatbots, found that both functional and psychological barriers significantly impacted users' negative emotions and resistance behaviours. Given this, IRT is particularly suitable for examining chatbot integration within OBCs. These communities typically have established norms and expectations for interaction that new technologies, such as chatbots, might disrupt, leading to resistance. Thus, applying IRT allows for an in-depth analysis of potential resistance factors specific to OBC settings and provides strategic insights to effectively manage and mitigate these barriers. Hence, the following hypotheses will be applied.

H1: *Traditional barriers will negatively influence chatbot adoption within online brand communities.*

H2: *Usage barriers will negatively influence chatbot adoption within online brand communities.*

H3: *Value barriers will negatively influence chatbot adoption within online brand communities.*

H4: *Image barriers will negatively influence chatbot adoption within online brand communities.*

Research indicates that perceived risk negatively influences chatbot adoption within online brand communities. Higher levels of perceived risk are associated with reduced trust and acceptance of AI technologies, including chatbots (Kasilingam, 2020; Li *et al.*, 2023). Furthermore, the quality of the chatbot, such as usability, responsiveness and trust, has been found to significantly enhance user satisfaction and adoption intentions (Teng *et al.*, 2024). According to Jiao *et al.* (2023), openness to innovation positively influences technology adoption, as individuals with a higher propensity for innovation are more likely to embrace new technologies like chatbots.

H5: *Perceived risk will negatively influence chatbot adoption within online brand communities.*

H6: *Higher perceived chatbot quality will positively influence chatbot adoption within online brand communities.*

H7: *Openness to innovation will positively influence chatbot adoption within online brand communities.*

Engagement within OBCs has been shown to increase trust in brand initiatives and may attenuate the impact of resistance-related constructs (Martínez-López *et al.*, 2021). Therefore, high engagement levels may buffer the negative effects of innovation resistance (e.g., tradition, usage, value, or image barriers) or amplify the positive effects of chatbot quality or openness to innovation (Alghamdi & Alhasawi, 2024). Engaged users may be more willing to try and tolerate new technologies introduced within the community, particularly if they trust the brand and value their community participation (Chang & Hsiao, 2024). Therefore, the following hypotheses will also be tested in this study.

H8: *Engagement will moderate the relationship between traditional barriers and chatbot adoption, so the negative effect of traditional barriers will be weaker for highly engaged members.*

H9: *Engagement will moderate the relationship between usage barriers and chatbot adoption, so the negative effect of usage barriers will be weaker for highly engaged members.*

- H10:** Engagement will moderate the relationship between value barriers and chatbot adoption, such that the negative effect of value barriers is weaker for highly engaged members.
- H11:** Engagement will moderate the relationship between image barriers and chatbot adoption, such that the negative effect of image barriers is weaker for highly engaged members.
- H12:** Engagement will moderate the relationship between perceived risk and chatbot adoption, such that the negative effect of perceived risk is weaker for highly engaged members.
- H13:** Engagement will moderate the relationship between chatbot quality and chatbot adoption, such that the positive effect of chatbot quality is stronger for highly engaged members.
- H14:** Engagement will moderate the relationship between openness to innovation and chatbot adoption, such that the positive effect of openness to innovation is stronger for highly engaged members.

Methodology

This study adopts a survey-based research design to examine attitudes towards chatbot integration within OBCs. Innovation Resistance Theory informs the conceptual model, which incorporates both direct and moderating effects. Specifically, OBC engagement is tested as a moderator of the relationship between key resistance constructs and chatbot adoption. The survey instrument is developed through a comprehensive review of literature on OBCs, chatbot technologies, user resistance to innovation and community engagement. It includes validated and adapted multi-item measures for perceived risk, chatbot quality, innovation openness and barriers to adoption (tradition, usage, image and value). OBC engagement is assessed using items capturing emotional, cognitive and behavioural dimensions of brand community involvement. All items are measured using a five-point Likert scale.

A professional survey panel provider will administer the instrument to a targeted sample of 400 OBC members. Efforts will be made to ensure demographic diversity across age, gender and experience with the brand community to enhance the external validity of the findings. Quantitative data analysis will be conducted using IBM SPSS Statistics. Initial analyses will involve data screening, descriptive statistics, reliability testing (Cronbach's alpha) and exploratory factor analysis to examine the dimensionality of the constructs.

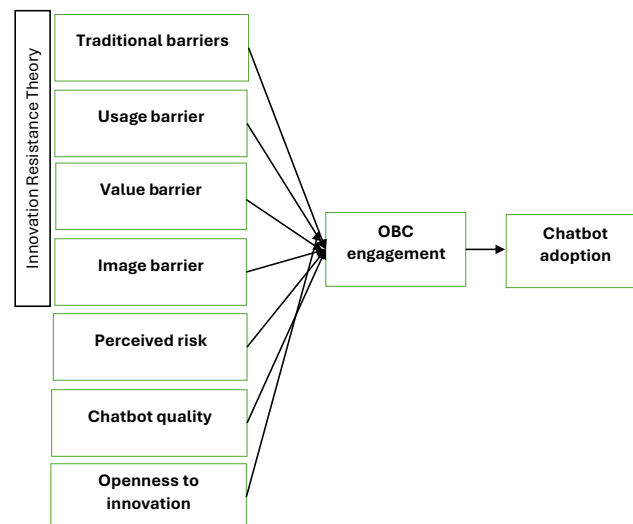


FIGURE 1 – Conceptual model

Following this, structural equation modelling (SEM) will be performed using IBM AMOS to assess the measurement model and test the hypothesised relationships among constructs. Model fit indices (e.g., CFI, RMSEA, TLI, χ^2/df) will be used to evaluate the adequacy of the proposed model. Moderation effects will

be examined through multi-group SEM, comparing path strengths across low and high levels of OBC engagement.

Conclusion

Future findings from this study are expected to provide valuable insights into the factors influencing chatbot adoption within online brand communities, offering practical recommendations for enhancing user engagement and optimizing digital community management strategies.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Destigmatising sex: how sexfluencers deconstruct sex positivity through digital advocacy on Instagram

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Abstract. This research investigates the role of "sexfluencers" - social media influencers committed to normalizing and destigmatising discussions surrounding sex and sexual health - in deconstructing societal taboos through digital advocacy. As cultural attitudes towards sexual expression evolve, shaped by historical contexts and societal norms (Foucault, 1990; Alderson, 2016), social media has emerged as a crucial platform for disseminating information and influencing perceptions regarding sexual wellbeing. This study critically examines how sexfluencers contribute to the discourse of sex positivity by promoting open communication, challenging stereotypes and advocating for body acceptance. Employing a thematic analysis framework (Braun & Clarke, 2006), we initially identified 30 sexfluencers, ultimately refining our focus to four diverse individuals representing a spectrum of identities and perspectives: a female doctor of Asian descent, a middle-aged lifestyle coach, an LGBTQ+ community member and a heterosexual male advocate. Data collection utilized the paid version of exportcomments.com, yielding a dataset of 3,158 text-based posts from Instagram, which was subsequently refined to 1,238 relevant items for analysis. The thematic analysis revealed ten core themes that encapsulate the sexfluencers' advocacy efforts: Open Communication and Authenticity, Body Positivity and Self-Acceptance, Challenging Stereotypes and Breaking Norms, Sexual Health and Wellbeing, Empowerment and Individuality, Sex Positivity and Pleasure, Consent and Boundaries, Diverse Relationship Styles, Advocacy and Awareness and Challenging Societal Constructs. Our findings indicate that sexfluencers play a pivotal role in reshaping the dialogue surrounding sexual health, ultimately fostering a more inclusive understanding of sexuality within contemporary society. This research contributes to the discourse on digital activism in the realm of sexual health and underscores the significance of social media in advocating for sex positivity and dismantling entrenched stereotypes.

Introduction

Sex positivity has emerged as a significant cultural and academic discourse, advocating for open, informed and non-judgemental discussions around sexuality, pleasure and bodily autonomy (Stardust *et al.*, 2022). Originating as a counter-narrative to sex-negative ideologies that frame sexuality as dangerous, deviant or morally suspect (Harden, 2014), the sex-positive movement has expanded to challenge heteronormative, cisnormative and patriarchal structures that regulate sexual expression (Belous & Schulz, 2022). Historically,

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sex education and public discourse on sexuality have been shaped by medical, religious and legal frameworks that reinforce shame and control (Mosher, 2017). However, the digital age has ushered in new spaces for sex-positive advocacy, particularly through social media platforms (Stardust *et al.*, 2022). Sexfluencers have redefined the landscape of sexual discourse by using digital media to destigmatise conversations about sex, pleasure and body image (White *et al.*, 2023). Digital platforms have facilitated alternative, community-driven approaches, enabling sexfluencers to bridge the gap between formal sex education and experiential knowledge (Stardust *et al.*, 2022). Despite their growing influence, academic literature on sexfluencers remains limited, this study will add to the literature by exploring sexfluencers discussions around sexual themes to understand the recurring topics being discussed on these platforms.

Literature review

Social media has created a space where people have access to more information and possibilities to understand different context and perspectives than ever before (Floreddu & Cabiddu 2016). The evolution of social media technology has however decreased user choice through technology innovations and data analytics (Pritchard & Button, 2024; Meston & Williams, 2023; Salty, 2020; El-Wardany, 2020). This poses challenges to widening narratives around sensitive topics such as sex. Sexfluencers have risen as a response to this (White *et al.*, 2023). While these accounts cover a range of topics there are a number of themes that can be considered in relation to sexfluencer content: destigmatisation, body positivity and sexual health.

Destigmatisation

Sexfluencers can act as a friend to their followers so that they can have meaningful dialogues and seek clarifications by interacting with them. More broadly, open dialogues supported by a non-judgemental environment can also furnish better sexual health outcomes (WHO, 2017; Aparicio *et al.*, 2018). A lesser-researched aspect of this sex-positive cultural shift is the role of sexfluencers who advocate for transparent communication about sexuality and authenticity by harnessing the power of social media platforms (Hudders & Lou, 2023). Such open dialogues about sexuality not only reduce stigma but also empower individuals allowing them to make better-informed decisions about their sex life and relationships.

Body positivity

The body positive narrative on Instagram takes various forms ranging from thinspiration (Boepple & Thompson, 2016), fitspiration (Jong & Drummond, 2016) and body positivity (Hynnä & Kyrölä, 2019). Lazuka *et al.* (2020) found that Instagram content pertaining to body positivity narratives was evolving to include more diversity and appreciation of a wider range of norms. Instagram is developing a more diverse narrative in which the binary narrative of fat or thin is being disrupted to encourage acceptance, with individuals encouraged to love the skin they are in (Hynnä & Kyrölä, 2019). Body positivity as a theory is defined as: ‘the rejection of unattainable, narrowly-defined beauty ideals and encourages individuals to challenge current societal messages regarding beauty and to accept more diverse body sizes and appearances as attractive (Lazuka *et al.* 2020)’. Thus, body positivity is the notion that individuals be encouraged to accept all body types and for no body type to be positioned as inferior to another

Sexual health

Sexual health is a key part of the discussion around sex on the internet and social media. Social media is being used to facilitate discussions around safe sex (Bull *et al.*, 2012) with posts imparting sexual health education receiving significant engagement (Engel *et al.*, 2023; Xu *et al.*, 2023). Social media is thought to be a primary source of information for young adults when looking for sexual health content (Xu *et al.*, 2022) leading to safer sexual behaviour adoption (Stevens *et al.*, 2017). It has been argued that sexual health content can improve sexual health literacy (Manduley *et al.*, 2018). The speed at which information can be assessed and relative ease in which it is available makes social media key source for sexual health information (Flanders *et al.*, 2017). Sex and sexual content have cultural, social and political value and it expands our

literacy on health (Stardust *et al.*, 2022). There are concerns, however, that sexual health conversations online often present a sex-negative approach (Knerer & Philpott, 2011). Sexfluencers are therefore becoming an important part of this narrative as they aim to promote positive experiences and responses to sexual health conversations.

Methodology

The method took an exploratory approach embed in interpretivist philosophy using latent level analysis (where the focus is on uncovering meaning behind what the subjects are expressing) to identify codes and subsequently themes based on the data (Braun & Clarke, 2006). An inductive approach for the identification of relevant codes was employed with themes emerging from the data (Patton, 1990). Initial screening collated a pool of 30 sexfluencers, which led to the selection of 4 sexfluencers. The final sample consisted of: 1) a female doctor of Asian descent focusing on sexual health content, 2) a middle-aged female lifestyle coach and author promoting open communication about sexuality, 3) an active LGBTQ+ community member specialising in intimate relationships and 4) a heterosexual male advocating love and connections. An online tool (Exportcomments.com) was used to capture social media content. The initial data set comprised a 3158 data items. A further refinement process reduced the data set to 1,238 items by eliminating all video-only content as this was outside of the software capabilities. A thematic analysis (Braun & Clarke, 2006) was conducted. The first coder and the second coder met with each other multiple times to agree on the coding process, fostering a consistent methodology. Both coders worked independently in the initial stage resulting in the identification of 187 codes. Through discussion these were condense to 3 themes: destigmatisation, body positivity and sexual health.

Findings and discussion

Sex has historically been a topic that was held as taboo in the public space with many negative connotations being attached to the word and the act throughout history (Piha *et al.*, 2018). Open discussions around the concept of sex positivity have increased (Ivanski & Taylor; 2017; Klein, 2021; Belous & Schulz, 2022) and an abundance of media content has emerged highlighting the potential benefits of sex-positive approaches (Dailey, 1997; Williams *et al.*, 2013).

Destigmatising sex

The first theme that emerged from the data was destigmatising sex. Destigmatising sex related conversations and willingness to ask questions about sex to your friends and family can lead to enhanced sexual and relational satisfaction (Mark & Jozkowski, 2013). The sexfluencers described sex conversations in positive terms, using their platforms to advocate for more open communication around sexual themes. This is exemplified by posts such as being open is crucial for breaking sexual (P1) and discussing sex and sexuality allows us to break free from societal norms (P3). This destigmatisation was also linked by the sexfluencers to healthier more fulfilling relationships with posts such as normalising sexual health-related discussion is essential for creating a safe and supportive environment (P4) and sharing desires, boundaries and concerns openly with our partners leads to a deeper understanding and a more fulfilling intimacy (P2). The sexfluencers were therefore using their platforms to develop conversations around destigmatisation of sex, encouraging followers to engage in more meaningful conversations with partners around sex and sexual desires. These sexfluencer-led conversations expand extant academic research advocating the merits of open sex-positive communication (Ivanski & Kohut, 2017; Mosher, 2017; Mercer, 2018; Belous & Schulz, 2022; Stardust, 2022; White *et al.*, 2023). Communication about sex, especially when it transcends the boundaries of traditional romantic relationships. Is also an element of being sex positive (Mark & Jozkowski, 2013). As sexfluencers push for a world where open communication about sexuality is normative, they challenge dated stigmas and encourage authenticity (Glickman, 2000) showcasing the vital role they can play in reshaping societal views on sexuality.

Body positivity

Body positivity has emerged as a concern for individuals and researchers since the mass adoption of social media (Griffiths *et al.*, 2018). Social media creates a space where people are exposed to higher volumes and diversity of visual content than ever before (Holland & Tiggemann, 2016). Instagram content is particularly relevant to the body positivity discussion as it is a highly visual medium which relies on images and videos for content creation (Casalo *et al.*, 2021). The findings suggest that within the context of sexfluencers the body positivity narrative focuses predominantly on empowerment. This took many forms when looking at the data with examples ranging from intimate whitening (P1), to douching (P2), or manscaping (P3). There were a high number of posts from all sexfluencers that aimed to engage their audience by educating or encouraging discussion of body positive themes however these varied between content creators. P1 followed the most stereotypical body positive narrative with posts such as 'every body is a bikini body' or 'my tummy don't jiggle jiggle, it folds'. She was also the only account to include fashion content with a number of posts included that promoted plus size fashion.

Sexfluencers challenged mainstream cisnormative beauty standards, promoting body positivity and arguing that body size and shape, disabilities, chronic illnesses and body scars do not impact pleasure or intimacy. The visibility created by sexfluencers pushes back against the objectification of marginalised bodies deemed abnormal. This would appear to expand the definition of body positivity when applying it to the context of sexfluencers. While fashion or fitness influencers tend to focus on constructing a largely weight-based narrative with relation to body positivity (Davies *et al.*, 2020), the sexfluencer approach to body positivity was broader focusing on building self-confidence in a way that could promote more positive sexual experiences. Through digital advocacy therefore sexfluencers are widening the definition of body positivity in the sexual advocacy space to move beyond the binary assumptions of fat or thin to expand into other areas of body positivity that are uniquely linked to sexual experiences and have under previous social norms been considered taboo subjects that should not be talked about in open forum.

Sexual health

Sexual health emerged as the final theme for consideration when reviewing the social media data. There has been an increase in social media being used to facilitate discussions around safe sex (Bull *et al.*, 2012) and to support sexual education (Engel *et al.*, 2023). The sexfluencers narrative around sexual health ranged from medical checkups, menstrual education, consent and erectile dysfunction. The findings suggest that the focus of each account when considering sexual health was slightly different depending on context. There were examples which explained how menstrual cups work (P1) or how to interpret medical results (P4), while other examples posed questions around penetration (P2) and erectile dysfunction (P3). These differences in the responses could possibly be explained by gender or profession but what it does show is that there is a range of topics that can be considered under the theme of sexual health. The sexfluencers were presenting a positive response to sexual health again working to break boundaries and provide educational support to those following their accounts. Sexual health content was designed to improve sexual literacy (Manduley *et al.*, 2018) and is a promising tool for sexual health promotion (Burns *et al.*, 2021).

Conclusions

Through their content, sexfluencers provide accessible, culturally relevant and socially engaging discussions on sexuality, often addressing taboos and knowledge gaps that mainstream institutions neglect. Considering the diverse cultural values related to modesty and communication, a one-size-fits-all approach to discussing sexuality might not always be appropriate. Sex positivity should be viewed as a flexible framework, rather than a rigid directive (Klein, 2021). Sexfluencers play a pivotal role here as they adopt different approaches in informing, educating and motivating their follower niches. Sex positivity encourages honest discussions about taboo sexual topics and promotes a non-judgmental mindset, preventing stigma. Sexfluencers' content

cover just about every topic including sexuality, body positivity, dating, sexual health, kinks, self-love and fetishes (Patel, 2023). Prior to the present study, there has been only limited research on how information sources, such as sexfluencers, contribute to promoting sex-positivity by encouraging open-minded perspectives and discussions about various sexual behaviours, preferences and orientations (White *et al.*, 2023).

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Digital signage and price tags: driving or diluting sales?

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Abstract. Digital signage represents one of the latest trends in in-store retailing. As technology evolves rapidly, digital signage is increasingly replacing traditional price-tags, adopting the form of display rails on shelves. Although digital signage holds the potential to enhance shopping entertainment through more colorful and dynamic information presentation. It also carries the risk of causing information overload, which could potentially dilute sales.

Keywords : digital signage; price; discounts; scanner data; information overload

Introduction

Today's retail environment faces a hardened challenge to attract consumers. Consumers grapple with recurring socio-economic crises, inflation, job insecurity and a generally perceived risk of spending their income on consumables, as planning stability seems less predictable in recent times (Dekimpe & van Heerde, 2023; Niros *et al.*, 2023; Stanca *et al.*, 2023). As consumption habits evolve at an accelerated pace, retailers are compelled to address the not-yet-satisfied demand for digitalization to engage consumers effectively. Even though numerous online retailers and delivery companies ceased operations following the end of the COVID-19 pandemic – when consumers returned to in-person shopping for entertainment and personal interaction – the challenge of maintaining profitable omnichannel strategies remains a priority for managers. Therefore, identifying cross-selling strategies across these channels is crucial. One emerging trend in this regard is digital signage. Historically, digital signage (DS), in the form of lit billboards and in-store TV displays, have been mainstays in the evolution of advertising. These are currently enjoying a revival in in-store marketing by digital displays (Bauer *et al.*, 2018; van de Sanden *et al.*, 2020).

In a retail setting, DS is often a networked display at the store level, showing advertisements or special offers to customers in-store or at the point of purchase (Nanni & Ordanini, 2024). Ranging from price-tag-sized displays to wall-sized installations, the advantages of DS are nearly self-evident: Advertisements are dynamic and easily updated via software or button presses. Moreover, DS enables an increase in ad frequency, allowing retailers to charge higher advertising fees or expand the reach of their private labels. By utilizing

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retailer's app with GPS tracking permission or face identification, the content can be personalized, enhancing the targeting strategy and overall shopping experience. DS also aids in better in-store navigation and promotes additional purchases (Battiato *et al.*, 2016; Dennis *et al.*, 2010; Garaus *et al.*, 2017; Garaus & Wagner, 2019; Nakayama *et al.*, 2023). On the store floor, staff can focus more effectively on operational aspects, such as maintaining attractive, clean shelves or providing customer service. The time previously allotted to updating paper ads or price-tags is no longer necessary with DS. Therefore, it's unsurprising that store designers emphasize the integration of DS into shelves and overall store design, innovative store fixtures now incorporate DS as display rails where price-tags formerly resided, transforming the entire shelf into a display. Companies like Panasonic (2025) and (DNR, 2025) have termed these innovations as engage rail and digital shelf edge.

DS further contributes to bridging the gap between the cannibalization of a retailer's online and offline channels by adding digital elements such as dynamic ads, augmented brand displays and in-store advice and interaction (Moravcikova & Kliestikova, 2017; Nakayama *et al.*, 2023; Sinem, 2024). However, DS isn't without its drawbacks: just as in the online environment, motion ads can become annoying or even lead to information overload, negatively impacting information acquisition and inherent reducing sales stimulation (Jacoby, 1984; Ketron *et al.*, 2016; Li, 2017). These issues could potentially apply to in-store DS as well, revealing a less desirable facet of this new shopping technology.

Given this context, the authors pose the question: Does digital signage on shelves accelerate or dilute sales? To answer this question, the authors utilize scanner data from convenience stores located within a German gas station chain and conduct additionally a questionnaire-based study. The remaining body of this extended abstract is structured as follows: We begin with a short theory overview before presenting the methodology. Subsequently, we discuss the results of the first study. The second and third studies will be presented at the conference. The paper concludes with our current stage of findings from the first study.

Digital signage and information overload

The effects of Digital Signage (DS) can be studied from several business research perspectives (Battiato *et al.*, 2016; Bauer *et al.*, 2018; Garaus *et al.*, 2017, 2021; Garaus & Wagner, 2019; van de Sanden *et al.*, 2020): A technology-oriented approach might apply the UTAUT theory, contrasting ease of use with apprehension about familiarity with technology. From a pure advertising research perspective, DS can be examined in terms of the content and design of the information displayed. From an experiential retailing standpoint, DS can be assessed by measuring engagement or the use of augmented reality at the point of sale. It is arguable that research on LCD digital price tags could be relevant (Ock *et al.*, 2019), but DS on shelves offer more complexity and enable a greater diversity of displayed information, including variations in tone, color, movement and sound.

Drawing from these perspectives, DS is purposed to visually attract customers and guide their attention to specific products or the store itself, by stimulating their interest and encouraging a positive purchase decision. DS can be viewed as the stimulus and the intermediary tool for identifying or satisfying needs. Given its digital nature, DS also contributes to the alignment of offline and online channels, fostering phygital retail environment. However, the positive implications of an improved retail experience – through evoked emotions or a more modern store aesthetic, for instance – do come with drawbacks. Firstly, DS typically displays a broader color range than conventional LCD-tags. Secondly, DS frequently incorporates motion or changing imagery (Garaus & Wagner, 2019; van de Sanden *et al.*, 2020). Thirdly, DS extends beyond merely showcasing the product or brand itself and contextualises it within broader emotional benefits such as friendship, enjoyment or fun. As a result, consumers are required to process and decode more information at the point of sale. An information overload can potentially occur, limiting DS's potential

to stimulate sales. Overload may stem from an overstimulation of visual and auditory senses, caused by an excess of displays, compounded by the usual colorful presentation of branded, packaged products on shelves. As a result, the main purpose of DS – to draw attention to products, promotions and prices, thereby enhancing sales – can quickly shift to cognitive strain on consumers, leading to a failure in acquiring, storing, or even neglecting information (Jacoby, 1984; Li, 2017; Röding *et al.*, 2023; Vogrincic-Haselbacher *et al.*, 2021). This fact is particularly noteworthy as price promotions displayed by DS can be overlooked or simply unseen, in traditional paper-based in-store advertising and promotional communication, the tags were generally single-color-coded, often in red, or displayed on larger signs at a 90-degree angle on a rod – always in a static, non-lit setting ((Cochoy & Soutjis, 2020). Consequently, the authors propose that DS at the shelf level in form of a new display rail format might have a positive impact on sales but a negative impact on utilizing promotions.

Methodology

To investigate whether DS can enhance sales at the shelf level in the display rail format, the authors conducted three studies. The first two studies are based on scanner data from two identical convenience stores (i.e., with the same assortment, same promotions, same location type and same target group) within a gas station chain in Germany. Each study was conducted over a period of 16 days. One store utilized traditional paper-based in-store advertising and shelf-labelling price tags, whereas the other implemented DS for advertising and shelf-level price-tags, incorporating display rail format accordingly. The authors considered two scenarios: the first scenario compared the effects of displaying price and brand information on paper versus DS, while the second scenario added price promotion information to the displays, specifically a discount of approximately 35% for the purchase of two products. Despite the use of scanner data, the study setup is best described as experimental. Figure 1 states the research model of the first study: The regression formula equals:

$$SQ = Constant + \beta * T + \beta * DS + \beta * P + \beta * TxDS + \beta * TxP + T * PxDS + \beta * TxDSxP$$

Study two mirrors study one, but uses a different product category and spans a different time period. Study three deviates from the scanner data analysis and incorporates a questionnaire-based approach. Participants were asked to answer questions related to relevant constructs after viewing videos of each display design. Consequently, study three follows its own research model and design. The findings of studies one and two will also be presented additionally at the conference.

Results Study 1

The linear regression analysis was performed using IBM SPSS v30, utilizing the software's linear regression syntax. Interactions were computed initially using the 'new variable' command. The fit of the regression is in an excellent range, signifying that a substantial proportion of the variance in the data set is explained (Hair *et al.*, 2013). R^2 stands at .970 and the ANOVA indicates a significant level of $p < .001$. In the collinearity diagnostics output of SPSS, none of the predictors have a variance portion exceeding .70, well below the threshold of .90. All predictors are statistically significant, as demonstrated in Table 2. The results show that during the specific time period, the number of units sold increases ($\beta=10.353$; $p < .01$), aligning with the notion that stock-keeping units diminish in the replenishment cycle. The application of DS on shelves positively impacts items sold ($\beta=5.541$; $p < .01$), potentially due to increased product visibility. Interestingly, promotions negatively affect units sold ($\beta=-1.888$; $p < .001$). It is plausible that the additional item has less perceived value compared to the attractiveness of price discount. As time progresses, the positive effect of DS on the quantity of items sold intensifies ($\beta=7.187$; $p < .01$); this could be attributed to a learning curve for consumers, particularly considering the timeframe may encompass customer repurchase cycles.

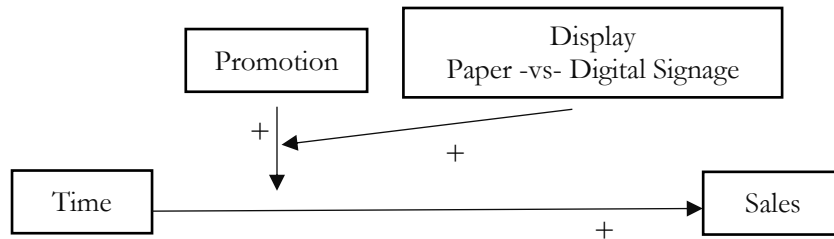


FIGURE 1 – Research Model Study 1:

TABLE 1 –

Variable:	Name:	Abbreviation:	Data:
Dependent	Sales Quantity	SQ	Metric
Independent	Time (Days)	T	Metric
	Digital Signage (Yes/No)	DS	Nominal
	Promotion (Yes/No)	P	Nominal
Interactions:		TxDS	
		TxP	
		PxDS	
		TxDSxP	

TABLE 2 – Regression analysis

Variables	β -coefficient:	p	[Lower 99 CI:	Upper 99 CI:]
Constant	-1.948	***	-2.882	-1.015
T	10.353	***	10.259	10.448
DS	5.541	***	4.608	6.475
P	-1.888	***	-2.480	-1.296
TxDS	7.187	***	7.092	7.281
TxP	1.646	***	1.587	1.706
PXDS	-2.444	***	-3.036	-1.852
TxDSxP	-1.497	***	-1.557	-1.437
Dependent: SQ				

*, $p < .10$; **, $p < .05$; ***, $p < .01$

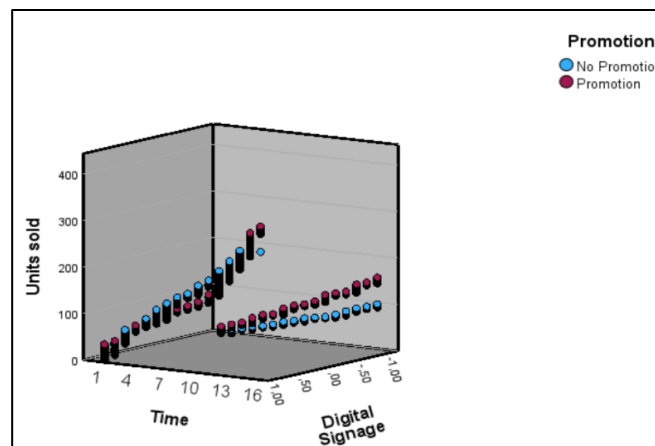


FIGURE 2 – Three-way interaction effect

The same temporal dynamics apply to promotions, as their effectiveness mildly improves over time ($\beta=1.646$; $p < .01$). Surprisingly, promotions displayed on DS negatively influence the number of units sold ($\beta=-2.444$; $p < .01$). This outcome reinforces the assumption that DS may cause an information overload, preventing consumers from positively interpreting the benefit of the promotion. Finally, the negative effect of promotion on DS persists over time ($\beta=-1.497$; $p < .001$), suggesting that paper-based promotions perform more effectively in raising units sold. This strongly highlights the assumption that DS can lead to information overloads, or potentially incorrect decoding of the information presented in display rail format. Figure 2 illustrates the three-way interaction:

Conclusions and discussion Study 1

The presented results contribute to our understanding of DS's potential in retail stores in display rail format. Our findings complement those of Nanni & Ordanini (2024), who recommended placing DS displays a large distance from the focal product to maximize the technology's potential. However, their DS design was based on large, TV-style screens. Our research further suggests that when DS is placed directly on the shelf in a fusion rail design. It is less effective than traditional paper-based displays. As Figure 2 demonstrates, promotions on DS are less potent than those on paper-based displays, as the slopes do not vary significantly in a DS setting. Nonetheless, DS shows a distinct advantage in enhancing the overall quantity of units sold. Therefore, these findings underscore the visible appeal of DS in store design for product enhancement.

Acknowledgements

Since none of the authors are native English speakers, grammar checks were conducted using an AI-based language model. To ensure the intended meaning was retained, the corresponding author thoroughly reviewed the grammar-corrected version of the initial draft multiple times.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Turning point in e-business: the continued use of e-commerce post Covid

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Abstract. The Covid-19 pandemic catalyzed significant shifts in consumer behavior, notably increasing the adoption of e-commerce as physical stores closed and social distancing measures were implemented. This study explores whether these online shopping habits persisted after the lifting of Covid-related restrictions. Using a quantitative approach, a survey was conducted two years after restrictions were lifted, collecting data from 414 participants. The study examines changes in online shopping frequency, product categories and demographic variables such as age. Results show that Covid accelerated e-commerce adoption, with a significant portion of late adopters continuing online shopping post-pandemic. Factors influencing long-term online shopping behavior include convenience, trust, price sensitivity and user experience. Additionally, differences in purchasing habits across product categories and age groups were observed, suggesting that external factors like the pandemic have lasting effects on consumer habits. The study highlights the importance of businesses adapting to these behavioral shifts to maintain competitiveness and underscores the need for inclusive digital strategies to address barriers to access. This study contributes to the understanding of long-term consumer behavior changes and offers insights for both practitioners and academics in the field of e-commerce.

Keywords : E-commerce; Covid-19; consumer behavior; Iceland; online shopping; digital adoption

Introduction

The Covid-19 pandemic brought about unprecedented changes in daily life, including significant shifts in consumer behavior. One of the most notable transformations was the surge in e-commerce usage. With physical stores closed and social distancing measures in place, many consumers were forced to adapt to online shopping, often for the first time. This moment of disruption created an opportunity to examine whether these behavioral changes would persist once restrictions were lifted (Sheth, 2020). This study aims to assess the persistence of consumers' online shopping habits following the lifting of Covid-related restrictions. It further investigates how these behavioral shifts differ across product categories, age groups and other demographic variables, while also examining the key drivers behind the continued use of online purchasing platforms. A quantitative approach using on-line survey conducted approximately two years after the Covid restrictions were released, based on a convenience sample from selected Facebook groups. The

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total number of participants were 476, whereof 35.2% were men, 64% women and 0.8% other. Although this profile does not reflect the population. It is a known bias in surveys based on Facebook samples and will be corrected in the analysis to reflect the population. This study furthermore reflects on a survey conducted by Andri Steinn Harðarson (2023) two weeks after the beginning of Covid19.

The results indicate that Covid served as a catalyst for change, prompting consumers to alter their behavior. Just over 27% of respondents belonged to late adopters prior to Covid; 8.2% had never purchased anything on the Internet, 10.95% 1-5 times before and 8.2% 1 times pr. year. These same groups participated quite actively during the first two weeks in Covid, whereof 41.7% of the first group, 80% of the second group and 53.3% of the last group purchased products on the Internet. When asked if they plan to buy on the Internet in the future, 75% of participants in these groups planned to do so.

The study illustrates how a transformative event like Covid can significantly alter consumer buying habits, particularly through increased e-commerce usage. As a result, businesses must adapt by strengthening infrastructure and creating user-friendly interfaces. This work provides valuable insights into this critical issue for both practitioners and academics.

Theoretical framework

To gain deeper insight into consumer behavior following the Covid-19 pandemic, this study draws on several theoretical frameworks. First, the Theory of Planned Behavior (TPB) (Ajzen, 1991) provides a foundation for examining the factors influencing online shopping intentions and behaviors. TPB posits that behavior is shaped by behavioral attitudes, subjective norms and perceived behavioral control. These components are particularly relevant in understanding how individuals made decisions to engage in e-commerce during and after the pandemic and how those decisions transformed into habits. Second, the Technology Adoption Life Cycle and Diffusion of Innovation Theory (Rogers, 2003) help explain the spread of e-commerce adoption across different consumer segments. This theory categorizes adopters into groups such as innovators, early adopters, early majority, late majority and laggards. The pandemic served as an accelerator, prompting even traditionally hesitant consumers, such as late adopters and technology-resistant individuals, to engage with digital platforms. Third, concepts from herd behavior theory (Banerjee, 1992; Burke *et al.*, 2010) provide insight into how social influence may have driven some consumers to mimic the behavior of their peers.

Methodology

Research design

This study explores whether the adoption of online shopping during the Covid period persisted into the post-Covid era. It evaluates the permanence of these newly formed habits and investigates variations across different product categories, age groups and other demographic segments. The analysis further delves into the underlying motivations and perceived barriers that shape online shopping behavior in the post-Covid context. Attention is also given to the key factors influencing the long-term continuation of such behavior, including convenience, trust, price sensitivity and the overall user experience. (Pantano *et al.*, 2020). The survey included both closed- and open-ended questions, capturing pre-Covid and post-Covid behavior. Respondents were asked about the frequency of online purchases, types of products bought, their preferred platforms and changes in attitudes toward digital commerce. The questionnaire also included questions on technology comfort, delivery expectations and user interface satisfaction (Rogers, 2003).

Sample

A quantitative online survey was conducted approximately two years after the initial Covid restrictions were lifted. The survey used a convenience sample recruited through selected Facebook groups, yielding 476

responses of which 414 were completed. Of the participants, 35.2% were male, 64% female and 0.8% identified as other. While the sample is not fully representative of the Icelandic population. It reflects common patterns in online survey participation and is weighted accordingly in the analysis to approximate broader population trends.

Results

The study confirms that Covid acted as a moment of change, significantly impacting consumer habits (Sheth, 2020). Over 27% of respondents were late adopters prior to Covid, including 8.2% who had never shopped online and 10.95% who had done so only 1–5 times. During the pandemic, these groups showed marked increases in online purchases: 41.7% of previous non-buyers, 80% of rare buyers and 53.3% of infrequent annual buyers made online purchases. Importantly, 75% of these respondents indicated their intention to continue shopping online in the future.

Although COVID-19 restrictions initially compelled many individuals to transition to online shopping, this study, conducted two years after the pandemic, suggests that the factors driving e-commerce adoption remain consistent over time. While physical stores had previously limited operations or were temporarily closed, consumers continued to favor online shopping due to its efficiency and convenience. Time constraints emerged as a pivotal factor, with respondents highlighting e-commerce as a practical solution for managing their daily routines. Its appeal was further strengthened by the convenience of home delivery and access to a broader range of products. The constrained product selection in physical stores continued to be a significant determinant of consumer preferences, with many individuals opting for the broader assortment and competitive pricing available at online platforms. The ability to compare prices online, coupled with the overall enjoyment of e-shopping experience, also remained key motivations for consumers.

Responses from 414 individuals, categorized into three distinct age groups 18–35, 36–50 and 51 and older were analyzed using an ANOVA test. The findings indicate that the factors influencing online shopping behavior were similarly valued across all age groups. Consequently, there was no statistically significant difference in the motivations for engaging in e-commerce based on age, suggesting that the key drivers of online shopping remain stable even in the post-pandemic period.

The analysis of the buying behavior of individuals affected by external factors (Impact = 1) and those not affected (Impact = 0) shows some differences across various product categories: Affected individuals tend to purchase more groceries on average (2.36) compared to those not affected (1.79). Affected individuals purchase slightly more clothing (3.65) than those not affected (3.41). There is a higher tendency for affected individuals to buy shoes (2.80) compared to those not affected (2.44). Both groups purchase furniture at similar rates, though affected individuals show a slightly higher mean (1.86) versus (1.63) for those not affected. Affected individuals show a slight increase in electronics purchases (2.66) compared to the unaffected group (2.46). Affected individuals engage in more entertainment purchases (3.32) compared to those not affected (3.12). The differences in other purchases are minor, with affected individuals slightly higher (2.82) than not affected individuals (2.77). Overall, affected individuals appear to have a slightly higher purchasing behavior across all categories. Cronbach's alpha for buying behavior data: 0.99

To deepen the analysis, we conducted independent t-tests. The *t*-value indicates that the difference in grocery purchases is unlikely to be due to random chances. This suggests that some underlying factor related to being affected (e.g., changes in economic conditions, lifestyle adjustments, or other situational influences like C19) is likely influencing the purchasing behavior.

TABLE 1 *t*-test results interpretation

Category	<i>t</i> -statistic	<i>p</i> -value	Interpretation
Food	4.52	0.00	There is a significant difference in grocery purchases between affected (Impact = 1) and unaffected (Impact = 0) individuals. The very low <i>p</i> -value (< 0.05) indicates strong evidence against the null hypothesis.
Clothes	1.94	0.05	There is a borderline significant difference in clothing purchases. The <i>p</i> -value is exactly at the significance level (0.05), suggesting that this result is marginally significant. Further investigation may be warranted.
Shoes	2.76	0.01	There is a significant difference in shoe purchases, with strong evidence against the null hypothesis. Affected individuals differ from those not affected in their shoe buying behavior.
Furniture	2.32	0.02	There is a significant difference in furniture purchases, suggesting affected individuals have different buying behaviors compared to unaffected individuals.
Electronics	1.63	0.10	There is no significant difference in electronic purchases, as the <i>p</i> -value is above the 0.05 threshold.
Entertainment	1.62	0.11	Like electronics, there is no significant difference in entertainment purchases.
Other	0.37	0.71	There is no significant difference in other purchases, indicating that affected and unaffected individuals behave similarly in this category.

The purchasing habits for groceries differ significantly based on whether individuals are affected or not, implying that the situation or context has led to meaningful changes in how much they buy. This insight can inform business decisions, marketing strategies and further investigations into consumer behavior.

The analysis of the data shows that affected individuals (Impact = 1) have a different pattern of grocery purchases compared to unaffected individuals (Impact = 0). This could mean they buy more, buy different types of groceries, or shop more frequently, for example. The significance of this difference is backed by the statistical analysis (i.e., low *p*-value), suggesting that the change in behavior is not due to random chance. A crisis like a pandemic C19, economic downturn, or natural disaster affects people's lives. It may lead to changes in how they shop for groceries. Affected individuals might be more cautious, buy in bulk, or prioritize certain types of products like basic items over luxuries.

The analysis revealed notable differences in purchasing behavior across specific product categories. Individuals who were affected by certain circumstances showed significant changes in how they shopped for groceries, clothing, shoes and furniture, suggesting that these categories are particularly sensitive to shifts in personal circumstances. On the other hand, spending patterns for electronics, entertainment and comparable items exhibited relative stability, suggesting that such purchases are less contingent on direct personal impact.

Previous research indicates that categories like clothing, electronics and home goods saw sustained growth post-Covid, while travel and entertainment remained more volatile (Baig *et al.*, 2020). Pantano *et al.* (2020) indicate that on the other hand, those who reverted to in-store shopping post-Covid cited reasons such as the desire for human interaction, the ability to inspect products physically and dissatisfaction with shipping times or customer service.

Discussion

The findings illustrate how external shocks such as a pandemic can rapidly accelerate digital adoption (Donthu & Gustafsson, 2020). Businesses that responded effectively to this shift by offering user-friendly platforms, efficient logistics and trustworthy digital experiences were better positioned to retain customers after Covid. Those who failed to adapt risked losing customers permanently.

For practitioners, the study emphasizes the importance of understanding new customer expectations in a post-Covid world. E-commerce is no longer a niche or alternative channel; for many. It has become an integral part of daily life, investments in user experience, personalization, mobile optimization and customer support are critical to maintaining competitiveness (Baig *et al.*, 2020).

From a policy standpoint, the findings highlight concerns about digital inclusion. Even though digital adoption has grown overall, barriers remain for some groups, particularly older adults and those with limited digital access. Future digital transformation strategies should address these gaps to ensure equitable participation in online markets. (Andrews *et al.*, 2018).

Conclusion

This study contributes to the understanding of long-term behavioral shifts triggered by global events. It provides evidence that the Covid-19 pandemic was more than a temporary disruption; it served as a catalyst for enduring change in consumer behavior, particularly in the realm of e-commerce. The findings offer actionable insights for both practitioners aiming to build resilient e-commerce strategies and academics seeking to explore consumer adaptation in times of disruption. By examining shifts across demographic groups and product categories, this study highlights the complexity of post-pandemic consumer behavior and underscores the need for adaptive, inclusive and user-focused digital commerce solutions in the years ahead.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

A comparison of esports tournament organizers' reward structures: which one to favor to attract audience and sponsors?

