CAN CONSUMERS DISTINGUISH EVENT SPONSORS FROM AMBUSH MARKETERS?

REINHARD GROHS
SEEBURG CASTLE UNIVERSITY
SEEBURGSTRASSE 8
5201 SEEKIRCHEN AM WALLERSEE, AUSTRIA
reinhard.grohs@uni-seeburg.at
+43 6212/2626-43

ELISABETH WOLFSTEINER
FH WIENER NEUSTADT

UDO WAGNER
UNIVERSITY OF VIENNA

Acknowledgements: The authors thank Marie Sabatky and Frank Burgenmeister for help with the data collection.

CAN CONSUMERS DISTINGUISH EVENT SPONSORS FROM AMBUSH MARKETERS?

Abstract

This research investigates why consumers often fail to correctly identify official event sponsors, frequently confusing them with ambush marketers—brands that associate themselves with events without paying sponsorship fees. Through three empirical studies combining eye-tracking technology and questionnaire data, the authors find that while consumers can initially encode sponsorship information accurately, this advantage tends to vanish when they are later asked to recall the sponsor from memory.

The studies reveal a key distinction between encoding and retrieval processes. In the third study, where participants identified sponsors during the actual presentation of sponsorship materials, the true sponsor was correctly identified 59% of the time compared to 41% for the ambush marketer. However, in the first two studies—where identification occurred after a delay—participants were no more likely to identify the official sponsor than the ambusher, with percentages such as 24% versus 26% in Study 2. This suggests that the ability to distinguish sponsors diminishes once short-term memory fades, which has significant implications for brand and event managers.

Importantly, the drivers of identification differ depending on the cognitive stage. During encoding, eye-tracking data showed that attention-related factors like fixation duration, primacy (first viewed), and recency (last viewed) significantly influenced identification. In contrast, during delayed retrieval, consumer heuristics—specifically perceived fit between brand and event and brand prominence—became the dominant predictors. These findings align with prior research by Johar and Pham (1999), who highlighted the role of fit and prominence in sponsor identification, and with Breuer and Rumpf (2012), who showed that viewer attention is a key component in processing sponsorship information.

The results underscore a critical challenge for official sponsors. While they may initially capture consumer attention and encode their brand-event linkage effectively, this advantage is undermined over time by the powerful influence of heuristics during memory retrieval. Ambush marketers, by capitalizing on high brand prominence and perceived relevance to the event, can create similar or even stronger associations in the minds of consumers without making formal sponsorship investments. These findings suggest that effective sponsorship strategies must address both immediate visibility and long-term memorability.

References

Breuer, C., & Rumpf, C. (2012). The viewer's reception and processing of sponsorship information in sport telecasts. *Journal of Sport Management*, *26*(6), 521-531.

Johar, G. V., & Pham, M. T. (1999). Relatedness, prominence, and constructive sponsor identification. *Journal of Marketing Research*, *36*(3), 299-312.

RAISING AWARENESS AND ENCOURAGING SOCIALLY RESPONSIBLE BEHAVIOURS THROUGH RHETORIC: A CONTENT ANALYSIS OF RHETORICAL FIGURES IN NGO'S ADVERTISEMENTS

PIONTEK VALENTIN
PH.D STUDENT
UNIVERSITY OF MONTPELLIER, MONTPELLIER RESEARCH IN MANAGEMENT
valentin.piontek@umontpellier.fr
+33 6 42 55 86 38

LICHTLE MARIE-CHRISTINE
FULL PROFESSOR
UNIVERSITY OF MONTPELLIER, MONTPELLIER RESEARCH IN MANAGEMENT

MUSSOL SARAH
ASSOCIATE PROFESSOR
UNIVERSITY OF MONTPELLIER, MONTPELLIER RESEARCH IN MANAGEMENT

RAISING AWARENESS AND ENCOURAGING SOCIALLY RESPONSIBLE BEHAVIOURS THROUGH RHETORIC: A CONTENT ANALYSIS OF RHETORICAL FIGURES IN NGO'S ADVERTISEMENTS

Extended Abstract:

This paper aims to identify and describe the mechanisms of rhetorical figures (RF) used in advertisement raising awareness for a cause or encouraging socially responsible behaviours.

From ancient Greece to these days, RF have been used to enhance persuasiveness of political discourses. But there are other fields that also benefit from these elements such as advertising. Indeed, prior studies identified and measured the effects of RF on the persuasion process when incorporated into advertisements: they can increase interest and depth of processing (Toncar & Munch, 2001; Huhmann & Albinsson, 2012), foster positive emotional responses such as pleasure and satisfaction (McQuarrie & Mick, 1996; Derosia, 2007), leading to favourable attitudes (Stathakopoulos et al., 2008; Van Enshot, Hoeken & Van Mulken, 2008).

While the cited works studied the general effects of RF with advertisements promoting everyday products, their use in nonprofit context such as NGO's awareness campaigns has received very little attention in the literature. We then lack insight on how RF could perform when there is no product nor service to promote.

To address this potential gap, we conducted a content analysis of NGO's advertisements collected from the database Ad.forum.com. We analysed 100 campaigns released in France between 2015 and 2025. Since this research focuses on verbal advertisements

The objectives of this study were to identify the most recurrent RF employed to raise awareness or encourage socially responsible behaviours. We also aimed to describe rhetorical patterns (i.e. how the RF is used).

Findings show that tropes (plays on meaning) are more recurrent than schemes (plays on structure) as 75% of the advertisements used a trope. Meaning that the most used deviation type, when it comes to spread awareness or encourage socially responsible behaviours, is a semantic one. We identified 23 different RF in our sample, however 3 of them clearly stood out, appearing frequently: antithesis (19%), paradox (17%) and syllepsis (16%).

Antithesis (juxtaposition of two words evoking opposite ideas, generally in a parallel structure), draws a contrast between two situations, for instance a small action with huge consequences. Paradox (statement that first seems false or contradictory, but at least makes sense in the end), is an interesting lever to encourage processing in order to comprehend the "hidden truth" in the message. Syllepsis (using a word that has two different meanings fitting the sentence), when used on a verb, could be a clever way to say that an action is acceptable in one context and not in another one.

Key words: Rhetorical Figures, Advertising, Responsible Communication

References:

DeRosia Eric D., (2008), The Effectiveness of Nonverbal Symbolic Signs and Metaphors in Advertisements: An Experimental Inquiry, Psychology & Marketing, Vol. 25(3): 298–316.

Huhmann, B. A., & Albinsson, P. A. (2012). Does rhetoric impact advertising effectiveness with liking controlled?. European Journal of Marketing, 46(11/12), 1476-1500.

McQuarrie, E. F., & Mick, D. G. (1996). Figures of rhetoric in advertising language. Journal of consumer research, 22(4), 424-438.

Stathakopoulos, V., Theodorakis, I. G., & Mastoridou, E. (2008). Visual and verbal rhetoric in advertising: the case of 'resonance'. International Journal of Advertising, 27(4), 629-658.

Toncar, M., & Munch, J. (2001). Consumer responses to tropes in print advertising. Journal of advertising, 30(1), 55-65

Van Enschot, R., Hoeken, H., & Van Mulken, M. (2008). Rhetoric in advertising: Attitudes towards verbo-pictorial rhetorical figures. Information Design Journal, 16(1), 35-45

BUY LESS, BUY BETTER... OR BUY MORE? THE CONTRADICTIONS OF SECOND-HAND FASHION PLATFORMS

MARIE BOUDI

PHD CANDIDATE IN MANAGEMENT SCIENCE AND ECONOMICS

UNIVERSITY OF BORDEAUX, IRGO

15 RUE SAINT-SIDOINE 69003 LYON

marie.boudi@gmail.com

0628383511

CATHERINE VIOT

UNIVERSITY PROFESSOR

IAE BORDEAUX, IRGO

BUY LESS, BUY BETTER... OR BUY MORE? THE CONTRADICTIONS OF SECOND-HAND FASHION PLATFORMS

Abstract

This study uses dualistic passion theory (Vallerand et al., 2003) to analyse how a harmonious passion for fashion can become obsessive, leading to over-consumption on second-hand fashion platforms. Qualitative analysis using IRaMuTeQ tool of 40 interviews recounting life stories reveals that the initial motivations for consumption are multiple, and that purchases provide satisfaction and excitement, elements conducive to overconsumption. Theoretical contributions focus on understanding the behaviour of these consumers, illuminated by the theory of dual passion. Managerial approaches to limiting over-consumption are proposed.

Key words: overconsumption, second-hand platforms, positive consumer responses, dualistic passion theory

Introduction

In 2023, second-hand consumption has significantly grown in France: almost 3 out of 4 French people bought a second-hand product during the year, all categories combined (+9 points vs. 2021)[1] . The growing popularity of second-hand clothing and fashion items among a wide audience is mainly due to economic reasons (76%), followed by the desire to consume more (51%). The environmental motivation, although present, comes in third place (39%)[2] . Platforms dedicated to the sale and purchase of second-hand goods, as defined by Roux and Guiot (2008), are places where consumers buy products that have already had a previous life. These platforms are part of a logic that promises to reconcile the principles of the circular economy with family budget management. Although they are perceived as drivers of responsible consumption, they can paradoxically encourage an acceleration in the renewal of owned objects and a buy-resell cycle (Juge et al., 2021). This article explores the paradoxes of second-hand fashion platforms, which are perceived as tools for responsible consumption, but are likely to encourage over-consumption. The question underlying this article is as follows: **Do passion for fashion and exposure to second-hand platforms encourage a transition towards individual over-consumption?** Using dual passion theory (Vallerand et al., 2003) explains how passion can become obsessive. It distinguishes between harmonious passion, which is deeply integrated into one's identity and harmonizes with other life aspects, and obsessive passion, driven by internal or external pressures, often linked to social acceptance or self-esteem needs. This theory has been applied to consumer behaviour on second-hand platforms. The results of the study show that obsessive passion, a state of dependency on second hand plateform, can divert environmental motivations towards recurrent consumption. This research adds to our understanding of the dynamics of sustainable consumption and suggests ways of promoting more responsible purchasing behaviour. These platforms do not merely facilitate purchases; they structure an experience that promotes repetition through immediate gratification, perceived scarcity, and the thrill of the hunt. In a society shaped by hyperconsumption (Lipovetsky, 2003), they can thus transform initially responsible motivations into routinized overconsumption practices. The study also analyses the contradictions between the intentions and practices of consumers on these platforms. Lastly, the article provides a literature review with suggestions for future research, presents the methodology and results, and offers a conclusion and discussion.

I. Literature review and research proposals

With the emergence of online second-hand platforms enabling users to buy and sell clothes with ease, while creating a community sharing similar values (Gopalakrishnan and Matthews, 2020), the consumption of second-hand fashion products has grown rapidly. Today, the relationship with consumption is still evolving, centred on quality of life and brand image, reflecting a change rather than the disappearance of hyperconsumption (Lipovetsky, 2003). In today's hyper-consumption society, consumption has become a goal in itself, contributing to the consumer's identity (“I consume therefore I am”) (Dimitrova et al., 2022). In a society where excessive buying is omnipresent, could consumers wishing to acquire consumer goods, despite limited purchasing power, find an alternative in second-hand goods? Second-hand goods enable them to own the same things as the upper social classes, which they would not be able to afford

[1] *"Second-hand market 2023*", Enov, 2023, https://enov.fr/blog/actus/marche-de-la-seconde-main-2023, (consulted on 10/10/2024)

[2] SOBRIETE AU QUOTIDIEN: ENTRE ENVIE D'AGIR ET CONTRAINTES QUOTIDIENNES (ademe.fr) *https://presse.ademe.fr/2024/03/sobriete-au-quotidien-entre-envie-dagir-et-contraintes-quotidiennes.html,* (consulted on 10/10/2024)

if they went through the new market (Roux and Guiot, 2001). Platforms are a new kind of intermediary which, thanks to digital technology, are able to facilitate contact between economic players, with very low transaction costs (Moati and Heilbrunn, 2022). Easy access, customisation options and the community influence stimulate consumption on these platforms (Wu et al., 2023), but they could also have a paradoxical effect. Indeed, by extending the space of choice for consumers, allowing them to evaluate their experience and share it with others by promoting market transparency and competition between sellers, they reinforce consumer power and help them to consume better (Moati and Heilbrunn, 2022). These platforms are becoming increasingly integrated into everyday activities, which can offer both opportunities and risks for sustainable consumption (Börjesson Rivera et al., 2014).

Motivation, defined as a set of goals directed towards specific gratification and satisfaction (McGuire, 1974), plays a central role in purchasing on platforms, intermediaries linking different groups of consumers (Viossat, 2018). Economic motivation (Roux, 2008) is based on price reduction, increased bargaining power and access to low-cost branded products, driving consumers towards collaborative consumption (Padmavathy et al., 2019; Peugeot et al., 2015). Convenience also motivates, making it possible to buy from anywhere with less effort and considerable time savings (Padmavathy et al., 2019). Finally, the immediate pleasure, emotions felt and network effects reinforce the attractiveness of platforms (Arnold et al., 2003; Bourreau, Perrot, 2020). For this first research proposal, we consider that there are several motivations (economic, convenience, immediate pleasure) experienced by consumers for the purchase of second-hand clothing and fashion items P1.

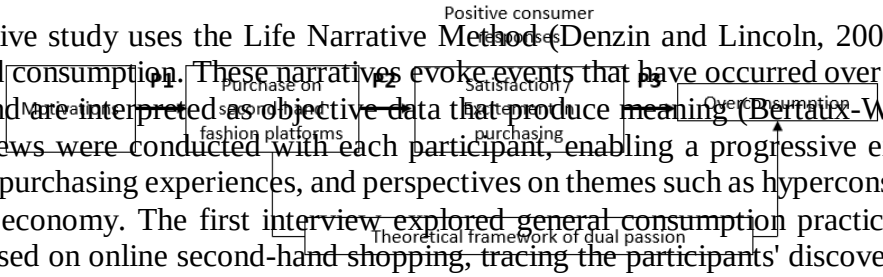
Satisfaction is defined as an evaluation of the surprise inherent in the acquisition of a product and/or a consumption experience [...] (Oliver, 1980). On second-hand platforms, it is often the result of an overall assessment of the customer journey (Dhingra et al., 2020). This perception depends on the site's ability to meet user expectations (Cyr et al., 2008). In addition, post-purchase satisfaction influences future behaviours such as repurchase and recommendation (Pereira et al., 2016). In the digital world, these platforms provide immediate satisfaction, often for unforeseen needs (Molesworth, 2013; Barton et al., 2021). Excitement and pleasure are central to the shopping experience, particularly online, indeed, Koufaris et al. (2001) show that consumers seek convenience and positive emotions and Jayawardhena (2004) emphasises that excitement is central. Machleit and Eroglu (2000) reveal that the shopping environment influences emotions, and Stoltman et al (1991) establish that the visual excitement of online products is linked to purchase frequency. On digital platforms, interactive elements reinforce this excitement (Kim et al., 2011). Arnold and Reynolds (2003) and Fiore et al. (2005) note an increased sense of escapism. We assume that the feeling of satisfaction and excitement related to the purchase are feelings that occur after completing a transaction on second-hand platforms, P2.

According to Chaplin and John (2007), the act of owning leads to the affirmation, definition and consolidation of the self, while generating satisfaction. The more significant a purchase is perceived to be, the more it influences overall satisfaction (Nicolao, Irwi and Goodman, 2009). This satisfaction is amplified when it is socially validated (Ladwein and Sánchez, 2019). In the digital world, the search for immediate gratification, even without physical interaction (Molesworth, 2013), and the anticipation of receiving the product (Cervellon and Vigreux, 2018) influence the intention to repurchase and reinforce loyalty (Anderson and Sullivan, 1993; Rust and Zahorik, 1993). Since the literature shows that satisfaction plays a central role in consumer loyalty and repurchase intention, it could also be a driver of overconsumption on second-hand platforms. Excitement, a combination of pleasure and stimulation (Russell, 1980) also plays a key role in the experience of online shoppers. They seek not only pleasure (Koufaris

et al., 2001), but also feelings of excitement (Jayawardhena, 2004) during their shopping sessions. Dawson (1990) points out that excitement can induce approach behaviour, encourage unplanned purchases and contribute to the hedonic value of shopping. These observations suggest that the feeling of satisfaction and excitement could also encourage over-consumption, particularly on second-hand P3 platforms.

Figure 1: Simplified conceptual framework and research proposals

II. Methodology



The qualitative study uses the Life Narrative Method (Denzin and Lincoln, 2008) to analyse second-hand consumption. These narratives evoke events that have occurred over the course of a lifetime and are interpreted as objective data that produce meaning (Bertaux-Wiame, 1986). Two interviews were conducted with each participant, enabling a progressive exploration of their habits, purchasing experiences, and perspectives on themes such as hyperconsumption and the circular economy. The first interview explored general consumption practices, while the second focused on online second-hand shopping, tracing the participants' discoveries, routines and social influences. A sample of 20 women aged between 18 and 65 (average: 33) was recruited via forums and social networks. In 2021, 82% of second-hand buyers were women (Natixis Payments Observatory). The interviews, conducted by videoconference or telephone, generated 35 hours of recordings and 275 pages of transcripts. The interview data was analysed using IRaMuTeQ, an open statistical text analysis software based on R (*Interface of R pour les Analyses MUltidimensionnelles de TExtes et de Questionnaires*, R interface for multidimensional analysis of texts and questionnaires). To do this, the corpus was coded by theme and the socio-demographic metadata was processed. Then, the tool identified and analyzed the results using factorial analysis and similarity analysis.

III. Results

Analysis of the two maps (Figures 1 and 2) highlights the diversity of consumer motivations on second-hand fashion platforms, grouped into several axes. Firstly, motivations centred on the purchase specific to the platforms emerge "buy", "look", "clothes", "second hand" linked to personal desires, specific needs, and the pleasure of finding fashion items. There is also an economic motivation with the terms "price" and "negotiate". Next, ecological and social concerns, illustrated by words such as "ecological", "planet" or "circular", reflect a motivation linked to sustainability and responsible consumption. In addition, practical motivations, such as the logistical ease of "parcels", "sending" and "receiving", underline a search for efficiency. Finally, emotional and identity-related aspects such as 'fashion', 'passion', 'desire' and 'appeal' are also present. The graphs show that consumers experience a wide range of motivations when they buy on second-hand fashion platforms. Thus, elements consistent with proposition P1 emerge from the data collected: consumer motivations on these platforms are diverse and multidimensional.

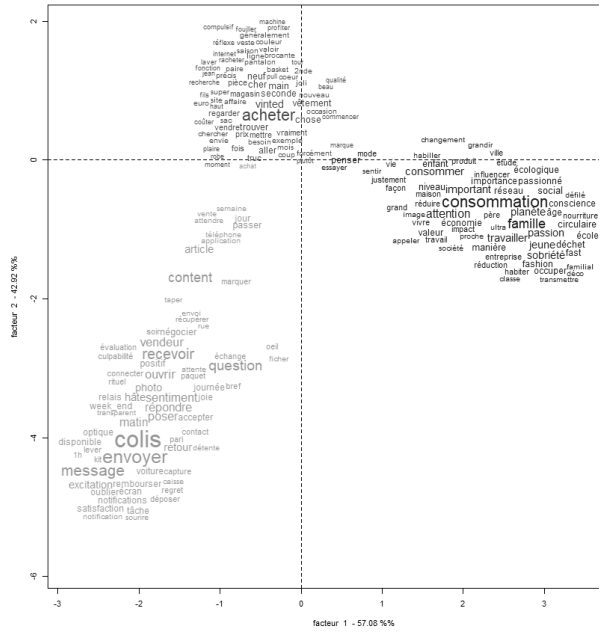


Figure 1 - Factor map

Figure 2 - Map of similarities

Buying fashion products on second-hand platforms generates a significant sense of satisfaction among consumers, particularly when they receive their items. Keywords such as "happy", "satisfaction"[1], and "parcel" identified in the analysis confirm that this emotion is closely linked to the completion of the purchase and the fulfilment of expectations. This satisfaction seems to stem from the finalisation of the purchasing process and the receipt of the expected products. The purchase of fashion products on these same platforms is also accompanied by a feeling of excitement, particularly noticeable during the stages of searching for and selecting items. Terms such as "excitement"[2], "desire", and "buy" highlight the emotional and stimulating aspect of this experience. This excitement reflects the anticipated pleasure of discovering a 'bargain' or a coveted item. In this way, elements consistent with the P2 proposition emerge from the data collected: the feeling of satisfaction and the excitement linked to the purchase are feelings that occur after completing a transaction on second-hand platforms.

On the factorial map, in the green zone, the feelings of satisfaction and excitement appear and seem to be initially associated with terms linked to the user experience, such as "happy", "message", "send" and "parcel"[3]. Secondly, this zone also includes the terms "guilt" and "regret"[4], which can be associated with negative feelings linked to remorse about a purchase. In addition, this zone includes the words "week", "evening"[5], "weekend", referring to regular connections to second-hand platforms. Finally, in the red zone, several terms such as "reflexes"[6], "repurchase", "take advantage", "rummage" underline a tendency towards over-consumption. In fact, several elements in line with suggestion P3 emerge from the data collected: the feeling of satisfaction and excitement could also encourage over-consumption, particularly on second-hand platforms.

Number	Verbatim
[1]	"I am happy because I know the value of things. And then, of course, the satisfaction of not having bought something new. The footprint! The footprint! The carbon footprint."
[2]	“Still a bit excited to find the product I want”

[3]	“I am often excited, so it's the excitement of receiving the package. I am eagerly waiting; I have two packages somewhere in the world.”
[4]	“A part of me still regrets the profile I had before because of Vinted. As I was saying, besides all the great advantages, it's an unimaginable range of possibilities”.
[5]	“My little pleasure all to myself [...] in the evening, it's the moment when... 'Well, let's go shopping.'”.
[6]	“It becomes an easy reflex, and you might tend to overconsume.”