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Abstract. Competitive video gaming, or esports, is now one of the largest forms of entertainment with hundreds of tournaments taking place throughout the year. Unlike traditional sports, many of these tournaments overlap & must thus compete for the best players in the player pool. One tool at tournament organizer's disposal is the design of the reward structure. We analyze the optimality of differing reward structures of two competing tournaments in the presence of a heterogeneous pool of players in terms of playing skill. Using a game-theoretic model, we show that the existence of a clear best player that is significantly better than the rest of the player pool results in a more exponential design of the reward structure at the optimum. In the absence of such a player, a more linear design is better. Furthermore, using a simulation-based framework, we show that smaller tournaments also favor exponential reward structures while larger tournaments favor more linear designs.

Keywords : esports; videogaming; tournament design; prize money; competitive sports

Introduction

Video gaming and in particular, competitive video gaming is a relatively new phenomenon that has grown rapidly in the past few years (Digital Media 2023). Today, video gaming is a \$180 billion industry, in comparison to the movie industry that at its peak pre-COVID was at a mere \$42 billion. However, video gaming, although expanding rapidly, encompasses many aspects, including sales of video game titles, but also of video gaming hardware including its many platforms (PC, console games, as well as purpose-built mobile devices). However, the most rapidly growing aspect of the video gaming industry is esports (competitive gaming). Although today it is valued at only \$1.1 billion, it is growing at an exponential rate.

Spending on esports covers many areas, from advertising and sponsorships to media rights, ticket sales and merchandising. For a single event, the prize pool alone can range from a mere few thousand to as much as tens of millions of dollars. For instance, in 2023, League of Legends had tournaments throughout the year with prize pools totaling over \$5 million. Their premier tournament of the year, the 2023 World

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Championship that ended on November 19th, 2023, had a prize pool of \$2.225 million (Liquipedia, 2023a). Similarly, Dota 2 annual tournaments total over \$20 million in prize pool. It is similar for other games like Counter-Strike and Fortnite as well as Rocket League, Rainbow Six, PUBG and FIFAe (Liquipedia, 2023b).

Given the scale of these events and the amount of money spent annually, research has just started to address the issues that is unique to this industry. One of the main challenges for event organizers is competition for audiences. Although some of these video games are heavily supported by the publishers, as the case is with Valve and their support for Dota 2 (contributing a large portion of the prize pool partly supported with crowdfunding through in-game purchases), for other games the monetary support comes from third party tournament organizers with sponsorships and advertisements. For these games, there is no central authority that manages the yearly tournaments and thus there is a lot of competition for attracting audiences to their events.

Naturally, the easiest way to attract a large audience is by expanding the prize pool. Buzz around the winnings of players playing video games permeates the gaming community and attracts more views to these events. It's an amiable cycle: more prize money attracts more audience, which attracts more sponsorships, which increases the prize pool, which attracts more audience. The effect is strengthened when you consider the fact that larger prize pool attracts the best players in the game, which in turn attracts viewers that want to watch these players compete in their favorite game. Whether it is the prize money alone that attracts viewers to these esports events or the fact that top stars are playing is difficult to disentangle, but it is clear that individually, both these factors play a role.

Besides increasing the prize pool as a means of attracting top players (and thus more viewers), tournament organizers have another tool at their disposal to attract top talent: the structure/distribution of the prize money. Generally, a winner-take-all prize structure is not efficient in a well-developed, mature sport as such a contest will only attract the few players that have a realistic chance of finishing first. On the other hand, in a new video game where players are unsure of their ability relative to others and/or where there is no clear best player popularly recognized, a winner-take-all prize structure could be an attractive design. More commonly, the prize money is distribution over the top n placing contestants.

A very common prize pool structure is an exponential one, where the winnings keep increasing at an exponential rate as contestants progress through the tournament. This is by far the most common format for prize pools (Rainbow 6 and Dota 2 use this format – see Table 2). Other structures include a linear prize structure where for each advancement the winnings increase by a fairly constant amount (see League of Legends). A logarithmic format is very rare in esports although it does get employed in traditional sports competitions.

There have been many studies conducted on this design question (see for example Szymanski, 2003), however, all of these only take into account internal efficiency. What is unique about esports, given that it's a relatively new phenomenon, is that there is often overlap between the timings of these events and thus contestants have to choose which event they want to compete in. Naturally, the design of the prize structure and what each player expects to win plays an important role in the players' decision-making process. Should the event organizers concentrate most of the prize pool towards the top finishers (i.e., an exponential reward structure)? This would surely attract the top talent to their event. Or should the organizers spread the prize pool down more evenly (i.e., a linear or a logarithmic reward structure)? This might forgo the top talent, but will attract a bulk of the next tier talent, making for a more intense competition. These questions are especially pertinent when there are other events taking place at the same time. Given the already large size of competitive video gaming and the continued massive growth of esports. It is a surprise that this question has not yet been studied.

Using a game-theoretic model, we show that when there is no clear dominant favorite player in the game, a more linear reward structure is optimal, with competing tournaments aiming for different contestant makeup: one favoring the best players while the other favoring more closely contested games. On the other hand, when there is a clear dominant favorite player in the game, a more exponential reward structure is optimal with competing tournaments focusing their prize money on either the high end or low end of the reward structure. In a simulation-based framework, we shed light in the mechanisms behind varying reward structures of competing esports tournaments with respect to tournament size. In varying scenarios, we reveal that for limited size tournaments an exponential reward structure is optimal, while for larger tournaments a more linear reward structure is better.

Methodology

We first analyze the problem using a game-theoretic model of the tournament organizations' reward structure design problem and then describe using numerical examples to support our propositions.

Game-theoretic model

We consider two tournament organizers (henceforth TO), A and B, that need to decide on the structure of their reward prize. We assume that both tournaments are taking place at the same time such that they compete for the same pool of players and that players can participate in at most one tournament. We also assume that both TOs have the same prize money available for distribution as reward. Although we understand that this is not a realistic assumption, it is a necessary one to study the optimality of differing reward structures, abstracted away from the benefits of having a larger budget. Therefore, given a budget, the TOs decide on the proportion that is allocated to the first-place finisher, the proportion that is allocated to the second-place finisher, etc. We denote these rewards as a_1, a_2, a_3 , etc. for Tournament A and b_1, b_2, b_3 , etc. for Tournament B, such that for all j , $a_j > a_{j+1}$, $b_j > b_{j+1}$ and $\sum_j a_j = \sum_j b_j$. For this analysis we limit j to 3, meaning that only the top 3 finishers in each tournament receive a prize.

We assume there are infinite players with given intrinsic ability p_i that can be ordered such that p_1 is the best player in the player pool. Although we assume that player ability can be ordered and ranked from the modeler's perspective, it is still a latent attribute and player performances contain a stochastic element to them. Thus when looking at the prize structure of tournaments, player p_1 *hopes* to win the top prize a_1 , but also takes into account the possibility of only winning a_2 instead. Similarly, player p_2 expects to win prize a_2 but also takes into account the possibility of only winning a_3 as well as possibly winning a_1 .

We model the players' utility for Tournament A as $UA_{ij} = x_j \cdot \rho_{ij}$, where x_j is the reward structure of the tournament (i.e. $x_j = [a_1 \ a_2 \ a_3 \ \dots]$) and ρ_{ij} is the expected probability of player i finishing in position j of the tournament. Similarly, UB_{ij} is the utility of player i for Tournament B. We assume vector of probabilities ρ_{ij} to have a normal distribution functional form with highest probability at $i = j$ and a standard deviation equal to the level of uncertainty players have about their own ability/skill and/or general stochasticity in tournament outcomes of that particular game. For simplicity, we set ρ_{ij} as follows:

$$\rho_{ij} = \begin{cases} m & \text{for } j = i \\ \frac{(1-m)}{2} & \text{for } j = i \pm 1 \\ 0 & \text{otherwise} \end{cases}$$

where $m \sim [\frac{1}{3}, 1]$ is a measure of players' uncertainty about their ability/tournament outcomes, with $m \rightarrow 1$ implying tournament outcome is a forgone conclusion. Thus, player i only takes into account the prize

money of position $j = i - 1$, $j = i$ and $j = i + 1$ when deciding which tournament to enter. Given the reward structures x_j for each tournament, player i will enter Tournament A if $UA_i \geq UB_i$ and will enter Tournament B otherwise. Note that for lower-level players, I.e. for $i \geq 4$, they only take into account the lowest possible reward of each tournament, o.e. a_3 and b_3 . This means that the TOs cannot separately influence the behavior of players $p_4 \dots p_\infty$ and thus when one of them prefers joining a particular tournament, all of them would prefer joining that tournament too. This is realistic as lower end players tend to either disregard prize money knowing perfectly well that it is outside of their reach, or only look at the lowest possible prize in the hopes that *maybe* they will be able to pull off a surprise. Since all these players prefer the same tournament given our model, we pool their qualities together and represent them collectively as p_∞ . Although p_∞ can theoretically be very large, we assume that, for the sake of viewership, $p_3 \geq p_\infty$. Therefore, the decision of reward structure design rests on the competition for the top 3 players and p_∞ .

Tournament organizers design the reward structure x_j to maximize profit. Profits come from ad revenue and sponsorship with both directly correlated with viewership. Viewership comes from two sources: (i) dedicated fans of individual players that follow them to whichever tournament they compete in and (ii) expected quality of games in a tournament. These two sources of viewership are correlated as good players accumulate a larger following as well as increase the expected quality of games in matches they compete in. We therefore combine these two sources into one metric called viewership quality v . Since better players bring in more viewers, viewership quality is thus a function of player ability, i.e. $v_k(P)$, where $k \in \{A, B\}$ and P is the set of p_i that competes in tournament k . Therefore, TOs design their reward structure x_j to maximize viewership quality $v_k(P)$. The better the players a tournament attracts, the higher the viewership quality and thus the higher the revenue the tournament receives. We model v_k as a multiplicative function of the players' ability. That is to say that $v_k(P)$ is the product of the players' abilities p_i that compete in the tournament. The reason we use a multiplicative function and not an additive one is that excitement in games is a function of not only the total quality of participants but also the closeness of results (Pawlowski, 2013, Wills *et al.*, 2020) and a multiplicative function captures the latter aspect better (Tofallis, 2014).

The game consists of three stages. In the first stage, TOs decide on the prize structure x_j for their tournaments. In the second stage, players choose which tournament they will compete in given the prize structures. Thus at the end of the second stage, viewership quality is set. In the third stage, the tournaments take place, viewers decide which tournament to watch and profits are realized.

Theoretical analysis

We analyze the model by first recognizing that in any equilibrium, the TOs have selected their reward structures and the players have selected the tournament in which they want to participate and no one would like to change their choices. From players' point-of-view it is straight forward, as their choice of tournament is an expected utility maximization endeavor. As for the TOs, given that they are identical, an equilibrium would mean that the viewership quality $v_k(P)$ of the tournaments are equal to each other (i.e. no tournament has an advantage/higher quality over the other). Table 1 below shows all possible combinations of tournament makeup. Without loss of generality, we let Tournament A be the tournament that player p_1 participates in. Since $v_k(P)$ is a product of the players that participate, there are only a few combinations of tournament makeups that can form part of an equilibrium solution. From Table 1, this means that many of the combinations can be eliminated from our possible solution set. As an example, the combination with Tournament A having $\{p_1, p_2\}$ and Tournament B having $\{p_3, p_\infty\}$ cannot be a possible equilibrium since there is no way of $v_A(p_1, p_2) = v_B(p_3, p_\infty)$ given $p_1 \geq p_2 \geq p_3 \geq p_\infty > 0$, outside of the trivial case of all p_i being equal. This leaves us with only two possible outcomes that need analysis: $v_A(p_1)$ and $v_B(p_2, p_3, p_\infty)$ and $v_A(p_1, p_\infty)$ and $v_B(p_2, p_3)$.

TABLE 1 – All possible combination of outcomes w.r.t the top 4 players' choice of tournament

Tournament A	Tournament B	Tournament A	Tournament B
$\{p_1, p_2, p_3, p_\infty\}$	$\{\}$	$\{p_1\}$	$\{p_2, p_3, p_\infty\}$
$\{p_1, p_2, p_3\}$	$\{p_\infty\}$	$\{p_1, p_2\}$	$\{p_3, p_\infty\}$
$\{p_1, p_2, p_\infty\}$	$\{p_3\}$	$\{p_1, p_3\}$	$\{p_2, p_\infty\}$
$\{p_1, p_3, p_\infty\}$	$\{p_2\}$	$\{p_1, p_\infty\}$	$\{p_2, p_3\}$

Note: Non-shaded area forming possible equilibrium solutions

The interesting case of $v_A(p_1)$ and $v_B(p_2, p_3, p_\infty)$ would arise when viewers are indifferent between (i) watching p_1 , the best player in the player pool, playing (against anyone) and (ii) watching closely contested games between any of the next tier players. You can think of this p_1 player as the Magnus Carlsen or Michael Jordan of the sport. For such an equilibrium, we need $UA_1 \geq UB_1$, $UA_2 \leq UB_2$, $UA_3 \leq UB_3$ and $UA_4 \leq UB_4$. The reward structures $[a_1 \ a_2 \ a_3]$ and $[b_1 \ b_2 \ b_3]$, that support this is then an equilibrium solution.

Similarly, for the case of $v_A(p_1, p_\infty)$ and $v_B(p_2, p_3)$, this is a likely scenario where there is not much separation between the top player and the rest of the field. In this case, we would need $UA_1 \geq UB_1$, $UA_2 \leq UB_2$, $UA_3 \leq UB_3$ and $UA_4 \geq UB_4$ and the reward structure that supports this would then be our other equilibrium solution.

Theoretical results

PROPOSITION 1. *For competing tournaments where there is a clear dominant player p_1 that enters Tournament A and players p_2 and p_3 and p_∞ enter Tournament B, the following conditions regarding the reward structures need to hold:*

$$a_1 - b_1 > b_2 - a_2 > 0 \quad (1)$$

$$a_1 - b_1 > b_3 - a_3 > 0 \quad (2)$$

If the TO for A is content with getting the best player in the player pool, at the expense of *ALL* the other players, then a reward structure where the first-place prize a_1 is extremely large is the way to do it. That first place prize has to be large enough such that the difference between it and the first-place prize of the other tournament is more than the disadvantage the tournament has in the second place prizes and the third place prizes, effectively sacrificing lower tier prizes for the top prize. That is the case with most tournament designs: an exponential prize structure.

However, in esports, there is usually no obvious best player. An exponential prize structure makes sense when the organizers want to get that best player and that best player is substantially better than the rest of the field *or* that best player will bring in disproportionately more viewers relative to the rest of the field. Table 2 below shows the prize structure for some of the top esports events and Table 3 shows the winners of the last three tournaments for each event.

TABLE 2 – Prize structure for some of the top esports tournaments

	Counter-Strike	DOTA2	League of Legends	Rocket League	Apex Legends	Rainbow Six	Overwatch
1st place	\$500k	\$1521k	\$445k	\$600k	\$600k	\$1000k	\$1000k
2nd place	\$250k	\$406k	\$333k	\$400k	\$320k	\$450k	\$400k
3rd Place	\$85k	\$271k	\$178k	\$200k	\$210k	\$240k	\$225k
4th Place	\$85k	\$186k	\$178k	\$200k	\$170k	\$170k	\$130k
Total prize pool:	\$1m	\$3.38m	\$2.225m	\$2.1m	\$2m	\$3m	\$1.855m

TABLE 3 – Winners and runners-up over the last 3 events of various esports competitions.

counter-strike	dota2	league of legends	rocket league	apex legends	rainbow six	overwatch	valorant
blast premier	the international	world championship	rlcs	agls	invitational	overwatch league	valorant champions
team vitality	team spirit	t1	team vitality	tsm	g2 esports	flordia mayhem	evil geniuses
faze clan	gaimin gladiators	weibo gaming	team bds	optic gaming	w7m esports	houston outlaws	paper rex
g2 esports	tundra esports	drx	team bds	dark zero esports	tsm	dallas fuel	loud
team liquid	team secret	t1	g2 esports	furia esports	team empire	san francisco shock	optic gaming
natus-vincere	team spirit	edward gaming	nrg esports	(no unified global event)	ninjas in pyjamas	shanghai dragons	acend
gambit esports	lgd gaming	damwon gaming	team vitality		team liquid	atlanta reign	gambit esports

Out of all these esports games, only DOTA2, League of Legends and Apex Legends has had a team place in the top 2 position more than once in the last three events (Apex Legends had two teams place in the top 2: Team Vitality and Team BDS). Interestingly, League of Legends' World Championship and Rocket League's RLCS are the least exponential in their tournament reward structure. DOTA2's The International, on the other hand, has one of the most exponential reward structures amongst the games, with first place getting over three times the prize money of second place. The tournaments in Tables 2 and 3 are the top tournaments in their respective game. There are other tournaments that take place within the sport, but they are usually smaller and take place at a different time than these major events so as not to compete directly with them. There are, however, some events that do compete with these prestigious tournaments, both in terms of prize money as well as timing. Table 4 shows one example.

Gamers8 is a global esports tournament organized by the Saudi Esports Federation that spans multiple video games, in July 2022, they hosted a competing tournament with approximated the same prize pool of \$2 million, although Rocket League's RLCS took place in August, so participants were able to compete in both tournaments, in 2023, Gamers8 hosted the tournament again, also in August but 10 days after RLCS, again narrowly avoiding direct competition. Table 4 shows the two tournament's full reward structure.

TABLE 4 – Prize structure of two competing esports tournaments for Rocket League. August, 2022, 2023

Rocket League		
	RLCS	Gamers8
1 st place	\$600k	\$500k
2 nd place	\$400k	\$300k
3 rd – 4 th place	\$200k	\$200k
5 th – 8 th place	\$100k	\$95k
9 th – 12 th place	\$30k	\$50k
13 th – 16 th place	\$20k	\$25k
17 th – 24 th place	\$16k	\$15k
Total Prize Pool	\$2.1m	\$2.0m

Even though the prize pool for both tournaments were the same, Gamers8 decided to adopt a more linear reward structure relative to RLCS. In line with our model suggestion, indeed, over the past 11 Rocket League tournaments, there has been 10 different winners. With no outstanding top team in the sport, Gamers8 seemed to understand that being attractive to the bulk of the player pool is more valuable to being attractive at the top. To be fair, these two tournaments did not take place at the exact same time and participants were able to compete in both tournaments. Given the lack of clear favourites in tournaments in esports, Proposition 1 does not really apply. A tournament organizer for these events would be better off getting players/teams that are more closely matched so that the games are more exciting rather than to land the best perceived player/team at the time. Thus, Proposition 2 below would be more apt.

PROPOSITION 2. *For competing tournaments in the presence of no dominant players, where players p_1 and p_∞ enter Tournament A and players p_2 and p_3 enter Tournament B, the following conditions need to hold:*

$$\min\left[\frac{1+m}{1-m}, \frac{2m}{3m-1}\right] (a_1 - b_1) > b_2 - a_2 > a_1 - b_1 > 0 \quad (3)$$

$$\min\left[\frac{2m}{1-m}, \frac{1-m}{3m-1}\right] (a_1 - b_1) > a_3 - b_3 > 0 \quad (4)$$

When there is no clear star player/team that the organizers want to attract, a reward structure that is a lot flatter is more optimal. Compared to Proposition 1 where most of the difference between the two tournaments happens at the top where a_1 needs to be sufficiently large, under Proposition 2 the biggest difference between the tournaments happens at the middle of the reward structure, where $b_2 - a_2$ needs to be sufficiently large, so much so that collectively the top two prizes of Tournament B should be higher than the top two prizes of Tournament A (rearrange the middle inequality in (3)). Tournament A still retains the higher winning for first place, but that winning is capped. What is interesting is that under Proposition 1, the uncertainty aspect of the players' skill (m) does not play a role in the design of the reward structure, while it does under Proposition 2. This make intuitive sense since if there is a best player that is substantially better than the rest of the field, that notion naturally should be free from uncertainty.

How, then, does uncertainty affect the optimal reward structure in the absence of a clear best player? As m decreases (i.e. outcomes become less certain), the left-hand side of the inequalities in Proposition 2 increase. In other words, the higher the level of uncertainty (or randomness in tournament outcome), the range of possible rewards in the equilibrium expands. This means that as uncertainty rises, the tournaments can diverge drastically in terms of reward structure from each other. Tournament B, the tournament that is foregoing the top talent for more competitive and exciting games, can allocate a lot more of its prize money to the middle tier finishers.

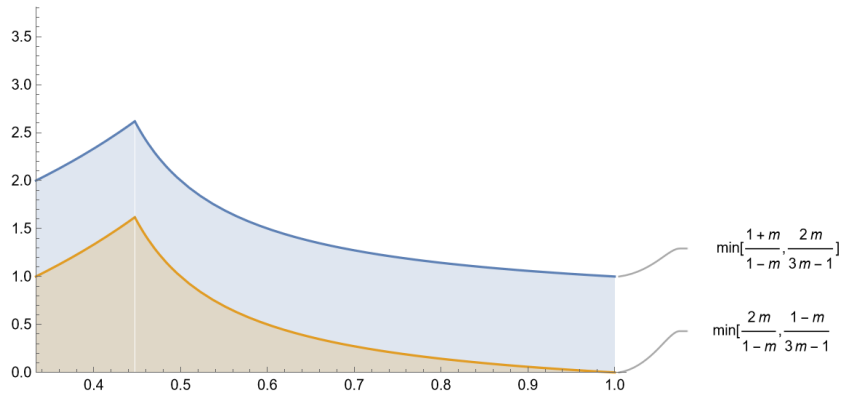


FIGURE 1 – The range of values for the factors in Proposition 2

Tournament A can also move some of its prize money from the mid-tier finishers to the lower tier finishers as uncertainty rises. The result is, under high uncertainty, the two tournaments can diverge in reward structure greatly, with Tournament A having a bigger gap between the first-place prize and the second-place prize and Tournament B having a bigger gap between the second-place prize and the third-place prize.

Looking back at Table 3 and assuming there is no best player/team that the TOs are trying to attract. If a competing tournament came along, they would be advised the following. Against a tournament like DOTA2's The International, it is best to adopt a more linear reward structure in the hopes of attracting more of the second tier of players with the aim of having closer and more exciting games. However, against a tournament like the World Championship or RLCS or AGLS, the option is either to mimic the linear/logarithmic reward structure or to allocate slightly more for the top prize and the lower prizes while reducing the prize for the middle tier finishes (effectively increasing the gap between first- and second-place reward). And if uncertainty about players' ability is high, perhaps even increase that skewedness. The reason is that you are better off either getting the best player for your tournament or getting similarly skilled good players rather than a random draw from the player pool and competing directly with the other tournament based on branding and awareness. Given this recommendation, we next use a simulation to present some numerical examples. These numerical examples rely on random utility theory (Thurstone, 1927; Train, 2003).

Data generation for numerical examples

For simplicity purposes and in particular to avoid side effects as discussed before, we assume that each player is faced with two competing tournaments at a time that offer the same total prize money, i.e. 300,000 MU. Hence, the total amount of prize money does not impact the players' decision for their attendance in one or the other tournament. Furthermore, we assume that the player's preference building for tournaments is based on the tournament's reward structure only and no other factors influence their decision for or against their participation in a specific tournament. Obviously, the player must exclusively decide for one or the other tournament and is not able to attend both tournaments in parallel. In particular, the players' decisions are exclusively based on the tournament's reward structure. As reward structures, we consider four levels: winner-takes-all (WTA); exponential (Exp); linear (Lin); and logarithmic (Log).

Determining player's decision to attend a specific tournament

We assume a set of 100 players that differ in their respective quality, i.e. playing skills and preferences for reward structures. In particular, we assume, that better players prefer reward structures that over-proportionally shift higher prize money to better rankings in tournaments, while players of less quality prefer a more balanced reward structure among rankings. For example, the reward structure WTA is more highly preferred by the best quality players in comparison to players of worse quality. This assumption yields face validity, because better players have a realistic chance to win a tournament and therefore to win the (first) prize money. In contrast, worse players prefer – for example - a linear reward structure over a WTA-structure, because their probability of finishing the tournament on 1st place is highly reduced while it is more likely that they will be ranked lower.

To set up our numerical examples, we formed four player segments with decreasing playing skills. We are aware that more (or even less) segments are likely, but use four segments to follow recommendations in relevant marketing literature. For example, Tuma & Decker (2013) reported in their meta-study of 700 empirical applications that a total of 4 segments are usually sufficient to represent a segmented market. Hence, segment 1 holds the best quality players, while segment 4 contains the worst quality players. Since no empirical advice or suggestions from the relevant literature is present, we varied the number of players in each segment and decided to attach the best 10% of players to the first segment, the next best 20% of players to the second segment, the next best 50% of players to the medium-skilled segment 3 and the last 20% of players to the less-skilled players to segment 4. Furthermore, we assigned quality indices for the

players in the associated segments, ranging from 2.75 for the players in segment 1 to 1.75 for the players in segment 2 to 1.25 for the players in segment 3 to 1.0 for the less-skilled players in segment 4. Obviously, we use increasingly higher indices for higher-skilled segments to better represent the meaning of top segments. In this vein, we assigned specific number of followers to each player in the specific segments: While we assume the best players to have 20,000 followers, the second-best players are assumed to have 10,000 followers. The medium-skilled players in segment 3 are assumed to have 5,000 followers and the less-skilled players are assumed to have 1,000 followers. These numbers are typical of followership on online streaming platforms like Twitch.tv (see Table A.1 in the appendix). In any case, our results are not sensitive to these numbers and are merely incorporated to more closely match the real world.

To build individual part-worth utilities for all player and all levels of reward structure, we follow the well-established approach of Vriens *et al.* (1996) and Andrews & Currim (2003). First of all, we fix the experimental reward structure level Log to zero and therefore assume this level as a reference level. Then, we draw segment-specific part-worth utilities from a uniform distribution over the interval -1.7 to 1.7 for each of the four player segments and sort the values accordingly to our assumption for segments' preferences. Table 5 contains the assumptions as well as the characterization of segments. Obviously, segment 1 with the best-skilled players favor the reward structure WTA over exponential, linear and logarithmic, while segment 4 with the less-skilled players has the reverse preference structure. Similarly, the best players yield the highest quality index and the highest number of followers. To ease the transition of the segment-specific preference structures in segment-specific part-worth utilities, Figure 1 illustrates the segment-specific preferences structures. Based on the segment-specific (mean) part-worth utility estimates, we decided to incorporate a small amount of inner-segment-heterogeneity. This adds a more realistic component to our numerical examples because, as is well-known, the assumption of perfectly homogenous segments may be overly restrictive (Wedel & Kamakura, 2000, p. 222). Therefore, we follow the approach of Andrews *et al.* (2002) and Paetz & Steiner (2017) and add individual-specific small error terms to the segment-specific part-worth utilities.

TABLE 5 – Characterization of segments

Segment	Size	Quality	Followers	Pref. structure
1 (best-skilled)	10	2.75	20,000	WTA > Exp > Lin > Log
2 (fine-skilled)	20	1.75	10,000	Exp > Lin > Log > WTA
3 (medium-sk.)	50	1.25	5,000	Lin > Log > Exp > WTA
4 (less-skilled)	20	1.00	1,000	Log > Lin > Exp > WTA

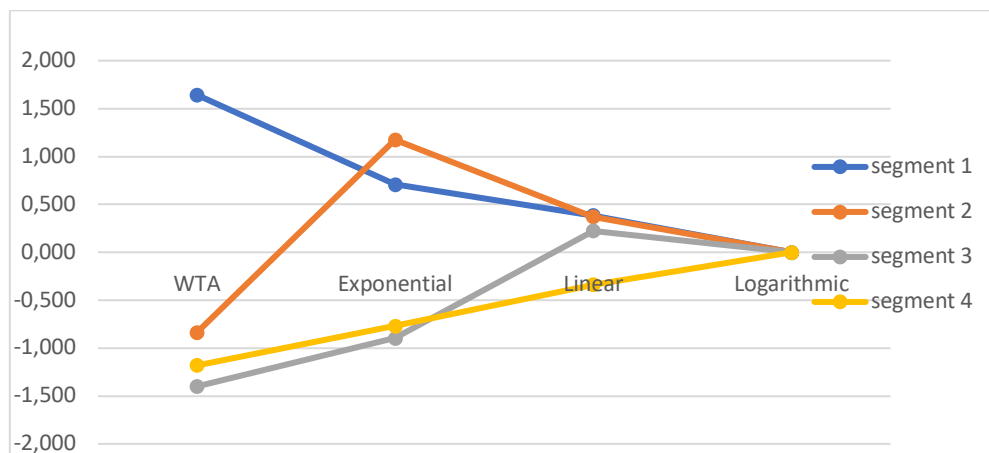


FIGURE 1 – Types of scenarios

$$\beta_{is} = \beta_s + sig_i \cdot \sqrt{0.05} \cdot h_i,$$

where sig_i is either -1 or +1 and drawn from a Bernoulli distribution with a probability of 0.5 and h_i is a vector whose components are drawn from Gaussian distributions with mean zero and variance 1.645. This results in individual specific part-worth utilities β_{is} .

Determining viewer's decision to watch a specific tournament

The number of viewers is a critical factor for event organizers, so we must specify the type of viewers and their specific behavior. First of all, we assume that the specific followers of a player follow their player to whichever tournament they participate in. Hence if player X attends Tournament A, we assume that all followers of player X view Tournament A. In this vein, if player X does not attend any tournament, then his/her viewers will abstain from watching the tournaments too. Furthermore, we assume an additional pool of independent viewers that select a specific tournament independent of the attendance of a specific player X.

Obviously, it can be assumed that followers from a specific player X who does not attend either tournament are grouped in this pool of 300,000 independent viewers. The assignment of independent viewers to a specific tournament is assumed to rely on the quality of the tournament, which in turn results from the quality of players in that specific tournament. This assumes that independent viewers, i.e. viewers that do not follow any specific player, are more likely to watch a tournament with excellent players, i.e. high overall tournament quality, than tournaments with less-skilled players. To model this behavior, we use a quality index of each player and build a multiplicative link to calculate the quality index of a tournament as the product of the quality indices of all participating players. In order to assign the independent viewers to either tournament, we use a Bernoulli distribution with the probability for Tournament A equal to the quality ratio of Tournament A compared to the total quality of tournaments (i.e., the sum of both tournaments' total qualities). The total number of viewers of tournaments is then calculated as the sum of the number of followers and the number of independent viewers.

In the following, we consider several scenarios that result from three experimental factors, i.e. type of competing tournaments, restricted number of players and filling option. For the first experimental factor, we consider the following four experimental levels that coincide with the competing tournaments' reward structure: Exp vs. Exp; WTA vs. Exp; WTA vs. Lin; and Exp vs. Lin. The competing reward structures are chosen in accordance to both realistic tournaments' reward designs and to draw conclusion on the most preferred reward structure based on our focal research question. Especially for the mirror tournaments Exp vs. Exp, we have to consider that this competing tournament builds a surrogate for all mirror tournaments. This reason grounds on our assumption that players preferences for certain tournaments exclusively rely on the reward structure of tournaments. If Tournament A and Tournament B have the same reward systems, a player has identical utilities for both tournaments and is indifferent between which tournament to choose. In this case, we consider a coin flip probability (50%) to assign the respondents to specific tournaments and make draws from a Bernoulli distribution. This approach accommodates a certain degree of randomness and therefore mirrors realistic behavior.

For the second experimental factor, we vary the maximum number of players allowed in a tournament starting from no restrictions to a maximum of 30 players per tournament. The reason for this restriction is to ensure that tournaments are of equal size and thus more easily comparable in quality. Without these restrictions, some tournaments would have a larger participation rate and thus make comparison difficult. In reality, tournaments never have trouble filling in their allocations and usually run several pre-tournament qualifications to ensure that the best skilled players qualify for the event. Thus, if 50 players want to enter Tournament A, but the number of players is restricted to 40 then the 40 best players (out of the 50 players) enter Tournament A.

Lastly, we consider the switching option, wherein players are free to enter the other tournament once they are excluded from their first-preferred tournament. However, even in this case, we employ the mechanism whereby the best players are selected to enter the tournament. For example, assuming a restriction of 30 players per tournament, 80 players preferring Tournament A and 20 preferring Tournament B, then all 20 players are allowed to enter Tournament B and the organizers of Tournament A choose the best 30 players from the 80. With Tournament A at its maximum, the remaining 50 players are allowed to enter Tournament B. In this case, the organizers of Tournament B choose the best 10 players out of the remaining 50.

Results and discussion

In our first numerical examples, we follow the experimental factors' combinations of varying numbers of restrictions of players by tournament, no switching opportunity for excluded players and varying types of tournaments. In particular, we have a 4 x 8 design resulting from four combinations of competing types of tournaments and eight levels for restrictions in the number of players for each tournament. The following scenarios emerge and are summarized in Table 6. For all scenarios, we calculated the tournament's total quality as well as the number of followers, number of independent viewers and the total number of viewers for varying restrictions in the number of players. Furthermore, we assume that excluded players from one tournament are not allowed to enter the other tournament instead.

Scenario I

Scenario I displays the mirror tournaments with exponential reward structures. By allowing for a maximum number of 100 players, i.e. no restrictions in the number of players, Tournament A encompasses 43 players with a total quality index of 9,956,384 and Tournament B 57 players with a higher quality index of 12,632,431. The respective number of followers and independent viewers are 339,000 followers and 132,606 independent viewers for Tournament A and 331,000 followers and 167,394 independent viewers for Tournament B. Naturally, the quality index as well as the number of followers remains stable for a restriction of the number of players up to 60 (or even 57). A further restriction of players per tournament leads to decreasing followers. Figure 2 displays the distribution of followers and independent viewers by tournament.

The number of independent viewers declines in Tournament A dramatically, if the maximum allowed number of players falls below 43 players. Hence, restrictions w.r.t. the number of players in tournaments seem less appropriate if the tournaments pursue maximization of viewers. This statement holds because the assignment of players to mirror tournaments was based on a random selection. Obviously, no restrictions in the number of players per tournament result in approximately evenly distributed viewers.

Scenario II

In scenario II, we set Tournament A with a WTA reward structure against Tournament B with an Exp reward structure. In case of no restrictions the majority of players favour the exponential reward design, resulting in 76 players in Tournament B and 24 players in Tournament A. The quality of Tournament B, with a quality index of 349,414,938, therefore exceeds the quality of Tournament A, with a quality index of approx. 359,954. This difference of a 1,000-times lower quality index of Tournament A in comparison to Tournament B results in an equally reduced number of independent viewers, e.g., 298 for Tournament A vs. 299,702 for Tournament B.

TABLE 6 – Types of scenarios

Scenario	Types of competing tournaments	Restricted number of max. players per tournament
I	Exp vs. Exp	100, 90, 80, 70, 60, 50, 40, 30
II	WTA vs. Exp	100, 90, 80, 70, 60, 50, 40, 30
III	WTA vs. Lin	100, 90, 80, 70, 60, 50, 40, 30

IV

Exp vs. Lin

100, 90, 80, 70, 60, 50, 40, 30

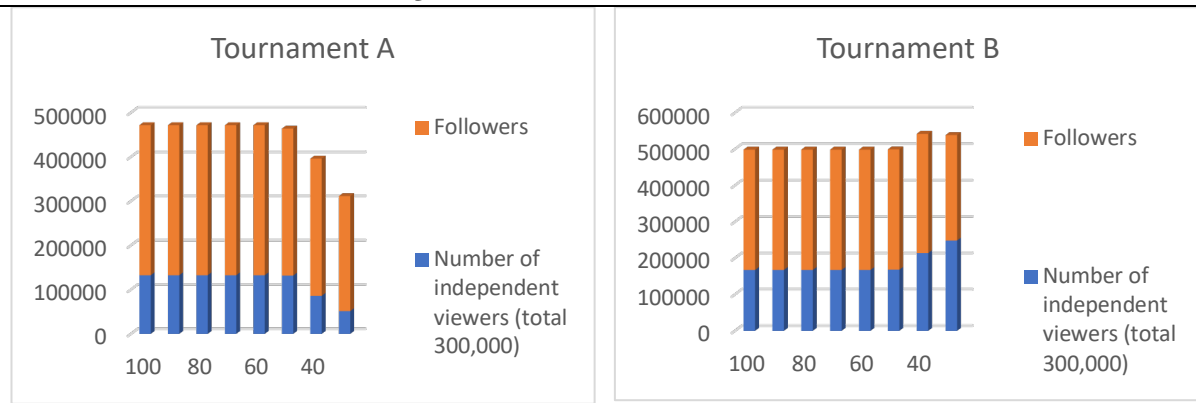


FIGURE 2 – Tournaments' total viewers by followers and independent viewers for Scenario I.



FIGURE 3 – Variations in the type of viewers per tournament for restricted number of players for scenario II

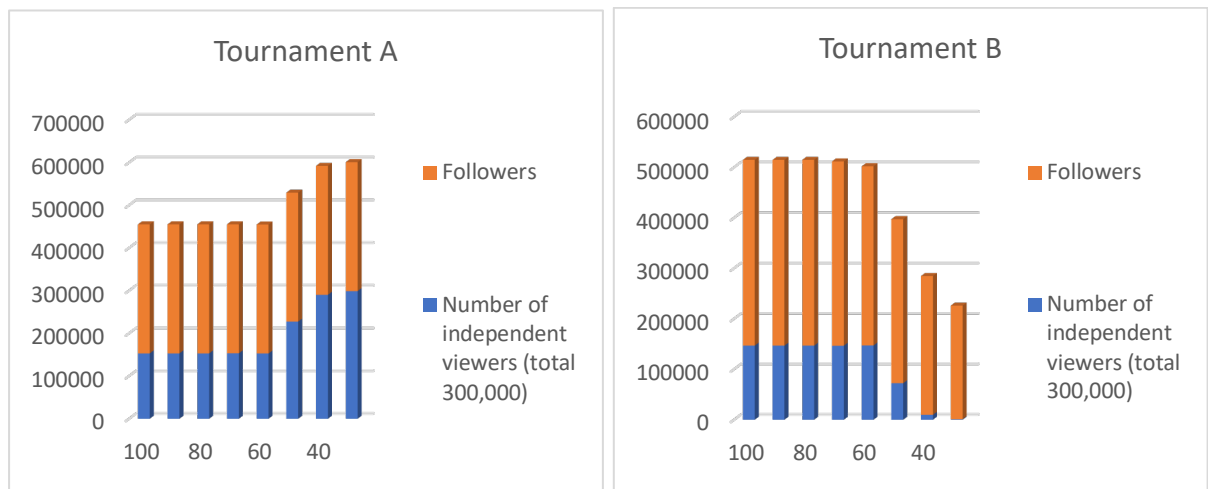


FIGURE 4 – Tournaments' total viewers by followers and independent viewers for Scenario IV.

This, however, is a direct result of unequal participation rates between the tournaments. Looking at the number of viewers, this becomes apparent. Tournament A, with 262,000 viewers, is only 1.5 times lower compared to Tournament B, with 405,000 viewers. The reason stems from the preference of high-quality players for a WTA reward structure in Tournament A and their associated high number of followers. A restriction of the maximum number of players per tournament to 32 or less results in a change in Tournament A's inferior number of viewers. At a maximum of 32 players per tournament, Tournament A still has 262,000 followers as viewers, but Tournament B's number of followers decreases to 260,000. Furthermore, the quality indexes of Tournament B decrease to 1,056,042 resulting in a number of independent viewers of 223,376, which still highly exceeds those of Tournament A (76,624). Figure 3 shows the variation in the tournaments' number of followers and independent viewers.

Scenario III

Scenario III is made up of a Tournament A with a WTA reward structure and Tournament B with a linear reward structure, if we assume no restrictions to the maximum numbers of players per tournament, this results in a distribution of 13 players in Tournament A and 87 players in Tournament B with associated quality indices of approx. 94,692 for Tournament A and 1,328,236,816 for Tournament B. This behaviour can be traced back to the fact that a linear reward structure is highest preferred by medium-skilled players who build the largest segment in our players' sample with 50% of players. Due to the strongly inferior quality of Tournament A, the independent viewers almost completely (299,976) watch Tournament B. Even a restriction of up to a maximum number of 30 players does not dramatically change the overall picture; while the number of followers as viewers converge (A: 225,000 vs. B 280,000), the number of independent viewers still diverge considerably (Tournament A: 64,608 vs. Tournament B: 235,392).

Scenario IV

In this scenario we set Tournament A with an exponential reward structure and Tournament B with a linear reward structure. The resulting distribution of players when no restrictions are present is 27 players in Tournament A and 73 players in Tournament B. The quality indices are on par with 11,413,647 for Tournament A and 11,019,557 for Tournament B. This results in an almost equal distribution of independent viewers to the competing tournaments, i.e. 153,203 for Tournament A and 146,797 for Tournament B. The number of followers as viewers is higher in Tournament B (368,000) compared to Tournament A (302,000) resulting in higher total numbers of viewers for Tournament B. However, the picture dramatically changes if the allowed maximum numbers of player per tournament is restricted to less than 60 players. For example, as displayed in Figure 4, with a maximum of 30 players the total numbers of viewers change to 600,970 viewers for Tournament A and 226,030 for Tournament B. This results in 298,970 independent viewers and 302,000 followers as viewers in Tournament A and 1,030 independent viewers in Tournament B.

Conclusions and managerial implications

In this study, we analyzed the optimality of differing reward structures of two competing tournaments in the presence of a heterogeneous pool of players in terms of playing skill. Using a game-theoretic model, we showed that the existence of a clear best player that is significantly better than the rest of the player pool results in a more exponential design of the reward structure at the optimum, in the absence of such a player, a more linear design is better. Furthermore, using a simulation-based framework, we showed that smaller tournaments also favor exponential reward structures while larger tournaments favor more linear designs.

One of the limitations of our study is the use of just the top three positions of the reward structure to model the optimality of its design, in reality, as seen in Table 4, most tournaments reward prizes all the way down to 20th place. Although we did analyze a model that consisted of prizes for the top 4 finishers, the analysis

was too complex and could not be completed in time for this paper. Preliminary results show that more nuanced structures are possible, like an S-shaped reward structure. This endeavor is left for future research. Another limitation of our study is the way preferences were modeled in our simulation-based numerical analysis. Preferences were for specific reward type and not for the expected winnings of each player. A more direct modeling of preferences might yield different results with more insights.