IV. Conclusion and discussion

This research sheds light on the complex motivations and emotions linked to the purchase of second-hand fashion on digital platforms. The results validate the proposals that these motivations are diverse and multidimensional (P1), combining economic, ecological, practical and emotional aspects. Feelings of satisfaction and excitement (P2) play a key role in the consumer experience, reinforcing their attraction to these platforms. These feelings can also encourage over-consumption behaviours (P3). The integration of dual passion theory (Vallerand et al., 2003) offers a relevant insight into these behaviours. The terms "passion" and "fashion" were identified in the analysis, revealing a harmonious passion through rational motivations towards second-hand platforms. Conversely, the latter can tend towards an obsessive passion, leading to the first signs of over-consumption: "repurchase", "reflex", revealing feelings of "guilt" and "regret" after online second-hand purchases. While buying second-hand can be part of a sustainable and economical approach, the results point to a paradoxical trend: these platforms, sometimes presented as responsible consumption tools by those who run them, encourage a repetitive buying cycle, fuelled by excitement and immediate pleasure. From a managerial point of view, this study highlights the importance of integrating tools that encourage responsible consumption on second-hand platforms: dashboards to track purchases, sustainable incentives, educational campaigns and ethical partnerships. Theoretically, it explores the concept of dual passion (Vallerand et al., 2003), highlighting the role of passion in purchasing behaviour, between pleasure and excess on second-hand fashion platforms. However, the study's limitations include an all-female sample and a focus on fashion. In addition to the word-based analysis, the emotional motivations behind consumer behavior could have been explored for greater insight into purchasing strategies. Future research should involve diverse populations and quantitative methods.

References

Anderson, E. and Sullivan, M, 1993. “The Antecedents and Consequences of Customer Satisfaction for Firms”, *Marketing Science*, 12(2), pp. 125-143

Arnold, M. J., & Reynolds, K. E. (2003). Hedonic shopping motivations. *Journal of Retailing*, 79(2), 77-95. https://doi.org/10.1016/S0022-4359(03)00007-1

Barton, C., Bonelli, F., Gurzki, H., Pianon, N., Tsusaka, M., & Mei-Pochtler, A. (2021, January 8). Digital or Die: The Choice for Luxury Brands. *BCG Global*. https://www.bcg.com/publications/2016/digitalor-die-choice-luxury-brands.

Bertaux-Wiame, I. (1986). Mobilisations féminines et trajectoires familiales: une démarche ethnosociologique. In Desmarais D, Grell P., Les récits de vie. Théorie, méthode et trajectoires types, Montréal, Editions Saint Martin, 85-99.

Börjesson Rivera, M., Håkansson, C., Svenfelt, Å., & Finnveden, G. (2014). Including second order effects in environmental assessments of ICT. *Environmental Modelling & Software*, 56, 105-115. https://doi.org/10.1016/j.envsoft.2014.02.005.

Bourreau, M., & Perrot, A. (2020). Digital platforms: regulate before it's too late. Notes du conseil d'analyse économique, 60(6), 1. https://doi.org/10.3917/ncae.060.0001

Chaplin, L. N. & John, D. R. (2007). Growing up in a Material World : Age Differences in Materialism in Children and Adolescents. *Journal of Consumer Research*, 34(4), 480-493. https://doi.org/10.1086/518546

Cervellon, M. C. & Vigreux, E. (2018). Narrative and Emotional Accounts of Secondhand Luxury Purchases Along the Customer Journey. *Vintage Luxury Fashion*, 79-95. https://doi.org/10.1007/978-3-319- 71985-6_6

Cyr, D., Dhingra, K., & Dhingra, R. (2008). Web site design, trust, satisfaction and e-loyalty: The Indian experience. *Online Information Review*, 32(6), 773-790. https://doi.org/10.1108/14684520810923935.

Dawson, S., Bloch, P., & Ridgway, N. M. (1990). Shopping Motives, Emotional States, and Retail Outcomes. *Journal of Retailing*, 58, 34-57.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2008). The landscape of qualitative research (3rd ed.). Sage Publications, Inc.

Dhingra, S., Gupta, S., & Bhatt, R. (2020). A Study of Relationship Among Service Quality of E-Commerce Websites, Customer Satisfaction, and Purchase Intention. *International Journal of E-Business Research*, 16(3), 42-59. https://doi.org/10.4018/IJEBR.2020070103

Dimitrova, T., Ilieva, I., & Stanev, V. (2022). I Consume, Therefore I Am? Hyperconsumption Behavior: Scale Development and Validation. *Social Sciences*, 11(11), 532. https://doi.org/10.3390/socsci11110532.

Fiore, A. M., Jin, H.-J., & Kim, J. (2005). For Fun and Profit: Image Interactivity, Hedonic Value, and Responses Towards an Online Store. *Psychology and Marketing*, 22(8), 669-694.

Gopalakrishnan, S., & Degirmencioglu, N. (2020). Development of Conceptual Model to Measure Determinants of Second-hand Luxury Shopping. International Textile and Apparel Association Annual Conference Proceedings, 77(1). https://doi.org/10.31274/itaa.11873.

Jayawardhena, C. (2004). Personal values' influence on e-shopping attitude and behavior. *Internet Research*, 14(2), 127-138. https://doi.org/10.1108/10662240410530844

Juge, E., Pomiès, A., & Collin-Lachaud, I. (2021). Plateformes digitales et concurrence par la rapidité. Le cas des vêtements d'occasion, *Journal Sage*, 37(1), 1-24. https://doi.org/10.1177/0767370121994831.

Kim, H.-S., & Hong, H. (2011). Fashion Leadership and Hedonic Shopping Motivations of Female Consumers. *Clothing and Textiles Research Journal*, 29(4), 314-330.

Koufaris, M., Kambil, A., & LaBarbera, P.A. (2001). Consumer behaviour in web-based commerce: an empirical study. *International Journal of Electronic Commerce*, 6(2), 115-138.

Ladwein, R. & Sánchez, A. (2019). L'ambivalence dans la décision d'acheter des produits de luxe : le cas des millennials. *Management & Avenir*, N° 106(8), 155-178. https://doi.org/10.3917/mav.106.0155

Lipovetsky, G. (2003). La société d'hyperconsommation. Le Débat, 124(2), 74-98. Gallimard.

Machleit, K. A., Eroglu, S. A., & Mantel, S. P. (2000). Perceived retail crowding and shopping satisfaction: What modifies this relationship? *Journal of Consumer Psychology*, 9(1), 29-42. https://doi.org/10.1207/s15327663jcp0901_3.

McGuire, W. J. (1974). Psychological motives and communication gratification. In The uses of mass communications: *Current Perspectives on Gratifications Research* (Vol. 3, pp. 167-196).

Moati, P., & Heilbrunn, B. (2022). Les plateformes, stade ultime de l'hyperconsommation? *Les Grands Dossiers des Sciences Humaines*, 68(9), 32-35.

Molesworth, M., & Knott, J. D. (2013). Digital Virtual Consumption. Taylor & Francis.

Nicolao, L., Irwin, J.-R., & Goodman, J.-K. (2009). Happiness for Sale: Do Experimental Purchases Make Consumers Happier than Material Purchases? *Journal of Consumer Research*, 36(August), 188-98.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, *17*(4), 460-469.

Padmavathy, C., Swapana, M., & Paul, J. (2019). Online second-hand shopping motivation - Conceptualization, scale development, and validation. *Journal of Retailing and Consumer Services*, 51, 19-32. https://doi.org/10.1016/j.jretconser.2019.05.014

Pereira, H. G., Salgueiro, M. de F., & Rita, P. (2016). Online purchase determinants of loyalty: The mediating effect of satisfaction in tourism. *Journal of Retailing and Consumer Services*, 30, 279-291. https://doi.org/10.1016/j.jretconser.2016.01.003

Peugeot, V., Beuscart, J.-S., Pharabod, A.-S., & Trespeuch, M. (2015). Partager pour mieux consommer? Enquête sur la consommation collaborative. Esprit, 2015/7(July), 19-29.

Roux, D., & Guiot, D. (2001). Le développement du marché de l'occasion. *Décisions Marketing*, 24, 25-35

Roux, D., & Guiot, D. (2008). A measure of second-hand purchase motivations, their antecedents and consequences. *Marketing Research and Applications*, 23(4), 63-95. https://doi.org/10.1177/076737010802300403

Rust, R. and Zahorik, A., 1993. "Customer satisfaction, customer retention, and market share", *Journal of Retailing*, 69(2), pp. 193-215.

Russell, J.A. and Pratt, G. (1980), "A description of the affective quality of environments", *Journal of Personality and Social Psychology*, Vol. 38, pp. 311-26.

Stoltman, J.J., Gentry, J.W., & Anglin, K.A. (1991). Shopping choices: the case of mall choice. In Holman, R., & Solomon, M. (Eds), *Advances in Consumer Research*, 18, Association for Consumer Research, Provo, UT, 434-40.

Vallerand, R. J., Blanchard, C. M., Mageau, G. A., & Koestner, R. (2003). Les Passions De L'ame: On Obsessive and Harmonious Passion. *Journal of Personality and Social Psychology*, 85(4), 756-767. https://doi.org/10.1037/0022-3514.85.4.756

Viossat, L.-C. (2018). Platforms, a model on the way to regulation. Constructif, 2018/2(50), 40-43.

Wu, D., Zhuang, M., Zhang, X., & Zhao, Y. (2023). Towards Circular Fashion: Design for Community-Based Clothing Reuse and Upcycling Services under a Social Innovation Perspective. *Sustainability*, 15(1), 262. https://doi.org/10.3390/su15010262

RESPONSIBLE CONSUMPTION AND PRODUCTION: EXPLORING THE CONSUMER PERCEPTION AND INFLUENCE OF LEGISLATION IN FRANCE

AZEEM, ABDUL
P.H.D STUDENT
UNIVERSITY OF MONTPELLIER - MRM
abdul.azeem@umontpellier.fr

SERE DE LANAUZE, GILLES
ASSOCIATE PROFESSOR
UNIVERSITY OF MONTPELLIER - IAE MONTPELLIER - MRM
Gilles.Sere-De-Lanauze@Umontpellier.Fr

SIADOU-MARTIN, BEATRICE
FULL PROFESSOR
UNIVERSITY OF MONTPELLIER - MONTPELLIER MANAGEMENT (MOMA) - MRM
Beatrice.Siadou-Martin@Umontpellier.Fr

RESPONSIBLE CONSUMPTION AND PRODUCTION: EXPLORING THE CONSUMER PERCEPTION AND INFLUENCE OF LEGISLATION IN FRANCE

Abstract:

Faced with the climate challenge, governments, public policies and legislation are intervening through more or less coercive measures to guide the behavior of businesses and consumers towards greater sustainability. Based on 12 semi-structured interviews conducted with French consumers, this exploratory research aims to understand consumer perceptions in this regard. To what extent, according to them, can legislation promote sustainable consumption in France? The results show that consumers' perception of French political decision-makers is mixed between a certain lack of awareness, satisfaction with their efforts and lack of confidence due to factors such as political inaction, slowness and lack of transparency in the application of regulations. However, with some measures to improve the disclosure of legislation through public campaigns and sanctions/incentives for companies, as well as companies' efforts in terms of better communication through labels, consumers could have a favorable attitude towards responsible products and be willing to pay more.

Key words: perception of sustainable legislation; consumer behavior change; responsible consumption; corporate social responsibility; disclosure of legislation

1. Introduction

Most consumers are aware of the global challenges such as climate change and depletion of resources due to our unsustainable lifestyle and overconsumption (Hanss and Böhm, 2012). These factors along with ever increasing population and ever-changing materialistic lifestyle, have caused major threats to the environment and society (Dhandra, 2019). Consequently, there is a need to change consumer behavior towards a more environmentally friendly and healthy lifestyle so that this trend of overconsumption and depletion of resources can be stopped (Cherian and Jacob, 2012; Sadiq, Adil and Paul, 2023). Research remains limited in understanding consumer attitudes, expectations, and reactions toward the role of government, public policies, and legislation in promoting eco-responsible products, as well as the distribution of responsibilities between consumers, firms, and public authorities. This paper addresses this gap by exploring the impact of sustainable legislation in France, particularly its influence on consumers and how public policies can complement and/or counter marketing communication to drive behavioral change.

2. Conceptual Framework

Consumers have a positive attitude towards sustainable consumption, but this is not reflected in their behaviors, well known as “green gap” or “consumer attitude behavior gap” in literature, further reinforced by abundant "unsustainable" supply leading to over-consumption (Adrita and Mohiuddin, 2020). Despite the efforts of marketers and researchers in terms of availability of sustainable products and awareness respectively, green gap is still very wide (Moraes, Carrigan and Szmigin, 2012; Nguyen, Nguyen and Hoang, 2019; Adrita and Mohiuddin, 2020; Park and Lin, 2020). Marketers or firms have also adopted sustainable production practices (carbon pricing (the cost is applied to greenhouse gas emissions in order to encourage polluters to reduce the combustion of coal, oil and gas), environmental labels, publication of annual sustainability reports), but there is no significant behavior change due to factors such as consumer skepticism (disbelief in sustainability claims), greenwashing (false claims about sustainable production), high price for sustainable products and lack of effective communication from the marketers (Berrone et al., 2017; De Jong et al., 2020; Kim, 2017). The adoption of responsible practices by firms can result from two processes: from an individual and voluntary commitment (whether they are pioneers or followers) (Kim, 2017) or from changes in legislation (Prothero et al., 2011; Kemper and Ballantine, 2019), the first option leading to slower evolution processes.

Given the limits of the actions of consumers (who would all like to be responsible citizens but still don’t change their behavior) and companies (which are caught up in the constraints of profitability and market competition) the role of institutions emerges to accelerate the pace of adoption of more virtuous behaviors (Kemper and Ballantine, 2019). As an authority, the legislator (policy makers, governments) through the ever-increasing number of norms and regulations aimed at guiding consumption in a virtuous manner, both on the supply and demand sides, is carrying out a delicate action in a market universe based on the freedom to undertake and to act (Kemper and Ballantine, 2019). Many legislative measures have also been introduced in France such as French anti-plastic and anti-waste laws, bonus-malus scheme, anti-greenwashing certificate, and French energy sobriety plan (Fadeeva and Van Berkel, 2021; Euronews, 2022; Mensah, 2024; Nikolaus, 2023). This paper is aimed to explore the impact of such sustainable legislations in France and to present a method for marketing communication that can potentially influence consumers towards responsible consumption by answering the following question:

Q1. What are consumer perceptions and expectations regarding sustainable product legislation on firms in France?

Q2. How can the roles of legislators, firms and consumers interact in the aim of promoting sustainable products?

3. Methodology

After designing a qualitative guide, we conducted interviews with 12 French consumers. Consumers were asked about their perception of responsible consumption, responsible communication, and their perception of sustainable legislation in France. They were also asked if communication from firms or the information campaigns from legislators could be improved. The sample consisted of 6 female and 6 male participants, aged between 18 and 52. Detailed demographic information can be found in Appendix 1. The interviews were audio-recorded, transcribed, and analyzed through a manual thematic analysis, allowing us to identify key themes related to French sustainable legislation, responsible consumption, responsible communication, and consumers' perception of French policymakers' actions.

4. Results

An in-depth analysis of the interviews revealed the interconnected influence, perceptions, and expectations regarding policymakers' efforts and firms' actions. These factors appear to interact at multiple levels. Below, we explore the perceived roles of consumers, firms, and the legal framework, followed by an examination of the variables and mechanisms through which legislation can influence both consumers and firms as anticipated by the participants.

I. Main Actors for Responsible Consumption and Production

Before analyzing consumer perceptions of legislation in France, it is essential to identify the key driver of significant change in responsible consumption and production. All the participants agreed that policy makers should take much of the responsibility to ensure responsible production from firms. For instance, *Participant 4* mentioned:

"I think it should be the public authorities, though, to make sure that there is no deception, excesses, bad practices"

Some participants emphasized the proactive role of firms in adopting sustainable practices, driven by growing consumer awareness of environmental issues. As *Participant 1* remarked:

"I think the magic equation here would be if a company can actually generate the same profit or even more profit by following eco-friendly or sustainable or renewable type of products"

Others noted that consumers could exert pressure on firms through actions like boycotting unethical products, as *Participant 10* stated:

"We could influence by boycott, by things like that, and suddenly, inevitably, they would be forced to change their way of producing, their way of doing things more eco-responsibly"

II. Consumer Perception of Legislation/Legislator in France

A. Satisfaction by Recognition of efforts of French Policy Makers

While many participants expressed concerns about French policymakers, they also shared positive expectations. Many participants acknowledged that French policy makers are making an effort for the environment but the efforts might be too slow as *Participant 2* noted:

"*I am satisfied, because they are trying to make things move, but I think it's too slow. They should be harder on it because it's starting to be a real emergency*"

B. Lack of Confidence

i. Political Inaction for Environmental Change

All the participants mentioned that environmental issues are not prioritized by French policymakers. According to these respondents, political leaders appear more focused on elections and financial gains than on environmental concerns. They also observed that few

political parties in France have a strong environmental focus, and such concerns are often associated with the French political left rather than the right. For example, *participant 5* remarked:

"A subject that is only mentioned on the left, only in the political failure of the left, when it should be a subject that should be addressed by everyone, from the left as well as the right"

ii. Slow Pace for Environmental Actions

Another factor contributing to lack of confidence is the perceived slow pace for environmental action. While several participants acknowledged that legislators are taking appropriate steps, they believe progress is insufficient to meet urgent environmental challenges. For example, *participant 6* highlighted this concern, stating:

"Personally, I think it's not moving fast enough. We need to move faster"

III. Examples and Illustrations of Various Ways in Which Legal Obligation May Influence the Promotion of Sustainable Products

A. Legislation Disclosure

As discussed above, while many legislative measures have been introduced in France, most participants highlighted a lack of communication about these initiatives. They emphasized the need for policymakers to improve consumer awareness, as better communication could positively influence choices toward eco-responsible products. Participants suggested using firms' websites, social media platforms, and official journals, but most favored public campaigns, government-supported labels, alongside QR codes detailing product information, and color-graded packaging by firms, as shown in Table 1 below.

Table 1: Legislation Disclosure	
Logos	*"If, in this case, we are absolutely certain that an eco-responsible logo is affixed to the product, and that this logo means something, and that a real eco-responsible logo, inevitably, yes, it would encourage us to buy more with confidence" Participant 4*
Public Campaigns	*"An advertising campaign, it is not interesting to show that the situation is changing. And then, to have an impact on people's day-to-day consumption, maybe indeed, I said that I didn't have much confidence in all these logos. Because ultimately, it was drowned in the middle of a whole bunch of information" Participant 6*
Color Graded Packaging QR Code	*"And then, for educated companies, indeed, with maybe a logo or even a QR code on the product that would allow us to have a little bit of the history of the product, it might be a good idea" Participant 5* *"Like I think something with colors from red to green just written into the product would be perfect. You should be able to know at the moment to look at the product that it's good or not for the environment" Participant 2*

B. Transparent Action of French Policy Makers

According to the participants, policy makers need to take transparent actions for the promotion of ecological products. These expectations include; a) regulations for local as well as foreign firms, b) penalties and incentives for firms, and c) disclosure in publications of unethical firms putting bans on their marketing campaigns as listed below in Table 2.

Table 2: Transparent Action of French Policy Makers	
Regulations for Local	*"But again, when you compete at a global level today, for instance, if I go back to the example of Shein, the manufacturing company from China, they*

and Foreign Firms	*are competing and taking market share from, the Europe, Western European countries, France in particular. And, many will say, well, in France, we're following regulations and rules to be more eco-friendly, but we're competing against a company in China who is not" Participant 1*
Penalties and Incentives for Firms	*"But at the end, when companies are not respecting the new law and directive or regulation and blah, blah, and so on, then the industry should pay a very, very, very strong penalty, cash penalty on that" Participant 3* *"I know the government can also help and you have, like, grants and, you know, incentives that they can put in place. Like, for instance, if you wanna buy an electric car, you may get, like, 5 or 7 thousand dollars" Participant 1* *"Maybe communicate it into like the media. Maybe, I don't know, make publication about companies that are not respecting the rules. And for instance, stopping them from like preventing them from doing advertisement for the product because it's not healthy" Participant 2*

IV. Positive and negative influence of legislation on firms and consumers

Through the analysis of interviews, we explored several ways through which legislation on firms might influence participants in positive and negative ways mentioned by the participants. Positively, it can enhance their trust leading to favorable attitudes towards ecological products and encouraging them to pay more. Negatively, it can give them an impression that too many regulations without transparency can force firms either to relocate or go entirely out of business as well as put huge financial constraints on farmers in terms of profit as explained in Figure 1.