Our study has tried to look at a few aspects of reward design. However, there are many other factors as play as well. One could be the advertising effect of the top prize, another the switching option of players that are excluded from one tournament. Having an exponential reward structure, as is the most common practice in esports, needs to be carefully considered. Several factors should be taken into account when designing a reward structure, including the number of contestants that will compete for the prizes, the existence of a top-quality player/team that is substantially better than the rest of the field and the general level of uncertainty in outcome, whether due to players' skill or randomness within the video game. For larger tournaments and/or where there is no dominant best player and/or when uncertainty of outcome is high, a more linear reward structure is better. For smaller tournaments, where there might be a dominant player or there is little uncertainty in outcome, an exponential reward structure is optimal. For extremely small tournaments, a winner-takes-all structure might be best.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Implicit ethical consumerism: measure development and cross-national validation

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Abstract. The literature has documented a pervasive attitude-behavior gap in ethical consumption, whereby many consumers do not consistently translate their expressed positive attitudes toward ethical products into behavior. For marketers investing in social responsibility initiatives, this suggests that more accurate segmentation and demand forecasting may require an implicit measure of ethical consumerism. This research draws from literatures in ethical consumption and the psychology of attitudes to develop and validate such a measurement tool. Across three pretests and three studies, findings show that our implicit measure (based on the Affect Misattribution Procedure [AMP]) is cross-culturally robust in predicting ethical consumption behavior beyond effects of explicit attitudes. Overall, this research indicates that academics and practitioners can enhance their predictive capabilities regarding ethical consumption behavior by integrating the AMP-inspired measure with traditional explicit measures, rather than solely relying on the latter.

Keywords : ethical consumerism; implicit attitude; attitude-behavior gap; psychometrics

Introduction

Across most cultural contexts, consuming ethically is socially desirable (Belk *et al.*, 2005; Hassan *et al.*, 2022). Ethical consumerism—a propensity to choose products that contribute positively to environmental, social &/or animal wellbeing (Carrington *et al.*, 2014)—may enhance consumers’ social status in the eyes of others (Griskevicius *et al.*, 2010). Consequently, consumers often exaggerate their explicit attitudes towards ethical products, creating a pervasive attitude-behavior gap (Carrington *et al.*, 2014, 2016). Although several theoretical explanations have been offered, the attitude-behavior gap remains pronounced (Park & Lin, 2020). Accordingly, the current research draws on literature in psychometrics and attitude theories to develop and validate an implicit measure of ethical consumerism that is cross-culturally robust and capable of predicting ethical consumption behavior beyond explicit attitudes. In so doing, we provide a novel measurement tool usable by marketers and environmental psychologists with interest in ethical

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consumption. Next, we review the literatures around (1) the ethical attitude-behavior gap and (2) implicit versus explicit attitudes. This leads to the development of an implicit measure of ethical consumerism that we refine and cross-validate in three studies conducted across national contexts. We conclude by discussing the implications of our findings.

Conceptual development

The ethical attitude-behavior gap

Defining an ethical product is challenging because ethicality is subjective. However, the literature (see Table 1 for summary) treats several product claims and attributes as generally ethical. For instance, products that reduce environmental harm (e.g., made from recycled materials), protect human rights (e.g., fair-trade) and promote animal welfare (e.g., cruelty-free) may be broadly considered as ethical products (Carrington *et al.*, 2014; Zollo, 2021). Henceforth we adopt this popular conception of ethical products and ethical consumption. Consumers worldwide report greater interest in ethical products than ever before (Gürhan-Canli *et al.*, 2018). Yet scholars continue to lament the gap between consumers' attitudes and behavior with respect to ethical products (Park & Lin, 2020). The phenomenon is pervasive cross-culturally. For instance, Young *et al.* (2010) observed that while 30% of UK consumers are very concerned about the environment, environmentally-friendly food products make up only 5% of food sales. Similarly, Vieira *et al.* (2023) surveyed consumers in Portugal and found mean scores of environmental concerns near the scale's ceiling, but average frequencies of pro-environmental behaviors below the scale mid-point. Goodarzi *et al.* (2021) showed that informing Italian consumers about sustainable technology improved attitudes but not adoption rates.

Scholars have sought to close the gap by examining what makes it so pervasive. This literature has shown that consuming ethically is socially desirable cross-culturally (Belk *et al.*, 2005) and satisfies a fundamental motive toward status attainment (Griskevicius *et al.*, 2010). Expressing favorable attitudes therefore confers social benefits at no cost. Conversely, consumers face a host of barriers to ethical consumption behavior. Ethical products are typically priced at a premium (Jägel *et al.*, 2012) and may conflict with other goals, like minimizing shopping effort (Vieira *et al.*, 2023). Psychologically, consumers may feel helpless to remedy grand social problems merely by choosing ethical products (Belk *et al.*, 2005).

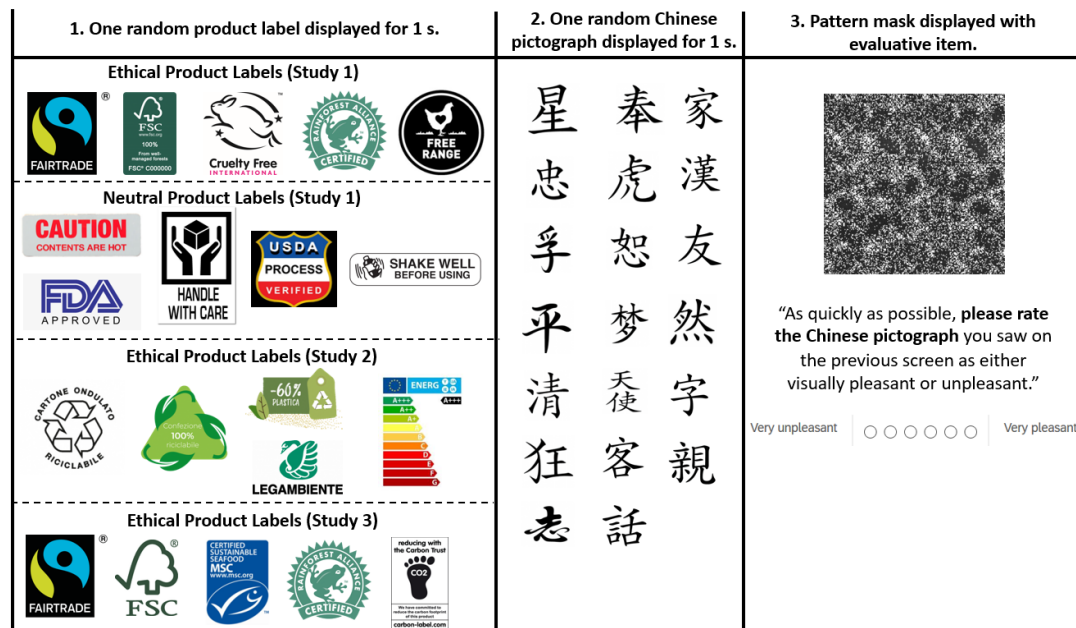
In sum, consumers are motivated to exaggerate their favorable attitudes toward ethical products beyond their actual behavior. This introduces measurement inaccuracies in segmentation and targeting strategies geared toward ethical consumers. For academic researchers, sole reliance on explicit measures of ethical consumerism may limit the validity of findings in this domain. Framing this attitude-behavior gap as a measurement issue (Carrington *et al.*, 2014), we therefore seek to address it by developing a measure of *implicit* ethical consumerism that may be used alongside existing explicit measures.

Implicit attitudes

Many cognitive processes, such as attitude formation, have nonconscious (i.e., implicit) components. In socially sensitive contexts (such as ethical consumption), implicit attitudes are particularly important to predicting behavior (Greenwald *et al.*, 1998). Because implicit attitudes may be formed non-consciously, they cannot be assessed using direct survey measures (Nosek, 2007). The most widely used measure of implicit attitudes is the Implicit Association Test (IAT; Greenwald *et al.*, 1998; see <https://implicit.harvard.edu/>). However, the IAT requires specialized software and relies on reaction-time data, complicating administration and inflating error variance (Payne *et al.*, 2005). We therefore adopt an alternative paradigm (the Affect Misattribution Procedure [AMP; Payne *et al.*, 2005]) for developing a novel measure of implicit ethical consumerism. In addition to its ease of administration, the AMP's reliability and predictive validity are commensurate with other implicit measures, including the IAT (Payne & Lundberg, 2014).

TABLE 1 – Relevant literature on ethical consumption and attitude-behavior gap

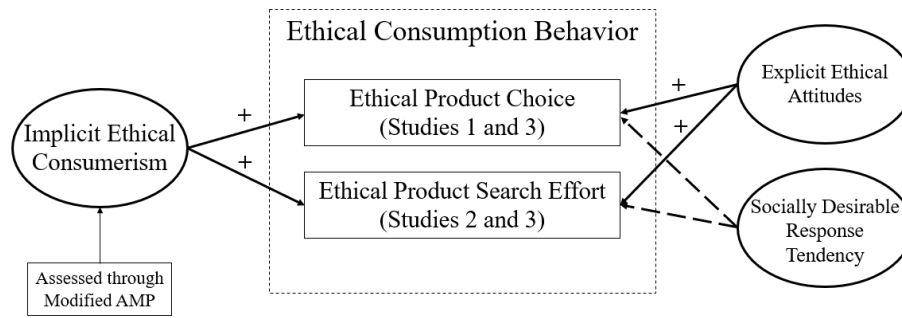
Theme	Acknowledged definition	Reference	Influential contributions
Ethics of Consumers	The ethical principles and standards that govern the behavior of individuals and groups in the acquisition, utilization and disposal of goods and services.	Muncy & Vitell, 1992, p.292	Belk et al., 2005 Devinney et al., 2010 Hassan et al., 2022
Ethical Consumerism	Social movement based in consumers' concerns about the ethicality and impact of their consumption choices upon the environment, animals &/or society	Carrington et al., 2014, p.2759	Carrington et al., 2016 Gürhan-Canli et al., 2018 Zollo, 2021
Sustainable Consumption	Purchasing goods produced with just wages, fair worker treatment and ecological sustainability countering animal testing, factory farming and politicians who oppose environmental regulations	Zollo et al., 2018, p.693	Goodarzi et al., 2021 Park and Lin, 2020 Zollo, 2021
Attitude-Behavior Gap	The widespread failure of consumers to put their ethical attitudes and ethical consumption intentions into action	Carrington et al., 2016, p.24	Carrington et al., 2014 Eckhardt et al., 2010 Park & Lin, 2020
Impediments to Overcoming the Attitude-Behavior Gap	-higher prices -perceived inferior quality -companies' greenwashing -lack of options -limited information -inconvenience	Zollo, 2024, 566-569	Jägel et al., 2012 Vieira et al., 2023 Young et al., 2010



Notes: Text-based portions of the procedure translated into Italian in Study 2.

FIGURE 1 Procedure for implicit ethical consumerism measure

The AMP exploits a psychological tendency of people to mistakenly transfer (i.e., misattribute) their affect for a known object onto an ambiguous one when the two objects appear together in close spatial or temporal proximity (Murphy & Zajonc, 1993). Therefore, if a previously neutral stimulus (e.g., an ambiguous pictograph) is presented proximally to another, favorable stimulus (e.g., an attractive person), an observer may report favorable attitudes toward the pictograph even though the true positive affect was generated by the attractive person (Payne *et al.*, 2005).



Notes: Direction and significance of social desirability's effects not hypothesized.

FIGURE 2 – Visual framework of key variables and predictions

In practice, the AMP exposes participants to a known attitude object, followed immediately by an ambiguous symbol. Participants are instructed to *only* evaluate the ambiguous symbol and not the initial known object. Because the symbol is ambiguous, participants will (non-consciously) transfer their implicit attitudes toward the known object onto the ambiguous symbol, resulting in an implicit measure of attitudes toward the known object. Our research efforts, detailed below, focus on developing and validating an implicit ethical consumerism measure inspired by this paradigm.

Methodological overview

Our studies included consumers in the US (Study 1) Italy (Study 2) and the UK (Study 3) for cross-cultural robustness. To serve as the known object, we used ethical labels commonly found on product packaging. Because ethical product labels are typically country- and language-specific, we conducted three pretests to identify three subsets of labels that are most familiar and ethical to consumers in the US, Italy, and the UK, respectively, to be used in the main studies. Following Payne *et al.* (2005), we used randomly selected Chinese pictographs to serve as ambiguous symbols (see Figure 1).

Participants in all studies and pretests were recruited using Prolific, an online panel used for cross-national consumer research. We included only participants who passed all attention check questions. Additionally in the main studies, participants listed all languages in which they are proficient and those who selected Chinese were excluded from analyses to maintain the validity of the AMP (which uses Chinese pictographs as ambiguous symbols). Sample characteristics are summarized in Table 2.

The generalized procedure (based on Payne *et al.*, 2005) and stimuli we developed are summarized in Figure 1. Study 1 included both ethical and neutral (for comparison) product labels as known objects. Because responses to the neutral labels did not impact our measure's effects or exhibit direct effects on the dependent variable, neutral labels were excluded from Studies 2 and 3 to simplify the procedure. Participants in all studies were given instructions regarding the symbol-rating task and were required to correctly answer comprehension check questions about these instructions before continuing.

In a given trial, a randomly selected product label was displayed for 1 second, followed by a randomly selected Chinese pictograph also displayed for 1 second, followed by a gray square as a pattern mask. Below the gray square, a single item asked participants to rate the visual pleasantness of the Chinese pictograph they had just seen (1 = Very unpleasant, 6 = Very pleasant). An even number of scale points was used to force participants to indicate some level of pleasantness/unpleasantness (Payne *et al.*, 2005). This was repeated for all product labels, resulting in ten (five) trials per participant in Study 1 (Studies 2 and 3). The ratings of the Chinese pictographs that were paired with the five ethical labels were averaged for each participant, representing an implicit ethical consumerism score. A visual framework of our predictions is summarized in Figure 2.

TABLE 2 – Sample characteristics

	Starting <i>N</i>	Failed attention check	Proficient in Chinese	Final <i>N</i>	Mean (SD) age	% Female	Country of residence
Study 1 Pretest	100	2	NA	98	32.21 (11.46)	57.1%	US
Study 1	396	6	24	366	29.63 (12.13)	65.0%	US
Study 2 Pretest	100	30	NA	70	29.96 (8.53)	34.3%	Italy
Study 2	514	100	0	414	28.49 (8.53)	50.5%	Italy
Study 3 Pretest	100	29	NA	71	35.41 (12.75)	45.1%	UK
Study 3 (T1)	602	91	22	489	45.49 (14.55)	53.6%	UK
Study 3 (T2)	278	2	0	276	46.20 (14.51)	54.0%	UK

Study 1

Pretest

This pretest was designed to guide our selection of US-based ethical product labels for the main study. Participants rated 20 ethical labels using one item each to operationalize ethicality and familiarity: Any product carrying this label is... (1 = Not at all ethical, 9 = Highly ethical) and How familiar are you with this label? (1 = Not at all familiar, 9 = Very familiar). The labels represented a range of ethical certifications that appear on common products in the US and reflected agreed-upon ethical product attributes (e.g., environmentally friendly, protective of animal welfare, etc.; Zollo, 2021). We summed the *ethical* and *familiar* ratings for each label and retained the top five labels (see Figure 1) in terms of this index.

Method

The main study consisted of two ostensibly unrelated parts. Part 1 was described as a symbol-rating task and Part 2 was described as a product-choice task. All participants were endowed with a \$0.25 bonus to be spent in Part 2. In actuality, Part 1 was our modified AMP, containing the five ethical labels derived from the pretest and five neutral labels for comparison, all in randomized order. Pleasantness ratings of the five Chinese pictographs that were paired with ethical labels were averaged into an implicit ethical consumerism score. Ratings of the pictographs paired with neutral labels were averaged into a control measure (implicit neutral consumerism). For comparison, participants also responded to a four-item scale ($\alpha = .89$) assessing explicit ethical attitudes adapted from Sudbury-Riley & Kohlbacher (2016) and a six-item version of Crowne and Marlowe's (1960) Social Desirability Scale ($\alpha = .60$) as a covariate. These two measures were presented in randomized order relative to the AMP.

Part 2 was a product-choice task based on Reich *et al.* (2018). Participants were instructed to imagine that they had four items on their shopping list. They were informed that at the end of the study they would receive the remainder of their \$0.25 bonus (not spent during the task) and that they would enter into a drawing to receive one of the products they chose. In this way, product choices and the associated prices were consequential to participants. We then presented participants with four product categories (water bottle, hand sanitizer, coffee beans and chocolate bar), in a table showing a side-by-side comparison between Brand A and Brand B in terms of four attributes: one ethical attribute, two extraneous attributes and a nominal price. The two brands only differed in terms of the ethical attribute and price, such that the ethical brand was always twice as expensive as the conventional brand. We randomized whether Brand A or Brand B contained the ethical attribute for each product. Participants chose one brand to purchase for each product category (1 = ethical choice, 0 = conventional choice). These scores were summed to create an index of ethical choice (range: 0 – 4). We included a single-item check to ensure participants were conscious of their choices: When you were choosing products in the shopping task, to what extent did you choose conventional vs. ethical brands? 1 = primarily conventional brands, 11 = primarily ethical brands). This item strongly correlated with the ethical choice index ($r = .84, p < .001$), validating the product-choice task.

TABLE 3 – Hierarchical linear regression results

Study 1 (DV = Ethical choice index)			Study 2 (DV = Search effort index)		
Predictor	β	p	Predictor	B	P
Step 1			Step 1		
Implicit ethical consumerism*	0.23	<.001	Implicit ethical consumerism*	0.13	.008
Step 2			Step 2		
Implicit ethical consumerism*	0.17	.003	Implicit ethical consumerism*	0.12	.02
Implicit neutral consumerism	0.10	.08	Set	-0.07	.18
			Type	0.03	.54
			Social desirability	0.07	.15
Step 3			Step 3		
Implicit ethical consumerism*	0.17	.004	Implicit ethical consumerism*	0.10	.05
Implicit neutral consumerism	0.10	.08	Set	-0.07	.17
Set	0.07	.16	Type	0.04	.45
Type			0.02	.67	.25
Social desirability	-0.01	.79	Explicit ethical attitudes	0.09	.09
Step 4					
Implicit ethical consumerism*	0.11	.03			
Implicit neutral consumerism	0.05	.32			
Set	0.04	.35			
Type	0.06	.19			
Social desirability	-0.05	.27			
Explicit ethical attitudes*	0.50	<.001			
Study 3 (DV = Ethical Choice Index)			Study 3 (DV = Search Effort Index)		
Predictor	β	p	Predictor	β	P
Step 1			Step 1		
Implicit ethical consumerism*	0.20	<.001	Implicit ethical consumerism*	0.17	.006
Step 2			Step 2		
Implicit ethical consumerism*	0.20	.001	Implicit ethical consumerism*	0.17	.006
Set	0.01	.89	Set	-0.05	.41
Type	0.02	.73	Type*	0.13	.04
Social desirability	0.09	.15	Social desirability*	-0.12	.04
Step 3			Step 3		
Implicit ethical consumerism*	0.12	.03	Implicit ethical consumerism*	0.15	.01
Set	-0.03	.60	Set	-0.06	.35
Type	-0.01	.82	Type*	0.12	.05
Social desirability	0.04	.49	Social desirability*	-0.13	.03
Explicit ethical attitudes*	0.43	<.001	Explicit ethical attitudes	0.08	.19

Notes: * $p < .05$; Implicit Ethical Consumerism highlighted in grey for emphasis; β = standardized regression coefficient.

Results/Discussion

The analysis consisted of a hierarchical linear regression, treating the ethical choice index as the dependent variable (see Table 3, top left panel). Step 1 included only implicit ethical consumerism as a predictor and results support its predictive validity via a positive significant effect ($\beta = .23, p < .001$). At step 2, we added implicit *neutral* consumerism ($\beta = .11, p = .08$) and implicit ethical consumerism remained significant ($\beta = .18, p = .003$). At step 3, we added two method factors (set and type) pertaining to the randomization of Chinese pictographs (both $p > .15$) as well as social desirability ($p = .79$) and implicit ethical consumerism's effect remained ($\beta = .17, p = .004$). Lastly, at step 4, we added explicit ethical attitudes ($\beta = .50, p < .001$) and the implicit measure's effect remained significant ($\beta = .11, p = .03$).

Results suggest that our implicit measure predicts ethical choices in a consequential choice task and that this effect is robust to method factors and socially desirable responding. Moreover, our implicit measure explained additional unique variance beyond effects of explicit attitudes. This reinforces our theorizing around the attitude-behavior gap, showing that explicit attitudes only partially explain ethical consumption and that an implicit measure may provide additional predictive power when administered alongside an explicit scale. One limitation was the hypothetical nature of the product-choice task (i.e., the prices paid were nominal deductions from a bonus). Study 2 was designed to address this by including a more behavioral measure of ethical consumption. In addition, Study 2 tests our measure's cross-cultural robustness among Italian consumers.

Study 2

Pretest

We repeated the pretest procedure from Study 1 among Italian consumers, translated into Italian and using eight ethical labels found in Italy. As before, the five labels rated most ethical and familiar were retained for the main study.

Method

This study implemented a survey (translated into Italian) containing two seemingly unrelated parts, similar to Study 1. Part 1 was again described as a symbol-rating task and included our modified AMP, the explicit ethical attitudes scale ($\alpha = .87$) and the Social Desirability Scale ($\alpha = .46$) in randomized order. Part 2 was described as a product-search task in which participants imagined themselves considering options of a European food delivery service, Just Eat. They were told that six service options would be displayed, one at a time, ordered least to most environmentally friendly. For each option, participants chose whether to continue learning about subsequent options or to select the current option and end the search. Because participants knew that the latter options were more ethical, their search effort (operationalized as the number of times they chose to continue searching, ranging from 0 – 5) represented a behavioral measure of ethical consumption. Search effort was especially consequential in this context because Prolific participants are motivated to complete each study as quickly as possible. Participants were not asked to make a final service selection but rather were debriefed that the task was assessing search effort upon its completion.

Results/Discussion

The analysis consisted of a hierarchical linear regression treating search effort as the dependent variable. Validating our measure, implicit ethical consumerism had a positive significant effect at each step of the model (p 's < .05; see top right panel of Table 3 for details). At the final step, we added the explicit ethical attitudes scale which had a marginally significant effect ($\beta = .09$, $p = .09$), whereas our implicit measure remained significant ($\beta = .10$, $p = .049$). Results therefore replicate the predictive validity of implicit ethical consumerism on a consequential measure of ethical consumption behavior, in a different cultural context.

Study 3

Pretest

We repeated the pretest procedure among British consumers, using 20 ethical labels found in the UK. As before, the five labels rated most ethical and familiar were retained for the main study.

Method

Study 3 followed the procedure of our prior studies with two notable exceptions. First, to ensure that completing our modified AMP did not bias participants' responses to subsequent dependent variables, we used a time-separated design. Second, for robustness, we included both the product-choice task from Study 1 (with US dollars converted into British pounds) and the product-search task from Study 2 (translated into

English). Thus, Part 1 of the study was again described as a symbol-rating task and included our modified AMP, the explicit ethical attitudes scale ($\alpha = .93$) and the Social Desirability Scale ($\alpha = .67$). An attention check, language proficiency question and demographics were also included. Ten days after completing Part 1, participants who passed the attention check and did not indicate Chinese proficiency were re-contacted to participate in Part 2, which included the two tasks containing the two dependent variables (i.e., an ethical choice index as in Study 1 and a search effort index as in Study 2) and a second attention check. Regarding the product-choice task, a check item was included as in Study 1 and the item strongly correlated with the ethical choice index ($r = .89, p < .001$).

Results/Discussion

The analysis consisted of two separate hierarchical linear regressions, one for each dependent variable (ethical choice and search effort). At each step of both models, implicit ethical consumerism had a positive significant effect (p 's $< .05$; see bottom panels of Table 3 for details). At the final step of the ethical choice model, the effect of our implicit measure remained significant ($\beta = .12, p = .03$) though explicit ethical attitudes' effect was stronger ($\beta = .43, p < .001$). This closely replicates Study 1 results. Similarly, at the final step of the search effort model, our implicit measure had a strong, significant effect ($\beta = .15, p = .01$) whereas the explicit measure was null ($\beta = .08, p = .19$). This replicates Study 2 results.

General discussion

Consumers tend to overreport ethical product attitudes, complicating marketers' efforts to incorporate social responsibility into their products. Although the literature has offered several explanations, this attitude-behavior gap persists. The current research, informed by literatures in ethical consumption and attitude formation, addresses this issue from a measurement perspective. Through adapting an existing AMP paradigm, our research offers a novel measurement tool aimed at capturing *implicit* ethical consumerism which has otherwise evaded practitioners and researchers. Findings show that our measure is cross-culturally robust and predicts ethical consumption behavior beyond the effects of explicit ethical attitudes.

Theoretical contributions

Our research illuminates the theoretical nature of the ethical attitude-behavior gap. The literature primarily focuses on explaining obstacles to ethical consumption behavior (e.g., Belk *et al.*, 2005), with only a minority critically examining explicit attitudinal measures in this context (e.g., Carrington *et al.*, 2014). Our work builds on this foundation by showing that ethical consumption may be better explained by a combination of explicit and implicit ethical attitudes, rather than predominately one or the other. Adding nuance, findings reliably show that our implicit measure's predictive role is secondary to explicit attitudes for certain ethical behaviors (e.g., product choice), while primary for others (e.g., search effort). This suggests that theories of ethical consumption should differentiate between types of ethical behavior when attempting to explain its psychological causes. Specifically, more subtle ethical consumption behaviors, such as information search, may have a more pronounced implicit basis relative to more deliberative ethical behaviors, such as product choice.

Similarly, our research contributes to theories of attitudes by showing interrelationships between implicit and explicit attitudes. Our findings show that both implicit and explicit measures may predict an expected outcome, albeit to different degrees. This extends predominant models of attitudes that typically focus on differentiating implicit from explicit effects. However, consistent other domains of socially acceptable behavior (e.g., alcohol consumption; Dovidio *et al.*, 2001), we demonstrate an area in which the implicit–explicit combination is more predictive of behavior than either attitude type alone. Moreover, follow-up analyses showed weak, positive implicit–explicit correlations ($r = .18, .19$ and $.18$ in Study 1, 2 and 3, respectively; all p 's $< .01$). The significant correlations support the concurrent validity of our implicit

measure, yet the effect sizes are weaker than implicit–explicit correlations in most other domains (Nosek, 2007). These weak correlations challenge existing assumptions and suggest the need for a more comprehensive theoretical framework of implicit versus explicit attitudes leading to ethical consumption (Dimofte, 2010).

Practical implications

Our findings suggest that practitioners should cautiously interpret market research that solely relies on explicit measures of ethical consumerism. Our research provides a simple, practitioner-friendly implicit measurement tool (along with a guiding framework for adapting it internationally) that may be implemented alongside explicit measures. Our work therefore provides a more precise metric for identifying ethically-minded consumer segments, answering calls for the further development of implicit consumer metrics (Dimofte, 2010). Likewise, our implicit measure reduces the inaccuracies in demand forecasting for ethical products caused by the attitude-behavior gap (Devinney et al., 2010), adding to the predictive toolkit of marketers.

Limitations and future directions

One limitation of this research is that our studies were not conducted in a field setting. Although the measures of ethical consumption behavior were consequential, participants were aware that they were participating in a research study. Future research should validate the effects of implicit ethical consumerism in a more ecologically valid setting. Another notable limitation is that we relied on Chinese pictographs to represent ambiguous imagery. While this was informed by extant AMP research (Payne et al., 2005). It limits generalizability and precludes the measure's use among sinophonic consumers. Future research should seek to test our measure's effectiveness while using an alternative set of ambiguous symbols, such as inkblots. Lastly, while our studies showed consistent results across three cultural contexts, all are considered Western cultures. Future research should attempt to replicate our implicit measure's effects across broader cultural differences. For instance, in cultures where ethical consumption is not as socially desirable, implicit and explicit measures may intercorrelate more highly and predict ethical consumption to similar degrees.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Understanding the impact of technology interaction on dysfunctional consumer behavior

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Abstract. This study investigates how interactions with AI agents influence consumers' propensity for unethical behavior, addressing a gap in research on AI's role in ethical decision-making. Through two experimental studies, we examine whether AI interactions reduce perceptions of social judgment, thereby increasing consumer misconduct. Study 1 tested an online compensation request scenario, showing that AI-driven interactions lower moral scrutiny, leading to more unethical behaviors, with social judgment fully mediating this effect. Study 2 replicated these findings in an airline compensation request context with an increased monetary incentive, further confirming that AI interactions diminish accountability cues, fostering moral disengagement. Our research contributes to the literature on AI-mediated consumer behavior by integrating social judgment and moral disengagement theories, demonstrating that AI's depersonalized nature can weaken ethical decision-making. By advancing discussions on AI ethics and consumer decision-making, this study sheds light on the unintended consequences of AI-driven service environments.

Keywords : unethical behavior; artificial intelligence; social judgment; entitlement.

Introduction

Extensive literature addresses undesirable customer behavior, commonly referred to as dysfunctional customer behavior, often characterized as immoral, unethical, dishonest, or aberrant (Campbell & Winterich, 2018). Such behavior can range from minor transgressions, such as lying, to more serious offenses, including abusive communication and theft. Typically, such behavior has adverse effects on companies, resulting in financial losses, causing physical and psychological repercussions for frontline employees (Reynolds & Harris, 2009). As a psychological and social phenomenon with significant economic implications, there has been considerable effort to understand the drivers, psychological triggers, contexts, consequences and underlying processes. Specifically, these drivers encompass diverse factors, such as the pursuit of emotional gratification and the absence of moral constraints, characteristics of the servicescape, the nature of the customer-retailer relationship and psychographic variables (Li *et al.*, 2024; Reynolds & Harris, 2009). In the context of services and retail, many dysfunctional behaviors involve direct interaction between the company and the customer, occurring across online and offline environments, including smart

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retailing settings. However, studies assessing the impact of emerging technologies on consumers' dysfunctional behaviors remain scarce. Existing research suggests that interactions with artificial intelligence (AI) may increase the likelihood of consumers engaging in dysfunctional behavior due to the absence of selfish intentions (Garvey *et al.*, 2023), reduced feelings of guilt when interacting with a non-human agent (Giroux *et al.*, 2022; Kim *et al.*, 2023) and heightened moral disengagement (Lei *et al.*, 2024).

Our research aims to shed light on additional explanatory factors that could deepen our understanding of a heightened propensity to engage in unethical behaviors when interacting with AI, as opposed to human employees. Specifically, our model includes psychological entitlement and social judgment. Individuals who feel entitled perceive themselves as more deserving of positive outcomes than others (Campbell *et al.*, 2004). Such feelings of entitlement are also associated with expectations of receiving benefits and preferential treatment (Grubbs & Exline, 2016; Harvey & Martinko, 2009). Furthermore, technological entitlement has been found to predict computer abuse behaviors (Amo *et al.*, 2022). Similarly, when consumers are aware that they are interacting with AI agents, their perceptions of being socially judged diminish, which, in turn, increases the likelihood of engaging in unethical behavior (Li *et al.*, 2024).

In this study, we propose that interacting with an AI agent instead of a human agent elicits feelings of entitlement and reduces perceived social judgment, thereby increasing the acceptability of unethical behavior. This research contributes to existing theory by comparing interactions with an AI chatbot versus human assistance via chat. While much of the existing literature attributes differences in consumer behavior to varying levels of technology anthropomorphism (e.g., Kim *et al.*, 2023; Lei *et al.*, 2024), we explore alternative explanatory mechanisms to better understand what drives consumers to adopt unethical behavior in the context of smart services and retail technologies. Our findings hold relevance not only for scholars in marketing/psychology but also for retailers and service providers seeking to mitigate unethical consumer responses, and policymakers interested in the potential societal consequences of AI-mediated interactions.

Literature review

Overall, the literature suggests that humans tend to exhibit more dysfunctional and unethical behaviors when interacting with artificial intelligence compared to interactions with human beings (e.g., Dootson *et al.*, 2023). Potential explanations for this phenomenon include a reduced sense of guilt (Kim *et al.*, 2023; Giroux *et al.*, 2022) and moral disengagement that emerges from interacting with agents not perceived as humans (Lei *et al.*, 2024). Although individuals may attribute some level of mind or agency to non-human entities such as AI agents and robots, this level is commonly perceived to be significantly lower than that of human cognition (Pitardi *et al.*, 2022). Based on this, we posit that in situations where individuals interact with a chatbot rather than a human employee, consumers will be more inclined to adopt unethical behaviors toward the AI agent. Accordingly, we hypothesize:

H1: *Interaction with an AI agent (vs. a human employee) will enhance consumer intentions to engage in unethical behavior.*

Ethical judgment refers to the extent to which a behavior or situation is considered morally acceptable (Reidenbach & Robin, 1990). Ethical judgments are susceptible to biases, influenced by contextual factors and can significantly affect consumer responses (Moraes *et al.*, 2020). Humans tend to be naturally concerned about being judged by others, whereas AI agents are typically perceived as having a reduced capacity to evaluate what is socially or ethically appropriate (Kim *et al.*, 2022). Possible explanations for this perception include the assumption that AI lacks the ability to form deliberate judgments (Li *et al.*, 2024), or that interactions with AI, as opposed to human third parties, evoke fewer moral concerns (Giroux *et al.*, 2022). Drawing from this prior literature, we propose that in customer service interactions, consumers are more likely to attribute social judgment to situations involving frontline employees than those involving technology, such as chatbots or AI agents. Therefore, we suggest that:

H2: *Perceptions of social judgment mediate the relationship between interaction with an AI agent and consumer intentions to engage in unethical behavior.*

Another potential explanatory mechanism for the impact of AI on consumer unethical behavior is psychological entitlement. Psychological entitlement refers to a general belief that individuals deserve more credit and are more entitled to positive outcomes than others (Campbell *et al.*, 2004; Fisk & Neville, 2011). Entitled individuals are more likely to disregard rules or instructions (Zitek & Jordan, 2017). Moreover, those with higher levels of entitlement tend to believe they deserve valuable resources, preferential rewards and privileged treatment, often without regard to their actual performance or merit relative to others (Grubbs & Exline, 2016; Harvey & Martinko, 2009).

Importantly, feelings of entitlement can also arise in interactions with technology. For instance, technological entitlement has been shown to predict computer abuse behavior (Amo *et al.* 2022). Previous research further suggests that deviant and unethical behaviors are more likely to occur when individuals perceive themselves to be in positions of power (Dubois *et al.*, 2015), interacting with AI agents may enhance consumers' perceived power and sense of entitlement, as the non-human nature of the interaction can shift perceived relational dynamics. Based on this rationale, we suggest that consumers interacting with AI are more likely to feel entitled to greater compensation and preferential treatment than those interacting with human employees. Hence, we suggest the following hypothesis:

H3: *Feelings of entitlement mediate the relationship between interaction with an AI agent and consumer intentions to engage in unethical behavior.*

Methodology

Study 1

RESEARCH DESIGN AND SAMPLE – A single-factor between-subjects design was used to test the hypotheses. Participants were randomly assigned to one of two conditions: in the first, they read a scenario in which a consumer (Sam) requested compensation from a human employee; in the second, Sam interacted with an AI chatbot for the same purpose. The scenario was set in a service context where an airline had lost Sam's suitcase. Sam sought compensation via the company's website. The estimated value of the lost possessions was approximately 500 Euros, but the airline allowed reimbursement requests of up to 1,000 Euros. Since the request process was self-reported, no proof of the actual loss amount was required. After being assigned to one of the two conditions, participants were asked how much compensation they believed Sam should request from the airline. This third-person technique, based on previous research, allows respondents to project their attitudes onto a third party to explain that person's behavior (Dootson *et al.*, 2022). Additionally, a similar question was included to assess how much compensation participants themselves would request in the same situation. To evaluate the acceptability of unethical behavior, participants were also asked whether they believed overstating the compensation request was justified (Schafers *et al.*, 2016). The research design included two control variables: AI Avoidance (Whenever possible avoid using Artificial Intelligence technologies) and AI familiarity (I am used to interacting with Artificial Intelligence technologies such as ChatBots). Demographic information was also collected. Data were gathered using an online panel (Prolific), where participants received a small financial compensation for their participation. Screening variables included language proficiency (English) and location (UK).

RESULTS - A total of 94 valid responses were collected ($M_{age} = 43$ years old, 50% female). Participants reported being familiar with using AI agents in consumption situations ($M = 4.49$, $SD = 1.73$). They also reported a moderated tendency to avoid AI ($M = 4.06$, $SD = 2.06$); however, neither AI avoidance ($t = .186$, $p = .852$) nor familiarity ($t = -.235$, $p = .814$) were significant covariates in the model. The manipulation check confirmed that the experimental conditions worked as intended ($t = -10.403$, $p = .001$). Participants

in the human interaction condition perceived that they were being assisted by a person ($M = 3.18$, $SD = 2.32$), while those in the AI interaction condition reported being assisted by an AI agent ($M = 6.84$, $SD = .48$). The main effect was significant ($t = -2.060$, $p = .042$), indicating that respondents believed Sam should request a higher compensation amount when interacting with an AI chatbot ($M = 807.49$, $SD = 197.57$) compared to when assisted by a human employee ($M = 726.14$, $SD = 185.26$). The acceptance of unethical behavior was marginally significant ($t = -1.69$, $p = 0.097$), with lower acceptance in the human condition ($M = 3.67$, $SD = 2.38$) compared to the AI condition ($M = 4.51$, $SD = 2.44$).

Study 2

RESEARCH DESIGN AND SAMPLE - Study 2 aimed to examine the potential explanatory mechanisms underlying consumers' increased propensity for unethical behavior when interacting with an AI agent compared to a human employee. A single-factor, between-subjects experimental design was employed. The manipulation closely followed that of Study 1, with minor textual adjustments. As in the previous study, the scenario involved an airline losing Sam's luggage, prompting the customer to request financial compensation online, either through an AI agent or a human employee. One notable change was an increase in the maximum compensation amount from 1,000 to 1,500 Euros. Additionally, we introduced the following measures: a 3-item scale to assess social judgment (Li *et al.*, 2024) and a 9-item scale to measure psychological entitlement (Campbel *et al.*, 2004). Furthermore, we included a 3-item scale to evaluate perceptions of accountability (Mero *et al.*, 2012) and a 4-item scale to assess dehumanization (Alnuaimi *et al.*, 2010) as control variables. Data collection was conducted via Prolific, using the same screening criteria and financial compensation as in Study 1.

RESULTS - The sample encompassed 178 respondents ($M_{age} = 42$ years old, 49% female). Participants reported being familiar with AI agents in consumption situations ($M = 4.76$, $SD = 1.70$) while exhibiting moderate levels of AI avoidance ($M = 3.87$, $SD = 1.92$). Control variables, including AI familiarity ($t = -.88$, $p = .378$), AI avoidance ($t = -.821$, $p = .413$) and perceptions of accountability ($t = .879$, $p = .380$), were not significant. However, there was a significant difference in perceptions of dehumanization across conditions ($t = -10.68$, $p = .001$), leading us to include it as a covariate in further analyses. The manipulation was significant ($t = -19.979$, $p = .001$), with participants in the human employee condition perceiving they would be assisted by a person ($M = 1.93$, $SD = 1.48$), while participants in the technology condition reported being assisted by an AI agent ($M = 6.31$, $SD = 1.45$). The main effect was not significant when considering how much money Sam would ask ($t = .028$, $p = .868$), nor when participants considered themselves in the situation ($t = .066$, $p = .797$). When analyzing the average compensation amount participants reported, the results suggest that lower levels of reimbursement would be associated with the human condition ($M_{Sam} = 933.56$, $SD = 333.50$; $M_{me} = 690.78$, $SD = 293.19$) compared to higher levels of compensation reported in the AI scenario ($M_{Sam} = 983.30$, $SD = 344.76$; $M_{me} = 759.02$, $SD = 365.94$). Nonetheless, these results were not statistically different.

To test the mediation, we used Model 6 of Process Macro in SPSS. The dependent variable was the amount of compensation participants would request from the airline and the sequential mediation included perceptions of social judgment and unethical behavior acceptability. Path *a* was significant ($\alpha = -.211$, $t = -2.140$, $p = .034$), as was path *b* ($\alpha = -.281$, $t = -3.585$, $p = .001$). The direct effect was not significant ($\alpha = -.24.115$, $t = -.483$, $p = .629$), but the indirect effect confirmed a full mediation of social judgment and unethical behavior acceptance ($\alpha = .070$, $LLCI = .008$, $ULCI = .156$). In other words, when interacting with an AI agent, consumers experience a reduced sense of social judgment, which increases acceptability and intentions to adopt unethical behavior compared to an interaction with a human employee.

The second mediation analysis followed the same model; however, instead of social judgement, the sequential mediation began with feelings of entitlement. Path *a* was not significant ($\alpha = .092$, $t = 1.590$, $p =$

.114). Path b was significant ($\alpha = .393, t = 2.911, p = .004$). Both the direct effect ($\alpha = -6.446, t = -.129, p = .897$) and the indirect effect ($\alpha = .037, LLCI = -.017, ULCI = .111$) were not significant. Therefore, the mediation of entitlement was not supported.

Conclusions and discussion

Our study contributes to the growing body of literature on dysfunctional consumer behavior by highlighting how interactions with AI agents influence consumers propensity for unethical actions. While previous research has primarily focused on consumer behavior in traditional human interactions or on the effects of overt versus undisclosed IA identity, our findings provide empirical support for the notion that AI interactions may exacerbate dysfunctional tendencies. Specifically, we extend existing theories on entitlement and social judgment by demonstrating how AI-driven interactions create an environment where consumers feel more justified in engaging in unethical behaviors. In doing so, we offer a nuanced perspective on how the depersonalized nature of AI agents shapes consumer psychology and decision-making.

One of our key contributions lies in demonstrating how AI interactions diminish social judgment cues, thereby increasing consumers' willingness to engage in unethical behavior. Prior research suggests that AI reduces anticipatory guilt, which promotes unethical consumer behavior (Kim *et al.*, 2023). Similarly, the lack of perceived human observation or judgment when interacting with AI agents lowers consumers' internal moral restraints, making unethical behaviors feel less consequential (Giroux *et al.*, 2022). Our study builds upon these findings by incorporating social judgment theory, as proposed by Li *et al.* (2024), suggesting that AI interactions play a critical role in consumers' ethical decision-making. When consumers perceive reduced scrutiny in AI interactions, their likelihood of engaging in deceptive or dishonest behavior increases, underscoring the ethical challenges posed by AI implementation in commercial settings.

Moreover, we contribute to ongoing discussions on the role of AI agents and their boundary conditions in shaping consumer morality (Lei *et al.*, 2024). Our findings suggest that AI engagement disrupts traditional consumer norms by creating environments in which social accountability is diminished. Unlike human service representatives, who provide cues for ethical behavior, AI agents lack the moral presence necessary to deter consumer misconduct. This insight highlights the need for businesses to consider how different AI implementations influence consumer behavior and ethical responsibility.