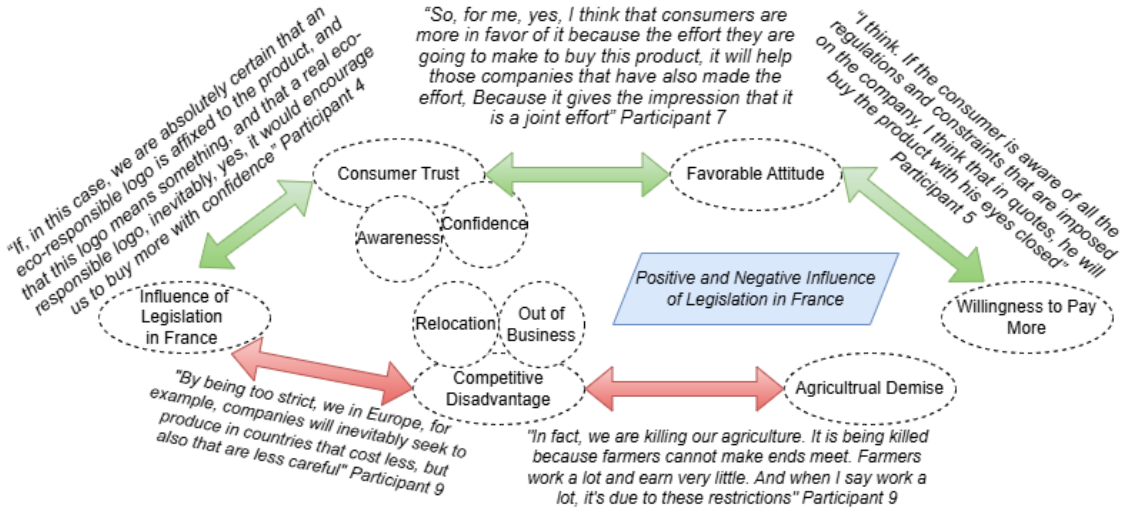


Figure 1: Positive and Negative Influence of Legislation as Anticipated by Participants

5. Discussion

The analysis of the interviews revealed several interrelated factors that influence the promotion of ecological products in France. According to participants, policymakers play a key role in promoting ecological products through a dual approach: enforcing regulations on firms via incentives and penalties, and ensuring transparency by communicating these measures to consumers as also stated by (Kemper and Ballantine, 2019). Consumers trust more on policy makers not only because of its significance as an authority but also because consumers expect it from governments, also in accordance with (Stuthridge et al., 2022). Consumers expect these regulations to be disclosed to consumers, promoted in campaigns supported by policy makers, adoption of such regulations by firms into practice, communicated by firms with details of product information such as product origin, process, impact, and life cycle through tools like

QR codes, product ads and labels justified with details. Participants also expect transparent action from policy makers; incentives and bonuses for firms abiding by the regulations and fines/penalties for firms not engaged in responsible production. The relationship among these factors as anticipated by the participants is illustrated below in Figure 2.

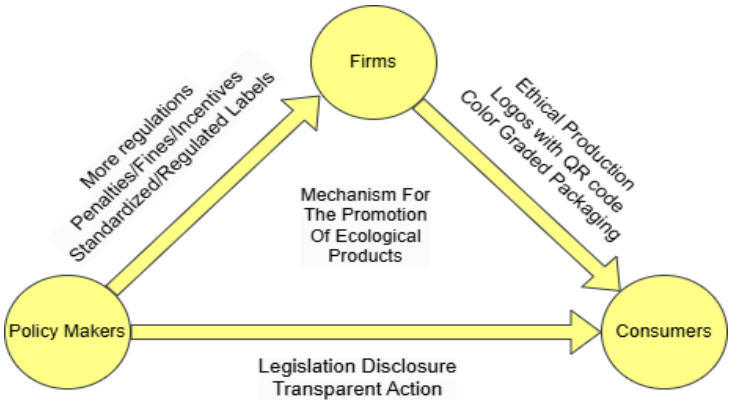


Figure 2: Mechanism for Ecological Product Promotion

A conceptual framework based on this feedback is presented below in Figure 3 to explain the mechanisms for promoting ecological products in France.

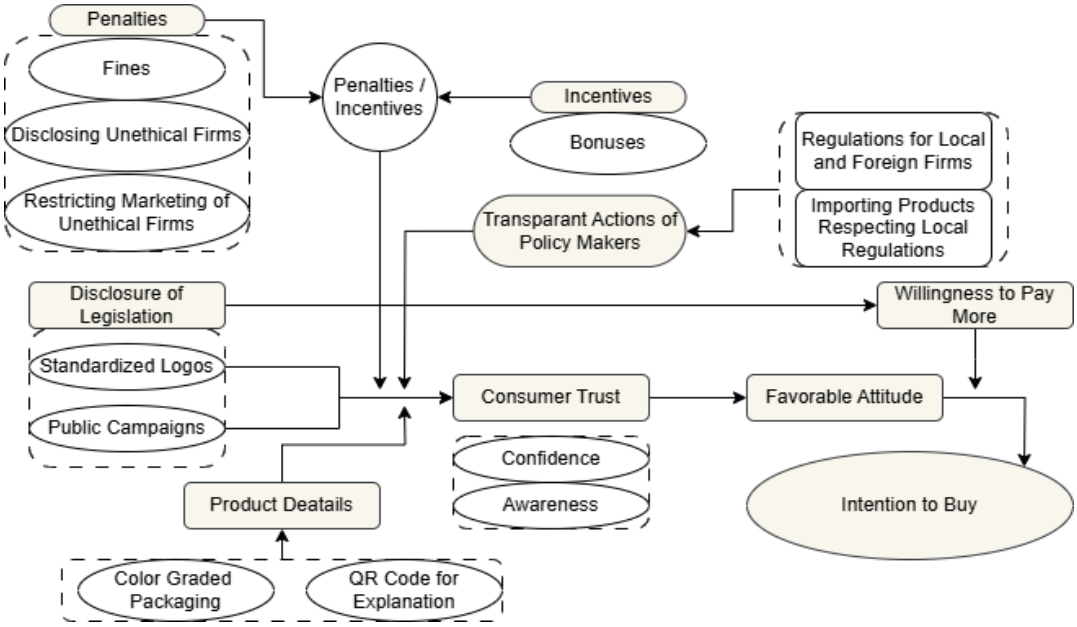


Figure 3: Conceptual Framework Explaining Relationship Between the Discussed Variables

6. Conclusion, Limitations and Research Avenues

Our analysis reveals that consumer perception of French policymakers is mixed. While there is satisfaction with their efforts, consumers expect more actions and legal obligations. However, trust remains low due to political inaction, slow progress, and a lack of transparency in enforcing regulations. Measures such as public campaigns to disclose legislation, penalties or incentives for firms, and improved firm communication (e.g., through labeling) could enhance consumer trust, attitudes toward ecological products, and willingness to pay. Future research should examine the mechanisms and effects of legal actions on trust and purchasing behavior, particularly the roles of legislative transparency and firm communication. Additionally, our

study's limitations, including sample size and diversity, highlight the need for further research on supervising marketing practices to achieve more virtuous outcomes.

References:

Adrita, U.W. and Mohiuddin, M.F. (2020) 'Impact of opportunity and ability to translate environmental attitude into ecologically conscious consumer behavior', *Journal of Marketing Theory and Practice*, 28(2), pp. 173–186.

Berrone, P., Fosfuri, A. and Gelabert, L. (2017b) 'Does greenwashing pay off? understanding the relationship between environmental actions and environmental legitimacy', Journal of Business Ethics, 144(2), pp. 363–379.

Cherian, J. and Jacob, J. (2012) 'Green marketing: a study of consumers' attitude towards environment friendly products', *Asian Social Science*, 8(12), pp. 117–126.

Dhandra, T.K. (2019) 'Achieving triple dividend through mindfulness: more sustainable consumption, less unsustainable consumption and more life satisfaction', *Ecological Economics*, 161, pp. 83–90.

Euronews (2022) France launches 'sobriety' energy savings drive to avoid winter power cuts. Available at: https://www.euronews.com/2022/10/06/france-launches-sobriety-energy-savings-drive-to-avoid-winter-power-cuts.

Hanss, D. and Böhm, G. (2012) 'Sustainability seen from the perspective of consumers', *International Journal of Consumer Studies*, 36(6), pp. 678–687.

De Jong, M.D.T., Huluba, G. and Beldad, A.D. (2020) 'Different shades of greenwashing: consumers' reactions to environmental lies, half-lies, and organizations taking credit for following legal obligations', *Journal of Business and Technical Communication*, 34(1), pp. 38–76.

Fadeeva, Z. and Van Berkel, R. (2021) 'Unlocking circular economy for prevention of marine plastic pollution: an exploration of G20 policy and initiatives', Journal of Environmental Management, 277, p. 111457.

Kemper, J.A. and Ballantine, P.W. (2019) 'What do we mean by sustainability marketing?', *Journal of Marketing Management*, 35(3–4), pp. 277–309.

Kim, Y. (2017) 'Consumer responses to the food industry's proactive and passive environmental CSR, factoring in price as CSR tradeoff', *Journal of Business Ethics*, 140(2), pp. 307–321.

Mensah, A.-M. (2024) Ecological bonus 2024: everything you need to know. Available at: https://www.beev.co/en/blog/fiscalite/bonus-ecologique-en-2024/.

Moraes, C., Carrigan, M. and Szmigin, I. (2012) 'The coherence of inconsistencies: attitude-behaviour gaps and new consumption communities', Journal of Marketing Management, 28, pp. 103–128.

Nguyen, H.V., Nguyen, C.H. and Hoang, T.T.B. (2019) 'Green consumption: closing the intention-behavior gap', *Sustainable Development*, 27(1), pp. 118–129.

Nikolaus, J.K. (2023) EU reaches deal banning 'climate-neutral' product claims. Available at: https://www.euractiv.com/section/energy-environment/news/eu-reaches-deal-banning-climate-neutral-product-claims/.

Park, H.J. and Lin, L.M. (2020) 'Exploring attitude-behavior gap in sustainable consumption: comparison of recycled and upcycled fashion products', *Journal of Business Research,* 117, pp. 623–628.

Prothero, A. *et al.* (2011) 'Sustainable consumption: opportunities for consumer research and public policy', *Journal of Public Policy & Marketing,* 30(1), pp. 31–38.

Sadiq, M., Adil, M. and Paul, J. (2023) 'Organic food consumption and contextual factors: an attitude–behavior-context perspective', *Business Strategy and the Environment,* 32(6), pp. 3383–3397.

Stuthridge, L. *et al.* (2022) '"It's all just marketing", a qualitative analysis of consumer perceptions and understandings of nutrition content and health claims in New Zealand', *International Journal of Environmental Research and Public Health,* 19(6), p. 3510.