Additionally, we contribute to research on psychological entitlement in AI-driven environments. Contrary to prior literature suggesting that interactions with AI agents trigger heightened feelings of entitlement, our findings indicate that entitlement does not necessarily lead to a greater likelihood of unethical behavior. This result challenges existing research indicating that entitled individuals are more likely to justify selfish actions (Campbell *et al.*, 2004) or that technological entitlement predicts abusive digital behavior (Amo *et al.*, 2022). If entitlement is not the explanatory mechanism driving consumer misconduct in AI interactions, further research is needed to identify the underlying variables influencing this complex phenomenon.

Beyond theoretical advancements, our study has practical implications for retailers, policymakers and AI developers. Retailers leveraging AI-powered customer service tools must recognize the potential for increased unethical behavior and design systems that mitigate this risk. Strategies such as incorporating subtle humanizing elements into AI agents, enhancing transparency about monitoring mechanisms, or implementing behavior deterrents could help curb consumer misconduct. Policymakers may also use these findings to advocate for guidelines that ensure AI implementations do not inadvertently encourage dishonest or harmful behaviors. By addressing these concerns, organizations can create AI-driven service environments that balance efficiency with ethical considerations.

In sum, our research broadens the theoretical discourse on AI and consumer ethics by shifting the focus from technology anthropomorphism to psychological entitlement, moral disengagement and social judgment as explanatory variables. By integrating these mechanisms into discussions of AI-mediated consumer interactions, we provide a more comprehensive understanding of the ethical challenges emerging in smart retail and AI-driven services. Considering the theoretical and methodological limitations of this research, we suggest that future studies employ more diverse datasets, particularly in terms of AI familiarity and cultural background, as these factors may influence consumers' propensity to adopt dysfunctional behavior. Furthermore, future research could incorporate additional control variables, such as moral identity or perceptions of warmth and competence associated with AI agents. Finally, future studies should examine boundary conditions that help explain the nuances of AI's impact on consumer unethical behavior. Variables such as power perceptions (high vs. low) or the type of touchpoint (face-to-face vs. online) could influence how consumers respond to AI and human interactions. Additionally, future research should explore how different AI design features, such as transparency regarding AI agency, influence consumer morality, ultimately informing the responsible deployment of AI in commercial settings.

Acknowledgments

This work was supported by national funds through FCT (Fundação para a Ciência e a Tecnologia), under the project UIDB/04152/2020 (DOI: 10.54499/UIDB/04152/2020) - Centro de Investigação em Gestão de Informação (MagIC)/NOVA IMS.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

Mitigating cognitive overload through aesthetic visual design

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Abstract. While businesses are under pressure to provide comprehensive and transparent information to meet growing societal demands, this overabundance of information can paradoxically result in decision difficulty and dissatisfaction among users due to cognitive overload. This paper investigates how visual aesthetic information design can reduce such negative effects on user behavior. Two experimental studies were conducted, systematically manipulating both the amount of product information and its visual presentation. The first study focused on manufacturer-provided information, whereas the second examined third-party information such as user reviews and Q&A sections. The results indicate that an aesthetically designed presentation significantly leads to lower decision difficulty, higher decision satisfaction and reduced switching likelihood. By integrating principles of aesthetic design into information presentation, this research enhances the understanding in information systems of user cognition and behavior and offers practical implications for improving user experience in digital marketplaces.

Keywords : cognitive overload; visual design; user behavior; information processing; web stores

Introduction

As the world transforms into an increasingly complex digital landscape, marketplaces are facing growing pressures in several areas, including sustainability, inclusion and data security (Burton-Jones *et al.*, 2021). Societal shifts and a growing public consciousness about environmental, social and ethical issues, have profoundly influenced user behavior (Kraus *et al.*, 2022). Furthermore, the growth of digital technologies has provided access to vast amounts of information, enabling users to be more informed and discerning in their behavior and especially in purchase decisions (Chernev *et al.*, 2015; Diaz-Andrade & Techatassanasoontorn, 2021). As a result, users have developed a greater societal awareness, leading to a surge in demand for businesses to provide detailed information about their offerings (Broniarczyk & Griffin, 2014). Consequently, businesses are now obliged to provide comprehensive information to ensure that their products and services align with the values and demands of diverse user groups (Hu & Krishen, 2019). However, the sheer volume of information available to users has led to the problem of cognitive overload, which can have a negative impact on user behavior and decision-making processes. The overabundance of information and choices could create a paradox in which users feel more confused and dissatisfied despite the increased availability of options (Bown *et al.*, 2003; Oppewal & Koelemeijer, 2005). The human brain only has limited cognitive capacity and being confronted with excessive information might overwhelm users,

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making it difficult for them to process and retain details. This overload ultimately impairs their decision-making ability (Hu *et al.*, 2017). To effectively address the challenges of cognitive overload, businesses need to develop and implement effective communication strategies for their marketplaces that provide users with relevant, accurate and easily digestible information. To achieve this, businesses should prioritize clarity and brevity in their communication design to avoid overwhelming users with excessive detail. Therefore, we argue that information should be presented in a well-structured, visually appealing and easily understandable format, making it more accessible and digestible for users (Reber *et al.*, 2004; Wang *et al.*, 2010; Schloss & Palmer, 2011). By doing so, businesses might prevent the negative effects associated with cognitive overload and empower users to make better-informed decisions.

To address this assumption, we conducted two studies in which we systematically manipulated the complexity of product information and its visual presentation in a marketplace environment, aiming to mitigate the effects of cognitive overload on users' decision process. The first study focused on information provided by manufacturers. In contrast, the second study examined information from third-party sources, such as user reviews and question-and-answer (Q&A) sections. The objective of the differentiating between these information types was to explore whether the type of information also influences its relevance to users and how it impacts their decision-making processes regarding cognitive overload.

Therefore, we combine and adapt the framework of the Cognitive Limitation Theory (Miller, 1956) and the Processing Fluency Theory of Aesthetic Pleasure (Reber *et al.*, 2004) to the context of marketplaces, focusing on user-related outcome variables. More specifically, we extend the findings of previous research by examining 1) how the amount of product information affects users perceived cognitive overload and therefore decision difficulty, decision satisfaction, as well as switching likelihood. Furthermore, we 2) analyze how these effects can be positively influenced by visual aesthetic information design. Finally, we 3) aimed to determine whether the effects of cognitive overload vary between different types of information (manufacturer vs. third-party information).

Methodology

Our research investigates to what extent visual design principles (particularly layout, typography and color) can positively influence the perception and processing of information. Rather than focusing solely on limiting information, we emphasize the importance of strategically presenting information in an aesthetic way that facilitates users' understanding and behavior. Therefore, our research aims to extend cognitive limitation theory. Miller's (1956) cognitive limitation theory suggests that there is a natural limit to how much information the human brain can process. On average, an individual can hold and manipulate approximately seven (± 2) pieces of information in short-term memory at one time. Miller's (1956) findings underscore the challenges faced by users in today's information-rich environment. The abundance of options and information can result in perceived cognitive overload, which in turn leads to decision-making difficulties, reduced satisfaction and an increased likelihood of switching to another provider.

This theory sheds light on the cognitive constraints that influence user's behavior and underscore the importance of taking these constraints into account when developing business strategies and communication techniques. For example, Jacoby *et al.*, (1974) as well as Malhotra (1982) already established the link between cognitive overload and its dysfunctional effects on users' decision making. Here, decisions can be seen as actions, such as making a purchase, consciously storing information, making recommendations, or deliberately ignoring information (Keller & Staelin, 1987; Iyengar & Lepper, 2000). It was found that users tend to simplify their information processing strategies when the number of choice alternatives exceeds a certain limit. Interestingly, the effects of cognitive overload were consistent whether users were presented with 10 to 25 alternatives or 15 to 25 attributes.

Furthermore, Kahn & Lehmann (1991) show that users were unable to filter out irrelevant information. The phenomenon of users relying on irrelevant information in their decision making was also explored by Lurie (2004), Hu *et al.* (2017) as well as Jabr & Rahman (2022). Those studies demonstrated that even the exposure to clearly irrelevant information significantly harms user behavior. However, research does not fully agree on whether the size and variety of choices is always rejected by users especially in the context of marketplaces. There are also some studies that argue for an abundance of information. For example, Bown *et al.* (2003) demonstrate the tempting nature of choice, showing that individuals often gravitate towards retailers with more options and product variations.

The results suggest that individuals view a greater number of choices as inherently valuable, leading them to prefer larger assortments. This preference for choice persists despite the possibility of cognitive overload and its potential negative consequences for user behavior, decision quality and satisfaction. Furthermore, research shows that individuals typically find larger assortments more appealing (Borle *et al.*, 2005; Oppewal & Koelemeijer, 2005). They suggest that the positive effects of a larger assortment on evaluation are enhanced when the assortment is diverse and well-balanced, by offering a wide range of choices. However, the research also points out that larger assortments can lead to longer decision-making times. While some people generally prefer a wide range of products and variants in the pre-sales phase, it leads to cognitive overload in the shopping phase. Moreover, Berger *et al.*, (2007) and Gourville & Soman (2005) emphasize the idea that introducing finer distinctions within a product line positively influences perceptions of quality.

This research particularly highlights the ambiguity that can arise from cognitive overload in a shopping environment. Based on these contrary findings, there seems to be a lack of research on the phenomenon of cognitive overload especially in the context of marketplaces. Although the concept of 'reducing cognitive overload' is well documented (Malhotra 1982), it discusses the need to limit the amount or complexity of information to avoid overwhelming the user's cognitive system (Townsend & Kahn, 2013, Hu *et al.*, 2017, Jabr & Rahman, 2022). This approach mainly takes a defensive stance against potential cognitive overload, focusing on the quantity of information involved in decision-making processes.

Our approach, however, reframes this understanding. Rather than focusing solely on limiting information, we emphasize the importance of strategically presenting information in an aesthetic way that facilitates users' understanding and decision-making. To implement and empirically test this idea we manipulate the visual representation of information, drawing on Reber *et al.* (2004) processing fluency theory of aesthetic pleasure. According to this theory, users respond positively to visual aesthetic stimuli that are easier to process, with simplicity and clarity being key factors in the layout, typography and colors. Structured layouts consciously arrange information in a manner that aligns with typical cultural reading patterns, in Western contexts, this means structuring information to flow from left to right and top to bottom.

This organization allows users to segment the visual field into manageable chunks, enabling faster and more consistent information processing (Wang *et al.*, 2011). Sans-serif fonts, with their clean and unornamented design, are easier and quicker to read than heavily stylized or intricate fonts. Complex typefaces require additional cognitive effort to decipher individual letters before forming words, which slows down the reading process. In contrast, sans-serif fonts facilitate clearer recognition and faster comprehension, enhancing the overall readability (McCarthy & Mothersbaugh, 2002). Furthermore, colors serve as crucial visual indicators that guide attention within a design. Depending on their contrast with the surrounding elements, colors can emphasize areas of information. This effect allows the eye to orient more quickly and efficiently, supporting faster recognition and understanding of details. (Schloss & Palmer, 2011). While Reber *et al.* (2004) comprehensively explored the concept of aesthetic pleasure, they did not further examine how consumer-related variables, such as decision difficulty, decision satisfaction and switching likelihood in a marketplace scenario, might also be positively impacted. To address these gaps, our model empirically investigates this connection, as proposed in the following framework (Figure 1) for both studies.

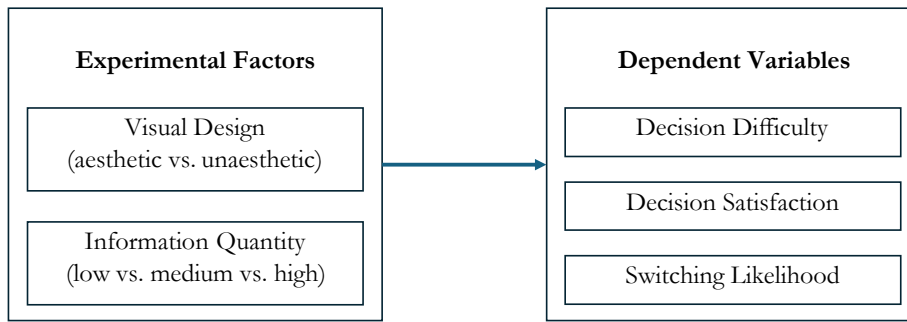


FIGURE 1 – Research model

Hypothesis development

Our research aims to explore how information quantity and visual aesthetic design influence users' decision-making in the context of marketplaces. An excess of information can overwhelm users, causing confusion, decision difficulties and a tendency to switch providers (Sweller, 2003). Decision difficulty, particularly evident when users are faced with numerous options or complex features, can deter user behavior and erode brand loyalty (Hanselmann & Tanner, 2008). Furthermore, the literature indicates that an abundance of choices or complex features can lead to cognitive overload, reducing motivation and enhancing decision difficulty (Iyengar & Lepper, 2000; Sela & Berger, 2011). Yet, the visual design quality might reduce these effects. A visually aesthetic design simplifies information processing by reducing perceived complexity, thereby facilitating decision-making even when dealing with extensive information (Townsend & Kahn, 2013; Huang *et al.*, 2023). Previous studies also confirm that aesthetic design positively affects users' perceptions, preferences and evaluations of products and brands (Janiszewski & Meyvis, 2001; Hagtvædt & Patrick, 2008). Therefore, we assume:

H1a: *An increase in information quantity leads to an increase of users' decision difficulty.*

H1b: *A visual aesthetic design leads to a decrease of users' decision difficulty.*

Decision satisfaction refers to the level of happiness and fulfillment an individual feels after deciding (Heitmann *et al.*, 2007; He & Bond, 2013). Understanding and improving decision satisfaction is crucial for business as it significantly influences users' behavior, brand loyalty and word-of-mouth recommendations. Previous research suggests that increasing the amount of information can reduce decision satisfaction due to cognitive overload, resulting in confusion or decision paralysis. For example, studies by Reibstein & Fromkin (1975) and Bettman & Kakkar (1977) highlight the delicate balance between providing sufficient choice and overwhelming users, suggesting that optimal decision satisfaction lies in managing the complexity of the information presented. However, Boatwright & Nunes (2001) and Hu *et al.* (2017) provide insights into this problem by focusing on preferred product attributes and enhancing preference fluency, leading to faster and more satisfying decisions.

Based on these findings, we postulate that a visual aesthetic design as proposed by Reber *et al.* (2004) could also potentially reduce the negative effects of high information quantity on decision satisfaction. Specifically, a visually pleasing design might enhance decision satisfaction even when presented with a large amount of information. This hypothesis is consistent with the findings of Townsend & Kahn (2013) and Huang *et al.* (2023), which collectively indicate that visual pleasing presentation methods enhance user perception. Therefore, we assume:

H2a: *An increase in information quantity leads to a decrease in users' decision satisfaction.*

H2b: *A visual aesthetic design leads to an increase in users' decision satisfaction.*

Cognitive overload arises when the quantity of information and choice exceeds what users can effectively process, influenced by the variety of options, complexity and personal experience. Hanselmann & Tanner (2008) highlight that such overload can decrease satisfaction and complicate decision-making, potentially prompting users to switch providers. Sela & Berger (2011) note that decision difficulty can lead to a fixation on minor decisions and a pursuit of more options, increasing the chance of users switching to find the best choice. Carmon *et al.* (2003) found that detailed option evaluation could create attachment, yet also post-choice regret, possibly causing users to switch in the future, Iyengar & Lepper (2000) indicate that too many options can reduce satisfaction, again possibly leading to switching the provider. Conversely, Townsend & Kahn (2013) suggest that while visual information can enhance appeal, it may also add to the overload, particularly with vast assortments. However, when considering the benefits of visual pleasing design (Janiszewski & Meyvis, 2001; Hagtvedt & Patrick, 2008), we assume that a well-designed visual presentation may reduce this likelihood of switching.

H3a: *An increase in information quantity leads to an increase in users' switching likelihood.*

H3b: *A visual aesthetic design leads to a decrease in users' switching likelihood.*

Research method

We conducted two different experimental studies, each designed to test our formulated hypotheses. The experiments were designed using a 2 x 3 between-subjects design with visual design (aesthetic vs. unaesthetic) and information quantity (low vs. medium vs. high). Both experiments explored a different type of information (manufacturer vs. third-party information) that could potentially induce a state of cognitive overload (Figure 2).

For the manipulation of the visual design, we drew on the findings of Reber *et al.* (2004), considering the structure of the layout, the typography and the color scheme implemented. In the unaesthetic setting, the information was presented in an unstructured layout, using a serif font and without the use of color. In contrast, in the aesthetic setting, we used a structured and organized layout (Wang *et al.*, 2011). Furthermore, we used a sans-serif font to facilitate readability (McCarthy & Mothersbaugh, 2002) and chose a congruent color scheme, following the guidance of Schloss & Palmer (2011) on color perception.

First, we conducted a preliminary pretest to validate the manipulation of aesthetic elements on a web store and to measure their impact on perceived aesthetic pleasure. The pretest involved four variations: 1) a completely unstructured variation with serif typography and no use of colors, 2) a structured version with clearly sorted information but still using serif typography and no colors, 3) a structured version with sans-serif typography but still without colors and 4) a structured version with sans-serif typography and the inclusion of colors. At each step, we observed a significant gradual increase in the perceived aesthetic pleasure of the web store. This pretest was designed to ensure that a stepwise integration of the three key elements (layout, typography and the use of color) effectively enhanced perceived aesthetics pleasure.

For the main study, we selected two distinct settings based on the insights from the pretest: An aesthetic setting, where all design principles identified in the pretest were implemented simultaneously. Furthermore, an unaesthetic setting, where none of these principles were applied, resulting in an unstructured design with serif typography and no use of colors. The rationale behind this approach was to maximize the contrast between the two settings, thereby amplifying the effect of aesthetic visual design, as we aimed to provoke a strong main effect on aesthetic pleasure, allowing for a clearer investigation of the influence on the dependent variables. Moreover, Chernev *et al.* (2015) emphasize the quantity of information as key determinant of cognitive overload. Their work highlights that the quantity of information as well as the abundance of external evaluations can contribute to cognitive overload. These elements are fundamental aspects of user decision making, particularly in digital shopping environments. In line with their findings, our experiments aim to explore these dimensions as potential triggers of cognitive overload.



FIGURE 2 – Impression of the second experimental design (example)

Therefore, in the first experimental study, we manipulate the type and amount of information provided by the manufacturer. Furthermore, in the second study we focus on third-party sources such as reviews and Q&A sections. To implement these manipulations, we worked with a professional design agency and modified a web store for T-shirts.

Web stores and products such as T-shirts are particularly well suited to the studies because of their inherent characteristics. First, users show ambivalent behavior regarding cognitive overload in the context of web stores, as analyzed by Borle *et al.* (2005), Oppewal & Koelemeijer (2005) and Berger *et al.*, (2007). For this reason, it is particularly interesting for our research to use such a setting. Secondly, web stores typically provide users with a wealth of information. From product details, reviews, images to personalized

suggestions, the amount of information available can be vast. This abundance reflects the diverse and enriched sources of information, which Broniarczyk & Griffin (2014) suggested could lead to cognitive overload. Consequently, manipulating the amount of information in an online shopping environment may provide practical insights into strategies to prevent cognitive overload.

Furthermore, the choice of a T-shirt as the product of interest also serves a crucial purpose. T-shirts are ubiquitous and familiar to most users, implying a lower need for technical or specialized knowledge in decision making. However, they also come with a multitude of variables such as sizes, colors, designs, fabric types, brands, price points and others that could contribute to cognitive overload. Thus, by using a web store and a T-shirt as the product, both studies ensure a realistic, relatable and rich context for examining the dynamics of cognitive overload and how it can be effectively managed. Finally, in accordance with established experimental principles (Cook & Campbell, 1979), the same web store was used for both experiments to maintain a high level of internal validity. By keeping the online shopping environment and products consistent we ensured that variations in the results could be more confidently attributed to the deliberately manipulated factors of information quantity and visual design. This approach was crucial in eliminating potential confounding variables and allowing a clearer examination of the phenomena.

Results of Study 1

This study implemented six experimental settings, each demonstrating a unique manipulation of information quantity and visual design. The central premise of the study is to vary the amount and presentation of information provided by a manufacturer. The low-information setting included an image of the products price, brand and availability, in the medium information setting, the information provided was expanded. In addition to the information provided in the low information setting, further details were added, like material, return policy and certifications details. These additions were intended to provide a more complete context for the decision-making process. The high information setting further expanded the data provided, including additional care instructions and a promotional discount option. This setting was designed to induce cognitive overload due to the overwhelming amount of information. The visual design dimension varied between the aesthetic and anesthetic settings. Participants in our study were randomly assigned to one of six experimental settings.

We successfully recruited a diverse sample of participants (64% female, with a mean age of 30 years and a standard deviation of 9 years) through outreach via email and posts on various social networking sites. In total, we collected responses from 189 participants that could be used for hypothesis testing. Once assigned to a setting, participants were free to browse the web store for as long as they wished. Based on personal preferences, the participants were shown either a male or a female model. After reviewing the online store, participants were asked to decide for themselves whether they would purchase the presented T-shirt (yes or no). Our objective was not to investigate in which scenario a positive purchase decision occurred more frequently, but rather evaluating the decision-making process. Therefore, we also asked them about our postulated dependent variables, namely decision difficulty, decision satisfaction and switching likelihood. Finally, we collected socio-demographic variables.

To avoid potential bias due to order effects, we randomized the scales and items in the online questionnaire. Discriminant validity for all indicators was assessed using Fornell & Larcker's (1981) criterion (AVE for all constructs > .5). The AVE for each reflective measure was greater than the squared correlations between that construct and any other construct. We were primarily interested in the effects of the experimental factors. Therefore, participants' responses were averaged and the aggregated measures were used as dependent variables in the data analysis. This allowed us to control for potential confounding effects and to further investigate whether the hypothesized relationships were primarily driven by the experimental factors.

TABLE 1 – ANOVA results of study 1

Decision difficulty					
Visual design (VD)			<i>F</i>		
Information Quantity (IQ)	aesthetic	unaesthetic	IQ	VD	IQ*VD
Low	2.64 (1.4)	2.84 (1.4)	.37	3.12*	1.07
Medium	2.42 (1.4)	3.00 (1.3)			
High	2.81 (1.6)	3.38 (1.2)			
Decision satisfaction					
Visual design (VD)			<i>F</i>		
Information Quantity (IQ)	aesthetic	unaesthetic	IQ	VD	IQ*VD
Low	4.96 (.9)	4.80 (.7)	1.41	4.36**	.26
Medium	4.76 (1.0)	4.43 (.9)			
High	4.90 (1.3)	4.52 (.8)			
Switching likelihood					
Visual design (VD)			<i>F</i>		
Information Quantity (IQ)	aesthetic	unaesthetic	IQ	VD	IQ*VD
low	2.69 (1.5)	2.88 (1.3)	5.28**	3.96**	.39
medium	3.42 (1.6)	3.70 (1.8)			
high	3.12 (1.5)	4.02 (1.4)			

* $p < .05$, ** $p < .01$; Mean (*SD* in brackets)

In summary, participants were evenly distributed across the six experimental settings and no significant differences in age or gender were found between settings. ANOVA tests were conducted to check whether the intended manipulation of perceived cognitive overload and aesthetic pleasure was successful. As expected, the results show that the additional presentation like material, return policy and care instructions gradually increase the perceived cognitive overload ($M_{low} = 2.07$ (1.2), $M_{medium} = 2.98$ (1.5), $M_{high} = 3.67$ (1.6), $F = 19.48$, $p < .01$). Additionally, it was demonstrated that the implementation of a cohesive layout structure, sans-serif typography and the strategic use of color accents also significantly improved aesthetic pleasure ($M_{aesthetic} = 4.17$ (1.1), $M_{unaesthetic} = 3.72$ (1.1), $F = 6.23$, $p < .05$). In Hypotheses H1a, H2a and H3a, we proposed that an increase in information quantity would lead to cognitive overload, as confirmed by our manipulation check and would negatively impact user decision difficulty, decision satisfaction and switching likelihood. Conversely, through Hypotheses H1b, H2b and H3b, we posited that a visual aesthetic design would positively affect these user-related outcomes (Table 1).

To test these hypotheses, we conducted several ANOVAs focusing on information provided by the manufacturer. The group means for decision difficulty in the aesthetic settings remained almost consistent, averaging around 2.7 points, regardless of whether participants were in a low, medium, or high information setting. This indicates that decision difficulty did not increase within this category, even as cognitive overload intensified, solely due to the presence of the aesthetic design, as previously defined. In contrast, in the unaesthetic scenario, decision difficulty increased incrementally with higher levels of cognitive overload. This effect, however, was significantly absent in the aesthetic scenario. Therefore, the aesthetic design clearly enhanced the processing fluency to such an extent that the increase in information did not lead to difficulties. A similar, yet inverse, phenomenon was observed for decision satisfaction. Within the aesthetic settings, satisfaction remained stable at a high level, regardless of the quantity of information. The results further revealed that the negative effects of cognitive overload were primarily observed in switching likelihood, which is notable since switching likelihood represents an actual behavioral intent rather than a cognitive process, as is the case of decision difficulty and satisfaction. This aligns with previous research (Malhotra 1982; Hu *et al.*, 2017; Townsend & Kahn 2013) and suggests that an increase in information quantity can still prompt a change in behavior, even when cognitive effort is reduced.

The findings indicate that the pleasant information processing enabled by an aesthetic design less impairs users' decision-making ability despite limited cognitive capacity. This concept effectively minimizes

cognitive demands by optimizing information presentation without reducing the information quantity itself, providing empirical support for H1b, H2b and H3b, as well as H1a. This leads us to conclude that information quantity does not negatively impact the user under all circumstances. Rather, visual design can prevent the negative effects of cognitive overload, in accordance with the processing fluency theory of aesthetic pleasure (Reber *et al.* 2004).

Results of Study 2

In the second experiment, we manipulated the information quantity factor by varying the amount and type of reviews, as well as user-generated content like Q&A sections, related to a single T-shirt presented to users. In the second experiment, we manipulated the information quantity factor by varying the amount and type of reviews, as well as user-generated content like Q&A sections, related to a single T-shirt presented to users. The results can be seen in Table 2.

In the low setting, minimal feedback data was displayed; participants were only shown a star rating (from 1 to 5) alongside the total number of reviews. In the medium setting, a chat window was displayed where users had previously discussed the product via a Q&A section, along with a consistent star rating. The high setting increased the complexity of the information; participants were provided with the same star rating, Q&A section and had access to numerous individual reviews, sorted to show the top five most positive and the top five most negative. In addition, the second factor in this study is visual design, which we manipulated across the two established levels: aesthetic and unaesthetic. From these two factors we developed the six established settings. 220 participants (women: 69.4%, *Mage* = 30.66 years, *SD* = 13.1) were assigned to a particular setting.

To isolate the potential effect of reviews, participants were presented with only one T-shirt in the web store, with no product variations. Participants were then asked to make a purchase decision, after which they completed the questionnaire. To further validate our hypotheses in the context of reviews and Q&A sections, we employed ANOVAs. The manipulation checks reaffirmed the significant effects observed in study 1. However, in this specific setting, the negative impacts of cognitive overload were no longer apparent et all. These findings suggest that effective and pleasant information processing, achieved through visual aesthetic design, preserved the decision-making capabilities of users despite their cognitive limitations.

TABLE 2 – ANOVA results of study 2

Decision difficulty					
Visual design (VD)			<i>F</i>		
Information Quantity (IQ)	aesthetic	unaesthetic	IQ	VD	IQ*VD
Low	2.35 (1.2)	3.55 (1.2)	.54	12.58**	1.32
Medium	2.81 (1.3)	3.29 (1.3)			
High	2.54 (1.0)	3.04 (1.2)			
Decision satisfaction					
Visual design (VD)			<i>F</i>		
Information Quantity (IQ)	aesthetic	unaesthetic	IQ	VD	IQ*VD
Low	4.02 (1.4)	3.72 (1.3)	.69	.38	4.65*
Medium	3.76 (1.2)	3.40 (1.6)			
High	3.00 (1.3)	3.09 (1.1)			
Switching likelihood					
Visual design (VD)			<i>F</i>		
Information Quantity (IQ)	aesthetic	unaesthetic	IQ	VD	IQ*VD
Low	3.09 (.2)	3.10 (.7)	.73	1.41	4.95*
Medium	3.11 (.5)	3.36 (.6)			
High	3.22 (.4)	3.73 (.5)			

* $p < .05$, ** $p < .01$; Mean (*SD* in brackets)

Compared to Study 1, the results presented here show some deviations. First, we observe that aesthetic visual design appears to help reduce perceived decision difficulty (confirming H1b), even as the amount of information increases. This suggests that a well-designed interface can act as a buffer against information overload in this context. However, for decision satisfaction, a significant interaction effect emerges. Specifically, aesthetic design increases satisfaction when information quantity is low to medium. Yet, when the amount of information becomes excessive, satisfaction declines—regardless of whether the design is aesthetic or unaesthetic. This indicates a critical tipping point at which the benefits of aesthetic design can no longer compensate for the cognitive overload caused by high information density. In this sense, aesthetic design functions as a buffer—but one with limited capacity. A similar pattern is observed for switching likelihood. At low levels of information, switching likelihood remains relatively low in both aesthetic and unaesthetic conditions, possibly because the amount of information is still manageable. However, as information quantity increases, switching likelihood rises significantly in the unaesthetic condition, while remaining comparatively low under aesthetic design. This finding aligns with prior research emphasizing the importance of recommendations in user decision-making (Li & Hitt, 2008; Dellaert & Häubl, 2012; Li *et al.*, 2017). Nevertheless, these interaction effects are particularly interesting, as they extend the findings from Study 1. One possible explanation could be the phenomenon of perceived usefulness. In Study 2, participants evaluated reviews, which may have been perceived as more relevant or beneficial for the decision-making process—consistent with the findings of Chan & Cui (2011) as well as Jabr & Rahman (2022). This highlights the importance of context in shaping the relationship between visual design, information quantity and user responses. Therefore, the findings support our broader assumption that aesthetic design does not universally negate the negative effects of high information load. Rather, it appears to act as a moderating factor, mitigating (but not eliminating) the impact of cognitive overload.

Conclusions and discussion

Our study frames the effect of a fluency driven visual design as a preventative measure against the negative impacts of cognitive overload, thereby promoting a decreased decision difficulty as well as switching likelihood and increased decision satisfaction for users. Previous theories present the human cognitive system as a structure with limitations and suggest that overloading of this system can be prevented primarily by reducing the amount or complexity of information presented to users. Our perspective differs from this idea in two ways. Rather than reducing the amount of information presented to users, our approach aims to facilitate information assimilation and enhance cognitive processing in line with the processing fluency theory of aesthetic pleasure (Reber *et al.*, 2004). This enhancement is realized by considering how information is arranged and communicated to users, focusing not only on the 'what' (i.e. the quantity and complexity of information) but also on the 'how' (i.e. the mode of presentation). The strategic arrangement and communication of information is as important as the information itself, suggesting a more balanced approach to dealing with cognitive limitations. Our research builds on the foundational studies by Jacoby *et al.* (1974), Malhotra (1982) as well as Kahn & Lehmann (1991), which explored the effects of cognitive overload on user decision-making, primarily focusing on the quantity of choices presented to users. These studies emphasized the cognitive limits faced by users when overwhelmed by numerous options. However, our findings suggest that not only the quantity but also the presentation of information, especially through visual aesthetic design, plays a critical role regarding the resulting effects of cognitive overload.

This insight extends previous work on the structure and complexity of choices by Carpenter *et al.* (1994), Iyengar & Lepper (2000) and Lurie (2004), which demonstrated how an abundance of options impacts user choice. Our results indicate that well-designed and aesthetically pleasing information displays can simplify the decision-making process, reduce decision difficulty and enhance user satisfaction. Thus, our study proposes an innovative approach to addressing cognitive overload—an approach rooted not in reducing the number of choices but in enhancing the presentation of information through strategic design principles in information systems. Furthermore, our findings contribute to the discussions initiated by Bown *et al.*

(2003), Borle *et al.* (2005) and Oppewal & Koelemeijer (2005) on why users might favor larger assortments despite the risk of choice overload, especially in the context of marketplaces. We propose that a structured, visually appealing presentation can improve processing fluency, making extensive assortments less daunting and more attractive to users. This claim expands on the research by Berger *et al.* (2007), highlighting that a cohesive visual strategy can serve as a crucial differentiator in product lines.

Managerial implications

Our research offers several practical implications that are crucial for marketing professionals and online retailing managers. First, our study underscores the need to shift focus from simply reducing the quantity or complexity of information to significantly improving the presentation of information. This transition requires a strategic management decision that prioritizes not just the amount and complexity of information but also the way it is communicated to users. Emphasizing high-quality information presentation can lead to more engaged and satisfied customers, as they can make decisions more confidently and efficiently, implementing such changes can be achieved through strategic management decisions and does not necessarily require substantial additional investment or resources. This can be efficiently managed by existing design teams, who can revamp visual communication strategies without the need for external resources. A visual design that incorporates careful consideration of layout, typography and color can significantly facilitate the absorption and processing of information, making the shopping experience more intuitive and less cognitively challenging for users, as Garaus (2017) highlighted, investing in design expertise, either developed in-house or through strategic partnerships, can enhance how information is presented and communicated. Management should ensure that designers are well-integrated into the strategic planning process, allowing them to craft well-structured, visually appealing product displays. Such displays can make extensive product assortments less overwhelming and more appealing, thereby encouraging longer and more satisfying browsing experiences for users.

This strategy suggests that management should embrace a wide range of choices but focus on presenting these options in a way that promotes easy information processing and enhances visual pleasure. Furthermore, the integration of principles of cognitive psychology into management strategies, as discussed by Caliskan *et al.* (2021), is crucial. Understanding the cognitive processes that underlie user decision-making enables managers to craft strategies that align more closely with user needs. This involves developing a more profound understanding of user behavior, investing in ongoing research and development in visual design and continually reassessing and refining communication strategies to ensure they remain effective and user centric. Another essential management task is the development of comprehensive visual guidelines. Establishing guidelines for marketing and communication materials ensures a consistent, high-quality visual identity across all touchpoints. This strategic decision not only enhances user perception and information processing but also strengthens brand identity.

Limitation and future research

While our study has primarily addressed the issue of cognitive overload in the context of decision-making through the lens of visual design, numerous other factors remain unexplored and present promising opportunities for future research. One crucial area worth investigating in more depth is the role of user decision-making heuristics. As heuristics are mental shortcuts individuals use to simplify decision-making (Wübben & Wangenheim, 2008), they may reduce cognitive load by lowering the amount or complexity of information that needs to be processed. Exploring the interaction between heuristic strategies and cognitive overload could offer a more comprehensive understanding of user behavior in complex environments. Furthermore, our study did not explicitly examine the potential effect of strong brand preference. Brand loyalty may play a significant role in modulating information processing, particularly under conditions of cognitive overload (Kraus *et al.*, 2022). Future research could investigate how strong brand loyalty helps users filter and prioritize information, thereby reducing cognitive burden and potentially improving decision accuracy. This could involve comparing decision-making processes among users with varying levels of brand

attachment to determine their susceptibility to overload effects. In addition, our findings suggest the need to explore the impact of aesthetic design on long-term decision satisfaction (Baiyere et al., 2020).

While our study focused primarily on immediate satisfaction, it would be valuable to assess whether these effects persist over time, contributing to longer-term satisfaction and potentially reinforcing brand loyalty. Finally, future research should consider the interplay between aesthetic design and cognitive biases such as the anchoring effect or the halo effect (Thorndike, 1920). Investigating such interactions could further enrich our understanding of user decision-making mechanisms. Exploring these avenues could provide a more holistic understanding of the psychological and contextual factors that shape user engagement, with meaningful implications for marketing and digital consumer behavior.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

The role of cues in healthy and sustainable food choices: a comparative study of online and offline grocery shopping

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Abstract. Digitalization and changing consumer preferences challenge offline and online grocery shopping. The present study aims at uncovering differences in stationary and online retailing based on sustainability. Therefore, a multi-study research project was conducted based on two surveys that include a discrete choice experiment each. Study 1 analyses the offline and online shopping for groceries with no sustainable differences (i.e., cereals). Study 2 uses traditional and vegan meat as a comparison between products with high sustainable implications. In Study 1, 287 participants show no significant differences between the distribution channel. 262 participants in Study 2 instead yield significant differences between offline and online grocery shopping. Participants prefer chicken meat to the vegan meat in the offline condition, whereas respondents in the online condition prefer vegan meat over chicken meat. Consumer preferences also differed in nutritional information. In the online condition, they prefer information on vitamins, whereas they found the nutriscore most informative in the offline condition. Study 2 also found similarities as recycled packaging was preferred over plastic packaging and consumers behave price sensitive in both conditions. Furthermore, we unraveled socio-demographic variables as drivers for sustainable preference differences in both conditions. Our results contribute to a better understanding of consumer behavior in varying shopping conditions and equips retail managers with valuable information in designing their retail channels.

Keywords : digitalization; distribution channel; sustainability; grocery retailing.

Introduction

Grocery retailing is increasingly facing challenges due to both digitalization (e.g., Ratchford *et al.*, 2022; Reinartz *et al.*, 2019) and sustainability preference of consumers (Panzone *et al.*, 2021). From a digitalization perspective, competing digital providers enter the market and correspond to customers' need for convenience. One example is commerce (Harter *et al.* 2024) – logistic services that bridge the last mile in grocery retailing (examples: GoPuff, Delivero, Zomato, Getir, DoorDash). Such competitors establish themselves and constitute to approximately 20% of revenues in grocery worldwide (Statista, 2025a). While consumers enjoy the convenience of delivery, their personal carbon footprint increases. Sustainable customers who try to achieve a zero-emission footprint may therefore abstain from digital service providers.

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For example, the share of customers with a lifestyle of health and sustainability is 12.8% in 2024 that use home delivery services for grocery shopping (Statista, 2024). It is comparable but still comparatively low to the overall share of German customers with 11.1%.

One key question that both stationary and digital retailers face is whether sustainability-oriented consumers are willing to utilize the corresponding stationary or digital distribution. Previous research suggests that shopping behavior maybe similar online and offline: Time spent and effort expended during the shopping trip tend to be comparable across channels (Anesbury *et al.*, 2016). However, some behaviors tend to differ when examining consumer behavior in online versus offline grocery shopping environments. In terms of information processing, research has controversial opinions: Information, such as ingredients or nutritional content, has more considerable relevance for online shoppers than for those shopping offline and visual cues have a smaller effect in the online environment (Degeratu *et al.*, 2000). This suggests a potential shift away from relying on heuristics (mental shortcuts) and a move towards rational decision making, thus relying more on information when shopping online. On the other hand, the results from a survey by the International Food Council suggests a higher likelihood of reading nutritional information while shopping offline (Olzenak *et al.*, 2020). Furthermore, front-of-package (FOP) nutrition labels are more likely to catch consumers' attention compared to labels on the back or sides of packages (Al-Jawaldeh *et al.*, 2020) and that FOP aid in distinguishing between healthier and less healthy products more effectively (Dubois *et al.* 2021; Zhu *et al.*, 2016). Thus, FOP assist consumers in making informed choices in a high-choice food environment. However, there is a significant gap in understanding their effectiveness in influencing choices between online and offline grocery shopping environments. This gap increases, if we consider research on sustainable products and their online and offline sales.

Sustainable products are highly relevant today and in the future. First, the revenues of organic food are increasing (Statista, 2025c). Second, consumers increasingly value sustainable – environmentally or socially – attributes and are highly concerned with product quality (Statista, 2025b). Lastly, worldwide society is increasingly facing health concerns, such as obesity and the environmental impact of food production. The production of meat is highly resource consuming, for example, 1 kg chicken meat requires more than 4,000 liters of water and 1 kg beef more than 15,000 liters (Tagesspiegel, 2022). Retailers do not only have to address shifting consumers preferences and values but have to take responsibility for a sustainable future.

Therefore, it is no surprise that the trend towards meat substitutes, so called vegan-meat, is growing continuously. In the DACH region, for example, sales of meat substitutes have more than doubled in the last five years (Statista Consumer Market Outlook, 2022) and (conventional) meat consumption has fallen significantly in the last 10 years. While per capita consumption in Germany was still 61.1 kg in 2013, meat consumption fell by more than 15% to 51.6 kg in 2023 (Federal Office for Agriculture and Food, 2024). Similar declines can also be seen in Austria (Statistik Austria, 2023) and Switzerland (Bundesamt für Statistik, 2024). In addition to health aspects (too much meat is unhealthy), consumers also cite ecological aspects, e.g., the disappearance of natural habitats, animal welfare and the environmental impact of animal production (such as greenhouse gas emissions), as reasons for reducing meat consumption (Bhattacharyya *et al.*, 2023; Marcus *et al.*, 2022). Therefore, consumers increasingly take the environmental sustainability of products and their production and distribution into account in their purchasing decisions.

Meat producers and retailers must therefore find sustainable alternatives in order to remain competitive. Meat substitutes based on plant-based proteins, such as soy, peas, or lupins, offer one way of compensating for the decline in revenue and sales of meat products. Plant-based proteins also offer opportunities for various product innovations. Although meat substitutes currently still have comparatively low sales volumes, these products offer high margins in comparison to traditional meat products (Schmitt, 2019). In particular, the costs for the production of meat substitutes are lower than for meat products. Nevertheless, (plant-

based) meat substitutes are sold at prices that are equal to or even higher than meat prices. One of the manufacturer's key arguments is sustainable production.

To gain deeper insights into the differences and similarities between online and offline purchases for groceries, we focus on sustainability as a driver for preference differences in these two sales channels. In two empirical settings, we evaluate preference differences and similarities for both a highly sustainable product, i.e. vegan meat and a product that is less viewed as animal-friendly or ecologically friendly, i.e. cereals. We inspect whether the decision behavior of respondents is influenced by the non-/sustainable product category in varying purchase channels. Our results are highly relevant for marketing practitioners and marketing managers, because they provide deep insights about the appropriate channel to distribute sustainable food products.

Methodology

Research design

In order to test the influence of the sales channel on the choice of non-/and sustainable products, two online surveys were conducted in July 2024. This first study comprises cereals, while the second study targets vegan meat. Cereals were chosen, because they are frequently purchased by customers and therefore well-known, but do not have any clear linkage to ecological or social sustainability. In contrast, vegan meat is viewed as a meat substitute that has a sustainable linkage ecological sustainability. The questionnaires consisted of several parts including demographic questions, questions about attitudes toward sustainable issue and a discrete choice experiment (DCE), respectively (Train, 2009).

In the DCEs, respondents had to indicate which product variant they would be most likely to buy in several choice situations. The attributes and associated attribute levels are displayed in Table 1. In both DCEs, we included a no-purchase option to provide respondents with the opportunity to opt out of a decision if none of the presented alternatives meets their preferences. Hence, we did not force respondents to a decision of a certain alternative.

Both studies show a total of seven choice situations including four options and one non-select option (4+1 alternative design) each. Subjects participated randomly in a between-subject design, i.e., one group of respondents was asked to imagine shopping online, while the other group was asked to imagine shopping in a bricks-and-mortar supermarket. The setup of the research design was the same in both studies.

TABLE 1 – DCE attributes and associated levels of Study 1 and Study 2

Study 1		Study 2	
Attributes	Levels	Attributes	Levels
Nutrition label	Nutriscore good nutrition value	Product type	Regular plain chicken
	Nutriscore bad nutrition value		Vegan plain chicken
	MTL GDA good nutrition value	Packaging	Recycled paper plastic
	MTL GDA bad nutrition value		
	BOP good nutrition value		
	BOP bad good nutrition value		
Customer rating	no customer rating available	Health description	vitamins
	Bad customer rating (2/5 stars)		Nutriscore
	Moderate customer rating (3.5/5 stars)		No info
	Good customer rating (5/5 stars)		10.99€
Price promotion	no price promotion available	Price (per two filets)	8.99€
	25% price reduction		5.99€
	50% price reduction		4.99€

TABLE 2 – Sample characteristics

	online condition		offline condition	
	Study 1	Study 2	Study 1	Study 2
Male	45%	39%	40%	46%
Household income max. 3000 €	67%	48%	75%	56%
Academic degree	54%	71%	67%	57 %
Mean age	25 years	27 years	25 years	27 years

Sample

In Study 1, 287 respondents participated: 153 for the online condition and 134 for the offline condition. 124 respondents came from Austria, 61 from Germany, 29 from Italy and 73 from other countries. In Study 2, 262 respondents participated, divided into 126 respondents for the online condition and 136 for the offline condition. 229 respondents came from Austria and 33 from other countries (Table 2).

The gender distribution of study 1 is relatively equally divided between male and non-male respondents in both conditions. The maximum net household income is 3,000€ at maximum for two-third resp. three-quarter of the respondents. The majority of respondents holds an academic degree and the mean age is 25 years in both conditions. For study 2, the distribution between male and non-male respondents is on par. However, the mean age is 27 years in both conditions and again relatively low. In contrast, the mean age in Austria is 43 years (Statistik Austria, 2024). However, the samples' young age is appropriate for our focal product category as inter alia vegan dietary habits are established before the 30th anniversaries (Splendid Research, 2020). The distribution of households with an income of 3,000€ at maximum versus 3,000€ and more is equal. The majority of respondents has an academic degree. Both studies demonstrate representativeness, as well-educated (Europäischer Rat, 2025) customers between 21 and 40 are termed passionate online shoppers whereas people above 60 clearly prefer stationary retailing (Statista, 2025d).

Results

Aggregated perspective

We started with the estimation of aggregated logit models for both studies and both conditions to inspect whether differences between the online and offline condition exist. Figure 1 displays the results for Study 1 (cereals). Obviously, no differences between the preference structures in the online and offline condition can be revealed. As expected, good nutritional values are more preferred than bad values (Figure 2a), higher price promotions are more preferred than smaller or no price promotion (Figure 2b) and lower customer ratings are favoured less (Figure 2c). Even the relative importances that respondents attach to the three attributes for their final purchase decision are almost on par in the online and offline condition. Nutritional information yields the highest importance (49% in the online versus 47% in the offline condition), followed by customer ratings with a relative importance of 31% online versus 33% offline and the price promotion with relative importances of 20% in the online versus 21% in the offline condition.

In Study 2, clear differences between the online and the offline condition emerge: while the plain chicken is preferred to the vegan meat in the offline condition, respondents in the online condition prefer vegan meat over plain chicken (Figure 2(a)). While respondents in the online condition prefer the nutritional information of vitamins most, the nutriscore is highest preferred in the offline condition (Figure 2 c). In both conditions, a recycled paper packaging is preferred over a plastic packaging (Figure 2b) and respondents from both conditions are price sensitive (Figure 2d). An inspection between the relative importances the respondents attach to certain product attributes, further similarities arise: In both conditions, the product type – 40% in the online and offline condition as well as the price 37% in the online and 35% in the offline condition – are highly important, followed by health description (13% online and 17% offline) and packaging with 10% in the online and 8% in the offline condition.

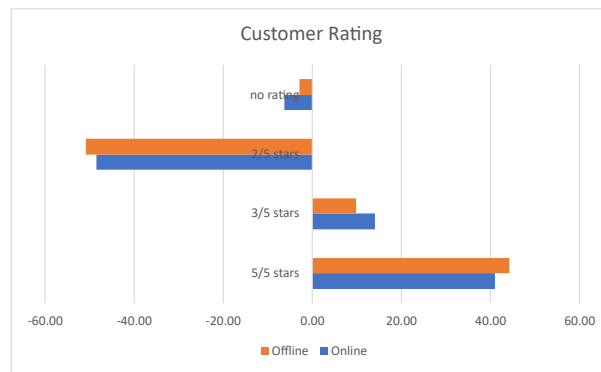
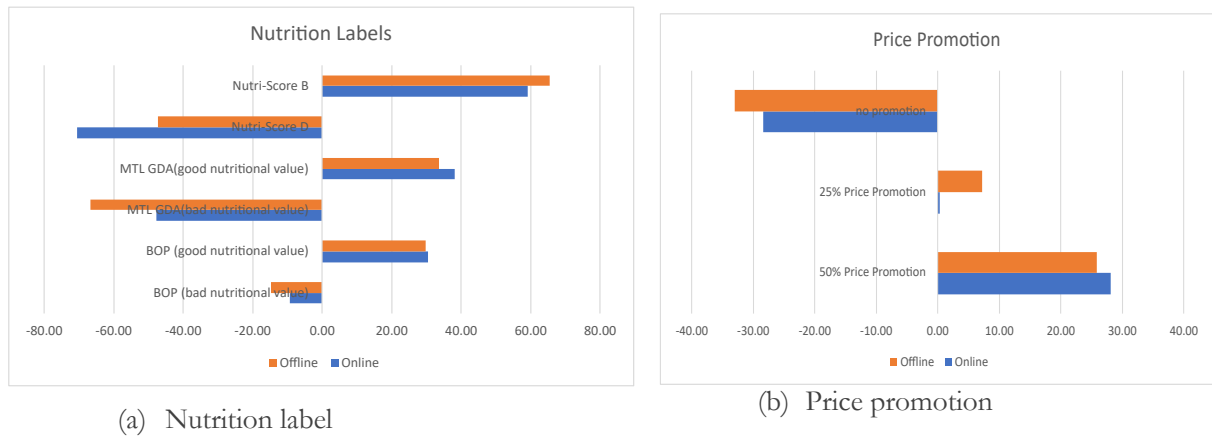


FIGURE 1 – Results of aggregated MNL models for study 1

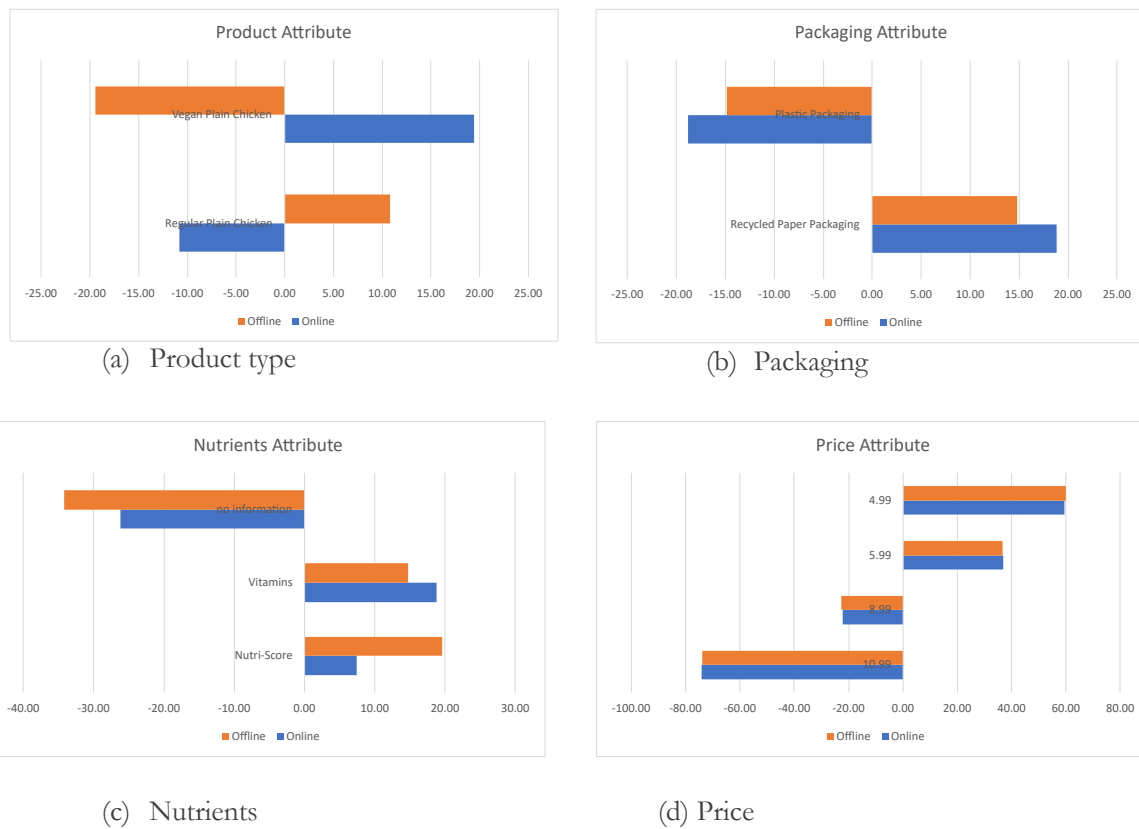


FIGURE 2 – Results of aggregated MNL models for Study 2

Individual perspective

Since our initial pre-evaluation with an aggregated logit model revealed no differences between the online and offline condition for Study 1, we next exclusively focus on Study 2 for an in-depth evaluation of customer preferences. To ensure data quality and use mostly unbiased data for estimation input, we checked for straight-lining behavior for the no purchase option and excluded eight respondents, i.e., four respondents from each condition. To gain deeper insights into our samples, we calculated correlations between the socio-demographic variables. Since the variable age is the only variable with metric scale and all other variables are of nominal scales, we relied on point-serial correlation for correlation between age and the socio-demographic variables and on tetrachoric correlations between the nominal scaled variables.

Table 3 displays the correlation matrices for both online and offline condition. In both conditions, we receive almost the same results: An increasing age corresponds with having an academic degree as well as a higher income. Male respondents are older and show a higher income. However, all correlations are moderate, which argues for no multicollinearity issues. This indicates a sound data base for our up-coming preference estimations. Next, we inspected the choice-shares of the DCE's alternatives. The share of choices was equally distributed between the real alternatives and the choice shares for the no-purchase option was lower than 15%, respectively. This suggests valid data quality. We decided to estimate mixed logit models to account for both unobserved and observed heterogeneity (Hensher & Greene, 2003). As observed heterogeneity, we considered the following variables: gender, age, academic degree and household income. Furthermore, we estimate one linear price parameter instead of partworth-utilities for each price level.

Table 4 yields the population means and parameters for the socio-demographic subgroups for the online condition. Obviously, plain chicken is rejected (in contrast to vegan meat) as well as a plastic packaging of the product. The nutriti score is most preferred health description and an increase of price is less favoured. Hence, price is not used as a quality signal by the respondents. Beside these population means, there are several significant interaction effects. For example, being male or having a higher income leads to the rejection of plain chicken meat. Being younger or having a higher income leads to a lower price sensitivity. If we use the partworth-utilities for plan chicken and price, we are able to determine respondents' willingness to pay (cp. Paetz, 2021). We found a surplus in willingness-to-pay of 2.47€ for the vegan meat in contrast to plain chicken. Furthermore, the highest relative importance is attached to the attribute price (54%), followed by product type (22%), health information (12%) and packaging (12%). For the offline condition, we estimated a Mixed Logit model, too.

TABLE 3 – Correlation matrix in online versus offline condition

	Academic		Income		Gender	
Age	0.537	0.539	0.571	0.405	0.211	0.185
Academic			0.160	0.420	-0.007	0.028
Income					0.380	0.430

Note: Correlations coefficients on the left resp. right refer to the online resp. offline condition.

TABLE 4 – Population means and parameters of socio-demographic subgroups for the online condition

Parameter	$\bar{Y}$	$\bar{Y}_{male}$	$\bar{Y}_{age}$	$\bar{Y}_{acad}$	$\bar{Y}_{income}$
Plain chicken	-2.820***	5.411***	-0.016	-1.483	3.966***
Recycling packaging	1.566***	-0.260	0.057	-0.430	-0.151
Vitamin	1.295***	0.109	-0.049	0.472	-0.200
Nutriscore	1.474***	0.361	0.032	0.781	0.605
Price level	-1.142***	-0.200	0.030*	-0.244	0.544***
No purchase	0.468	0.310	0.212**	-2.291*	-0.041

Signifikance level: *** <0.001; ** 0.01; * 0.05

TABLE 5 – Population means and parameters of socio-demographic subgroups for the offline condition

Parameter	$\bar{V}$	$\bar{V}_{male.}$	$\bar{V}_{age}$	$\bar{V}_{acad}$	$\bar{V}_{income}$
Plain chicken	1.681***	0.792	0.076*	-2.438***	2.211***
Recycling packaging	0.844***	-0.497	0.048	-0.584	-0.217
Vitamin	1.615***	-0.385	0.016	0.560	0.046
Nutriscore	1.530***	-0.908*	0.034	1.164*	-0.373
Price level	-0.781***	-0.125	0.001	-0.013	0.332***
No purchase	1.890***	-2.433***	0.120*	0.402	0.853

Signifikance level: *** <0.001; ** 0.01; * 0.05

The population means and parameters for the socio-demographic subgroups for the offline condition are displayed in Table 5. The respondents in the offline condition prefer plain chicken (versus vegan meat) as well as a recycled packaging. This is in contrast to the online sample as well as vitamin information as the most preferred health description. The price parameter shows a negative sign once again, which argues for decreasing preferences for increasing prices. Several interaction effects become obvious. As in the online sample preferences for chicken interact positively with being male and a higher income, but negatively with an academic degree. As before, a higher income decreases respondents' price sensitivity. In contrast to the online condition, the monetary surplus for vegan meat is negative, i.e., -2.15€. Furthermore, the highest relative importance is attached to the attribute price (53%), followed by product type (19%), health information (18%) and packaging (10%).

Discussions and conclusion

Our results reveal important results with respect to interactions between sustainability and digitalization that are highly important to understand the consumption and shopping behavior of respondents of sustainable and non-sustainable food in different sales channels for groceries. First, we found no variations in consumer preferences in the online and offline condition for cereals. In our study cereal were used as a non-sustainable product because there is no linkage to sustainability, e.g., ecological or social sustainability on first sight.

Second, in contrast to this first result, we discovered substantial preference differences of customers in the online and offline shopping condition, when a highly (ecologically) sustainable product category, i.e. vegan meat is considered. For this sustainable product, respondents in the offline condition preferred meat products, i.e. plain chicken over a plant-based meat substitute. In contrast, respondents in the online condition had a stronger preference for vegan meat than for chicken. Most of our findings correspond to recent results from relevant literature. For example, with regard to the preferred type of packaging recycled paper-based packaging was preferred to plastic packaging – with no differences between the online and offline condition. This preference follows previous studies (e.g., Lindh *et al.*, 2015), which show that consumers perceive paper-based packaging as more environmentally friendly than plastic packaging.

Third, in alignment with Lehmann *et al.* (2025), the empirical results showed overall that men have a lower preference for vegan meat. Additionally, in line with previous studies (e.g., Cranage *et al.*, 2004), we found respondents to prefer products with nutritional information to those without labelling. Interestingly, the Nutriscore in the offline condition was rated more positively by female respondents than by male respondents. This is in contrast to the influence of the vitamin data, where no differences between men and women were observed either in the online and offline condition. Consistent with theory and previous studies (e.g., Degeratu *et al.*, 2000), increasing prices showed a negative influence on product choice, regardless of the online versus offline condition. This effect was particularly pronounced among respondents with lower incomes, who reacted more strongly to lower prices. As expected, the positive interaction effect between price and income confirms that higher income groups are less price-sensitive.

Lastly, in contrast to our results, previous studies (e.g., Huyghe *et al.*, 2017) showed that consumers make healthier choices when shopping for food online than in bricks-and-mortar stores. One possible reason for this is the lower number of impulse purchases and reduced sensory influence when shopping online. Since many customers consider meat substitutes, i.e., vegan meat, to be healthier than conventional meat (Bhattacharyya *et al.* 2023), this could explain the higher acceptance rate of meat substitutes in the online condition. This assumption is supported by further results from our survey: 39% of participants from the online condition rated vegan meat as healthy, while only 28% of respondents from the offline condition shared this assessment. In addition, ethical and sustainable aspects also play a role, as the survey also shows: 75% (72%) of respondents in the online condition and 66% (55%) of respondents in the offline rated meat substitutes as ethical (sustainable). These differences underline that the sales channel not only significantly influences the perception of the products, but also their acceptance.

Acknowledgements

We thank Ljubinka Radosavljevic and Marta Rodolfi for their assistance in the data collection.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

The impact of corporate influencers on the corporate brand

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Abstract. Influencer marketing has become an essential strategy for companies to enhance brand image, sales and revenues. Corporate influencers, a specific type of influencers, are employees who share their workplace experiences on social media, particularly LinkedIn, shaping perceptions of the corporate, employer and product brand. Despite their increasing relevance, research on corporate influencers remains limited. This study examines whether LinkedIn posts by corporate influencers influence attitudes toward the corporate brand. The study extends the Social Media Value Influencer Model (Lou & Yuan, 2019) by integrating the Source Credibility Theory (Ohanian, 1990) and Ducoffe's (1996) Advertising Value Model. A 2 x 3 experimental design with a randomized survey ($N = 538$) was conducted at the end of 2023, analyzed using variance-based structural equation modeling. Results confirm that corporate influencers positively impact corporate brand attitudes, with credibility being the dominant factor. Perceived credibility enhances influencer attitudes, advertising value, trust in posts and brand attitudes. Additionally, advertising value increases when posts are entertaining and informative without causing irritation. These findings highlight the importance of corporate influencers being perceived as trustworthy, attractive and knowledgeable. Companies should focus on credibility and building trustful relationships in corporate influencer communication to strengthen brand perception.

Keywords : advertising value model; corporate influencer; credibility; social media influencer.

Introduction

Influencer marketing has become a key component of corporate strategies, helping companies achieve both economic and brand-related goals (Pan *et al.*, 2025; Schultz, 2025; Wies *et al.*, 2023), such as enhancing brand image, increasing revenue and driving sales. Influencers serve as (digital) opinion leaders and role models, leveraging their social reach to shape the attitudes and behaviors of their followers (Leung *et al.*, 2022; Lou & Yuan, 2019). They frequently share content about their daily activities, integrating personal opinions and product recommendations into their narratives (Schultz, 2025). Research has predominantly compared influencers by the number of their followers. For example, followers attribute high expertise to influencers with many followers, whereas followers attribute influencers with few followers with accessibility and authenticity (Schouten *et al.*, 2020). Influencers with few followers have a higher number and a wider range of sponsored posts which are often seamlessly woven into their lifestyle and social activities through subtle

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patterns (Hogsnes *et al.*, 2024). Recent findings further suggest that influencers with low followership outperform influencers with high followership based on return of advertising spend (Beichert *et al.*, 2024). Beyond their follower reach, influencers can further be distinguished based on their activity area or the social media platform. Typical examples for the area of activity are health, finance, lifestyle, fashion, cosmetics, travel and gaming (Schultz, 2025). Influencers may also be classified based on the social media platform that oftentimes follows the platforms with most members, such as Instagram, TikTok, Twitch and YouTube.

Companies may also employ special types of influencers: virtual and corporate influencers. Whereas virtual influencers are digitally created, fictitious personalities who have their own social media profiles (Franke *et al.*, 2023), corporate influencers are employees who actively engages in social media based on their professional experiences within a company (Schmidt & Baumgarth, 2018). Due to their direct connection with the employer, their shared experiences are often perceived as an authentic reflection of the company, employer and product brand. Ideally without appearing as a deliberate branding effort (Hesse *et al.*, 2021). Among social media platforms, LinkedIn plays a crucial role for corporate influencers and businesses across various industries, including chemical, finance, healthcare, media, retail and public services (Ebner & Eck, 2022). Despite their growing significance, corporate influencers remain an underexplored research area. The present study answers the question if LinkedIn posts of corporate influencers impact attitude towards the corporate brand.

Methodology

Research design

In order to answer the research question, we constructed an online survey. The questionnaire consists of three parts: The first part asks about the usage behavior and frequency of the social media platform LinkedIn and whether the test subjects have already had contact with corporate influencers. The second part is dedicated to the 2 (company) x 3 (brand communication) experimental design. For this, the participants were randomly assigned to a LinkedIn post from a female corporate influencer. The corporate influencer works represents either an established company or a newer (start-up) company. The posts differ in three level of brand communication (without logo, with logo, with logo and text). After the exemplary post, respondents answered measurement items representing our research model (Figure 1). Afterwards, we gather demographic details at the end of the questionnaire.

The present research model is inspired by the Social Media Value Influencer Model (Lou & Yuan, 2019). Lou & Yuan (2019) address the question of trust in branded posts to impact brand awareness and purchase intentions. We expand the framework in two more conceptual building ways. First, we incorporate the source credibility theory (3- and 4-item scales by Ohanian, 1990, Munnukka *et al.*, 2016; Lou & Yuan, 2019; Martins *et al.*, 2019) and added influencers' interactivity and authenticity (each 5-item scales by Jun & Yi, 2020) to further explain the perceived credibility of influencers and influencer marketing. Attitude toward Influencer is measured by 4 items by Chetoui *et al.* (2020). Second, we integrate Ducoffe's, (1996) advertising value model including entertainment, informativeness and irritation as key communication blocks. These dimensions are captured with 3-, 4- and 6-item scales to account for the communicative aspects of corporate influencer posts.

We capture trust in branded post (3 items by Wu & Lin, 2027) and brand attitude (3 items by Munnukka, 2016) as outcome variables. All measurement scales are based on previous research modified to the context of corporate influencer. The items are measured by 7-point rating scales, ranging from 1 (strongly disagree) to 7 (strongly agree).

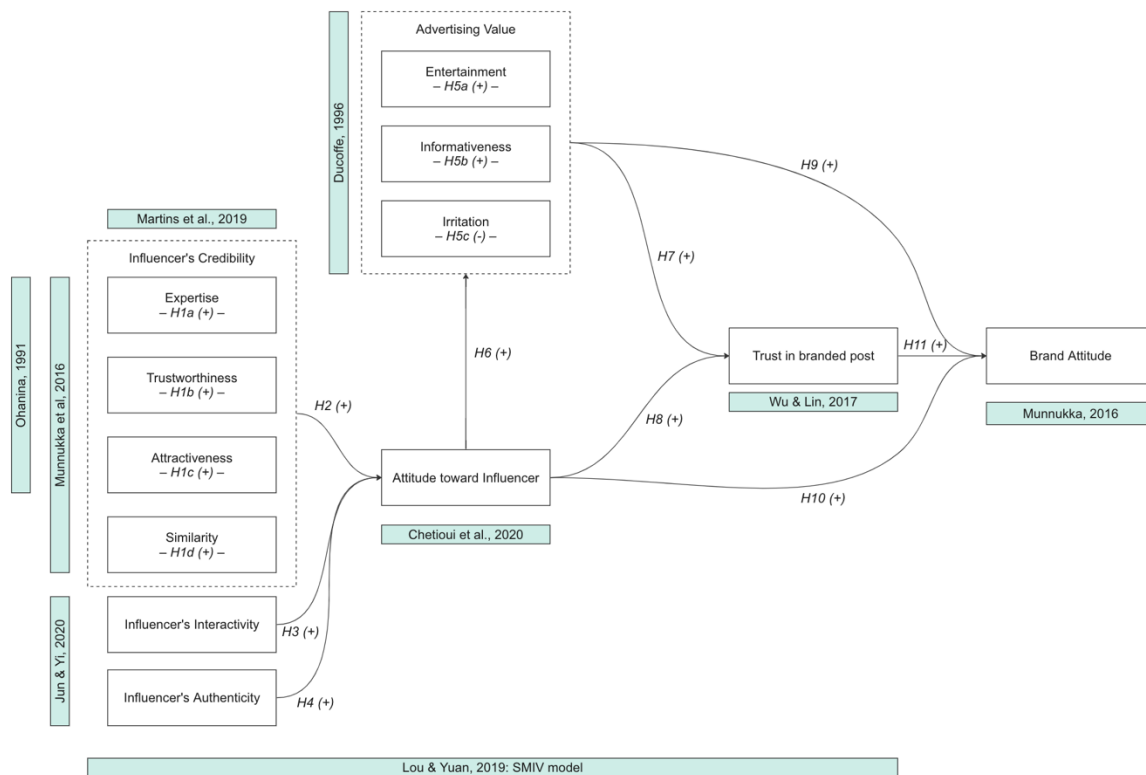


FIGURE 1– Research model.

Sample

We conducted an online survey over a two-month period. Based on established scales and a 2x3 experimental design, a randomized survey was conducted in October and November 2023. Beyond the established scale measures, we also collected demographic data as control variables. All questionnaires were checked for completeness, response behavior (such as ‘straightlining’) and processing time (relative speed index ≤ 2 ; Leiner, 2019). After data cleaning, the final sample includes 538 questionnaires. The sample is characterized by 43.2% female, 55.3% male and 1.5% divers. The mean age is 33.6 years (SD 9.13). Whereas half of the participants is passively using (as silent reader) LinkedIn, more than half (53.1%) of the participants use LinkedIn actively at least once or twice a week.

Results

We used partial least squares structural equation modeling (PLS-SEM) to estimate the parameters in our measurement model (outer model) and structural model (inner model). This variance-based SEM approach has limited distributional needs regarding the measured items and minimal computational requirements for the underlying algorithm (Hair *et al.*, 2020). The use of PLS-SEM is appropriate because it supports the prediction and explanation of dependent variables in a theoretically grounded structural model (Hair *et al.*, 2021; Sarstedt *et al.*, 2014). In turn, PLS-SEM generally achieves high levels of statistical power for hypothesis testing.

A variance-based structural equation analysis tests the presented research model (see Figure 1). The measurement models are assessed by inspecting the individual item reliability, composite reliability and discriminant validity. For validation purposes, this study employs bootstrap resampling with 5,000 cases and a significance level of 0.05. We carefully construct the questionnaire and employed structural designs against common method bias. For example, we ensure anonymity and confidentiality and request explicit consent

and approval for participation. The questionnaire also includes an attention check and we separate independent and dependent variables. Additionally, a seriousness check is performed at the end of the questionnaire. We also control for response bias by comparing the first half to the second half of responses which show no significant differences. The empirical results were not significantly different across both brands, so we report the aggregated results including both brands.

The measurement models demonstrate reliable and valid measurement overall. Considering indicator reliability, five measurement items must be excluded due to low loadings (II3 = 0.697; II4 = 0.629; II5 = 0.697; AT3 = 0.421; BA2 = 0.308). All other loadings of the measurement items lie between 0.718 and 0.926 and exceed the required value of 0.7 in case of good construct reliability. We can also assume construct reliability with values for Dillon-Goldstein's rho (between 0.838 and 0.939) over 0.7 for all latent constructs, in addition, the average variance extracted (AVE) for all constructs is at least 0.50 (between 0.605 and 0.836), so convergence validity can be assumed.

The discriminant validity is evaluated using Fornell-Larcker criteria and evaluating the cross-loadings. All construct correlations are below the corresponding diagonal value that represents the square root of the average variance extracted. Moreover, the cross-loadings confirm that every item has the highest loading with the corresponding construct.

The empirical results of the structural model nearly completely confirm the proposed research model. Based on source credibility theory, influencer credibility is significantly increased by influencer expertise (H1a: $\beta = 0.255, p < 0.001$), trustworthiness (H1b: $\beta = 0.525, p < 0.001$), attractiveness (H1c: $\beta = 0.123, p < 0.001$) and similarity (H1d: $\beta = 0.168, p < 0.001$), validating the underlying structure. The empirical results also confirm the significant effect of influencer credibility (H2: $\beta = 0.577, p < 0.001$) and interactivity (H2: $\beta = 0.275, p < 0.001$) but not of authenticity (H3: $\beta = 0.015, p = 0.655$). Posts of corporate influencers also validate Ducoffe's Advertising Value approach. Advertising value of corporate influencers posts increases with entertainment (H5a: $\beta = 0.273, p < 0.001$) and informativeness (H5b: $\beta = 0.127, p < 0.001$) and decreases with irritation (H5c: $\beta = -0.139, p < 0.001$). Attitude toward the corporate influencer has considerable impact advertising value and further strengthens follower's perceived advertising value (H6: $\beta = 0.389, p < 0.001$). Both advertising value (H7: $\beta = 0.289, p < 0.001$) and attitude toward influencer (H8: $\beta = 0.524, p < 0.001$) positively affect trust in corporate influencers' posts. Finally, the empirical results also support the positive effects of advertising value (H9: $\beta = 0.128, p = 0.018$), attitude toward influencer (H10: $\beta = 0.351, p < 0.001$) and trust (H11: $\beta = 0.179, p < 0.001$) on attitude toward the corporate brand.

Finally, we report the coefficient of determination R^2 values. Following Chin (1998), R^2 values of 0.67, 0.33 and 0.19 are categorized as substantial, moderate and weak respectively. R^2 for credibility is substantial at 0.745. Attitude toward influencer ($R^2 = 0.591$), advertising value ($R^2 = 0.647$) and trust in branded post ($R^2 = 0.584$) are in between the substantial and moderate category leaning towards substantial, whereas R^2 for brand attitude at 0.363 is at lower end of the classification leaning towards moderate.

Discussion

The majority of respondents used LinkedIn at least once a week. They mainly consume (world and event) news, industry and company information, as well as work-related insights. Over half of the respondents indicated that they have corporate influencers in their LinkedIn network and follow their content. Based on these descriptive results, we confirm the topic of corporate influencers as a current and relevant one for companies. First, the empirical results validate the measurement of credibility for corporate influencers, in line with previous findings (Lou & Yuan, 2019; Martins *et al.*, 2019; Munnukka *et al.*, 2016), attractiveness, expertise and trustworthiness determine the perceived credibility. Across all scenarios, corporate influencers'

trustworthiness exerted the highest impact, followed by the perceived expertise and attractiveness. As the scenarios displayed female corporate influencers, it is interesting to note that male participants perceived trustworthiness of these influencers significantly higher than female participants. The previously mentioned order of the three dimensions is constant for female and male participants.

Second, credibility also predominantly shapes participants' attitude toward the corporate influencers. This finding is line with the characterization of credibility as a key component when people choose or follow a social media influencer (e.g., Nam & Dân, 2018; Pan *et al.*, 2025). Combined with interactivity, credibility shapes the attitude towards the corporate influencer. Instead of previous findings that support the positive effect of authenticity (e.g., Jun & Yi, 2020; Kim & Kim, 2021), the positive relationship on attitude toward corporate influencer was not supported. Qualitative comments suggest that posts by corporate influencers are manipulative and compulsorily positive. Such posts are perceived as manipulative as these have a clear agency of shaping an image towards the company. Further, corporate influencer posts are compulsory positive because their professional existence in the company may be at risk otherwise. As corporate influencers are paid through their salary, they are assumed to not negatively comment about their employer, reducing perceived authenticity. Instead of positive employer reviews, followers are looking for more information and knowledge transfer in corporate influencer posts.

Third, attitude toward the corporate influencer also strongly contributes to the advertising value of corporate influencers' posts. The attitude has a higher absolute effect than entertainment, informativeness and irritation. Nonetheless, the empirical results support the underlying dimensions of Ducoffe's advertising value model. The present study thus contributes to the advertising value model by extending the message dimensions with media characteristics (influencer attitude). The empirical results further suggest that in the case that the company is known, the effect of attitude toward the influencer is higher than in the case when the company is not known. Furthermore, the effect of informativeness is significantly in the case when the company is not known. In this case, we can assume that people find posts of corporate influencers informative.

Fourth, the attitude toward corporate influencers and posts' advertising value influence trust in branded posts and company brand attitude positively. Based on total effects, attitude toward corporate influencers has the highest impact, followed by advertising value and trust in branded posts. Thus, the empirical findings support previous results from other social media influencers (e.g., Belanche *et al.*, 2021; Lou & Yuan, 2019; Munnukka *et al.*, 2016). The integration of branded elements, such as logo and slogan, intensifies the advertising value of corporate influencer's post. Business networks, such as LinkedIn, can be of interest for companies due to multiple reasons. Companies may present their products and services and may recruit personnel. A company page on social networking sites thus supplements their existing communication channels, such as a company homepage, in order to reach customers, decision-makers and human talents at the same time. However, as company pages on social networking sites have a lower reach than individual profiles, it is advisable to add social media and corporate influencers to the company's marketing mix.

Even in professional contexts, humans still look for other human interests and opinions, instead of relying on external influencers, companies can use its own employees as corporate influencers. Strategically, companies may rely on board members or founders or other employees can actively communicate in this way. If a board member or founder is positioned as the face of the company, their profile's reach may increase, potentially attracting news and media. In addition, a company board member or founder usually already has a well-developed network, which can have a positive impact on the company. However, it should be noted that supporting a social CEO is also time-consuming – potentially needing additional resources in the corresponding department. For example, if only one person supports the social activities, the company is at risk when the employee who built up the brand ambassador leaves the company the social activities

take a considerable hit. If a company uses own employees as corporate influencers, they can be active on the social networking site of their own accord. They may also require less resources and their departure will have less impact. When using such corporate influencers, companies should ensure that the influencers are perceived as credible and are not seen as a pure intermediary for company content. The present study shows that corporate influencers are perceived as credible when they are trustworthy, attractive, have expertise and people can identify with them. Whatever the strategical choice or mix, the present results contribute to the relevance of corporate influencers. Corporate influencers that are perceived credible and interactive contribute to trust in company branded content and overall positive brand attitudes towards their company.

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Consumer psychographics, product category and geographic factors in Indian showrooming and webrooming: a qualitative approach

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Abstract. Omnichannel retailing has significantly reshaped consumer behavior, particularly through showrooming and webrooming practices. This study investigates the interplay of psychographic traits, product characteristics and geographic context among Indian omnichannel consumers. Through in-depth interviews, the research identifies four psychographic consumer segments (Tactile Evaluators, Risk-Averse Rationalists, Deal-Seeking Navigators and Situational Switchers). The analysis suggests that showrooming is often a rational. Information-seeking strategy rather than an impulsive or hedonic act, especially among quality- and price-conscious consumers. Results also highlight the critical role of product type, with experience goods encouraging tactile evaluation and search goods prompting risk-driven online research. Geographic differences also emerged, influencing shopping behavior across metropolitan and semi-urban contexts. The study offers nuanced insights for retailers aiming to refine omnichannel strategies through targeted, psychologically informed customer engagement practices.

Keywords : omnichannel retailing; showrooming; webrooming; consumer psychographics; qualitative segmentation

Introduction

Omnichannel retailing has transformed the consumer decision-making process, turning it into a dynamic and personalized journey (Frasquet & Miquel-Romero, 2021; Herhausen *et al.*, 2019; Lemon & Verhoef, 2016; Tueanrat *et al.*, 2021). Consumers may follow a straight, linear shopping path—either entirely online or in-store—or engage in more complex behaviors such as webrooming (researching online before purchasing in-store) and showrooming (evaluating products in-store before buying online) (Flavián *et al.*, 2016; Gensler *et al.*, 2017; Kumar *et al.*, 2017). As consumers increasingly transition across channels, showrooming and webrooming have emerged as critical behaviors shaping omnichannel retail strategies, influencing how retailers manage pricing, customer experience and channel integration (Aw, 2019, 2020; Flavián *et al.*, 2020; Goraya *et al.*, 2020).

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Research on showrooming and webrooming has primarily focused on two areas: (1) identifying the drivers of these behaviors—e.g., Arora *et al.* (2022), Arora & Sahney (2019), Frassetto & Miquel-Romero (2021), Kleinlercher *et al.* (2020), Manss *et al.* (2020), N. Sharma *et al.* (2023)—and (2) developing counter-strategies to mitigate revenue loss from consumers switching to competitors—e.g., Arora & Sahney (2018), Fassnacht *et al.* (2019), Jiao & Hu (2022), Rapp *et al.* (2015), Sahu *et al.* (2021). Initially, these behaviours were perceived as threats, as they often led consumers to purchase from rival retailers, reducing revenue (Aw, 2019; Gensler *et al.*, 2017; Manss *et al.*, 2020). In response, later studies explored strategies to retain consumers within the same retailer's ecosystem, such as price matching (Su & Tian, 2023; Wei *et al.*, 2023; Zeng, 2022), seamless online-offline integration (Fang *et al.*, 2021) and enhanced in-store experiences (Jing, 2018; Goraya *et al.*, 2020; Srivastava *et al.*, 2022; Zhang & Zhang, 2020).

While these strategies help retailers remain competitive (Frassetto *et al.*, 2021; Aw, 2019), they fail to fully account for individual differences in showrooming and webrooming behaviors, often leading to customer dissatisfaction caused, for example, by the mismatch between expectations formed during online research or in-store exploration and the actual purchase experience (Gasparin *et al.*, 2022). Research increasingly suggests that psychographic characteristics—such as personality, decision-making styles, or risk tolerance—can play a relevant role in shaping omnichannel behavior; yet, they remain largely underexplored (Blömker & Albrecht, 2024). Furthermore, although segmentation studies exist for showroomers (Schneider & Zielke, 2020; Viejo-Fernández *et al.*, 2019, 2020), the assumption that consumers engage exclusively in either showrooming or webrooming is misleading, as the same individual may exhibit both behaviors, influenced by psychographic traits, product type and geographical location (Roy *et al.*, 2022).

Psychographic variables have been widely used to explain online shopping (Sands *et al.*, 2016), group buying (Klein & Sharma, 2022) and multichannel behavior (Konus *et al.*, 2008; Nakano & Kondo, 2018), yet their influence in omnichannel consumers—who fluidly transition between online and offline shopping—remains underexplored (Mishra, 2021; Sharma *et al.*, 2024; Zhang *et al.*, 2021). This is surprising, given that omnichannel consumers have 30% higher lifetime value than single-channel shoppers (Y. Lee & Cheon, 2019) and drive a 250% increase in purchase frequency and a 13% rise in average order value (ClickZ, 2019; Hossain *et al.*, 2020).

Beyond psychographics, product characteristics and geographical context further shape showrooming and webrooming behaviors by influencing how consumers weigh channel benefits and risks depending on the product they purchase. Search products (e.g., electronics) and experience-based products (e.g., clothing) interact with consumer psychographics, influencing decision-making and shaping omnichannel shopping behavior (Girard *et al.*, 2003). Geographical location may also exert an effect on these behaviors, because factors such as access to branded stores, local retail infrastructure and delivery service availability significantly affect whether a consumer showrooms or webrooms (Blömker & Albrecht, 2024; PwC, 2024). However and despite these considerations, no prior research has systematically examined how psychographics, product type and geography interact to shape omnichannel shopping behavior.

India, with over 900 million internet users (PwC, 2024) and a projected 427 million online shoppers by 2027 (Statista, 2024), represents a rapidly evolving omnichannel retail market. Consumers increasingly navigate multiple platforms before making purchase decisions and decision-making styles may influence their preference for webrooming or showrooming. Understanding how these styles drive webrooming and showrooming behaviors is essential for retailers seeking to optimize omnichannel strategies. The Indian retail environment, characterized by a mix of organized and unorganized retail, growing e-commerce penetration and mobile-first digital adoption, presents a unique setting to study these behaviors. This highlights the need to consider geographical and infrastructural differences in shaping omnichannel shopping preferences.

To address this gap, the present study develops a typology of omnichannel consumers based on psychographic segmentation, while accounting for product characteristics and geographic-related variables. By shifting the focus from external factors, such as pricing and competition, to intrinsic consumer traits, this research provides a consumer-centric perspective on omnichannel behavior. The findings will help retailers design targeted marketing strategies to enhance customer engagement and retention and understanding these dimensions will allow retailers to develop personalized engagement strategies, increase conversion and foster long-term loyalty.

Literature review and theoretical framework

Showrooming (browsing in-store before purchasing online) and webrooming (researching online before buying in-store) add complexity to consumer decision-making, as shoppers navigate multiple channels while weighing various trade-offs (Balakrishnan *et al.*, 2014; Flavián *et al.*, 2016; Gensler *et al.*, 2017; Schneider & Zielke, 2020). Given this complexity, we draw on judgement and decision-making research (Appelt *et al.*, 2011) and omnichannel retailing studies (Verhoef, 2021) to examine how individual differences—e.g. risk attitudes, cognitive ability, motivation, personality traits and decision-making styles—influence showrooming and webrooming behaviors. Prior research has primarily segmented consumers based on channel preferences and characteristics (Konus *et al.*, 2008; Nakano & Kondo, 2018). However, showroomers and webroomers display distinct psychographic traits that shape their shopping journeys. For instance, showroomers exhibit higher price sensitivity, frequently comparing in-store and online prices to maximize value (Gensler *et al.*, 2017; Schneider & Zielke, 2020). Their impulsive and exploratory nature makes them highly responsive to promotional displays and sensory engagement (Fernández *et al.*, 2018; Viejo-Fernández *et al.*, 2020). Despite their focus on price, showroomers are willing to pay a premium when they perceive added value in brand reputation, convenience, or product quality (Viejo-Fernández *et al.*, 2018).

In contrast, webroomers are methodical and analytical decision-makers, relying on extensive pre-purchase research, product reviews and brand reputation to enhance decision confidence (Flavián *et al.*, 2016; Santos & Gonçalves, 2019). Their high need for cognition drives them to prioritize logical analysis over sensory feedback, ensuring informed purchases (Viejo-Fernández *et al.*, 2018; Kleinlercher *et al.*, 2020). Additionally, immediacy is a defining trait of webroomers; they value quick product access, preferring physical stores for instant possession after online research, minimizing waiting time (Aw, 2019; Herrero-Crespo *et al.*, 2020).

Risk attitudes further differentiate these groups: showroomers exhibit high risk tolerance, making purchase decisions with limited prior research, relying on in-store exploration and immediate validation (Viejo-Fernández *et al.*, 2020). They are also more likely to purchase online when platforms are secure and user-friendly (Rapp *et al.*, 2015). Webroomers, in contrast, are risk-averse, using detailed online research to mitigate uncertainty and preferring retailers with strong post-purchase support and consistent product quality (Arora & Sahney, 2019; Muthaffar & Vilches-Montero, 2023).