Appendix 1

Table 3. Participant Data

Participant	Age	Gender	Education	Employment	Nationality
Participant 3	51	Female	Master	Life Coach	French
Participant 9	34	Female	Bachelors	Sales woman	French
Participant 10	23	Male	Bachelors	Steward	French
Participant 11	18	Female	Pre-Bachelors	Student	French
Participant 12	30	Female	Professional Diploma	Driver	French
Participant 5	35	Male	Masters	IT Firm	French
Participant 6	47	Male	Civil Engineering	Geo-Technician	French
Participant 7	28	Male	College Diploma	IT Firm	French
Participant 13	27	Female	Masters	Administration	French
Participant 2	25	Female	Bachelors	Music Industry	French
Participant 1	50	Male	Masters	Business Strategy	French
Participant 4	52	Male	Professional Diploma	Maintenance Technician	French
Participant 8	22	Female	Professional Diploma	Air Hostess	French

Appendix 2 (Main results and the corresponding verbatims synthetically extracted from the Thematic Analysis Grid)

Main Theme	2nd Level Sub-Themes	3rd Level sub-Themes	Verbatim
Main Actors for Responsible consumption	Policy Makers	Public authorities Governments Politicians	*All 12 Participants* *"I think it should be the public authorities, though, to make sure that there is no deception, excesses, bad practices" Participant 4* *"But there must also be a form of pressure from public power, from the power in place. Because if we let them do it, if we let companies do whatever they want, then we're not going to get by." Participant 9*
	Firms	Brands Companies Businesses	*Participant 1,3,7* *"I think the magic, equation here would be if a company can actually generate the same profit or even more profit by following eco-friendly or sustainable or renewable type of products" Participant 1*
	Consumers	Customers Individuals	*Participant 9, 10* *"We could influence by boycott, by things like that, and suddenly, inevitably, they would be forced to change their way of producing, their way of doing things more eco-responsible" Participant 10* *"And we are starting to boycott certain products. Because you see ingredients inside, that will make... which, for example, are cancer trainers" Participant 9*
Consumer perception of French policy makers	Satisfaction with efforts	Recognition of Efforts	Participant 1, 2, 5, 6, 7, 8 , 9 "*I am satisfied, because they are trying to make things move, but I thinks it's too slow. They should be harder on it because it's starting to be a real emergency" Participant 2*
	Lack of Trust	Political Inaction	Participant 3, 5, 8 *"No, I don't think they're making enough efforts. The problem is, because they are more concerned by their re-election" Participant 3* *"A subject that is only mentioned on the left, only in the political failure of the left, when it should be a subject that should be addressed by everyone, from the left as well as the right" Participant 5* *"After that, it also depends on the political parties. There are some who are more or less invested in the environment" Participant 8*
		Slow Pace	Participant 2, 6, 7, 9 *"Personally, I think it's not moving fast enough. We need to move faster" Participant 6* *"So, in fact, not much is happening in terms of evolution, in terms of improvement, of increasing the level of legal constraints on companies" Participant 6*

Recommendations for French policy makers	Globalization of laws	Regulations for local and foreign firms	Participant 1, 3, 7, 9, 11 *"Let's say that at the international level too, there should be laws that are adopted and applied by all countries. Because, for example, if we make efforts in France and in other countries, they continue to pollute, the problem will remain" Participant 11*
	Standardized Logos	Universal, European level or standardized label	Participant 1, 4, 5, 6 *"Yes, through a logo, for example, yes, a logo that would be universal. And it will have a set, the logo, the advertising campaign" Participant 4*
	More Regulations	Stricter and More regulations	All 12 Participants *"And if not, the public authorities, I also think that it is important for the public authorities to put more emphasis on this eco-responsible side in companies" Participant 8*
	Ban/Penalties for firms and consumers	Penalties/Fines	Participant 3, 12 "In addition, if they are forced to comply with regulations, as we said earlier, fines, all that, I think that as a result, they will produce a lot more services, a lot more eco-responsible products" *Participant 12*
		Restriction on marketing	Participant 2 *"Maybe communicate it into like the media. Maybe, I don't know, make publication about companies that are not respecting the rules. And for instance, stopping them from like preventing them from doing advertisement for the product because it's not healthy"*
		Disclosing unethical firms	Participant 2 *"Maybe communicate it into like the media. Maybe, I don't know, make publication about companies that are not respecting the rules. And for instance, stopping them from like preventing them from doing advertisement for the product because it's not healthy"*
		Fine for consumers	Participant 8 *"For example, in Singapore, there is not a single plastic bottle on the ground or a cigarette butt on the ground. Because it's punishable by a fine for throwing things in the street. And once again, if we put this in place in France, there would already be enormous progress"*
	Importing only the Ethical Products	Only importing ethical products	Participant 4 *"They could import what they have passed as a law and the new laws that will be applied and others"*
Disclosure of Legislation	Logos	Product Labels	*Participant 1,6,7* *"I think that would increase consumers' confidence and will make that logo, whatever logo we decide to use, relevant when making purchases" participant 1*

	Public Campaigns	Government supported advertisement	*Participant 2,4,5,6,7,8,9,10,11,12 "Well, yes, through advertising, through the official journal, first of all, but... Yes, yes, we now have advertising campaigns on this or that disease, this or that prevention of disease at such and such an age and others. So, inevitably, they could do the same thing on the promotion of eco-responsible products" Participant 4 "An advertising campaign, it is not interesting to show that the situation is changing. And then, to have an impact on people's day-to-day consumption, maybe indeed, I said that I didn't have much confidence in all these logos. Because ultimately, it was drowned in the middle of a whole bunch of information" Participant 6*
	Social Media Platforms	TikTok Instagram YouTube Influencer marketing	*Participant 4, 12 "I think they should be communicated by the most common media today. For example, social networks to reach the youngest. Like TikTok, Instagram. In fact, something modernized to attract also the youngest audience which are by the way future generations" Participant 4*
	Firm Websites	Business websites	*Participant 3 "Regarding communication, at some point they could have in their website, they could have a website mentioning, okay, for each industry, these are the companies that are following the eco-responsible level and have a definition of the eco-responsible level"*
	Official Journals	State Journal	*Participant 4, 10 "The best way would be, well, I think, to publish in the official journal, because everything that is published in the official journal, it goes through the major media channels" Participant 10*
Influence of Legislation	Consumer Trust	Confidence	*Participant 1, 2, 5, 8 "I would be confident if they have a label who says that it's organic, but I wouldn't be confident about their ability to make enough effort for it. It's not enough, they don't give a fuck and they're, sorry, for money" Participant 2*
		Awareness	*Participant 5, 11,12 "After all, of course, there are some people who don't care, but seeing that there are measures that are being taken, they will... Maybe become aware of the difference between eco-responsible products and products that are not" Participant 11*
	Favorable attitude Towards Ecological Products	Favorability	*Participant 2, 3, 7, 11, 12 "So, for me, yes, I think that consumers are more in favor of it because the effort they are going to make to buy this product, it will help those companies that have also made the effort,,,,,,, Because it gives the impression that it is a joint effort" Participant 7*

	Willingness to Pay More	Justification to pay more Higher interest	*Participant 4, 5, 7, 9* *"If, in this case, we are absolutely certain that an eco-responsible logo is affixed to the product, and that this logo means something, and that a real eco-responsible logo, inevitably, yes, it would encourage us to buy more with confidence" Participant 4* *"Well, there you go, because consumers will buy a product that is declared to be eco-responsible, but there you go, all you have to do is put a label, no one can find their way around" Participant 4* *"I think. If the consumer is aware of all the regulations and constraints that are imposed on the company, I think that in quotes, he will buy the product with his eyes closed" Participant 5* *"Will have more value than simply a small logo that has been decided by an independent group or a few people. I think it will enhance the logo itself a little more and it will be more interesting for everyone to buy these products" Participant 7* *"If you're a committed customer, you'll be willing to pay more, because you know it's for a cause, such as women, while respecting the environment" Participant 9*
	Apprehension / Concern	Competitive Disadvantage	Participant 1, 6, 7 *"But again, when you compete at a global level today, for instance, if I go back to the example of Shein, the manufacturing company from China, they are competing and taking market share from, the Europe, Western European countries, France in particular. And, many will say, well, in France, we're following regulations and rules to be more eco-friendly, but we're competing against a company in China who is not" Participant 1*
		Firm Relocation	Participant 7, 9 *"By being too strict, we in Europe, for example, companies will inevitably seek to produce in countries that cost less, but also that are less careful" Participant 9*
		Lack of Support for Farmers	Participant 9, 10 *"I don't think so, because, as we've already seen, compared to farmers and all that, it's complicated for them, financially, to make money because of these productions, which are very standardized, which have to comply with a lot of specifications" Participant 10*
Consumer Expectations from Firms	Recommendations for Firms	Explain Why Eco and Product Life Cycle	Participant 1, 2, 3, 5, 6, 8, 9, 11 *"when I buy an eco-responsible product, if someone explains to me why it is eco-responsible and they really give me a clear visibility on the product and what is eco-responsible about it, maybe that justifies all its price. And in this case, I'm ready to buy it and it will maybe encourage the purchase" Participant 11*

		QR Codes for Product Details	Participant 5 *"And then, for educated companies, indeed, with maybe a logo or even a QR code on the product that would allow us to have a little bit of the history of the product, it might be a good idea"*
		Color Graded Packaging	Participant 2 *"Like I think something with colors from red to green just written into the product would be perfect. You should be able to know at the moment to look at the product that it's good or not for the environment"*

COMMUTE TIME ON FARE-FREE PUBLIC TRANSPORT: A TIME FOR SELF-REFLECTION? INFLUENCE OF INTROSPECTIVE VALUE ON SATISFACTION

BOURAGBA YOUNES
MONTPELLIER RESEARCH IN MANAGEMENT (MRM)
PLACE EUGÈNE BATAILLON – CC 19001 – BÂTIMENT 15, 34095 MONTPELLIER, FRANCE.
younes.bouragba@umontpellier.fr

GOURMELEN ANDRÉA
MONTPELLIER RESEARCH IN MANAGEMENT (MRM)
PLACE EUGÈNE BATAILLON – CC 19001 – BÂTIMENT 15, 34095 MONTPELLIER, FRANCE.
andrea.gourmelen@umontpellier.fr

N'GOALA GILLES
MONTPELLIER RESEARCH IN MANAGEMENT (MRM)
PLACE EUGÈNE BATAILLON – CC 19001 – BÂTIMENT 15, 34095 MONTPELLIER, FRANCE.
gilles.n-goala@umontpellier.fr

COMMUTE TIME ON FARE-FREE PUBLIC TRANSPORT: A TIME FOR SELF-REFLECTION? INFLUENCE OF INTROSPECTIVE VALUE ON SATISFACTION

Abstract

This study examines the influence of introspection in the public transportation (PT) experience, considering cognitive chronic time pressure (CCTP) and PT usage frequency. Data from 209 users of free PT in Montpellier were analyzed using regressions and moderated mediation. Introspection enhances PT satisfaction, with effects moderated by CCTP and usage frequency. PT satisfaction also improves life satisfaction. Findings suggest optimizing service frequency and sensory-friendly environments to foster introspection and reduce time pressure. Managerial implications were addressed, and limitations were noted. This research underscores the role of personality traits and PT usage frequency in improving PT systems and well-being.

Key words: Introspection value ; fare-free public transport satisfaction ; life satisfaction ; cognitive chronic time pressure ; frequency of fare-free public transport use

LE TEMPS DE TRAJET EN TRANSPORTS EN COMMUN GRATUITS : UN TEMPS POUR PENSER A SOI ? INFLUENCE DE LA VALEUR D'INTROSPECTION SUR LA SATISFACTION

Résumé

Cette étude examine l'influence de l'introspection dans l'expérience des transports publics (TP), en tenant compte de la pression temporelle chronique cognitive (PTCC) et de la fréquence d'utilisation des TP. Les données de 209 utilisateurs de TP gratuits à Montpellier ont été analysées à l'aide de régressions et de médiation modérée. L'introspection améliore la satisfaction vis-à-vis des TP, avec des effets modérés par la PCC et la fréquence d'utilisation. La satisfaction TP améliore également la satisfaction de vie. Les résultats suggèrent d'optimiser la fréquence des services et de créer des environnements sensoriels pour favoriser l'introspection et réduire la pression temporelle.