Technology orientation further distinguishes showroomers from webroomers. Showroomers are more mobile-dependent, using smartphones for real-time price comparisons, product scanning and digital coupon retrieval (Schneider & Zielke, 2020; Kokho *et al.*, 2018). Webroomers use technology primarily for pre-purchase research, favoring structured e-commerce platforms that provide detailed product insights (Flavián *et al.*, 2020). Desire for social contact also plays a role. Showroomers actively seek social engagement, relying on sales associates and peer discussions before making decisions (Fassnacht *et al.*, 2019). Many enjoy the hedonic aspects of in-store shopping, including browsing and product interaction (Schneider & Zielke, 2020; Viejo-Fernández *et al.*, 2020). Webroomers, in contrast, value autonomy, depending on digital tools for independent decision-making and being more influenced by online social proof, such as reviews, ratings and brand reputation, rather than face-to-face interactions (Flavián *et al.*, 2016).

Building on these psychographic distinctions, we propose a framework for omnichannel consumer segmentation, focusing on internal traits rather than channel characteristics. We integrate Ailawadi *et al.* (2001) for psychographics, the Big Five personality traits and the Consumer Decision-Making Styles (CDMS) framework (Lyonski *et al.*, 1996), alongside risk attitudes, cognitive ability and motivation as core determinants of omnichannel consumer behavior. This empirically grounded model provides deeper insights into how individual psychographic traits shape showrooming and webrooming behaviors, helping retailers develop more effective engagement strategies tailored to different consumer profiles.

Consumer decision-making styles in webrooming and showrooming.

The rapid expansion of digital commerce has reshaped consumer interactions with retail channels, integrating both online and offline touchpoints. Sproles & Kendall (1986) identified eight consumer decision-making styles—quality-consciousness, brand-consciousness, novelty-fashion consciousness, recreational shopping, price-consciousness, impulsiveness, confusion due to excessive information and habitual brand loyalty—that influence shopping behavior. While these styles have been widely studied in traditional and online retail contexts, their role in omnichannel shopping, particularly in webrooming and showrooming remains largely underexplored. This further leads us to hypothesize that quality-conscious consumers, who prioritize product reliability and information accuracy, are more likely to engage in webrooming. They rely on expert reviews, product comparisons and online specifications before purchasing in-store to ensure quality validation (Nakano & Kondo, 2018). Brand-conscious consumers, who associate prestige with quality, also often engage in loyal showrooming, preferring to experience premium products in flagship stores before purchasing through online platforms (Schneider & Zielke, 2020).

Novelty-fashion-conscious consumers, driven by trend-seeking behavior, frequently alternate between showrooming and webrooming based on product availability and promotional incentives. They may showroom to engage with new collections firsthand but opt for online purchases when limited-time releases or influencer-driven campaigns create urgency (Sharma & Dutta, 2025). Social commerce and digital previews increasingly influence this segment, making omnichannel engagement fluid (Johnson & Ramirez, 2020). Recreational shoppers often prefer in-store experiences but engage in webrooming to explore trends and promotions before visiting physical stores (Nakano & Kondo, 2018).

Price-conscious consumers exhibit strong showrooming tendencies, using physical stores to inspect products before purchasing online for better deals (Schneider & Zielke, 2020). The availability of real-time price-comparison tools and personalized discount notifications reinforces this behavior (Nakano & Kondo, 2018). Impulsive shoppers, who make spontaneous purchase decisions, generally complete transactions in the first channel they engage with, but digital promotions and flash sales can prompt showrooming, where in-store browsing leads to an online purchase triggered by sudden price incentives (Agrawal, 2022).

Consumers overwhelmed by excessive product information often switch between showrooming and webrooming in search of reassurance. The complexity of online choices and conflicting reviews frequently drive them to physical stores for in-person guidance before making a purchase (Schneider & Zielke, 2020). However, as AI-driven recommendations and streamlined product filters reduce decision fatigue, online purchases may become more appealing. Habitual brand-loyal consumers exhibit strong retailer affinity and are likely to engage in loyal showrooming or webrooming, interacting with a brand's online and offline platforms without switching to competitors (Schneider & Zielke, 2020). These consumers may research through official websites but prefer in-store purchases for service assurance (Sharma & Dutta, 2025).

Risk attitudes in webrooming and showrooming.

Webrooming is largely driven by risk aversion, as consumers seek to mitigate financial, product and convenience-related risks (Yadav *et al.*, 2024). Concerns such as product quality uncertainty, transaction security and post-purchase service reliability drive consumers to validate products in-store before purchasing

online (Flavián *et al.*, 2019; Singh *et al.*, 2014). Financial risks—including fraud, hidden costs and insecure payments—often discourage online transactions, reinforcing the need for in-store validation (Forsythe *et al.*, 2006; Ho & Awan, 2019). Similarly, product risk, or the fear of receiving an item that does not meet expectations, strengthens webrooming tendencies, as physical inspection provides reassurance (Aghekyan-Simonian *et al.*, 2012; Dai *et al.*, 2013). In contrast, showrooming reflects a stronger emphasis on price benefits, where consumers are willing to take risks in exchange for cost savings. Risk-tolerant shoppers prioritize discounts and convenience, even if it means facing potential uncertainties such as delayed deliveries or complex return policies (Figner & Weber, 2011; Nguyen *et al.*, 2022). They are also more inclined to purchase from online brand stores, trusting their authenticity despite possible risks. Unlike webrooming consumers, who prioritize certainty, showrooming consumers accept trade-offs such as longer wait times or limited post-purchase support if it means securing a better price (Singh & Rosengren, 2020). Same as consumer decision-making styles, despite extensive research on risk perception in online and offline shopping, the direct role of risk attitudes in shaping webrooming and showrooming remains insufficiently explored. While some studies suggest that higher risk aversion strengthens webrooming tendencies, others argue that improvements in online security, return policies and consumer trust have reduced showrooming hesitation. Given these inconsistencies, further research is necessary to determine whether risk aversion continues to drive webrooming behavior or if evolving consumer trust in digital retail channels has led to greater showrooming acceptance. This is particularly relevant in high-digital-engagement markets like India, where consumers actively use both online and offline channels but remain cautious about product authenticity, financial security and service reliability.

Cognitive ability in webrooming and showrooming

Cognitive ability influences how consumers process, evaluate and compare information when making purchase decisions. It includes intelligence, decision-making styles and information-processing skills (Appelt *et al.*, 2011). While its direct effect on webrooming and showrooming remains unexplored, need for cognition (NFC) (Cacioppo *et al.*, 1983) serves as a strong indicator of consumer engagement in complex decision-making (Fleischhauer *et al.*, 2014). Consumers with high NFC prefer detailed research and comparative analysis, making them more likely to engage in webrooming, where they extensively search online before purchasing in-store to confirm product attributes (Kim, 2019; Park & Kim, 2019). Studies suggest that higher cognitive deliberation correlates with increased multichannel engagement, where consumers rely on online information but seek final validation in-store (Rodríguez-Torrico *et al.*, 2020). This preference for structured decision-making makes webrooming a logical choice, particularly in product categories requiring detailed specifications, reviews and tactile confirmation. However, when online retailers provide comprehensive product details and strong credibility signals, high-NFC consumers may shift toward showrooming, evaluating products in-store before leveraging online advantages (Zhu & Meyer, 2017). Again, despite existing insights on cognitive ability and information-seeking behavior, its direct influence on webrooming and showrooming remains underexplored.

Motivations

Webrooming and showrooming are shaped by various functional, experiential and psychological motivations (Kollmann *et al.*, 2012). Traditional motivations such as financial savings, product exploration, entertainment, self-expression, convenience and decision support (Chandon *et al.*, 2000) have been widely studied in the motivation-opportunity-ability framework (Macinnis & Park, 1991) and recognized as key influencers (Valentini *et al.*, 2020). However, individual psychological traits may further determine how consumers navigate between online and offline channels. Those with a hedonic orientation may be more inclined toward showrooming, as they seek sensory and interactive shopping experiences before purchasing online (Konuş *et al.*, 2008; Lee & Jung, 2020). In contrast, task-oriented shoppers may be more likely to engage in webrooming, using online research to streamline in-store purchases (Chimborazo-Azogue *et al.*, 2022).

Similarly, exploratory buying behavior tendency (EBBT), which reflects innovativeness and variety-seeking, may drive cross-channel shopping behaviors. High EBBT consumers could be more likely to engage in webrooming, using online sources to explore options before purchasing offline, or in showrooming, physically evaluating products before seeking better deals online (Mukherjee & Chatterjee, 2021). Conversely, low EBBT consumers may exhibit a single-channel preference, avoiding extensive cross-channel shopping (Hallikainen *et al.*, 2019). Resistance to change (RTC) may moderate consumers' likelihood of switching between channels. Those with high RTC could display channel inertia, avoiding both webrooming and showrooming, while low RTC consumers may be more open to cross-channel shopping (Juaneda-Ayensa *et al.*, 2016; Oreg *et al.*, 2008). Additionally, need for touch (NFT) may play a role in determining channel preference. Consumers with high NFT might favor showrooming, requiring physical interaction before purchasing online, while webrooming consumers with high NFT may prefer to research online but complete their purchase in-store for sensory validation (Maggioni *et al.*, 2020; Peck & Childers, 2003). Digital innovations like zooming, 360-degree product views and augmented reality could potentially reduce showrooming tendencies (De Canio *et al.*, 2022). While prior research has explored these psychological motivations in general shopping behavior, their role in driving webrooming and showrooming remains underexamined. Further investigation could provide insights into how these factors shape cross-channel decision-making, helping retailers develop more effective omnichannel strategies.

Personality

Personality traits, often captured within the Big Five framework (extraversion, neuroticism, openness, conscientiousness and agreeableness, Hahn *et al.*, 2012) may influence consumers' engagement in webrooming and showrooming. Prior research suggests that individuals with high openness are more inclined toward online shopping, while those high in agreeableness may prefer offline stores (Hermes & Riedl, 2021). Additionally, extraversion, conscientiousness and agreeableness have been linked to a stronger preference for in-store purchases (Hermes *et al.*, 2022). However, the role of these personality traits in webrooming and showrooming behavior remains unclear. Consumers high in openness may be more likely to engage in showrooming, as they explore in-store experiences before purchasing online, while those high in conscientiousness may favor webrooming, researching products online before making an informed in-store purchase. Conversely, individuals with high neuroticism may avoid cross-channel shopping due to uncertainty, preferring to stick to a single channel. Given the complexity of personality-driven shopping behaviors, further research is needed to examine how these traits shape channel-switching tendencies in omnichannel retailing (Liu *et al.*, 2019).

Product type

The influence of product type on webrooming and showrooming behavior is shaped by key product attributes, including information asymmetry, perceived risk, price sensitivity and the role of sensory evaluation. One of the primary attributes distinguishing experience from search goods is information asymmetry, which refers to the difficulty in fully assessing a product's quality and performance based on online descriptions alone (Lian & Yen, 2013). Experience goods, such as cosmetics and fashion apparel, are highly susceptible to this issue due to their subjective nature and variability. In the case of cosmetics, factors like texture, color accuracy and scent make it challenging for consumers to rely solely on online descriptions or reviews. Similarly, fashion apparel requires physical fit, comfort testing and tactile evaluation, making in-store visits an essential part of the shopping process. Therefore, experience goods, which are characterized by high information asymmetry and the need for physical interaction, tend to drive webrooming behavior, while search goods, which can be objectively evaluated through available product information, are more likely to encourage showrooming (Nelson, 1970; Schneider & Zielke, 2020). The high uncertainty associated with these products elevates perceived risk, which further reinforces webrooming behavior, as consumers prefer to research online before visiting a store to confirm their choice and reduce uncertainty (Park & Lee, 2009; Sharma & Krishnan, 2002).

On the other hand, search goods, such as consumer electronics and books, exhibit low information asymmetry, as their quality and features can be objectively assessed through online descriptions, specifications and user reviews (Chiang & Dholakia, 2003). Consumer electronics, such as smartphones and laptops, often drive showrooming behavior because their performance and technical specifications can be evaluated through online sources. However, many consumers still prefer to visit a store to experience the product hands-on before making a final decision. Despite this, the ability to compare prices easily online, combined with the standardization of features across different retailers, often leads consumers to purchase these products from digital storefronts to secure a better deal (Fassnacht & Unterhuber, 2016; Girard *et al.*, 2003). Books, another typical search good, follow a similar pattern. As the content is fixed and easily assessable through online previews and reviews. In-store visits may serve a browsing function rather than a purchase intention, leading to showrooming behavior where consumers examine books in physical stores but ultimately purchase online for convenience or cost savings (Hong & Pavlou, 2014; Weathers *et al.*, 2007).

Another important product attribute is price. Consumers tend to be less price-sensitive for experience goods, especially those with hedonic attributes, such as premium cosmetics or premium fashion items, because their value is often tied to brand experience and emotional satisfaction rather than just cost (Wakefield & Inman, 2003). As a result, the need for price comparison is lower, making webrooming behavior more prevalent. Conversely, for search goods like consumer electronics, price sensitivity is often high because product specifications remain the same across retailers, prompting consumers to search for the best deal online after inspecting the product in-store (Fassnacht & Unterhuber, 2016).

The role of sensory evaluation and salesperson interaction also plays a crucial role in moderating shopping behavior. Experience goods such as cosmetics and fashion apparel require direct sensory engagement—touch, feel and scent—which makes in-store trials indispensable. In these cases, webrooming is strengthened by the perceived helpfulness of in-store salespeople, as expert advice can reduce uncertainty and enhance purchase confidence (Aw, 2020; Sharma & Krishnan, 2002). By contrast, for search goods like electronics and books, where product information is more objective and standardized, online reviews and descriptions often serve as substitutes for salesperson assistance (Hong & Pavlou, 2014).

These distinctions illustrate how product characteristics influence consumers' webrooming and showrooming behaviors. Experience goods, marked by high information asymmetry, greater perceived risk and a need for sensory evaluation and salesperson interaction, encourage webrooming, as consumers prefer to research online but finalize their purchase in-store. In contrast, search goods with low information asymmetry and higher price sensitivity drive showrooming, where consumers inspect products in-store but check online reviews and opt for online purchases to secure a better deal.

Understanding these dynamics lays the groundwork for examining how product attributes shape both webrooming and showrooming behaviors, offering insights into how retailers can refine their omnichannel strategies. While limited research has investigated the influence of product type on showrooming, its impact on webrooming remains largely unexplored. Gaining deeper insights into these effects can help retailers enhance online product information, improve in-store experiences and create better synergy between digital and physical channels to more effectively cater to consumer preferences.

Regional variations in India

India's urban classification system segments cities into metropolitan (tier-1), tier-2 and tier-3 categories, each exhibiting distinct retail infrastructure, digital penetration and consumer shopping behavior. Metropolitan cities such as Mumbai, Delhi and Bangalore offer extensive access to branded retail stores, modern shopping malls and advanced e-commerce services, enabling seamless integration between online and offline shopping. In contrast, tier-2 and tier-3 cities, such as Jaipur, Indore and Coimbatore, have growing but

limited access to premium retail brands and organized shopping infrastructure (Chandola, 2024). While e-commerce adoption is rising in these regions, consumer trust in physical retail, concerns over product authenticity and higher price sensitivity shape their omnichannel shopping behavior. In metropolitan cities, showrooming is prevalent, particularly for consumer electronics, premium fashion and high-value goods, where consumers visit stores for product trials but complete purchases online to take advantage of discounts, exclusive offers and flexible return policies (Chatterjee *et al.*, 2021). The availability of instant price comparisons, secure digital payments and rapid delivery services further reinforces this behavior (PwC, 2024). However, webrooming is also common, especially for experience goods such as cosmetics and premium fashion, where sensory evaluation, salesperson guidance and trust in authenticity influence purchase decisions (Lian & Yen, 2013).

In tier-2 and tier-3 cities, webrooming dominates due to limited premium retail options, fewer international brands and a stronger reliance on local retailers. While consumers in these cities use e-commerce for product research and price comparisons, they often finalize purchases in-store due to trust in offline shopping, product authenticity concerns and a preference for in-store assistance (Haridasan & Fernando, 2018; Mishra, 2018). Additionally, 54% of consumers in these regions prioritize discounts over fast delivery, reinforcing their preference for in-store negotiations and immediate product access (PwC, 2024). Showrooming is less common in these cities due to fewer premium retail outlets and a lower inclination toward digital-first shopping (PwC, 2024). These distinctions emphasize the need for region-specific omnichannel strategies. While metropolitan consumers engage in showrooming due to pricing transparency, brand accessibility and strong e-commerce integration, tier-2 and tier-3 consumers favor webrooming due to the need for in-store verification, limited retail options and greater trust in offline networks.

Methodology

This study adopts an exploratory qualitative research design to develop a typology of omnichannel consumers based on psychographic segmentation. Unlike prior work that centers on external enablers such as pricing or platform efficiency, this study foregrounds intrinsic consumer characteristics—including motivations, decision-making styles, personality traits and shopping orientations—as primary influences on omnichannel behavior. Additionally, product type (experience vs. search goods) and geographic context (urban, rural and semi-urban environments) are explored as moderating factors. A qualitative approach is appropriate given the need to capture nuanced reasoning processes and contextual influences that are often overlooked in structured survey formats (Lewis, 2015). The aim is to generate a consumer-centric framework that reflects the psychological and situational complexities of channel-switching behavior.

Participants were selected through purposive sampling to ensure relevance to the study objectives. Eligibility required prior engagement in both showrooming (searching in-store, purchasing online) and webrooming (searching online, purchasing in-store)—behaviors aligned with established definitions of omnichannel consumers (Juaneda-Ayensa *et al.*, 2016). Thirteen participants (7 males, 6 females), aged between 24 and 47 years, were recruited to ensure demographic and behavioral diversity across professional, technological and lifestyle backgrounds. All participants had recently made purchases through both online and offline channels and across varied product categories, ensuring experiential relevance and data richness.

Data were gathered through semi-structured, in-depth interviews lasting 45 to 60 minutes. Interviews were conducted either in person or via secure video conferencing platforms, based on participant convenience. The interview protocol was structured around three core dimensions: (i) Psychographic traits, which included decision-making styles (e.g., quality consciousness, impulsiveness), personality attributes, cognitive traits, risk attitudes and motivational orientations; (ii) Product characteristics, distinguishing between experience goods and search goods following Nelson's (1970) framework.

TABLE 1 - Summary of the four segments resulting from the analysis

Segments	Predominant Behavior	Key Traits and Decision-Making Styles	Primary Product Categories	Geographic Variation	Motivations and Behavioral Triggers
Tactile Evaluators	Showrooming	High need for touch, quality-conscious, low impulsivity, brand-aware	Apparel, cosmetics, footwear	Metro and tier-2 cities	Need for sensory/physical verification of fit, fabric, or shade; emotional appeal followed by rational evaluation
Risk-Averse Rationalists	Webrooming	High risk aversion, high need for cognition, thorough and perfectionist, deliberate	High-involvement products: electronics, mobile phones, appliances	Metro and tier-2 cities	Concerns about product authenticity, post-sale support and technical clarity
Deal-Seeking Navigators	Showrooming (strategic)	Price-conscious, digitally savvy, rational and pragmatic	Fashion, footwear, accessories (but electronics and small appliances, too).	Urban and semi-urban areas	Offline trial for fit/comfort; online purchase driven by discounts, coupons, EMI options
Situational Switchers	Mixed (adaptive)	Can temporarily resemble other segments. Context-sensitive, moderate risk tolerance, flexible, influenced by urgency or mood	Apparel, electronics, varied categories	Metro, tier-2 and semi-urban areas	Channel choice depends on occasion, convenience, social setting and immediacy of need

Participants were asked to describe specific purchase experiences involving both product types, with attention to information asymmetry, perceived risk, price sensitivity and sensory evaluation and (iii) Geographic and situational variables, such as store accessibility, traffic and urban vs. rural infrastructure; these are factors that may shape the convenience and attractiveness of each shopping channel. This approach enabled the capture of both micro-level behavioral reasoning and macro-level contextual influences shaping omnichannel preferences.

All interviews were audio-recorded with participant consent and transcribed using Revoldiv, a free AI-assisted transcription tool. Each transcript was meticulously reviewed against the original audio to ensure fidelity to participant phrasing, tone and meaning. Two coders analyzed data independently using inductive thematic analysis (Braun & Clarke, 2006). The process involved initial open coding to identify recurring patterns in reasoning, emotion and behavioral triggers; iterative clustering of codes into broader themes; development of a typology of omnichannel consumers, based on psychographic consistencies across participants; cross-case analysis to examine how product type and geographic context moderated consumer behavior within each profile.

Results

The qualitative analysis offered a detailed picture of how consumers navigate between online and offline shopping environments. Participants showed flexible behavior rather than fixed channel preferences, adjusting their choices based on motivations, perceived risks, need for information or sensory information and available discounts. Shopping decisions were shaped by individual differences in how people process information, make decisions and respond to their immediate context. Based on these patterns, four psychographic shopper profiles were identified: Tactile Evaluators, Risk-Averse Rationalists, Deal-Seeking Navigators and Situational Switchers (Table 1).

Showrooming appeared frequently across segments, but it was rarely spontaneous or solely affect-driven. While emotional or sensory appeal might have played a role in initial in-store engagement, participants frequently describe deliberate, rational motives for showrooming. A common theme across interviews was the need to confirm tactile attributes such as fit, texture, or color accuracy before purchasing online to benefit from discounts or platform incentives (e.g., “I go to the store, try things, figure out the sizes and then I go to their shopping app and shop there... I get 50 rupees off”). Participants in the Tactile Evaluator segment evidenced a high need for touch and sensory validation, but their behavior was not impulsive. Rather, they initiated their shopping journeys in physical stores to assess quality and fit, followed by structured online searches to compare prices and identify deals, often completing their purchases on e-commerce platforms that provided additional incentives. These behaviors reflect a calculated integration of affective triggers and cognitive effort.

Webrooming, by contrast, was generally more deliberate and strongly associated with high-involvement, high-risk product categories, such as electronics and appliances. Participants who engaged in this pattern typically demonstrated a high need for cognition, strong risk aversion and a perfectionist approach to decision-making. These Risk-Averse Rationalists began their journeys online, thoroughly researching product specifications, user reviews and expert comparisons. However, due to concerns about authenticity, potential product defects, or the desire for after-sales support, they preferred to make their final purchases in physical stores. Their narratives emphasized the importance of verifying credibility through in-person interaction and trusted retailers, particularly for expensive or technically complex items (e.g., “Firstly if I'm going with the heavy budget... that time I see first present brand in my budget... then see the features of the product... then I check the reviews... then I go with the offline store... I like to talk to the people because they know the real features on it, For electronics. I first compare all the features online, shortlist models and then go to the store to make sure it's real”).

Deal-Seeking Navigators also engaged in showrooming but did so with a value-maximizing orientation. Their offline visits were often purpose-driven, intended to verify product fit or comfort, but their purchase decisions hinged on securing the most advantageous price. These participants used technology actively to track discounts, apply coupon codes and access special platform offers. While not impulsive, their behavior was pragmatic and strategic, characterized by a willingness to wait for platform discounts or sales events. The interview data confirmed that this pattern was prevalent across product categories such as fashion, footwear and accessories, where product experience mattered but price remained the ultimate decision criterion (e.g., “I go online, search the shoes, specific brand, when I select the shoes or select the colour of the shoes, then I go offline store, search the store nearby me, go and try the shoes. It suits on me or not, when I get satisfied with the shoe. I go back on the first step again, order online”).

Situational Switchers exhibited adaptive behaviors that changed depending on urgency, convenience, social context, or environmental cues. They alternated between webrooming and showrooming based on factors such as proximity to stores, time constraints, or brand experience. Their decision-making was neither rigid

nor entirely preference-driven; instead, it reflected a dynamic adjustment to momentary needs (e.g., “It depends on situation and it depends on situation first. If I need urgently or like I don't have to wait for it. So I go with the physical stores [...] according to my situation and condition and my budget, then okay buy it. If I have a lot of time to wait for it and I don't have any hurry to buy it. So then I go with the online.. It depends on the mood exactly very much nowadays, at least. Because sometimes the time is less, you have to buy. [...] So it's better to go and get it if I am liking it rather than researching it and then taking a decision and then waiting for it to get delivered. [...] it's not always the same thing, but when I'm doing a leisure shopping then definitely I can do the research ok., So, i have to visit a birthday party tomorrow. So, i definitely would love to buy offline. But if I have to visit a wedding after one month, so it's preferred online”). Even the timing of events or the type of occasion influenced shopping strategy. This group illustrated the flexibility consumers apply in evaluating how best to approach a particular shopping situation, adjusting their strategies with awareness of both contextual demands and personal preferences.

Across all segments, product category played a decisive role in channel behavior. For example, for apparel, consumers consistently prioritized physical verification. Four participants described processes in which they visited stores to assess fit, color accuracy and fabric comfort before finalizing a purchase, either online or offline. The need for tactile feedback was often cited as outweighing modest online discounts, but not big ones. Even extensive online research was typically framed as a preliminary step, with the in-store trial remaining essential to the final decision. Footwear also required physical assessment, especially concerning fit and comfort; two participants expressed difficulty in gauging shoe size and comfort through online platforms; despite attractive online pricing, the uncertainty around fit often motivated them to try footwear in-store before making a decision. Cosmetics and skincare showed a similar, albeit slightly different, pattern; while tactile engagement was less critical than in apparel, participants highlighted the importance of shade matching and the ability to assess product authenticity in person; online research and price comparisons were common, but consumers often visited physical stores to test shades or examine labels. This hybrid approach allowed shoppers to balance the benefits of online convenience with the reassurance provided by in-store trials.

For electronics, such as mobile phones, laptops and appliances, decision-making was more complex. Some participants engaged in detailed online research to compare specifications, read reviews and evaluate deals. However, concerns about product authenticity, warranty coverage and the risk of receiving damaged or refurbished items led many to purchase offline after thorough digital investigation. These cases reflected the strongest pattern of webrooming, with the physical store serving as a final validation point before committing to high-value purchases. Accessories like watches also showed a reliance on physical interaction. One participant emphasized the need to assess strap quality, comfort and design details in person; in addition to product evaluation, the opportunity to negotiate price or receive in-store service contributed to a preference for offline shopping in this category. From the responses, products that require sensory validation—such as apparel, cosmetics, footwear and accessories—tend to encourage showrooming, even when consumers are experienced digital users. The shopping behavior for electronics was contingent on the consumer's risk profile; however, for higher-ticket electronics, although digital exploration was important, the final purchase was often executed offline to minimize perceived risk.

Geographic context further moderated behavior, in metropolitan areas, participants reported easier access to malls and branded stores, enabling more frequent showrooming. At the same time, these consumers often used mobile apps in-store to compare prices or check inventory. In tier-2 or semi-urban regions, participants relied more on offline trust networks for final purchases, particularly for high-risk items, though they used online platforms for browsing and discovery. This variation highlights how shopping behavior reflects not only personal traits and product categories but also infrastructural and cultural environments

Conclusions and discussion

This study contributes to the emerging literature on omnichannel shopping by examining how consumers in India move between online and offline channels. Our findings support the idea that showrooming and webrooming are not tied to fixed consumer types. Instead, they depend on a mix of individual traits, product characteristics and context. Participants adjusted their behavior depending on the situation rather than sticking to habitual patterns. This aligns with earlier segmentation research (Konus *et al.*, 2008; Nakano & Kondo, 2018), challenging the notion, often found in earlier literature (e.g., Gensler *et al.* (2017) that showrooming and webrooming represent stable, mutually exclusive consumer types and supports the view that these behaviors follow multi-stage decisions rather than mutually exclusive paths (Mukherjee & Chatterjee, 2021).

One key finding is that showrooming is often a planned and thoughtful process. This contrasts with earlier studies that described it as mostly impulsive or socially driven (Schneider & Zielke, 2020; Viejo-Fernández *et al.*, 2018). In our sample, even participants with strong hedonic preferences used physical stores to evaluate products before buying online. Deal-Seeking Navigators and Tactile Evaluators. In particular, approached showrooming as a way to gather information—often using mobile devices in-store—before completing their purchase online (Fiestas & Tuzovic, 2021). This highlights a more deliberate use of showrooming than has typically been reported (Sit *et al.*, 2018).

Our findings on webrooming are consistent with previous research that describes these shoppers as cautious and information-driven (Flavián *et al.*, 2016; Santos & Gonçalves, 2019). Risk aversion and a preference for certainty were especially strong drivers in our study; participants often chose to finalize purchases offline to confirm product authenticity or clarify warranty conditions. While webrooming is sometimes seen as a time-saving tactic (Aw, 2019; 2020), our participants described it as effortful but worthwhile—particularly when it led to a sense of control and confidence (Flavián *et al.*, 2019, 2020).

The shopper profiles identified in this study build on recent efforts to classify omnichannel consumers using psychological traits as well as behaviors (Schneider & Zielke, 2020; Viejo-Fernández *et al.*, 2020). For example, Deal-Seeking Navigators blended price sensitivity with platform familiarity, extending earlier concepts tied to economic motivations (Arora *et al.*, 2017; Nakano & Kondo, 2018). Situational Switchers, meanwhile, showed that flexibility across channels is common and not yet fully captured in many typologies. Product type also played an important role. Our findings support previous distinctions between search and experience goods (Girard *et al.*, 2003; Nelson, 1970) and add nuance to recent work showing how these categories affect information search and purchase behavior (Basu, 2018). In-store inspection was more common for products where fit, texture, or authenticity mattered, while electronics prompted more online research due to higher perceived risk. This suggests that product features continue to shape channel use, even among digitally savvy shoppers. We also found clear differences by geography. Consumers in metropolitan areas used both showrooming and webrooming more actively, supported by better access to retail technology and infrastructure. Those in tier-2 cities relied more on trusted offline networks and local service. These patterns underline the need to adapt omnichannel strategies to different regional contexts.

From a practical standpoint, our results suggest that retailers should look beyond technical channel integration and focus on supporting customer journeys that are shaped by goals, preferences and context. In this sense, personalization may play a pivotal role in enhancing the customer experience across touchpoints (Lemon & Verhoef, 2016). For showroomers, this might mean improving in-store experiences and enabling easier online comparisons. For webroomers, offline spaces should help confirm and complete digitally informed decisions. Retailers that recognize and support these different paths will be better positioned to build trust and long-term satisfaction.

From a theoretical standpoint, the study contributes to research on omnichannel retailing by highlighting the experiences of Indian consumers, a context that remains largely underexplored. While previous work often treats showrooming and webrooming as distinct, goal-driven behaviors, our findings suggest that these practices may be more fluid and context-dependent. Many participants described switching between online and offline channels multiple times during the same purchase journey, depending on the product type, perceived risk, convenience and availability.

The proposed typology—comprising Risk-Averse Rationalists, Tactile Evaluators, Deal-Seeking Navigators and Situational Switchers—offers a more nuanced framework for understanding how consumers use channels differently based on both situational and psychological factors. These categories reflect not only different motivations but also variations in how consumers weigh product evaluation, trust and price. In doing so, the study expands current models of omnichannel behavior by emphasizing the role of uncertainty management, experiential needs and flexibility in the decision-making process. The findings also suggest that theories of omnichannel behavior should better reflect how shoppers move back and forth between channels rather than following a fixed path. Many participants adjusted their approach depending on context, showing that decision-making is often flexible and ongoing. Concepts like trust, control and information sufficiency came up across the different shopper types and should be considered more closely in future research.

From a practical perspective, the results suggest that retailers should approach omnichannel strategy as a form of decision support rather than simply focusing on channel integration. Participants' behaviors reveal that online and offline channels are used in complementary ways: offline spaces often serve to reduce uncertainty—through product trial or interaction with staff—while online channels offer breadth of choice, pricing benefits and convenience. Retailers can enhance the value of physical stores by supporting sensory engagement and providing transparent, easily accessible information. This is especially relevant for consumers who prefer to validate product fit or quality before making a purchase. For online environments, maintaining accurate descriptions, offering detailed reviews and ensuring visible return or warranty policies can help build trust and facilitate webrooming journeys. Segment-specific strategies may also improve outcomes. For example, Deal-Seeking Navigators may respond well to dynamic pricing tools or loyalty incentives, while Risk-Averse Rationalists may value clear information and strong post-sale support. For more flexible shoppers, tools that preserve continuity across channels—such as synchronized wishlists or saved carts—may encourage conversion.

The study also highlights how product category plays a central role in shaping channel preferences. For categories like clothing, cosmetics and footwear, many consumers prefer to validate options in-store to check fit, comfort, or shade—even if they first researched online. In these cases, offline channels play a key role in reducing uncertainty. For electronics and other high-value items, shoppers were often more willing to purchase online, particularly when the product was familiar and price differences were significant. However, concerns about authenticity and after-sales support led some participants, especially Risk-Averse Rationalists, to prefer in-store purchases or to rely on trusted platforms or official brand websites. These patterns suggest that omnichannel strategies should be tailored not only by segments, but also by product category. For high need-for-touch items, stores can focus on product trial, assistance and return flexibility. For standardized or high-investment items, trustworthy online experiences, price transparency and clear service terms are more likely to influence purchase decisions and shopping behaviors.

Finally, geographic variation emerged as a relevant factor. Consumers in metropolitan areas often valued speed and self-service, while those in tier-2 cities emphasized personal assistance and reliability. Tailoring staff training, promotion and fulfillment strategies to local preferences may therefore improve the overall effectiveness of omnichannel initiatives.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

COntent: personalized content creation by marketer and AI

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Abstract. Within the field of marketing, content marketing no longer is a side issue. Reaching target audiences requires content to be personally relevant. Generative artificial intelligence (Gen AI) can help improve efficiency by managing increased workloads. The goal of the COntent project is to assist Flemish SMEs in automating and optimizing their content marketing using Gen AI technology. It focuses on the question: How can AI support marketers in creating relevant, personalized content? Together with Flemish SMEs, we work on the co-creation of SEO/SEA texts, social media posts, newsletter and website content. To account for the technology's social embedding, each use case is approached from both strategic, technical, ethical and legal perspectives. Experiments are done to evaluate whether co-created AI-content achieves the defined goals.

Keywords : content marketing; co-creation; personalization; automation; generative artificial intelligence

Introduction

Within the field of marketing, content marketing is no longer a side issue. Creating content with a personal relevance to members of the target audience is becoming increasingly important for marketers. Still, creating content with personal relevance for (potential) customers can be a strenuous and time-consuming task for marketers, especially for those working in SMEs with relatively limited resources at their disposal. To help marketers in SMEs manage the increased workload, artificial intelligence can help improve efficiency. In particular, generative artificial intelligence (Gen AI) applications, such as ChatGPT, provide marketers with a range of possibilities to work more efficiently. The appeal of these applications not only lies in their capacity of quickly and creatively producing relevant text, but also in their versatility, user-friendliness and accessibility (e.g., Cardon *et al.*, 2023; Haluza & Jungwirth, 2023; Paul *et al.*, 2023; Truly, 2022). Nevertheless, this technology also raises ethical concerns, such as issues of accountability, authenticity and bias and legal challenges, such as copyright issues and potential misuse. Given the relative novelty of the technology, the fact that it is here to stay and that it is being used in a rather ad hoc manner, there is a need for more knowledge, greater awareness and critical reflection before Gen AI can be more widely implemented in the context of SMEs.

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The ‘Content’ project aims to assist Flemish[†] SMEs in automating and optimizing their content marketing using Gen AI technology. Our research question is: *How can AI support marketers in creating relevant, personalized content?* More concrete: How user-friendly, accessible and cost-effective are AI content generation tools today? What ethical and legal challenges arise from using these AI tools and how can they be addressed responsibly? What added value does co-created AI content offer to marketers?

Methodology

Research design

Our research project adopts an experimental design as methodology: we develop eight use cases for studying the concrete implementation of Gen AI tools in a business context. Each use case starts from a specific content marketing-related need, expressed by a Flemish SME. These include the writing of SEO/SEA texts, social media posts, newsletters, website content, etc. to optimize marketing efforts. To address these needs, Gen AI applications are purposefully selected and implemented in the respective SME’s content marketing activities. Reflections are formulated about the expected and the realized impact of implementing the Gen AI applications (using A/B testing, where one group views human-written content and another views AI co-created content). For each use case we also collect qualitative feedback, by questioning the SMEs about their experiences.

The empirical part of our research is embedded, first, in an extensive review of the literature, in which we mapped potential benefits for marketers in using Gen AI, as well as potential ethical and legal challenges. Second, eight in-depth, semi-structured interviews were conducted with digital marketing and/or technology firms that can be considered ‘early adopters’ (Rogers, 1995) of Gen AI technology. The aim of these interviews was to capture insights in terms of early experiences with using Gen AI, entrepreneurial culture regarding new technologies and awareness about its ethical and legal issues. Both the literature review and the interviews suggest that Gen AI can be a helpful tool for our target audience. It may support a plethora of operational tasks as idea-generation for users starting from a blank page; it can be used as a sparring partner for testing or refining ideas; as a critical friend to reveal the user’s blind spots. In these and other ways, the technology yields significant gains in time-efficiency (although it remains rather difficult to quantify). On the other hand, Gen AI also confronts the user with some important practical, ethical and legal challenges – the relevance of which depends on the concrete context of its use. On the practical and ethical side, users of the technology are urged to continuously monitor the quality of the generated content, as issues of authenticity (how to preserve one’s own tone of voice?), standardized content and customer disengagement and bias may occur. On the legal side, the use of the technology requires users to reflect – among others – on ownership of (sensitive) data, cyber-security, GDPR-compliance, etc.

Sample

The use-cases selected all share an interest in digital marketing: *Anna Pops* (shoes for children) wants to use Gen AI for writing Instagram posts, *VALA* (Flemish AI academy) is actively using Gen AI for writing LinkedIn posts, *Jacky Woo* (interior solutions) feels the need to rewrite her web-texts using Gen AI, *Phil’Suits* (tailor-made suits) wants to get inspired by Gen AI to generate appealing content matching their personas, *Maeskes Roem* (coffee) is curious how Gen AI can support finding and writing new topics for the newsletters, and *Afix Group* (scaffolding) uses Gen AI to generate new blog articles for 3 different customer segments. Our focus on SMEs is motivated by their tendency to have fewer resources to invest in digital marketing. To appeal to a broad audience of potentially interested businesses, our sample of use cases covers a diversity of economic sectors (both B2C and B2B). Moreover, to generate more insights, each use case tackles a specific content marketing-related need where Gen AI tools could provide support.

[†] ‘Flemish’ refers to Flanders, the Dutch-speaking part of Belgium

Preliminary results: Gen AI and social media posts

Given that our use cases are in different stages of elaboration, we limit ourselves to discussing the more advanced case of *Anna Pops*. To adequately integrate the AI-tool in the firm's communication strategy, we have adopted the two-step approach from Design Thinking (Brown, 2008), which includes a phase of strategic preparation and a phase of practical implementation. The strategic preparation, consisting of three steps, lays the foundation of a well thought out AI-integration. The first step ('Empathize') focuses on how *Anna Pops* can acquire more insight in the needs of its customers. Our analysis shows that its customers appreciate above all how the shop distinguishes itself from the large online players in retail. They prefer *Anna Pops* for its authentic approach and personal contact – elements that should be kept in its digital communication. The second step ('Define') seeks to clearly specify the firm's marketing and entrepreneurial targets. This exercise goes beyond merely determining the firm's target group, the vision and mission. We looked at how AI can contribute to more efficient communication, with respect for *Anna Pops*' personal touch. We formulated our objectives in a 'SMART' way (Ogbeiwi, 2017). In a third step ('Ideate'), we selected ChatGPT from a series of possible AI-tools, given the possibility it offers to create a personal GPT. This offers an accessible solution that comes with few risks.

The strategic preparation is ensued by the technical implementation phase, which entails a prototyping phase and a testing phase. During the prototyping phase, *Anna Pops*' historical data was collected from Instagram, yielding 1500+ posts covering a 10 years' period. For each post, we saved valuable data like the text, the time of posting, the number of likes and shares and diverse engagement metrics. These data provide the foundation for grasping *Anna Pops*' unique communication style. Next, *Anna Pops*' own GPT was configured, which entailed several steps, such as setting up a personal GPT, defining basic instructions ('prompting'), defining the GPT's workflow and refining the output. In the testing phase the user engages in a conversation with the GPT, who will ask feedback on the results given. The user will incorporate the GPT's output or will have to further optimize instructions in order for the GPT to come up with a more satisfying result.

Conclusions and discussion: Gen AI and social media posts

The use case of *Anna Pops* provides valuable insights in the integration of Gen AI in a brand strategy oriented on approaching the customer in a personal and authentic way. First, the use case shows the importance of authenticity to a smaller firm like this to maintain a competitive edge. The critical use of AI as an assistant for generating authentic content appeared to be a successful strategy. The success of the AI implementation is explained by its incremental approach. Starting with simpler applications, such as idea-generation and text optimization, allowed *Anna Pops* to experiment, to acquire familiarity with the technology, without endangering her brand identity. The use case also illustrates that AI and authenticity are not mutually exclusive. By strategically deploying AI for certain aspects of content creation, efficiency gains are achieved without sacrificing the personal approach. Although at *Anna Pops* there was initial restraint regarding the use of AI-tools, it is now seen as a clear added value, especially in the creative process. The technology plays the role of a digital sparring partner that stimulates creativity, while the user remains in control. These experiences underline that successful AI-implementation is about striking the right balance between technological innovation and personal brand values.

Acknowledgements

The COntent research project was funded by PWO-funding from Odisee University College.

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*Proceedings 31st International Conference on Recent Advances in Retailing and
Consumer Science, July 7 – 10, 2025, Zagreb, Croatia*

The influence of virtual assistants' (VAS') form on consumer fun perception and VA service engagement in online retail

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Abstract. Advancements in generative AI have significantly transformed the interface design of Virtual Assistants (VAs), progressing from formless, text/voice-based chatbots to those with visual elements and eventually into those with highly realistic, human-like representations. Nevertheless, most research still assumes that VAs are primarily text/voice-based. Another common assumption is that social appeal is regarded as the primary factor influencing consumers' interactions with VAs. However, many consumers prefer to shop online alone and to escape their daily routines, seek hedonic pleasure and enjoy the exploration process. This underscores the need to redirect the focus of VA studies from perceived social aspects to examining how perceived 'fun' can enhance VA service engagement and, consequently, improve the online shopping experience. To address these gaps, we drew on two theories: (1) Avatar Marketing Theory, which posits that 'form realism' is as important as behavioral realism in determining the effectiveness of avatars (including VAs) and (2) Consumer Fun Theory, which suggests that 'fun' is a key driver of consumer behavior, driven by two factors: 'hedonic engagement' (active immersion in an experience that is pleasurable) and a sense of 'liberation' (feeling of release from psychological constraints). Guided by these theories, we explore whether a VA's form (its presence and realism) influences consumer engagement with VA services through 'fun'. Additionally, we examine how consumers' shopping motivation can serve as a significant moderating factor in this context. These relationships were tested through two experimental studies. In Study 1, we confirm that a VA with a 'visual form' (vs. one without) enhances consumer engagement with VA services through a serial mediation process (VA form → Perceived Liberation and Hedonic Engagement → Fun → VA Service Engagement). Study 2 further tests and expands on these findings, demonstrating that a VA with high (vs. low) form realism leads to a more pronounced effect on these serial paths (VA form realism → Perceived Liberation and Hedonic Engagement → Perceived Fun → VA Service Engagement). Additionally, Study 2 reveals a significant moderating effect, showing that recreation-oriented shoppers (vs. task-oriented shoppers) experience stronger effects in these relationships. These findings provide valuable insights for refining VA design and improving the online shopping experience.

Keywords : online shopping assistants; virtual assistants; form realism; consumer fun; service engagement

Introduction

The retail landscape continues to evolve with the rapid advancement of generative AI, with virtual assistant (VA) services emerging as one of the most notable areas of innovation. VAs are AI-driven applications that emulate the role of human shopping assistants, providing support to customers by answering questions,

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offering product recommendations and processing transactions in online retail spaces (Rese *et al.*, 2020). Early versions of VAs were limited to basic chatbots, relying solely on text or voice interactions without any visual components (Bawack *et al.*, 2021; Li *et al.*, 2024). However, the integration of generative AI has upgraded VAs, enabling them not only to exhibit realistic behavior (interaction) but also to take on realistic forms (appearance; Lee & Kim, 2024). This evolution has led VAs to progress from formless entities to basic avatar-like interfaces and eventually to highly realistic representations, allowing consumers to feel more immersed in their interactions (Keeling *et al.*, 2010). Examples of this transformation include IKEA's animation-like VA, *Anna*, on its U.S. platform and Firework's highly realistic human-like VA (see Appendix).

This transformation necessitates a corresponding advancement in VA literature, with a greater focus on understanding whether the added visual elements of VAs truly enhance consumer engagement and influence their interactions in meaningful ways. Despite this need, much of the existing literature still treats VAs as simple text/voice-based chatbots, primarily investigating whether a VA's *behavioral realism*¹ (i.e., the extent to which a VA authentically replicates human behavior) influences consumers' perceptions and engagement with the VA and if so, through which psychological mechanisms (Guo & Luo, 2023; Jiang *et al.*, 2022; Song *et al.*, 2022). For example, studies have extensively examined how VAs' behavior or behavioral realism, such as conversational authenticity (Rese *et al.*, 2020) and language tone (de Sá Siqueira *et al.*, 2024; Guo & Luo, 2023), influence consumer attitudes towards VA services and their overall service experiences. While these insights are valuable, little is known about whether the *form* of VAs—whether present or absent and with varying levels of realism—affects consumers' perceptions of the VA. Addressing this gap is crucial as VAs increasingly adopt more sophisticated forms. Understanding how these forms impact consumer behavior and the psychological processes behind them will help guide the design of more effective VA interfaces, leading to better VA services online.

Another significant gap in the literature is the prevalent assumption that social appeal is the dominant factor influencing consumers' shopping experiences in online retail, as it often is in offline environments. This perspective is reflected in studies that analyze VA-consumer interactions through frameworks such as Social Response Theory (Nass & Moon, 2000) and Social Identity Theory (Tajfel & Turner, 2004). For instance, research has explored how different behaviors of VAs foster consumers' perceptions of social presence (De Cicco *et al.*, 2020; Munnukka *et al.*, 2022), para-social interaction (Mostafa *et al.*, 2024) and para-friendship (Ki *et al.*, 2020). These social factors have been seen as key mediators that affect consumer engagement with VAs. While enhancing the social aspect of shopping was crucial in traditional brick-and-mortar retail, where shopping was often a communal activity involving friends, family, or even in-store assistants (Chen *et al.*, 2021; Wenzel & Benkenstein, 2018), the shift to online retail has made us reconsider whether social interaction remains the key factor or if other factors, like fun, play a more significant role.

Unlike in brick-and-mortar stores, many on-line shoppers do so alone, often for enjoyment rather than necessity, without an immediate intent to purchase. Research shows that consumers are increasingly using online shopping to explore products, seek stress relief, and seek entertainment and enjoyment (Kim *et al.*, 2010; Koch *et al.*, 2020). This makes online shopping distinct from offline shopping, a solitary and less goal-driven activity, offering an escape from the pressures of daily life (Anand *et al.*, 2019; Mir, 2023). As a result, there is a need to redirect VA research, moving beyond a focus on their social aspects. Instead, research should explore whether providing 'fun' is the key element that online retailers, even in their VA services, should prioritize.

¹ Behavioral realism describes the extent to which a virtual entity authentically replicates human behavior (Miao *et al.*, 2022). This level of realism can vary depending on the mode of communication and the nature of the responses, which may range from pre-scripted interactions to dynamic, spontaneous replies (Blascovich *et al.*, 2002).

Our study is designed to address these two critical gaps in the literature by drawing on Avatar Marketing Theory (Miao *et al.*, 2022) and Consumer Fun Theory (Oh & Pham, 2022). Avatar Marketing Theory suggests that enhancing consumer engagement with avatars—digital entities such as VAs—and improving their marketing effectiveness are critical objectives in the contemporary digital era. The theory further suggests that these outcomes depend not only on behavioral realism but also on ‘form realism.’ On the other hand, Consumer Fun Theory suggests that today’s consumers increasingly seek experiences that provide a sense of ‘fun.’ This sense of fun is achieved when two key factors are present: ‘hedonic engagement’ (active immersion in a pleasurable experience) and a ‘sense of liberation’ (a psychological release from constraints or stress). Guided by these theories, we investigate whether a VA’s visual form (absence vs. presence) and further, a VA’s form realism (low vs. highly realistic), significantly impact consumer engagement with VAs and whether this effect is driven by the fun perception consumers experience during their interactions. Furthermore, given that consumers who shop online often have ‘recreation-oriented motivations’ (seeking enjoyment) in addition to ‘task-oriented motivations’ (shopping for specific needs, such as making a purchase or browsing for products), we also explore whether a consumer’s shopping motivation acts as a significant moderator in this new mechanism between consumers and VAs.

Theoretical background and hypotheses development

Review of literature and research gap on VAs

As briefly outlined in the introduction, existing VA literature has largely revolved around examining how VAs’ behavior—whether in terms of behavior type or the level of behavioral realism—affects customer perception, satisfaction and engagement with the VA service (Chin & Yi, 2022; Guo & Luo, 2023; Sung *et al.*, 2021). For instance, studies have examined the effects of behavior type—specifically, verbal vs. nonverbal behavior—on customer interactions with VAs. Research has shown that nonverbal behaviors of VAs—such as posture, gestures, facial expressions and eye contact—significantly impact customers’ interactions, perceptions and attitudes toward VAs (Rosenthal *et al.*, 2019; Saunderson & Nejat, 2019; Wang & Ruiz, 2021), as much as verbal dialogic behaviors. Additionally, Aly & Tapus (2016) found that combining verbal and nonverbal behaviors in VAs enhances consumer engagement more effectively than verbal communication alone. Their study demonstrated that multimodal VA communication, including speech and gestures, increased users’ sense of engagement compared to single-modal communication (voice only).

Further research has delved into how the level of realism in VA behavior affects their effectiveness. For instance, Calahorra & Martín (2024) investigated how user behaviors are impacted by the naturalness of a voice-based VA’s speech. They discovered that a more human-like voice not only improved social presence but also made the VA seem friendlier and increased users’ feelings of security. This led to greater user engagement, with users more likely to continue using the VA for purchases and providing higher ratings. Similarly, Araujo (2018) investigated how customers’ perceptions of VA services are influenced by the level of anthropomorphism in communication. The study found that a VA using human-like conversational cues, such as hello and goodbye, enhanced feelings of social presence and fostered a deeper emotional connection with customers, compared to when the VA used more mechanical phrases like start and exit.

While these studies are valuable in highlighting how the behavior and realism of VAs can affect service effectiveness, we identified two key limitations in the current research. First, much of the existing literature focuses on traditional, formless VAs, primarily emphasizing the impact of VA behavior, even though more recent versions of VAs have adopted increasingly visual forms with varying degrees of realism. Second, although a few studies have begun to recognize the importance of VA form in shaping consumer service experiences, they tend to place disproportionate emphasis on its role in enhancing the VA’s social appeal, similar to the focus on VA behavior. As a result, many studies on VA form are grounded in social theories. For example, Song *et al.* (2023) building on social response theory, explored the impact of a VA’s visual interface on its perceived effectiveness as a social actor. Their findings showed that VAs with animated

images, as opposed to robotic ones, were more likely to be perceived as competent social actors, thereby enhancing consumers' perceptions of their service quality. Similarly, Qiu & Benbasat (2009), drawing on a social interaction perspective, discovered that people respond more socially to visual VAs than to text-only ones, regardless of the specific visual representation. However, one key question remains: Do consumers shopping online need social appeal?

To address these limitations, we aim to shift the focus from VA's behavior to *form* and its influence on consumers' expectations—from social connection to other critical needs when shopping online—such as *fun*. Noting that VA services are increasingly integrated and widely used in online retail, we focus on the unique fact that online shoppers often seek experiences that are hedonically engaging, liberating and enjoyable, beyond social connection. Therefore, drawing on Avatar Marketing Theory (Miao et al., 2022) and Consumer Fun Theory (Oh & Pham, 2022), this study examines whether VAs' visual form (presence vs. absence) and the degree of form realism (low vs. high) affect consumers' VA engagement. Additionally, we explore whether 'fun' acts as a key mediator in this relationship, moving away from traditional social mediators. Finally, we investigate not only the direct and indirect effects of VAs' form on consumers' VA service engagement through fun, but also how consumers' personal shopping motivations (task- vs. recreation-oriented motivations) may moderate this relationship.

The direct effect of VA form on consumer engagement with the VA

Modern VAs range from avatar-like figures to highly realistic, human-like representations. While they function similarly to traditional chatbot-style VAs in managing consumer engagement, their defining distinction is the presence or absence of a visual component. The impact of visual representation in virtual entities, particularly in avatar-based embodiments, has been extensively studied. Research suggests that visual embodiment of a virtual agent can positively shape user perceptions and behaviors, often enhancing the perceived effectiveness of its service. For example, in the online retail context, Qiu & Benbasat (2009) found that consumers showed an increased willingness to interact with an AI recommendation agent when it featured a male, animated-style avatar as compared to one that only used text without a face. Similarly, Go & Sundar (2019) demonstrated that incorporating a female human-like image into a chat interface—rather than displaying only a dialogue bubble—fostered more favorable attitudes toward the website providing the chat service. These findings highlight the beneficial role of a virtual agent's form in shaping consumer evaluations of virtual service interaction. We believe this positive effect of having a visual form will also apply to the VA service context in our study. Therefore, we propose:

H1a: *A VA with a visual form (vs. no visual form) will lead to higher consumer engagement with the VA in online shopping contexts.*

The direct effect of VA form realism on consumer engagement with the VA

AVATAR MARKETING THEORY: Extending beyond the positive effect of VA form proposed in H1a, we further hypothesize the positive effect of form realism. As digital agents with visual embodiment increasingly take on human-like roles, it becomes crucial to understand how to design these avatars to maximize their performance outcomes and service and marketing effectiveness. To address this, Miao et al. (2022) introduced avatar marketing theory, based on two key premises: (1) they must have both anthropomorphic appearance (i.e. form realism) and interactivity (the ability to communicate and behave like a human, i.e. behavioral realism) and (2) the theory further suggests that the effectiveness of avatars is determined by not only by the level of behavioral realism but also by the level of form realism—e.g., low vs. high (Nowak & Rauh, 2005). For instance, avatars with high behavioral realism are capable of engaging in fluid and natural conversations, whereas avatars with low behavioral realism typically offer scripted or generic interactions (Miao et al., 2022). An avatar with a higher degree of form realism has a highly realistic appearance, almost indistinguishable from a real human, while one with a lower degree of form realism typically has an unrealistic, cartoonish appearance (Miao et al., 2022).

The debate over the relative importance of form realism versus behavioral realism in avatar-based marketing and service remains ongoing. Some scholars emphasize the critical role of behavioral realism, arguing that it directly influences customers' perceptions of interaction quality and their overall satisfaction with the service (Chattaraman *et al.*, 2019; Jiang *et al.*, 2022; Oh *et al.*, 2017). Conversely, other researchers contend that form realism may now warrant greater attention (Seymour *et al.*, 2020), especially with advancements in AI technology that have enabled avatars to adopt more human-like appearances. Empirical studies support this view, showing that VAs with high form realism significantly enhance the effectiveness of VA services by improving user engagement and trust. For instance, in the context of e-commerce customer support, Song *et al.* (2023) found that a highly anthropomorphic service agent with a male avatar was perceived as more competent than a less human-like, robotic-style agent, leading to greater consumer intention to engage with the agent. Similarly, Letheren *et al.* (2021) observed that consumers are more inclined to accept and prefer service robots that exhibit a higher degree of humanness, particularly android robots that closely resemble humans, compared to those with a more mechanical or robotic appearance. Given these findings, we believe the strong effect of form realism on consumer engagement will also hold true in our context. Therefore, we propose:

H1b: *A VA with high (vs. low) form realism will lead to higher consumer engagement with the VA in online shopping contexts.*

The mediating role of fun in the relationship between VA form and consumer engagement with the VA

CONSUMER FUN THEORY: In today's fast-paced, often stressful world, the pursuit of 'fun' has emerged as a central theme in modern consumer life (Oh & Pham, 2018). With the constant juggling of work, family obligations and numerous daily tasks, individuals frequently experience significant stress. As a way to counterbalance these stressors, they actively seek out opportunities for 'having fun' (Sandua, 2024), a concepts that refers to pleasurable activities that evoke sfeelings of enjoyment. This desire for fun is often expressed through behaviors such as indulging in gourmet food, engaging in leisure activities, or shopping—each offering an escape (or liberation) from daily stressors and providing moments of hedonistic pleasure. To gain a more nuanced understanding of why certain consumption experiences are perceived as more fun than others, Oh & Pham (2018) introduced Consumer Fun Theory. In their framework, they define fun as an experience of liberating engagement (Oh & Pham, 2022, p. 47), emphasizing that the enjoyment derived from an experience is rooted in two key psychological factors. The first factor is 'hedonic engagement,' which refers to the immersive participation designed for pure enjoyment, such as getting lost in browsing an online store or exploring products to buy (Lee & Youn, 2024). When consumers fully engage in these moments, they perceive the experience as fun. However, while hedonic engagement plays an important role, it is not enough on its own to create a truly enjoyable consumption experience. The second factor, 'liberation,' is also essential (Oh & Pham, 2018). Liberation refers to the temporary release from the psychological constraints of everyday life (Brigham, 2005). This momentary escape, facilitated by consumption, enables individuals to experience a sense of relief and freedom, which contributes to the feeling of fun. In sum, the theory posits that providing consumers with a sense of both liberation and hedonic engagement is essential for creating a deeply gratifying and 'fun' consumer experience. Guided by this theory, we examine whether the form of a VA (its presence and higher realism) influences consumer engagement with the VA by enhancing their sense of fun through both liberation and hedonic engagement.

The serial mediation effect: VA Form → 'Liberation' → Fun → Engagement with the VA

Previous research has shown that VAs with a visual presence, as opposed to those without a form, foster positive consumer perceptions and emotions, such as trust, support and intimacy. For instance, Liew *et al.* (2017) found that, the presence of an avatar on websites, compared to its absence, led to more favorable consumer attitudes, such as increased trust, which in turn encouraged greater patronage intentions. Similarly, Chattaraman *et al.* (2014) found that a virtual agent featuring a feminine anime-style image on a retail website, compared to the absence of such an agent, improved users' perceptions of the VA, making customers feel

more interactivity during the interaction. Building on these insights and incorporating Consumer Fun Theory, we propose that the presence of a visually embodied VA—compared to a VA without a visual representation—in online retail settings will lead to more positive consumer perceptions, particularly enhancing their sense of liberation (freedom from daily worries) during the interaction. We believe this sense of liberation will, in turn, foster a greater sense of perceived fun, which will ultimately increase the consumers' engagement with the VA. Therefore, we propose:

H2a: *The impact of a VA's form—(a) absence vs. presence—on consumer engagement with the VA is sequentially mediated through the following process: A VA with a visual form (vs. one without) fosters a greater sense of liberation among consumers, which in turn enhances their sense of fun, ultimately boosting engagement with the VA.*

Beyond the mere presence of a VA's visual form, we further propose that the degree of form realism also elicits more favorable attitudes and enhances user engagement with the VA. For example, Chiang *et al.* (2022) found that a highly anthropomorphic robot resembling a human, compared to a mechanical robot, evoked more positive consumer emotions and was perceived as more intimate. This heightened sense of intimacy encouraged users to share their thoughts and preferences more openly. Similarly, Baek *et al.* (2022) demonstrated that participants experienced a stronger psychological connection and more positive reactions to a smiling, high-form-realism VA compared to a machine-like, low-form-realism counterpart. Furthermore, in a study conducted by Lu *et al.* (2024), one participant stated that a chatbot with more human-like facial features, names and professional attire enhanced their comfort and willingness to interact with the agent compared to a chatbot without such human-like characteristics. These findings highlight the importance of form realism in shaping consumer perceptions and interactions with VAs.

Building on this body of research and incorporating Consumer Fun Theory, we propose that the higher the form realism of a VA, the more positively consumers will react to it, experiencing a greater level of liberation during the interaction. Furthermore, guided by Gaston *et al.* (2020), who show that a sense of freedom elicited by an experience fosters hedonic feelings, we believe that the liberation evoked by a VA will lead consumers to feel hedonic fun during their interaction with the VA. Lastly, given past findings suggesting that enjoyment derived from a consumption experience enhances consumer engagement with both the activity itself and the related service (Nguyen *et al.*, 2007; Slåtten *et al.*, 2009), we propose the following sequential relationships:

H2b: *The impact of a VA's form—(b) low vs. high realism—on consumer engagement with the VA is sequentially mediated through the following process: A VA with high (vs low) form realism fosters a greater sense of liberation among consumers, enhancing their sense of fun and ultimately driving increased engagement with the VA.*

The serial mediation effect: VA Form → 'Hedonic Engagement' → Fun → Engagement with the VA

In addition to proposing liberation and fun as key serial mediators in the relationship between VA form and consumers' engagement with the VA, this section, following Consumer Fun Theory, introduces another serial mediation pathway—this time through hedonic engagement and fun. Prior research suggests that virtual agents with a visual form, compared to those without, evoke higher levels of hedonic engagement, which in turn increases the intention to engage with the virtual agent again. For example, Qiu and Benbasat (2009) found that consumers interacting with an AI recommendation agent featuring a masculine, animated-style avatar felt a stronger sense of perceived interaction and engagement, compared to those interacting with a text-only agent. This enhanced engagement increased enjoyment, which, in turn, positively influenced consumers' continued use of the AI agent. Building on these findings, we propose:

H3a: *The impact of a VA's form—(a) absence vs. presence—on consumer engagement with the VA is sequentially mediated through the following process: A VA with a visual form (vs. one without) leads consumers to experience a greater sense of hedonic engagement, which in turn enhances their sense of fun, ultimately boosting engagement with the VA.*

Additionally, we propose that the level of realism in a VA's form will further influence this serial mediation effect, as suggested by the following past research. Becker *et al.* (2023) found that service robots with high form realism—featuring distinct human-like traits—elicited more positive consumer attitudes compared to robots with low form realism (e.g., those with machine-like appearances). Specifically, Paauwe *et al.* (2015) demonstrated that robots designed with human-like features (high form realism) led to greater consumer engagement than robots with vehicles-like appearances (low form realism). The human-like features facilitated more effective interactions in a natural and enjoyable way, leading to a more immersive experience. These findings indicate that elevating the form realism of a virtual agent enhances consumers' hedonic engagement, fostering a more immersive interaction. Moreover, research underscores the intricate relationship between hedonic engagement and the perception of fun, with studies indicating that consumers are more likely to perceive an experience as enjoyable (fun) when they are deeply immersed in it. According to Oh & Pham (2022), as consumers' hedonic engagement with an experience increases, so does their perception of fun. This notion is corroborated by Papagiannidis *et al.* (2017), who found that consumers in a high-realism condition (e.g., 3D environment) reported significantly higher levels of hedonic engagement compared to those in a lower-realism condition (e.g., 2D desktop setting). This increased hedonic engagement, in turn, amplified perceived enjoyment, which ultimately led to positive behavioral outcomes, including purchase intention. Building on these findings, we propose:

H3b: *The impact of a VA's form—(b) low vs. high realism—on consumer engagement with the VA is sequentially mediated through the following process: A VA with high realism (vs. low) fosters greater hedonic engagement among consumers, amplifying their sense of fun and ultimately driving increased engagement with the VA.*

The moderating effect of consumers' online shopping motivation

Just as the level of realism in a VA's form—whether with a less or more realistic appearance—can shape consumers' perceptions and behaviors in online shopping, we believe that consumers' personal shopping motivations also play a critical role in this context. Shopping motivation has been widely recognized in retail services literature as an important moderating factor (Luk *et al.*, 2013). Moon *et al.* (2017) define shopping motivation as a consumer's overall attitude or mindset toward the shopping process. According to Kaltcheva & Weitz (2006), consumers' shopping motivations can be categorized into two primary types: task-oriented and recreation-oriented. Task-oriented shoppers view shopping as a goal-directed activity, focused on acquiring necessary products, services, or information, with little to no enjoyment derived from the process itself (Büttner *et al.*, 2015). In contrast, recreation-oriented shoppers see shopping as a form of entertainment, seeking inherent satisfaction and enjoyment from the shopping activity itself (Kaltcheva & Weitz, 2006). They take joy in browsing products, exploring new arrivals, or engaging with visually appealing and immersive content. Given this, we believe the serial mediation effect proposed in H2 and H3 will be stronger for recreation-oriented shoppers compared to task-oriented shoppers. Therefore, we propose:

H4: *Consumers with recreation-oriented shopping motivation (compared to task-oriented motivations) will strengthen the serial mediation effects observed in both H2b and H3b.*

Holistic research design

Figure 1 presents our research model, along with the hypotheses discussed above. To test the proposed hypotheses, we conducted two online experiments. Study 1 investigated the impact of a VA's form (absence vs. presence) on consumers' engagement with the VA service, examining both direct effects and indirect effects through a serial mediation process via the experience of fun—testing H1a, H2a and H3a. Building on the insights gained from Study 1, Study 2 was designed with two main objectives: (1) to assess whether enhancing the realism of a VA's form (low vs. high) results in a more pronounced effect on service evaluations, operating through the same serial mediation process—addressing H1b, H2b and H3b; and (2) to investigate whether consumers' shopping motivations moderate the serial relationships (H4). Notably,

we employed various AI techniques—Bing’s AI Image Creator, Voila AI Artist and HeyGen—to generate our own custom VA stimuli, reflecting the VA interface designs currently in use by leading market players. These stimuli were randomly assigned to participants during the data collection process. The resulting data were then analyzed using the PROCESS macro and MANYMORE program.

Study 1 – H1a, H2a and H3a

Study 1 employed a one-way between-subjects design (VA form: absence vs. presence) to examine whether the presence of a visual form in a VA leads to more favorable engagement with the VA service compared to a formless VA, within the context of online fashion retail. We chose this setting because visual cues—such as product images, model displays and even the VA’s appearance—play a crucial role in shaping consumers’ perceptions, service satisfaction and overall shopping experience.

Stimuli development: manipulating va form using generative AI

To manipulate the form of the VA into two distinct conditions—(1) the absence condition and (2) the presence condition—we developed two video stimuli, each based on a standardized text scenario and two different VA representations. First, we developed a standardized service *scenario* for the video, following a consistent protocol (see Table 2), which included customer greetings, information on new arrivals and promotional details. This uniform scenario was applied across both conditions to ensure consistency. Next, we used generative AI to create two sets of images: (1) a background image of a fashion retail store and (2) a visual representation of the VA. To create the background image of a fashion store, we used Bing’s AI Image Creator with the prompt: *Create a high-resolution image of a retail store for a non-luxury fashion brand, such as Zara or H&M, named Livia Style*. The AI-generated image was refined until it accurately reflected a typical fashion retail environment, allowing participants to easily contextualize the study. We then used Bing’s AI Image Creator again to generate a visual representation of the VA for the presence condition. Specific keywords such as *female assistant in a non-luxury fashion retail store, depicted from the upper body, American, friendly demeanor, introducing herself to customers* were provided to guide the AI in creating an image that mirrored real-world VA examples. After obtaining both the fashion store background image and the VA image (which was later used in the ‘high form realism’ condition in Study 2), we transformed the VA image into a more stylized, cartoonish version using the Voila AI Artist a This stylization, which we employed for the ‘VA presence’ condition in this study, was inspired by IKEA’s animated VA, Anna (Table B).

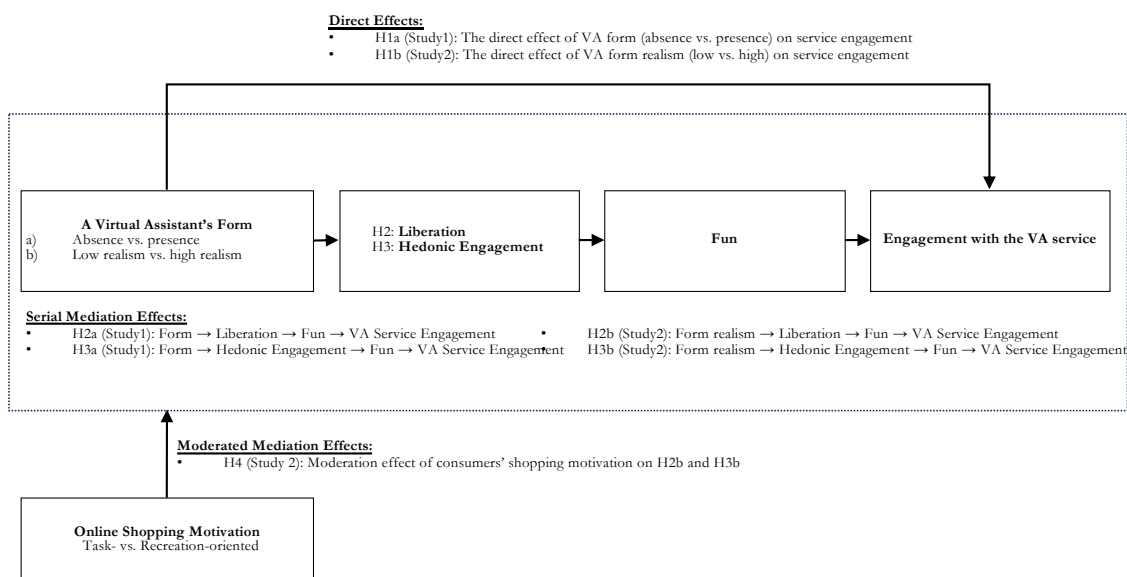
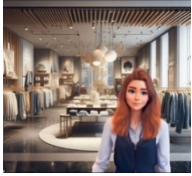
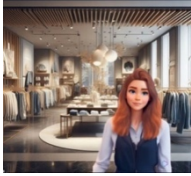
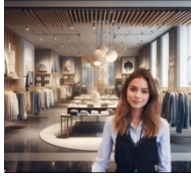


FIGURE 1 – Conceptual model and research hypotheses

TABLE 1 – Summary of experiment design for Studies 1 and 2

	Study 1	Study 2
Purpose	• H1a: To test the direct effect of a VA's form on VA service engagement. • H2a: To test the serial mediation effect of liberation and fun on the relationship between the VA's form and VA service engagement. • H3a: To test the serial mediation effect of hedonic engagement and fun on the relationship between the VA's form and VA service engagement.	• H1b: To test the direct effect of a VA's FR on VA service engagement. • H2b: To test the serial mediation effect of liberation and fun on the relationship between the VA's FR and VA service engagement. • H3b: To test the serial mediation effect of hedonic engagement and fun on the relationship between the VA's FR and VA service engagement. • H4: To examine the moderation effect of consumers' online shopping motivation on H2b and H3b.
Independent variable	A VA's form: • Absence • Presence	A VA's form realism (FR): • Low • High
Dependent variable	• VA service engagement	• VA service engagement
Mediators	• Liberation • Hedonic engagement • Fun	• Liberation • Hedonic engagement • Fun
Moderator	• N/A	• Online shopping motivation: ○ Task-oriented motivation ○ Recreation-oriented motivation
Experiment design	• A 2 (visual form: absence vs. presence) between-subjects design	• A 2 (FR: low vs. high) x 2 (shopping motivation: task vs. recreation) between-subjects design
Stimuli development using generative AI	Video stimuli designed to manipulate VA's form: • Images featured in the video: ○ The image of a simulated online fashion store was generated using Bing's AI Image Creator. ○ The VA for the visual form presence condition was generated using Bing's AI Image Creator, which was subsequently processed through the Voila AI Artist a • Textual scenario used in the video: ○ Textual scenarios, including greetings, information about new arrivals and promotional details, were developed according to the VA's service protocol. • Narration and animation: ○ VAs for both conditions (absence and presence) were narrated with AI-generated speech using HeyGen.	Video stimuli designed to manipulate VA's FR: • Images featured in the video: ○ The image of a simulated online fashion store was generated using Bing's AI Image Creator. ○ The high-FR version of the VA was generated using Bing's AI Image Creator. ○ The low-FR version of the VA was derived from the high-FR VA image by processing it through the Voila AI Artist a • Textual scenario used in the video: ○ Textual scenarios, including greetings, information about new arrivals and promotional details, were developed according to the VA's service protocol. • Narration and animation: ○ VAs for both conditions (high-FR and low-FR) were narrated with AI-generated speech using HeyGen. - Textual scenario designed to manipulate consumers' online shopping motivation: • Two textual scenarios were designed to represent different shopping motivations (task-oriented and recreation-oriented) when visiting an online fashion store.
Conditions and sample size	• Absence ($N = 100$) • Presence ($N = 81$)	• Low-FR x Task ($N = 100$) • Low-FR x Recreation ($N = 102$) • High-FR x Task ($N = 104$) • High-FR x Recreation ($N = 104$)

TABLE 2 – Example stimuli

Manipulation	Stimuli			
	Study 1		Study 2	
	Absence condition	Presence condition	Low-FR condition	High-FR condition
				
VAs' form and realism	Narrative scenario: Good afternoon and welcome to LIVIA STYLE. I am Clara and I am here to help you today. We are excited to show you our newest items and some of our most popular products. Plus, we've got some great deals waiting for you. Would you like a quick tour to see what's new? How about trying our best-selling item. I think it will go really well with your style. And, just so you know, we are offering discounts on our older collections. If you make a purchase today, you'll also earn extra points on our membership programs. Feel free to let me know if you want to try anything on or if you have questions about our latest products or loyalty programs, as I am here to assist you. Final video stimuli incorporating the aforementioned images and scenario: — 'Absence' condition - https://singuserf48317ac.au1.qualtrics.com/ControlPanel/File.php?F=F_ml10pO0fhg4lacZ — 'Presence' and 'Low-FR' conditions - https://singuserf48317ac.au1.qualtrics.com/ControlPanel/File.php?F=F_lBYCTjHawXdG9zM — 'High-FR' condition - https://singuserf48317ac.au1.qualtrics.com/ControlPanel/File.php?F=F_a30O74tE4eyEbrb			
Consumer's online shopping motivation	Study 2			
	Task-oriented condition: Please imagine you've received an invitation to a formal dinner next month. However, you realize that your wardrobe lacks a suitable dress or suit for the occasion. So, you decide to browse online to find and purchase a nice dress or suit that fits your needs. When browsing the website, you click on Interact with the assistant Clara. Then, you will see a video where an AI-empowered virtual retail assistant guides you through a virtual fashion retail store.		Recreation-oriented condition: Please imagine a lazy day at home with no particular plans, just feeling bored. You sit in front of the computer, watching videos, yet finding none that catch your interest. Suddenly, an advertisement for an online fashion retail store pops up. Out of curiosity, you decide to click on the store website. When browsing the website, you click on Interact with the assistant Clara. Then, you will see a video where an AI-empowered virtual retail assistant guides you through a virtual fashion retail store.	

Note. Virtual assistant (VA); Form realism (FR).

Table 3 – Construct reliability and convergent validity assessment

Scale items	Study 1				Study 2			
	Loadings	α	AVE	CR	Loadings	α	AVE	CR
<i>Form realism</i>					.937	.844		.942
This virtual assistant looks real and natural.					.971			
This virtual assistant looks realistic.					.977			
This virtual assistant in its entirety seemed to be authentic for this occasion.					.797			
<i>Liberation</i>		.996	.877	.966		.928	.765	.929
Through engaging with this virtual assistant. I felt delight that outweighs my worries.	.924				.885			
I felt carefree while engaging with this virtual assistant.	.946				.887			
I was able to let go of things I had on my mind during my engagement with this virtual assistant.	.940				.843			
The experience with this virtual assistant made me feel liberated.	.935				.882			
<i>Hedonic engagement</i>		.939	.796	.940		.907	.717	.910
Interacting with this virtual assistant provided me with a sense of engagement.	.846				.874			
I was absorbed in the experience of engaging with this virtual assistant.	.918				.880			
I truly felt present and in the moment during my engagement with this virtual assistant.	.908				.877			
Engaging with this virtual assistant evoked a sense of playfulness.	.895				.750			
<i>Fun</i>		.966	.877	.966		.951	.828	.951
Engaging with this virtual assistant was an immensely fun experience.	.964				.909			
Engaging with this virtual assistant provided me with a lot of fun moments in this experience.	.938				.918			
Engaging with this virtual assistant provided me with pleasurable experiences.	.934				.899			
Engaging with this virtual assistant was enjoyable.	.910				.913			
<i>VA service engagement</i>		.980	.909	.980		.976	.893	.977
I am interested in utilizing this virtual assistant service again if there is an opportunity.	.948				.943			
I intend to utilize this virtual assistant service in the future if there is an opportunity.	.951				.956			
I plan to use this virtual assistant service in the future if there is an opportunity.	.978				.967			
I expect to use this virtual assistant service in the future if there is an opportunity.	.967				.947			

Note. Cronbach's alphas (α); Average variances extracted (AVEs); Composite reliabilities (CR).

TABLE 4 – Discriminant validity assessment (Fornell-Larcker criterion)

Construct	Study 1				Study 2				
	2	3	4	5	1	2	3	4	5
1. Form realism					.918				
2. Liberation	.937				.651	.874			
3. Hedonic engagement	.915	.892			.694	.854	.847		
4. Fun	.919	.915	.937		.664	.868	.867	.910	
5. VA service engagement	.845	.888	.878	.954	.625	.788	.799	.838	.945

Note. The square root of average variances extracted (AVEs) are bolded on the diagonal.

Next, we employed HeyGen, an AI-integrated video creation tool, to combine the textual scenario, images and AI-generated audio narration, resulting in the final two distinct video stimuli. In the absence condition, the VA's form was omitted, retaining only the AI-generated voice, the textual scenario and the background store image. In contrast, in the presence condition, the VA's visual representation was animated with synchronized lip movements and facial expressions that matched the AI-generated speech, thanks to the capabilities of HeyGen (Table 2). No manipulation check was necessary in Study 1, as the presence or absence of the VA's visual form in the video stimuli did not require further validation.

Main-test: survey questionnaire and data collection

An online survey was created using the AI-generated stimuli. The survey was structured into four sections: (1) consent and introduction, (2) stimulus presentation, (3) main variable questions and (4) demographic information. In the first section, participants were asked to provide consent and were presented with definitions of VAs to ensure clarity regarding the research context. After reviewing this information, they were randomly assigned to one of two video conditions: the absence condition and the presence condition. In the second section, participants were required to watch the video for a minimum of 50 seconds to ensure full engagement before proceeding to the next section.

In the third section, participants provided their assessments of the interaction with the assigned VA, in terms of perceived liberation (Oh & Pham, 2022), hedonic engagement (Hwang & Choi, 2020; Oh & Pham, 2022), fun (Oh & Pham, 2022; Tasci & Ko, 2016) and their engagement intention with the VA (Ki *et al.*, 2020; Kim & Hur, 2023). All items were measured on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7; see Table 3). In the final section, participants were asked to provide their demographic information. The survey was conducted by Dynata, a professional marketing research firm. After excluding invalid responses, a total of 181 valid responses from U.S. residents aged 18 and older were retained for analysis. Of these, 100 were in the absence condition and 81 were in the presence condition. Descriptive analysis revealed that the majority of respondents were female (50%), between the ages of 25 and 35 (27%), Caucasian (76%), married (45%), had a bachelor's degree (38%), worked full-time (51%) and earned between US\$75,000 and US\$149,999 annually (35%).

Measurement model test results

The results of the confirmatory factor analysis (CFA) assessing the measurement model indicated a satisfactory fit: $\chi^2_{113} = 282.53$, $\chi^2/df = 2.50$, $CFI = .967$, $TLI = .960$, $NFI = .946$ and a medium RMSEA = .091 (Gheshlagh *et al.*, 2018). As shown in Table 3, all factor loadings were above the .71 threshold, demonstrating strong construct reliability (Tabachnick *et al.*, 2013). Additionally, the values for Cronbach's alpha (α), composite reliability (CR) and average variance extracted (AVE) all exceeded the recommended cut-offs of .70, .60 and .50, respectively, supporting convergent validity (Sarmiento & Costa, 2017). Discriminant validity was confirmed using the Fornell-Larcker criterion, as presented in Table 4 (Cheung *et al.*, 2023).

TABLE 5 – Hypotheses test results with PROCESS macro analyses (Model 80)

Hypothesis	Type	Study 1				Study 2			
		Effect	LLCI	ULCI	Result	Effect	LLCI	ULCI	Result
H1a VF→SE	Direct	-.017	-.280	.215	Not supported	---	---	---	---
H2a VF→LB→FUN→SE	Indirect	.068	.008	.165	Supported	---	---	---	---
H3a VF→HE→FUN→SE	Indirect	.063	.008	.146	Supported	---	---	---	---
H1b FR→SE	Direct	---	---	---	---	.060	-.012	.125	Not supported
H2b FR→LB→FUN→SE	Indirect	---	---	---	---	.147	.096	.209	Supported
H3b FR→HE→FUN→SE	Indirect	---	---	---	---	.148	.097	.210	Supported

Note. Visual form (VF); Form realism (FR); Liberation (LB); Hedonic engagement (HE); Perceived fun (FUN); VA Service engagement (SA); Lower limit of 95% confidence interval (LLCI); Upper limit of 95% confidence interval (ULCI).

Hypotheses test results

We used Hayes' (2015) PROCESS macro (Model 80, bootstrapping with $N = 5000$ resamples) to test our hypotheses. As shown in Table 5, the direct effect of VA form (absence = 0, presence = 1) on consumer engagement was insignificant ($\beta = -.017$, 95% $CI = [-.280, .215]$), rejecting H1a. However, the presence of a VA form generated significant positive indirect effects. Hedonic engagement and fun (indirect effect: .063, 95% $CI = [.008, .146]$) and liberation and fun (indirect effect: .068, 95% $CI = [.008, .165]$) exhibited strong sequential mediation effects, supporting H2a and H3a. The presence of the VA form significantly increased perceptions of hedonic engagement ($\beta = .337$, $p < .05$) and liberation ($\beta = .338$, $p < .05$) in comparison to the voice-only (absence) condition. These increases in hedonic engagement ($\beta = .455$, $p < .001$) and liberation ($\beta = .492$, $p < .001$) which in turn boosted fun and consumer engagement with VA services ($\beta = .410$, $p < .001$).

Study 2 – H1b, H2b, H3b and H4

Building on the insights from Study 1, Study 2 further examined whether enhancing the realism of the VA's form would produce more significant direct (H1b) and serial mediation effects (H2b and H3b) compared to a lower level of realism. Additionally, it explored how consumers' motivation for online shopping influenced these serial mediation effects—addressing H4. To investigate this, we employed a 2 (VA form realism: low vs. high) $\times$ 2 (consumer shopping motivation: task-oriented vs. recreational-oriented) between-subjects design.

Stimuli development: manipulating VA form realism and consumers' online shopping motivation

For the low form realism condition, we used the same video stimulus from Study 1's presence condition, featuring an animated, cartoonish VA that aligns with the conceptual and operational definitions of low form realism as outlined by Miao *et al.* (2022). For the high form realism condition, we employed the corresponding hyper-realistic version of the low form realism VA, created using Bing's AI Image Creator, as detailed on page 6. Please refer to Table 2 for the final images, scenarios and videos used for each VA form realism condition.

On the other hand, to manipulate consumers' online shopping motivation, we adapted the stimulus design used by Coskun *et al.* (2019) and Wenzel & Benkenstein (2018). The task-oriented scenario was as follows: Imagine you've received an invitation to a formal dinner next month. Realizing that your wardrobe lacks a suitable dress or suit for the occasion, you decide to browse online to find and purchase a dress or suit that meets your needs. While browsing the website, you click on 'Interact with the assistant Clara,' where you'll see a video featuring an AI-powered virtual retail assistant guiding you through a virtual fashion retail store. In contrast, the recreation-oriented scenario read: Imagine spending a lazy day at home with no particular

plans, feeling bored. You sit in front of the computer, watching videos, but none capture your interest. Suddenly, an advertisement for an online fashion retail store appears. Out of curiosity, you click on the store's website. While browsing the website, you click on 'Interact with the assistant Clara,' and a video featuring an AI-powered virtual retail assistant guides you through a virtual fashion retail store. The stimuli used for both form realism and online shopping motivations are presented in Table 2.

Pre-test: manipulation check

A pre-test was conducted to validate the manipulation: the degree of the VA's form realism (low vs. high) and consumers' shopping motivation (task-oriented vs. recreation-oriented). This pre-test was administered via the same marketing research firm, Dynata, with a sample of 197 U.S. participants aged 18 and above. Participants were randomly assigned to one of four experimental conditions: (1) low form realism VA with task-oriented shopping motivation ($N = 50$), (2) low form realism VA with recreation-oriented shopping motivation ($N = 50$), (3) high form realism VA with task-oriented shopping motivation ($N = 50$) and (4) high form realism VA with recreation-oriented shopping motivation ($N = 47$).

To validate the manipulation of VA form realism, participants were asked to assess the randomly assigned VA's appearance using a 7-point Likert scale ranging from cartoonish (1) to humanlike (7; Miao et al., 2022). To test the manipulation of shopping motivation, we adapted a two-item scale from Coskun et al. (2019): (1) to acquire some needed products (task-oriented; reverse-coded) and (2) to gain enjoyment during the shopping trip and spend leisure time (recreation-oriented). Both items were measured on a 7-point Likert scale, where 1 represented strongly disagree and 7 represented strongly agree.

Independent samples t-tests confirmed the successful manipulation of both VA form realism ($t[195] = -10.8, p < .001$) and shopping motivation ($t[195] = -31.5, p < .001$). Specifically, the VA with low form realism ($N = 100; M = 2.63$) was perceived as significantly more cartoonish than the VA with high form realism ($N = 97; M = 4.71$). Additionally, the task-oriented group's score for recreational motivation ($N = 100; M = 1.95$) was substantially lower than that of the recreation-oriented group ($N = 97; M = 5.78$). Together, these findings confirm the success of both manipulations.