Mots clés : Valeur d'introspection ; satisfaction à l'égard des transports publics gratuits ; satisfaction dans la vie ; pression temporelle chronique cognitive ; fréquence d'utilisation des transports publics gratuit

Introduction

Ordinary experiences, such as mobility, play a crucial role in our quality of life. In 2019, Statista estimated that a Parisian spent an average of 64 minutes per weekday in public transportation (Statista, 2020)[1]. With the rise of remote work and the heterogeneity of available services, this time is often perceived as unpleasant, a sacrifice, or a necessary evil to reach one's workplace or leisure activities, ultimately affecting individuals' quality of life (Cepremap, 2023)[2]. While solo car use remains predominant, the challenge lies in promoting more sustainable mobility, both active (walking, cycling) and shared (subway, bus, tram, etc.).

Life satisfaction (LS) has been used as a representation of individuals' quality of life in disciplines such as psychology, economics, and sociology (Moeinaddini et al., 2020). According to Delbosc et al. (2020), LS is explained by two distinct groups of factors. The first encompasses genetics and personality, which are generally stable and beyond individual control (Lyubomirsky et al., 2005). The second includes various factors, among which social relationships, health, and income are considered the most influential—factors that are facilitated by transportation (Delbosc et al., 2020), in other words, mobility. Indeed, several studies have shown that mobility enables individuals to access resources and opportunities that enhance well-being (Archer et al., 2013; Spinney et al., 2009) and life satisfaction (Delbosc et al., 2020). However, mobility is not solely about access to resources; it also involves the time individuals spend traveling. Within mobility research, travel time has traditionally been considered lost, dead, or empty time that should be minimized (Watts & Urry, 2008), or even the cost of reaching the desired destination (Jain & Lyons, 2008). However, it can also be perceived and experienced differently—as a gift (Jain & Lyons, 2008) or as a moment dedicated to activities, daydreaming, and personal reflection (Watts & Urry, 2008). Thus, travel time can serve as an opportunity for self-reflection in a society burdened by pressure and the cult of urgency (Aubert, 2003). Moreover, consumer behavior literature has examined time perception as a personality trait, conceptualizing time as a subjective experience (Lallement & Gourmelen, 2018). Based on these observations, each individual may experience their travel duration differently, thereby shaping their mobility experience.

This research aims to explain the influence of perceiving travel time as personal time—that is, the introspective value—on public transportation[3] (PT) satisfaction and life satisfaction, while considering the moderating role of subjective time pressure (cognitive chronic time pressure) and PT usage frequency. Data were collected from 209 beneficiaries of free PT in Montpellier between October 22 and November 4, 2025. Subsequently, statistical analyses were conducted using SPSS V28 to test the relationships between the aforementioned concepts (linear regressions and moderated mediations).

Literature Review and Hypothesis Development

Time Perception and Travel Time. Time in marketing has been studied from two perspectives: (1) as a resource to be managed, an objective time (e.g., travel time); (2) and as a personality trait, a subjective time (e.g., chronic time pressure - CTP). CTP is a permanent lack

[1] https://fr.statista.com/statistiques/825351/temps-moyen-transport-commun-villes-france/

[2] Note de l'Observatoire du Bien-être n°2023-01 – À pied, à vélo, en bus ou en voiture : les trajets domicile-travail

[3] Our research focuses on the use of public transportation, specifically bus and tram, in the city of Montpellier

of time that the individual feels (Lallement & Gourmelen, 2018), defined as "an incessant, chronic struggle to get more things done in less and less time" (Rizkalla, 1989, p. 1). It includes a cognitive aspect characterized by the awareness of a constant lack of time, and an affective aspect represented by the feelings associated with it. In the retail field, for example, Kim and Kim (2008) demonstrated that CTP moderates the relationship between enjoyment and shopping behavior. Furthermore, Lallement and Gourmelen (2018) emphasize the moderating role of CTP in situations such as shopping and the experience of consumer behavior.

As a resource to be managed, travel time in public transportation can be analyzed from two perspectives. The first is an economic perspective, where the user seeks to reduce their travel time and maximize temporal gains (Lyons & Urry, 2005). This logic has led to public policies focused on saving travel time (Jain & Lyons, 2008). The second adopts a social, material, and spatial perspective, highlighting the numerous opportunities for space appropriation and time usage (Watts & Urry, 2008). This perspective does not limit itself to analyzing travel time as a constraint, but focuses on its use and valuation. In this sense, it is considered a time "filled with highly valued activities… stretched and compressed in moving practices… a transition time, a time for me" (Watts & Urry, 2008, p. 12), in other words, a moment for introspection.

The Introspection value. According to Laurent (2022), the introspection value (IV) is a dimension of the context value, perceived in situ by the individual. Based on the used scale, introspection value represents the perceived opportunity for users of public transportation in Montpellier to dedicate their travel time to moments of solitude, isolation, and personal reflection, facilitated by being freed from the task of driving. In the context of public transportation (PT), introspection is difficult to experience due to the lack of intimacy and the high level of crowding. However, thanks to the relaxation and liberation from driving, an individual using PT may experience this introspection. Although academic research has not established a direct link between IV and satisfaction with PT, Mazengani et al. (2022) explain that productive activities, such as progressing in work or studies, contribute to increasing satisfaction with daily commuting. However, influenced by individual preferences (Laurent, 2022), the effect of IV on PT satisfaction could be moderated by chronic cognitive time pressure, a personality trait and a state chosen by the individual (Rastegary & Landy, 1993).

Hypothesis 1: The introspection value positively influences PT satisfaction.

Hypothesis 2: CTP moderates the relationship between the introspection value and PT satisfaction.

PT Satisfaction and Life Satisfaction. On the one hand, Delbosc et al. (2020) showed that life satisfaction has as much influence on mobility as mobility has on life satisfaction, making it impossible to determine whether happy individuals travel more or whether traveling more makes individuals happier. On the other hand, it has been shown that the frequency of PT use influences overall satisfaction with PT and recommendations (Ingvardson & Nielsen, 2019).

Hypothesis 3: PT satisfaction positively influences life satisfaction.

Hypothesis 4: The frequency of PT use moderates the relationship between the introspection value and PT satisfaction.

Research Methodology and data

Data Collection. Data collection was carried out from October 22 to November 4, 2025, using a self-administered questionnaire with a convenience sample of 209 beneficiaries of free public transportation (PT) in Montpellier, including 134 students. The sample consisted of individuals with an average age of 24.15 years, comprising 82 men and 121 women (Table 1: Sociodemographic characteristics and mobility practices). The questionnaire began with a filter question regarding the benefit of free PT in order to exclude non-beneficiary respondents.

Measured Variables and Data Analysis. The questionnaire included, in addition to the frequency of PT use and socio-demographic variables, the following variables, measured using validated 7-point Likert scales from the literature: chronic cognitive time pressure (CCTP) was measured using the 5-item scale by Gourmelen and Lallement (2016), the introspection value was measured using the 4-item scale by Laurent (2022), PT satisfaction was measured using the 4-item scale by Hur et al., (2015), and life satisfaction was measured using the 5-item Satisfaction With Life Scale (SWLS) by Diener et al., (1985). Data were analyzed using regressions and moderated mediation (Hayes, 2018) (Table 2: Measurement scales).

Study results

Test of H1. The results show that the introspection value has a significant positive influence on PT satisfaction (**β** = 0.173; **t** = 2.525; **p** < 0.012). H1 is therefore supported (Table 3: Linear regression test results).

Test of H2. The results show that chronic cognitive time pressure moderates the influence of the introspection value on PT satisfaction (**F**(3,205) = 6.5844, **p** = 0.0003), with an explained variance of 8.79% ($\mathbf{R}^2$ = 0.0879). H2 is therefore supported. However, the introspection value has a direct negative effect on PT satisfaction (**b** = -0.3787, **p** = 0.0096). Furthermore, the effect of the introspection value on life satisfaction through PT satisfaction depends on the level of CCTP. When CCTP is low (3.2), the indirect effect is non-significant (**b** = -0.0142, 95% **CI** [-0.0771; 0.0333]). However, it becomes significant at higher levels of CCTP (≥ 5), with a more pronounced effect when CCTP reaches 6.08 (**b** = 0.0886, 95% **CI** [0.0447; 0.1423]) (Tables 4: Moderated mediation analysis for chronic cognitive time pressure).

Test of H3. Results show that PT satisfaction has a positive influence on life satisfaction (**β** = 0.361; **t** = 5.575; **p** < 0.001). H3 is therefore supported (Table 3: Linear regression test results).

Test of H4. The results show that the frequency of PT use moderates the influence of the introspection value on PT satisfaction (**F**(3,205) = 7.7368, **p** = 0.0001), explaining 10.17% of the variance ($\mathbf{R}^2$ = 0.1017). H4 is therefore supported. However, the interaction between the introspection value and the frequency of PT use is significant (**b** = 0.0473, **p** = 0.0251), indicating that the relationship between the introspection value and life satisfaction varies depending on the level of PT use frequency. The conditional effect shows that the introspection value has a significant effect on life satisfaction at high levels of PT use frequency (≥ 5), but not at low levels (Tables 5: Moderated mediation analysis for PT use frequency).

Discussion

This research provides an in-depth understanding of the underlying mechanisms of the free shared mobility experience by examining the influence of introspective value on public transportation (PT) satisfaction and the effect of PT satisfaction on life satisfaction. First, introspective value positively influences PT satisfaction, suggesting that individuals who perceive travel time as an opportunity for personal reflection are more likely to be satisfied with

public transportation. This finding aligns with prior research (Jain & Lyons, 2008; Watts & Urry, 2008), which indicates that travel time is not merely "lost time" but can serve as a valuable resource. However, under high chronic cognitive time pressure (above 5/7), individuals' ability to derive value from introspection is compromised, negatively affecting PT satisfaction, as their perceived time scarcity limits their capacity for reflection. Second, the moderating role of PT usage frequency in the relationship between introspective value, PT satisfaction, and life satisfaction was demonstrated. Regular users integrate introspection more effectively into their mobility experience, amplifying both their PT satisfaction and, by extension, their life satisfaction. This finding reinforces the notion that repeated interactions with a service enhance satisfaction through familiarity and habit formation (De Vos et al., 2022; Maubisson & Rivière, 2021).

Although Laurent (2022) did not establish a link between introspection and engagement in mobility behavior change, our findings indicate that introspection is a crucial component in designing mobility experiences that sustain user engagement in shared transportation. This research contributes to the experience design literature by reframing travel time as a "gift" rather than a cost, challenging the traditional economic view of travel time minimization and underscoring the importance of subjective experiences in shaping mobility satisfaction. Furthermore, our research demonstrates the relevance of chronic cognitive time pressure (CCTP) in consumer behavior within the mobility context, highlighting the dual nature of travel time: while it can serve as a source of relaxation and reflection for some, it may exacerbate stress for those already experiencing time constraints. Lastly, our findings suggest that frequent users may develop coping mechanisms to transform travel time into a meaningful experience, further emphasizing the need to design PT services that cater to long-term users.