Main-test: survey questionnaire and data collection

Following the successful validation of all manipulations, we proceeded with the main test, which was organized into four sections: (1) consent and introduction, (2) stimulus presentation, (3) manipulation and main variable questions & (4) demographic information. After participants provided their informed consent and reviewed the introduction, which included definitions and examples of VAs in the retail context, they were randomly assigned to one of the four conditions: (1) a low form realism VA with task-oriented shopping motivation, (2) a low form realism VA with recreation-oriented shopping motivation, (3) a high form realism VA with task-oriented shopping motivation & (4) a high form realism VA with recreation-oriented shopping motivation.

Participants watched their randomly assigned video stimuli for at least 50 seconds and confirmed their attention to the VA's appearance by answering a validation question: Where is the VA in the video? before continuing. In the following section, participants completed the manipulation questions, using the same measures from the pre-test. Next, participants rated their experience with the assigned VA in terms of liberation (Oh & Pham, 2022), hedonic engagement (Hwang & Choi, 2020; Oh & Pham, 2022), fun (Oh & Pham, 2022; Tasci & Ko, 2016) and intention to engage with the VA service (Ki et al., 2020; Kim & Hur, 2023). A seven-point Likert scale was used to score each metric, with 1 representing strongly disagree and 7 representing strongly agree. Table 3 lists all of the measurement items used in Study 2. The survey concluded with a section asking participants for their demographic information.

TABLE 6 – Moderated mediation analysis (moderator MV) results using the Manymome Package in R

Hypothesis	Type	Conditional sequential mediation effects						I	LL CI	UL CI	
		Task-oriented condition (MV=0)			Recreation-oriented condition (MV = 1)						
FRxMV→LB→FUN→SE	Indirect	.096	.062	.147	.178	.122	.263	.086	.046	.141	S
FRxMV→HE→FUN→SE		.119	.078	.180	.161	.109	.241				S

I = Index of Moderated Mediation; S = Supported

Note. Form realism (FR); Liberation (LB); Hedonic engagement (HE); Perceived fun (FUN); VA Service engagement (SE); Online shopping motivation (MV); Lower limit of 95% confidence interval (LLCI); Upper limit of 95% confidence interval (ULCI).

This main survey was also distributed by Dynata to U.S. citizens aged 18 and older, following the same sample frame as in Study 1. The final dataset consisted of 410 participants, split across four conditions: (1) a low form realism VA with task-oriented shopping motivation ($N = 100$), (2) a low form realism VA with recreation-oriented shopping motivation ($N = 102$), (3) a high form realism VA with task-oriented shopping motivation ($N = 104$) and (4) a high form realism VA with recreation-oriented shopping motivation ($n = 104$). A power analysis ($\alpha = .05$, 80% power with a medium effect size of .15) confirmed that the sample size exceeded the minimal required number of participants (153) for a model with 20 predictors (Cohen, 1988). The demographic profile of participants was as follows: 52% were female, 26% were over the age of 55, 24% were between 25 and 35, 73% were Caucasian and 43% were unmarried. Most participants reported an annual household income between US\$75,000 and US\$149,999 (30%), were employed full-time (50%) and had college education (35%).

Manipulation test results

The results of independent samples t-tests confirmed that the manipulations of both form realism ($t[408] = -56.5$, $p < .001$) and shopping motivation ($t[408] = -38.1$, $p < .001$) were successful. Specifically, low form realism VA stimuli ($N = 202$; $M = 2.17$ [mean ≤ 3]) were viewed as more cartoon-like compared to the high form realism VA stimuli ($N = 208$; $M = 5.73$ [mean ≥ 5]). Regarding shopping motivation, participants in the task-oriented shopping motivation scenario ($N = 204$; $M = 2.35$) found it less recreational than participants in the recreation-oriented shopping motivation scenario ($N = 206$; $M = 5.39$). Therefore, all the manipulations were deemed successful in the main test as well.

Measurement test results

The results of the CFA for the measurement model showed an excellent fit, as evidenced by the following fit indices: $\chi^2/df = 2.88$, $CFI = .972$, $TLI = .967$, $NFI = .958$ and $RMSEA = .068$ (Gheshlagh et al., 2018). The robustness of the constructs was confirmed through tests for convergent and discriminant validity. All factor loadings exceeded the threshold value of .71, indicating strong construct reliability (see Table 3; Tabachnick et al., 2013). Additionally, good convergent validity was demonstrated, with values for α , CR and AVEs surpassing the recommended thresholds of .70, .60 and .50, respectively (Cheung et al., 2023; Sarmiento & Costa, 2017). Discriminant validity was confirmed as well, as the correlations between all construct pairs were below .85 and less than the square root of the AVE values (see Table 4).

Hypotheses test results

To test H1b, H2b and H3b, we employed the PROCESS macro (Model 80) with 5,000 bootstrapped resamples. The analysis revealed that the direct effect of form realism (measured on a 7-point scale) on VA service engagement was insignificant ($\beta = .060$, $CI = [-.012, .125]$), indicating that H1b was not supported. However, the two serial mediation pathways showed significant results. A VA with high form realism, compared to one with lower realism, demonstrated stronger indirect effects on service engagement through two sequential pathways: (1) liberation and fun (indirect effect: .147, 95% $CI = [.096, .209]$) and (2) hedonic engagement and fun (indirect effect: .148, 95% $CI = [.097, .210]$). These findings support H2b and H3b,

confirming that form realism enhances service engagement indirectly by fostering liberation, hedonic engagement and fun. These findings support H2b and H3b, confirming that form realism enhances service engagement indirectly by fostering liberation, hedonic engagement and fun.

To test the moderation effect (H4), we performed linear regression analyses using the *manymome* package in R (Cheung & Cheung, 2023). We assessed the conditional indirect effects of form realism (measured on a 7-point scale) on VA service engagement across different levels of shopping motivation orientation (task-oriented = 0, recreation-oriented = 1). As shown in Table 6, the moderated mediation analysis yielded significant results—supporting H4. Specifically, the ‘recreation-oriented’ condition had a stronger positive indirect effect through the pathway ‘form realism → liberation → fun → VA service engagement’ (indirect effect: .178, 95% CI = [.122, .263]) than the ‘task-oriented’ condition (indirect effect: .096, 95% CI = [.062, .147]). Similarly, the ‘recreation-oriented’ condition (indirect effect: .161, 95% CI = [.109, .241]) had a stronger positive indirect effect through the sequence ‘form realism → hedonic engagement → fun → VA service engagement’ than the ‘task-oriented’ condition (indirect effect: .019, 95% CI = [.078, .180]). These findings corroborate H4.

Conclusions and discussion

Generative AI has dramatically transformed online retail, especially by evolving VAs from simple, formless text- or voice-based chatbots (VAs without a visual form) to highly sophisticated, lifelike entities (VAs with form and moreover, higher form realism). However, there remains a significant gap in understanding how the visual portrayal of VAs, which can vary from simple presence to various levels of realism, impacts overall customer shopping and service experiences. Understanding the impact of form and form realism in VAs is important because these visuals have a more immediate and tangible impact on consumers’ perceptions and impressions than behavioral traits alone. This gap is further exacerbated by the prevailing perspective in existing literature, which assumes that VA-consumer interactions are inherently social, where social presence—similar to the human interaction found in brick-and-mortar stores—drives VA service engagement.

However, this assumption overlooks the shift in customer behavior driven by the rise of internet shopping. Many consumers shop alone, often without expecting the social connections they might find in physical stores, especially when they visit online retail sites for ‘pleasure’ rather than necessity (Erjavec & Manfreda, 2022; Venkatesh *et al.*, 2022). Given this transformation, the traditional conceptualization of the VA-consumer relationship must be reevaluated, it is essential to explore how customers’ perceptions of fun during their interactions with VAs may play a more significant role in shaping the VA-consumer experience in online retail settings. Additionally, given that consumers in online retail exhibit two different shopping motivations—task-oriented (focused on making a purposeful purchase) and recreation-oriented (focused on browsing and leisure)—understanding whether these motivations moderate the effects of VA form on service engagement through ‘fun’ is also important. This consideration is particularly relevant within the online context, where these different motivations can significantly influence how consumers interact with VAs.

To address these gaps, we conducted two experimental studies, drawing on Avatar Marketing Theory and Consumer Fun Theory. In both studies, we examined the impact of visual representations of VAs—ranging from simple presence to varying degrees of realism—on VA service engagement, with consumer ‘fun’ and its underlying factors, including ‘liberation’ and ‘hedonic engagement,’ serving as crucial mediating variables. Additionally, Study 2 extended these findings by investigating how consumers’ buying motivations—task-oriented versus recreation-oriented—moderate the effects. Taken together, these studies offer valuable theoretical and practical insights.

Theoretical implications

First, our findings contribute to theoretical advancements by emphasizing the often-overlooked visual and tangible elements of VA interface design—an area largely neglected in prior research, which has predominantly focused on the behavioral dimensions of VAs, such as conversational authenticity and tone of language (de Sá Siqueira *et al.*, 2024). While we acknowledge the role of VAs' behavioral traits in enhancing consumers' perceptions of service quality, our study significantly advances this understanding by demonstrating that the mere presence of a VA's form, coupled with the degree of form realism, plays an essential role in shaping customer perceptions and service engagement—not directly, but indirectly, through the consumer perception of 'fun,' which we will elaborate on in the next section. These findings resonate with existing research across diverse contexts, which shows that visual elements in online retail—such as website layout (Ramezani Nia & Shokouhyar, 2020; Wu *et al.*, 2013) and product display (González *et al.*, 2021)—are well-established as crucial factors in shaping consumer experiences. In this vein, our study adds to this body of work by emphasizing that the visual interface of VA services can also significantly influence consumer engagement in online retail. Furthermore, our research offers additional empirical support for the theoretical underpinnings of Avatar Marketing Theory, which asserts that the realism of a form is just as critical as behavioral realism. By applying this theory to the specific context of VA services, our findings underscore the importance of visual realism in shaping consumer interactions with VAs in online retail settings.

Second, our study is particularly meaningful in that it is the first to not only propose, but also empirically validate, that a VA's form—encompassing both its mere presence and the level of realism—enhances customer engagement with the VA service through the emerging and increasingly important consumer perception of 'fun,' which is driven by consumers' sense of 'liberation' and 'hedonic engagement.' In doing so, our research shifts the focus away from the conventional emphasis on social presence in VA interactions. Instead, we demonstrate that, in an online context, providing consumers with a sense of escapism from their daily routines (liberation), the pursuit of hedonic pleasure (hedonic engagement) &, ultimately, enjoyment (fun) during VA interactions and online shopping, significantly amplifies the impact of VA form and realism on consumers' intention to engage with VA services. This contribution is also theoretically significant, as it offers empirical support for Consumer Fun Theory (Oh & Pham, 2022) and its conceptual framework within the unique context of VA services.

Finally, our study offers additional insights to the VA literature by more precisely demonstrating how customers' shopping motivations—task-oriented versus recreation-oriented—interact with the influence of VA form (presence and realism) on consumer engagement with VA services. Our findings reveal that the impact of VA form on consumer engagement is more pronounced for those with a recreation-oriented motivation for visiting online retail stores, as compared to those with a task-oriented motivation. This highlights an important nuance for retailers, offering valuable insights into which consumer motivations are most conducive to fostering optimal VA interactions.

Practical implications

As online shopping continues to grow in prevalence and technologies like generative AI enhance VA services—improving not only interaction behaviors (communication skills and realism) but also visual appearance (embodied VAs with lifelike human forms)—online retailers are strategically exploring how to leverage these innovations to improve the customer experience. Our findings suggest that online retailers can improve the effectiveness of their VA services and address a significant gap in the online shopping experience by incorporating a visible, human-like form, rather than relying solely on text- or voice-based interactions. While some may be concerned that a highly human-like VA could evoke feelings of eeriness, our research shows that a more lifelike VA elicits stronger positive responses—such as stress relief, deeper engagement and increased enjoyment—leading to more positive interactions and higher service usage. We therefore recommend that online retailers invest in creating more lifelike and visually engaging VAs, offering

consumers an immersive and emotionally resonant online shopping experience, one that has traditionally been the hallmark of physical retail environments.

Furthermore, it is essential to acknowledge that consumers' shopping motivations significantly shape how the realism of VA form influences their service evaluations. Our findings reveal that consumers visiting online stores for recreational purposes—seeking enjoyment and leisure—are more likely to experience a positive emotional journey ('form realism → liberation → fun → service evaluation' and 'form realism → hedonic engagement → fun → service evaluation') when interacting with highly realistic VAs, compared to those with low realism. As shopping motivations directly affect consumers' emotional and hedonic experiences, online retailers should consider tailoring their VA services to align with these motivations. For example, by analyzing browsing patterns, retailers can identify periods when recreational shoppers—those who browse for leisure rather than immediate purchase—are most active, such as weekends or specific times of the day. During these peak times, deploying VAs with more lifelike appearances can amplify consumers' sense of liberation and hedonic engagement, leading to greater enjoyment and more favorable service evaluations. This approach will not only help enhance the overall shopping experience but also encourage repeat visits and may improve conversion rates. By tailoring VA form design to align with shoppers' motivations, online retailers can maximize emotional engagement, transforming VA services from merely functional tools into powerful drivers of emotion that foster customer satisfaction, strengthen loyalty and differentiate services.

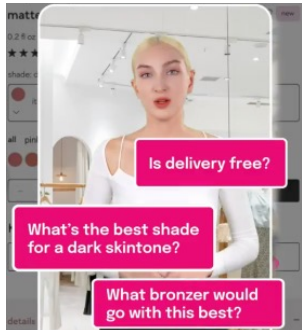
APPENDIX

TABLE A - Representative VAs without Visual Form

Retailer	Domino's	ASOS
Retailer's VA	Dom	Nibble AI
VA type	Both text- and voice-based chatbot	Text-based chatbot
Launch year	2014	2021
Key features	- Enables hands-free pizza ordering through voice-activated commands, enhancing user convenience. - Streamlines order placement and tracking via apps, accommodating custom requests such as toppings or delivery instructions with precision. - Delivers personality-driven interactions infused with humor and empathy, addressing customer concerns creatively (e.g., talking apology cards) to build loyalty and strengthen customer connections.	- Tailors conversation strategies to user behavior, previous bids, urgency and contextual factors, creating a more dynamic and adaptive interaction. - Facilitates price negotiation by allowing users to place bids and provide justifications, delivering a highly personalized shopping experience.

Note. Virtual assistant (VA)

TABLE B – Representative VAs with visual form and varying degrees of form realism

Retailer	IKEA	Firework
Retailer type	Furniture and home goods	Fashion and retail
Retailer's VA	Anna	AI Virtual Assistant (AVA)
VA type	VA with low-form realism	VA with high-form realism
VA's interface		
Launch year	2004	2024

Note. Virtual assistant (VA).

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Upcycling economy: consumer perceptions of food made from surplus food

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Abstract. Food waste is a critical global issue, with an estimated 30–40% of food production lost along the supply chain. Upcycled food, which repurposes surplus ingredients into high-quality products, represents a promising strategy within the circular economy to reduce waste and promote sustainability. This study explores consumer perceptions of upcycled food, focusing on key psychological and perceptual drivers of its adoption. It develops a theoretical model aimed at assessing how environmental attitudes, product characteristics and food neophobia shape consumers' willingness to consume these products. The results showed that product perceived healthiness is the key driver in increasing the judgement of the product and the moral obligation to buy, while reducing the perception of risk. Conversely, perceived risk and food neophobia are relevant barriers to experimenting with upcycled food. Finally, the more information consumers are given about the production process, the greater the perception of product innovation and the greater the perception of risk. Our findings provide both theoretical insights and practical guidance for the food industry, supporting the transition toward sustainable consumption.

Keywords : upcycled food; upcycling economy; circular economy; food waste; information transparency

Introduction

Current estimates suggest that between 30% and 40% of all food produced is wasted (Upcycled Food Association, 2024). Throughout the food supply chain, including manufacturing, handling, storage, packaging, distribution and consumption, significant food loss occurs (Bangar *et al.*, 2024). This not only leads to substantial waste of natural and economic resources but also exacerbates the environmental impact of food production. The growing awareness of the environmental impacts associated with food production and waste has driven the search for innovative solutions to reduce system inefficiencies. The circular economy represents a key response to the increasing scarcity of resources and the escalating rate in waste generation, positioning itself as a driver of the transition toward a more sustainable economic system (Mies & Gold, 2021). Within this production and consumption model, upcycling is included. We talk about upcycled when waste is used and reintroduced into the production chain, thus resulting in an increase in 'value' (Bridgens *et al.*, 2018; Forbes, 2021). In the case of food, this includes, for example, fruit peels and seeds, vegetable pulp, by-products from grain processing, or products that do not meet the aesthetic standards required by large-scale distribution. Upcycled products help prevent food waste by transforming

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surplus food into new, high-quality products that are safe for human consumption. Repurposing food that would otherwise be discarded presents a creative challenge that generates both economic gains and environmental benefits (Bangar *et al.*, 2024; Bhatt *et al.*, 2021).

Given the growing popularity of upcycled food as a key trend in sustainable consumption (Aschemann-Witzel *et al.*, 2023; BusinessWire, 2021; Peschel & Aschemann-Witzel, 2020), it is essential to understand how consumers perceive these products and identify the drivers and barriers that facilitate or hinder their adoption. To this end, the present study aims to assess both the positive and negative factors influencing consumers' willingness to consume upcycled food. The proposed conceptual model is structured around three key dimensions of consumer perception of sustainable food: environmental attitudes, perceived product characteristics and food neophobia. With reference to the first area, starting from the norm activation model (NAM; Schwartz, 1977), we hypothesize that environmental concern-related (awareness of consequences) and consciousness-related (ascription of responsibility) variables impact the moral obligation toward the purchase of upcycled food, which in turn influences the desire to eat. Regarding the perceived characteristics of the product, judgments on its expected healthiness and degree of innovation are expected to influence both the perceived product value (positively) and the perceived risk of consumption (negatively), which in turn influence the desire to taste the product. The expectation of healthiness of upcycled products would also increase the moral obligation towards purchasing them (personal norms). Expected tastiness is expected to have a positive impact on desire to eat the product.

Consumer discomfort with novel foods (food neophobia) is considered a deterrent to upcycled food consumption, contributing to worsening perceived healthiness and expected tastiness and reducing the salience of personal norms. However, the negative effects of food neophobia can be countered by increasing consumer knowledge about how food processing waste is transformed into novel foods. In other words, an high level in detail of information (i.e., transparency of information) provided to consumers about the production process through which upcycled foods are obtained and about the control and certification mechanisms may have the potential to increase recognition of the innovative nature of these products and reduce the perception of risk associated with their consumption, which in turn negatively influences desire to taste the product. This variable was manipulated to assess the effect of two different levels of information transparency (high and low) on consumer responses. In Figure 1, the proposed model is presented.

Our research seeks to make a significant contribution to the existing literature on upcycled products from two key perspectives. First, it advances the theoretical understanding of consumer acceptance of unconventional food products, such as upcycled food, by identifying the psychological and perceptual factors that shape their adoption. Second, from a practical standpoint, it offers valuable insights for stakeholders in the food industry by identifying the factors that influence consumers' perceived value and risk of food made from surplus ingredients, as well as their sense of moral obligation to purchase and their desire to consume such products. By bridging these dimensions, this study provides a deeper understanding of the mechanisms driving consumer behavior in the context of sustainable food innovation.

Methodology

To pursue the research objective, an online questionnaire was sent for self-administration to a sample of 355 Italian people ($M = 39\%$, $F = 59\%$, not specified=3%; mean age=40.7, mix=20 max=87), casually distributed among two experimental conditions (high and low transparency). Respondents were shown the images of some upcycled products images (apple chips, chocolate cookies, cherry jam and cheese crackers) accompanied by a text which differed depending on the experimental condition: (a) Upcycled foods are foods made from food processing residues, i.e. surpluses and by-products of primary processing that are transformed into new edible products.

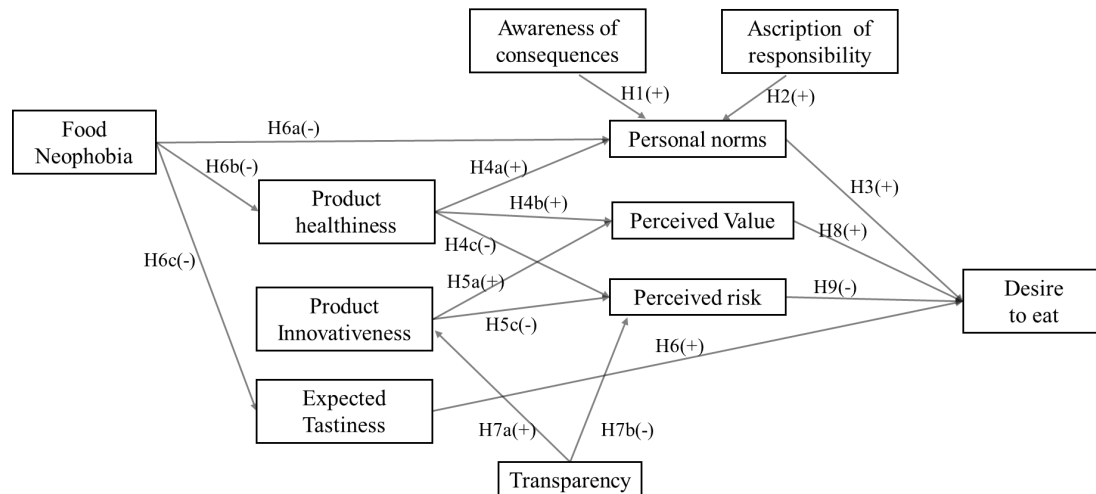


FIGURE 1 – Conceptual model

Examples include fruit peels turned into fiber-rich flours, bars made from hop grains left over from brewing, or vegetable stock cubes made from vegetable residues (low transparency condition); (b) Upcycled foods are foods made from food processing residues, i.e. surpluses and by-products of primary processing that are transformed into new edible products. Examples include fruit peels turned into fiber-rich flours, bars made from hop grains left over from brewing, or vegetable stock cubes made from vegetable residues. The treatment and requalification of these products is based on transparent and rigorous production processes that guarantee maximum hygiene and safety conditions. All production is subject to general process and product safety regulations at every stage of processing. This recycling of surpluses gives new life to food products that are highly nutritious and absolutely safe to consume. (high transparency condition). The degree of information was then used as a dichotomous variable in the conceptual model.

The other variables of interest were measured with scales developed and validated in the literature: awareness of consequences (Han, 2014), ascription of responsibility (Steg & Groot, 2010) personal norms (Han, 2014), product perceived healthiness (Bui *et al.*, 2013), product innovativeness (Lowe & Alpert, 2015), expected tastiness (Paakki *et al.*, 2022), food neophobia (Guidetti *et al.*, 2018), product perceived value (Voss *et al.*, 2003), perceived risk (Keh & Pang, 2010), desire to eat (Lambert *et al.*, 1991). The internal reliability of the scales was assessed using Cronbach's alpha index, which was satisfactory for all constructs ($\alpha > 0.70$). For the analysis of the conceptual model, structural equation modelling was performed using the LISREL statistical software.

Results

The analysis showed that the structural model fits the data well (Satorra-Bentler $\chi^2=1094.474$, $df = 475$; $RMSEA = 0.061$; $NFI = 0.951$; $NNFI = 0.968$; $CFI = 0.972$). Results from path coefficients (Fig. 2) and t -values supported the robustness of the norm activation model also in the context of upcycled food. Awareness of consequences of food industry activities on the environment and the ascription of responsibility towards environmental protection also to consumers positively impact the personal norms toward upcycled food (respectively, $\beta = 0.209$, $p < 0.01$ and $\beta = 0.271$, $p < 0.01$), which in turn increases the desire to eat these products ($\beta = 0.146$, $p < 0.01$). A path of causal relationships emerges between the dimensions related to the judgement of the product. Upcycled food value is strongly and positively influenced by product perceived healthiness ($\beta = 0.890$, $p < 0.01$), which also encourages the moral obligation towards purchasing them ($\beta = 0.382$, $p < 0.01$) and decreases the risk perception ($\beta = -0.382$, $p < 0.01$). The expectation of tastiness and product perceived value, in turn, increase the desire to eat the product (respectively, $\beta = 0.162$, $p < 0.01$ and $\beta = 0.369$, $p < 0.01$).

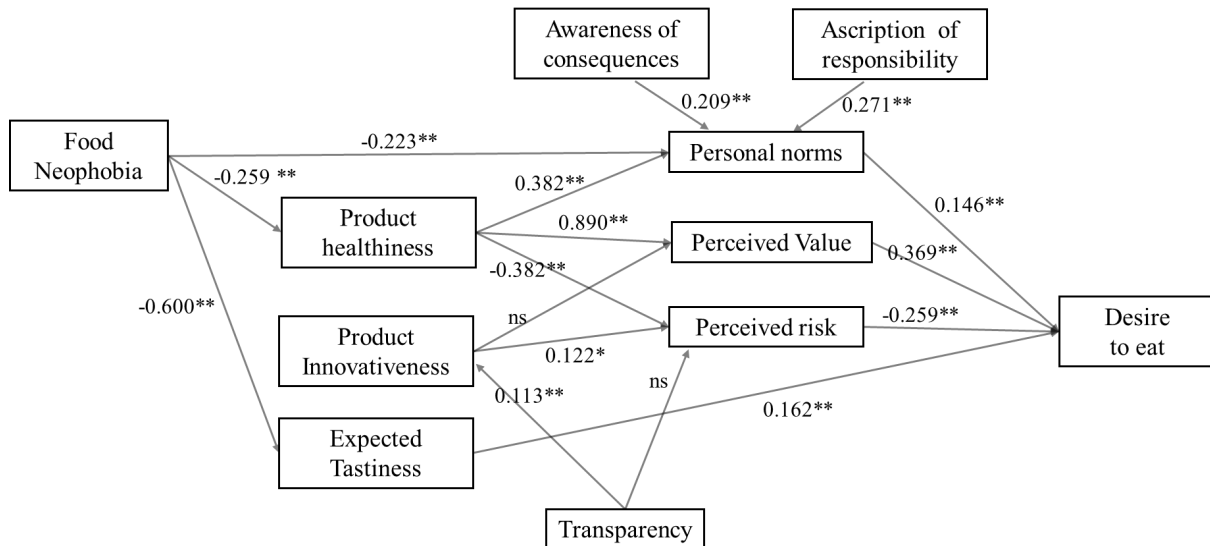


FIGURE 2 – Structural model with standardized coefficients

On the contrary, the concern associated with the consumption of upcycled products (perceived risk) decreases the desire to eat ($\beta = -0.259, p < 0.01$). A significant role of food neophobia also emerged: consumer discomfort with novel foods leads individuals to lower their moral norm ($\beta = -0.223, p < 0.01$), healthiness perception ($\beta = -0.259, p < 0.01$) and tastiness expectation ($\beta = -0.600, p < 0.01$) when it comes to upcycled foods.

The role of communication transparency in influencing product evaluation is only partially supported, increasing consumer knowledge about how food processing waste is transformed into novel foods increases the perception of product innovation ($\beta = 0.113, p < 0.01$), but does not reduce the perception of risk in consumption. Furthermore and contrary to what was hypothesized, the judgment on the innovativeness of the product acts as a driver of risk attribution ($\beta = 0.122, p < 0.01$): in other words, the more transparent the communication, the more the product is considered innovative and the greater the perception of risk associated with its consumption.

Conclusions and discussion

The study aims to contribute to the existing body of research on the psychological barriers, as well as the drivers that encourage the consumption of upcycled food. The results showed that the perceived healthiness of the product is the main factor determining the increase in the judgement of the value (effectiveness and usefulness) of the product and the moral obligation to purchase, while reducing the perception of risk. Conversely, the perceived risk and food neophobia are relevant barriers to the experimentation with foods made from food processing residues. Finally, the more information consumers are given about the production process of these products, the greater the perception of product innovation, which however acts as a fuel for the perception of risk.

The findings provide valuable theoretical and managerial insights into potential pathways for further research, highlighting the positive and negative factors that may influence consumer eating choices. Food neophobia is an obstacle to approaching upcycled food. While it is very difficult to change this psychological trait observed in some consumers who are reluctant to experiment with novel or unconventional foods, it is possible to work in a marketing key to mitigate its effect. One possible solution could be to avoid emphasizing the differences between upcycled and conventional products. Simply presenting the products as new market alternatives that are completely similar to what consumers already know, if not by brand, can reduce consumer concern and improve perceived healthiness, taste expectations and purchase intent. Perceived healthiness also plays a key role in consumer choice. Therefore, companies should focus on

communicating the health benefits associated with upcycled products. Creating marketing campaigns that highlight nutritional properties and potential wellness benefits can increase perceived healthiness, positively influencing judgments on the value of the product and incentivizing purchase.

Finally, an interesting insight that emerged from the study concerns the level of detail of the information provided to consumers about the production process of upcycled foods, the control and certification mechanisms and the importance they attach to product innovation. Given the role of transparency in communication and the role of product innovation that emerged from the conceptual model, it seems essential to communicate the value of the product without overemphasising innovation. Companies should avoid positioning upcycled products as overly innovative, as this can increase the perception of risk. Instead, it is useful to simply position these foods as valid and familiar purchase alternatives, comparable to traditional products: this approach can facilitate consumer acceptance of the product and reduce risk perceptions.

Acknowledgements

Funding: Project funded under the National Recovery and Resilience Plan (NRRP), Mission 4 Component 2 Investment 1.3 - Call for tender No. 341 of 15/03/2022 of Italian Ministry of University and Research funded by the European Union – NextGenerationEU. Award Number: Project code PE0000003, Concession Decree No. 1550 of 11/10/2022 adopted by the Italian Ministry of University and Research, CUP D93C22000890001, Project title Research and innovate on network on food and nutrition Sustainability, Safety and Security – Working OnFoods (OnFoods)

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Proceedings 31st International Conference on Recent Advances in Retailing and Consumer Science, July 7 – 10, 2025, Zagreb, Croatia

Comparing text- and video-based interactions with virtual assistants in e-commerce

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Abstract. Human-computer interactions have been profoundly changed by the increasing use of Virtual Assistants (VAs) into a variety of digital ecosystems which improved user capability to perform several tasks such as receive product recommendations and complete online transactions. Although text-based chatbots have long been used in different contexts, little is known about the potential of video-based VAs. In particular in e-commerce settings. This study aims to examine how VA textual versus video communication modalities impacts user's VA perceived social presence and its role in influencing trust, engagement. Intention to use and their overall satisfaction with the assistant. The proposed conceptual model was tested using a structural equation modelling approach. According to the results, a video-based VA is perceived as more socially present as compared to the textual one. This positively influenced the dimension of trust and engagement which lead to an increased satisfaction and intention to use the VA.

Keywords : virtual assistants; chatbots; human-computer interactions; social presence; anthropomorphism

Introduction

The increasing integration of technology into daily life has made virtual assistants (VAs) play a more crucial role in human-computer interactions by helping users with several everyday tasks. The incorporation of these systems into smart home assistants and smartphones has made VAs an essential part of digital ecosystems, enabling them to perform a wide range of tasks (Malodia *et al.*, 2022; Rawassizadeh *et al.*, 2019). Conversational agents like VAs also include text-based chatbots (Diederich *et al.*, 2022; Gnewuch *et al.*, 2017) which are frequently used in e-commerce, banking and healthcare systems with customer service being a major use case (Behera *et al.*, 2021). Early iterations of chatbots, which only relied on text-based interactions to simulate human conversation (Zumstein & Hundertmark, 2017), were limited to executing predefined commands (Natale, 2019) offering basic information retrieval. However, with the integration of natural language processing and machine learning, text-based chatbots have acquired the ability to better process human inputs, facilitating more natural and intuitive interactions and becoming integral components of both commercial and personal digital experiences as VAs (Gholami & Al Abdwani, 2024).

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How effectively the assistant conveys information and responds to queries is not limited to technological improvement but also regards the communication style, which could be a critical factor in shaping user experience (Bylieva *et al.*, 2021; Jiang *et al.*, 2022; Cai *et al.*, 2024). For instance, differences in VAs textual responses features, such as warmth and competence, can be factors shaping users' attitude towards a brand and their purchase intention of a product (Roy & Naidoo, 2021). Furthermore, a formal conversation style compared to a more casual one, can help customer to perceive the VA as more competent and could help them feel less uncomfortable in disclosing some personal information (Cox & Ooi, 2022). When it comes to audio-based interactions, as seen in voice assistants, they could create a more natural and conversational experience, potentially enhancing user engagement (Rzepka *et al.*, 2021). Recent evidence demonstrated that users who engage with a virtual assistant that speaks in a human voice, feel it as more socially present than users who converse with a VA that speaks in a synthetic voice, further strengthening confidence in the VA (Chérif & Lemoine, 2019). Existing research comparing speech-based and text-based interactions suggests that verbal communication tends to elicit more positive attitudes toward VAs (Cho *et al.*, 2019; Novielli *et al.*, 2010; Schroeder & Schroeder, 2018). Furthermore, speech-based interactions are considered more intuitive and natural, requiring less cognitive effort (Kock, 2004) which increases the enjoyment of the interaction (Pal *et al.*, 2020; Yang & Lee, 2019). Some research has also investigated the impact of visual elements in VAs. In order to assess whether such features could modulate users' experience. The findings suggest that an anthropomorphic static image representing the VA, raises user expectations for interactivity and could help in decreasing the perceived impersonality of the communication (Go & Sundar, 2019). Furthermore, an increased level of attention is directed to the VA when it has an anthropomorphic appearance (Chen *et al.*, 2024).

To our knowledge, video-based VAs have not yet been studied, especially considering e-commerce settings. On the basis of the evidence previously discussed. It remains crucial to investigate whether a video-based VA with anthropomorphic features in appearance, facial expression and voice, can further humanize the interaction thus increasing users' satisfaction and intention to use such technology. It has been shown that the customer journey from discovery to desire to purchase, may be improved using VAs (Kaczorowska-Spychalska, 2019; Zumstein & Hundertmark, 2017) and that businesses increasingly rely on them for customer service, product recommendations and personalized interactions (Gholami & Al Abdwani, 2024). Therefore, understanding the impact of different VA communication modalities on user experience is particularly relevant for retailers that develop and use VA technologies in e-commerce contexts.

To address these issues, the present study seeks to investigate the relationship between VA communication modalities (textual vs. human-based video) and users' intention to use these systems, by means of a structural equation model (SEM). It is hypothesized that these different types of communication affect how users perceive the VA to be, specifically whether they experience it as a real entity which is socially and emotionally present during an interaction, a concept known as perceived social presence (PSP) (Oh *et al.*, 2018). This would then start a series of causal effects that have a significant impact on users' engagement and trust, which in turn will increase users' satisfaction and intention to use the VA.

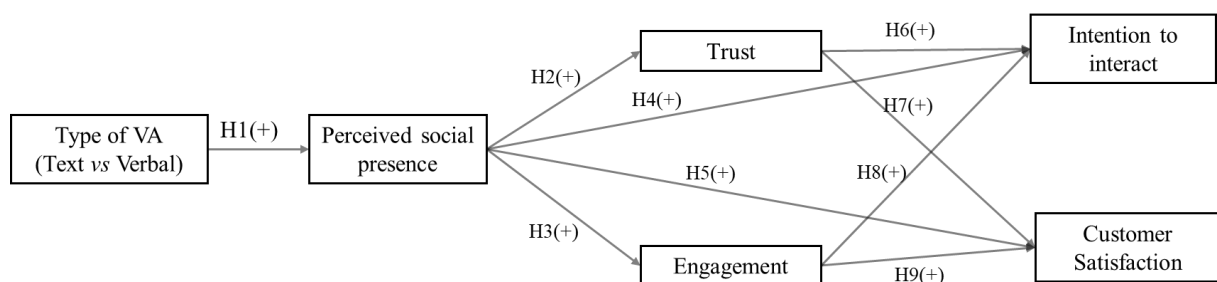


FIGURE 1 – Conceptual model

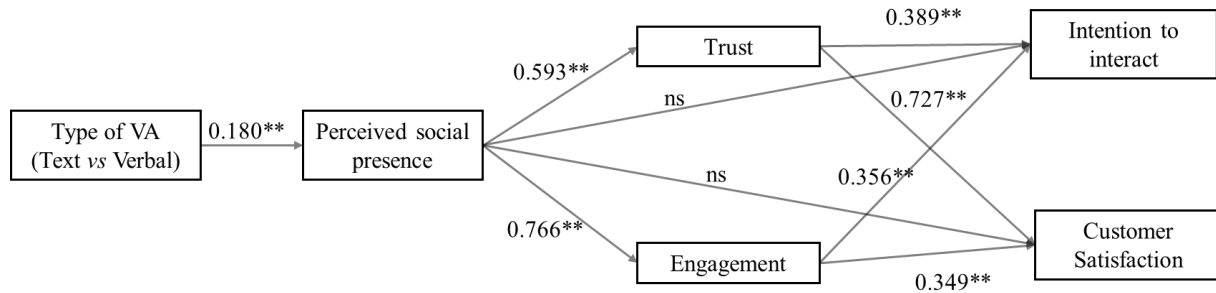


FIGURE 2 – Structural model with standardized coefficients

Figure 1 shows the proposed model and the research hypotheses. The findings contribute to the growing body of research on human-VA interaction by providing evidence on how different VA modalities impact user experience offering valuable insights for retailers seeking to enhance services effectiveness by utilizing and optimizing VA communication strategies.

Methodology

A between-subjects experimental design was conducted to manipulate the VA communication modality (textual vs. video). A total of 211 Italian ($M = 34.45\%$, $F = 64.11\%$, not specified = 1.44% ; mean age = 30.6, min = 19, max = 75) users were involved, equally and randomly distributed between the two experimental conditions ($N_{\text{textual}} = 100$, $N_{\text{video}} = 111$). They were asked to interact with an e-commerce site and simulate the purchase of electronic products (a tablet, a smartphone and a computer) following the instructions provided by the VA. An offline e-commerce website prototype, designed in PsychoPy v2023.1.0 (Open Science Tools Ltd.), was used to simulate a realistic but controlled shopping experience where participants interacted with the VAs. The type of interaction was identical for the two experimental conditions, which differed only in the type of VA, textual or video. In the video condition the VA was AI-generated using a real human female face speaking to the user. At the end of the shopping experience, participants filled in an online questionnaire aimed at measuring the latent variables. Perceived social presence was measured through the 3-item scale by Zhang *et al.* (2021). Trust in the VA was assessed using the three items developed by Xiong *et al.* (2023). Three questions were aimed at measuring the level of user engagement (Liang *et al.*, 2024). Finally, Intention to use and satisfaction were measured through the scale proposed, respectively, by Abbad (2021) and (Xu *et al.*, 2022). The internal reliability of the scales was assessed using Cronbach's alpha index, which was satisfactory for all constructs ($\alpha > 0.70$). For the analysis of the conceptual model, structural equation modelling was performed using the LISREL statistical software.

Results

The analysis showed that the model fitted the data well (Satorra-Bentler $\chi^2 = 193.149$, $df = 127$; $RMSEA = 0.050$ ($p > 0.01$); $NFI = 0.979$; $NNFI = 0.991$; $CFI = 0.993$; $SRMR = 0.106$). Results from path coefficients (Fig. 2) and t-values supported the key role of VA communication modalities in influencing the perceived social presence: video-based interactions elicit a greater perception of social interaction with a human entity ($\beta = 0.180$, $p < 0.01$) compared to text-based interactions. Perceived social presence, in turn, represents a significant driver in conditioning the user experience to such an extent that it influences both the trust placed in the VA ($\beta = 0.593$, $p < 0.01$) and the level of engagement during the interaction ($\beta = 0.766$, $p < 0.01$). These last two variables play a key role in the path of causal relationships as they have a positive impact on customer satisfaction ($\beta_{\text{trust}} = 0.727$, $p < 0.01$; $\beta_{\text{engagement}} = 0.356$, $p < 0.01$) and intention to interact ($\beta_{\text{trust}} = 0.389$, $p < 0.01$; $\beta_{\text{engagement}} = 0.349$, $p < 0.01$). Mediation analysis also showed that trust and engagement fully mediate the relationship between (a) perceived social presence and (b) satisfaction (indirect effect of PSP on satisfaction: 0.591 , $p < 0.01$) and behavioral intention (indirect effect of PSP on intention to interact: 0.342 , $p < 0.01$).

Conclusions and discussion

The aim of the research was to investigate the role of VAs in e-commerce, particularly in relation to the impact of text-based vs. video-based interactions on user experience. The results indicate that video-based VAs create a higher perception of social presence making the users feel like interacting with a more human-like entity rather than a fully automatized system. This perception enhances trust toward the assistant which is essential for increasing credibility in digital commerce. It furthermore increases the level of engagement with the VA creating a more enjoyable user experience. Both trust and engagement positively influence users' satisfaction and intention to use the VA. Their mediating role underscores the importance of such dimensions as critical psychological factors significantly contributing to creating meaningful human-computer interactions.

From a theoretical point of view, the study enriches the knowledge on human-VA interactions. In particular, it aims to fill the gap in the literature on video-based VAs, focusing on the concept of humanization. The results show that the use of virtual shopping assistants that resemble a human being in the appearance, facial expression and voice characteristics can generate positive effects in the interaction with users in terms of increased trust. Involvement, satisfaction and willingness to interact.

These findings have crucial managerial implications as they highlight the critical role of integrating more human-like VAs interactions for customer services. A more interactive and humanized assistant could help customers feel more comfortable and confident in their purchase decisions. Having a virtual assistant that is human in every way can facilitate an emotional connection, making interactions more personal and memorable. This is particularly useful in scenarios such as product recommendations, personalized consultations and post-purchase support. The sense of trust and engagement elicited by more anthropomorphic video-based VAs could not only enhance overall customer satisfaction but also provide consumers with a sense of human connection that encourages them to continue the interaction. Video-based VAs could be particularly useful in high-investment product categories where trust is a major determinant of purchase intent. By incorporating more anthropomorphic VAs, businesses can create a more reassuring and engaging digital shopping environment. The results of this study have also managerial implication indicating that investment in employing video-based VAs, as compared to chatbots, could be considered as a strategic decision which could increase customer satisfaction.

These results also have broader implications for the use of video-based anthropomorphic VAs beyond e-commerce. This has potential applications in sectors such as healthcare, education and customer service, where trust and engagement play critical roles. For example, in healthcare, the need for service from patients (for booking, payment, understanding the procedures to be followed, etc.) is often high. A VA that can replicate the human interaction with the staff responsible for this type of care can improve the patient experience. Furthermore, the findings highlight the key role of perceived social presence in human-computer interaction, reinforcing the idea that more naturalistic, human-like digital assistants could improve user experiences across various domains. Companies should therefore consider the adoption of humanized VAs as a strategic decision. Developing AI-driven customer service tools with anthropomorphic features can enhance the perception of a real social interaction. This improved perception of social interaction can lead to increased customer satisfaction and, consequently, improved business performance.

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