Managerial implications

From a managerial perspective, the results encourage the consideration of introspection value in the design and co-construction of the experience. It is essential to create sensory environments that promote introspection by designing spaces that are more soothing and conducive to personal reflection. This could involve enhancing the physical space with more comfortable seating, soft and inspiring music, and reducing advertisements on trams and buses. However, it is also relevant to use advertisements that engage the imagination of the users.

Shared mobility managers, through PT, must consider users' chronic cognitive time pressure. Given that users have no control over the duration of their trips, it is crucial to optimize the duration and frequency of vehicle services to reduce time-related stress. During peak periods, such as early and late hours, it is advisable to increase the number of vehicles in service and their frequency. Additionally, managers can highlight regular users who express higher satisfaction with PT and life satisfaction through advertising campaigns. This communication could encourage less frequent users to increase their use of free PT, thus promoting modal shifts and better efficiency in the use of this free mobility service, partly funded by citizens' tax contributions (Bouragba et al., 2024). Furthermore, managers could consider implementing a reward system to acknowledge regular users, such as electing the best user and emphasizing the reduction in carbon footprint achieved by using PT. Why not offer, via the mobile app or the MAAS (Mobility As A Service), the possibility for users to plan their trips based on personal preferences? For example, longer but calmer trips conducive to introspection, or faster but more stressful trips. This could be achieved by analyzing congestion and the presence of other users. Indeed, crowding and lack of privacy make introspection difficult on PT (Laurent, 2022). Finally, the positive impact of PT satisfaction on life satisfaction emphasizes the importance of

providing a quality service, not only for practical reasons but also to contribute to the overall well-being of citizens.

Limitations, and Future Research Directions

First, the sample is relatively small (n = 209), with 134 students. Future research should include larger and more diverse samples to enhance generalizability. Second, longitudinal studies could provide deeper insights into the temporal dynamics between introspection, PT satisfaction, and life satisfaction. Third, while the moderating effects are significant, they explain a small proportion of the variance ($R^2 = 0.0879$ for CCTP and $R^2 = 0.1017$ for PT usage frequency), suggesting that other unmeasured factors may play a crucial role. Future studies could examine the influence of service quality, the physical environment of PT, trip purpose (e.g., commuting vs. leisure), additional personality traits, and the impact of social interactions within PT. Additionaly, mindfulness appear to be an interesting concept. defined as « *the state of being attentive to and aware of what is taking place in the present* » (Brown and Ryan, 2003, p. 1), it has been shown to enhance work commute and mental health (Lajeunesse & Rodríguez, 2011). Mindfulness could also transform commute travel into an introspective moment, acting as a catalyst for the subjective travel experience, particularly by reducing the negative impact of chronic cognitive time pressure (CCTP). When individuals are mindful, they are able to detach from stress related to urgency and time pressure, which could reduce anxiety during trips and make this time more pleasant and constructive. Fourth, a qualitative approach (e.g., semi-structured interviews or observations) could provide richer insights into the introspective experience and its impact on PT satisfaction and life satisfaction. Finally, this research was conducted in the context of free PT. Testing the proposed model in a paid PT setting would be valuable to assess the robustness of the findings across different.

Bibliography

Archer, M., Paleti, R., Konduri, K. C., Pendyala, R. M. and Bhat, C. R. (2013). Modeling the connection between activity-travel patterns and subjective well-being. Transportation Research Record, 2382(1), 102-111.

Aubert, N. (2003). Le culte de l'urgence: la société malade du temps. Paris, France: Flammarion.

Bouragba Y., Gourmelen A., and N'Goala G. (2024) La mobilité gratuite dans une ville voulue intelligente : analyse du discours de la presse–Le cas de la ville de Montpellier. Congrès ARIHME (Association pour la recherche interdisciplinaire sur le management des entreprises), Novembre 2024, Paris

Brown, K. W., and Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. Journal of personality and social psychology, 84(4), 822.

De Vos, J., Singleton, P. A. and Gärling, T. (2022). From attitude to satisfaction: introducing the travel mode choice cycle. Transport Reviews, 42(2), 204-221.

Delbosc, A., Kroesen, M., Van Wee, B. and de Haas, M. (2020). Linear, non-linear, bi-directional? Testing the nature of the relationship between mobility and satisfaction with life. Transportation, 47(4), 2049-2066.

Diener, E. D., Emmons, R. A., Larsen, R. J., and Griffin, S. (1985). The satisfaction with life scale. Journal of personality assessment, 49(1), 71-75.

Gourmelen, A. et Lallement, J. (2016). Proposition d'une typologie d'acheteurs alimentaires selon leur rapport au temps et à la technologie. Revue Management et Avenir, 7, 129-151.

Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. Communication Monographs, 85(1), 4-40.

Hur, W. M., Moon, T. W., and Jung, Y. S. (2015). Customer response to employee emotional labor: the structural relationship between emotional labor, job satisfaction, and customer satisfaction. Journal of Services Marketing, 29(1), 71-80

Ingvardson, J. B. and Nielsen, O. A. (2019). The relationship between norms, satisfaction and public transport use: A comparison across six European cities using structural equation modelling. Transportation Research Part A: Policy and Practice, 126, 37-57.

Jain, J. and Lyons, G. (2008). The gift of travel time. Journal of Transport Geography, 16(2), 81-89.

Kim, H. Y., and Kim, Y. K. (2008). Shopping enjoyment and store shopping modes: the moderating influence of chronic time pressure. Journal of retailing and consumer services, 15(5), 410-419.

LaJeunesse, S., and Rodríguez, D. A. (2012). Mindfulness, time affluence, and journey-based affect: exploring relationships. Transportation research part F: traffic psychology and behaviour, 15(2), 196-205.

Lallement, J. et Gourmelen, A. (2018). Le temps des consommateurs: état des recherches et perspectives. Recherche et Applications en Marketing (French Edition, 33)(4), 98-131.

Lyons, G. and Urry, J. (2005). Travel time use in the information age. Transportation Research Part A: Policy and Practice, 39(2-3), 257-276.

Lyubomirsky, S., Sheldon, K. M. and Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. Review of General Psychology, 9(2), 111-131.

Maubisson, L. and Rivière, A. (2021). Plus de valeur pour plus de satisfaction? Étude du rôle modérateur du cumul d'expériences du consommateur. Recherche et Applications en Marketing (French Edition, 36)(1), 6-40.

Mazengani, R., Josset, J. M. and Soulié, N. (2022). Conditions, activités, habitudes et bien-être dans les transports quotidiens: étude de cas à Paris-Saclay. RTS. Recherche, Transports, Sécurité, 2022, 17p.

Moeinaddini, M., Asadi-Shekari, Z., Aghaabbasi, M., Saadi, I., Shah, M. Z. and Cools, M. (2020). Applying non-parametric models to explore urban life satisfaction in European cities. Cities, 105, 102851.

Rastegary, H. and Landy, F. J. (1993). The interactions among time urgency, uncertainty, and time pressure. In Time Pressure and Stress in Human Judgment and Decision Making (pp. 217-239). Boston, MA: Springer US.

Rizkalla, A. N. (1989). Sense of time urgency and consumer well-being: Testing alternative causal models. Advances in Consumer Research, 16(1).

Watts, L. and Urry, J. (2008). Moving methods, travelling times. Environment and Planning D: Society and Space, 26(5), 860-874.

Figures and tables :

Table 1 - Sociodemographic characteristics and mobility practices

Sociodemographic characteristics		**Indicateur**
Âge moyen (ans)		24,15
Gender	Men	79
	Women	124
	Non-binary	2
	Did not prefer to answer	4
Household composition	One person	76
	Two people	45
	Three people	32
	Four people	34
	Five people or more	22
Area of residence	City center	111
	Peri-urban area	79
	Rural area	19
Parental situation	With child(ren)	181
	Without child(ren)	28
Monthly income	0-500€	101
	501-1000€	51
	1001-2000€	35
	2001-3000€	15
	3001-4000€	5
	More than 4000€	2
Professional situation	Full-time employee	39
	Part-time employee	15
	Self-employed / independent	7
	Not currently working but looking for work	4
	Not currently working but not looking for work / unable to work	1
	Housewife / man	3
	Student / Pupil	134
	Other	6
Data on mobility practices		**Indicateurs**
Average travel time (minutes)		24,2
Average distance (kilometers)		9,08
Possession of car and/or motorcycle license		143
Possession of a car/motorcycle		128
Use of the car	0 days per week	70
	1 day per week	27
	2 days per week	30
	3 days per week	28
	4 days per week	15
	5 days per week	15

	6 days per week	6
	7 days per week	18
Use of the public transport	0 days per week	19
	1 day per week	15
	2 days per week	14
	3 days per week	28
	4 days per week	1
	5 days per week	63
	6 days per week	33
	7 days per week	39

Table 2 - Measurement scales and principal component analysis (PCA)

Measure	Items	Communalities	Loading	KMO	% VE	α
Chronic cognitive time pressure (Gourmelen and Lallement, 2016)	I sometimes feel like there aren't enough hours in the day	0,615	0,784	0,863	68,79	0,89
	I need more hours in the day to do everything that's expected of me	0,766	0,875			
	I feel like I never have time for myself	0,707	0,841			
	I'm overworked compared to the time I have	0,698	0,836			
	I feel like I never manage to get everything done	0,654	0,809			
Introspection value (Laurent, 2022)	Having a moment to be alone	0,805	0,897	0,861	85,3	0,94
	Having a moment to isolate myself	0,882	0,939			
	Having a moment for myself	0,89	0,943			
	Having a moment to think about myself	0,835	0,914			
Satisfaction of TeCs (Hur et al., 2015)	I am satisfied with this free public transport service and its performance	0,691	0,831	0,727	58,18	0,84
	My choice to use this free public transport service was a wise one	0,758	0,871			
	I am satisfied with what I have done with this free public transport service	0,773	0,879			
	I feel bad about my decision to use this free public transport service	0,104	-			
Life satisfaction (Diener et al., 1985)	In many ways, my life is close to my ideal	0,581	0,762	0,79	55,23	0,79
	The conditions of my life are excellent	0,49	0,7			
	I am satisfied with my life	0,559	0,748			
	So far I have achieved the important things I want in life	0,562	0,75			
	If I could live my life over again, I would change almost nothing	0,568	0,754			

Table 3 - Linear regression test results

	β	t	p
Introspection value on TeC satisfaction	0,173	2,525	0,012
PT satisfaction on life satisfaction	0,361	5,575	0,001

Tables 4 - Moderated Mediation Analysis – Chronic Cognitive Temporal Pressure (CCTP)

Moderated Mediation Analysis – Chronic Cognitive Temporal Pressure (CCTP)						
Predictors	coeff	se	t	p	LLCI	ULCI
Introspection value on TeC satisfaction	-0.379	0.145	-2.613	0.010	-0.664	-0.093
Chronic Cognitive Temporal Pressure on PT satisfaction	-0.362	0.117	-3.086	0.002	-0.593	-0.131
Chronic Cognitive Temporal Pressure moderation	0.105	0.029	3.608	0.000	0.048	0.163
PT satisfaction on life satisfaction	0.339	0.063	5.364	0.000	0.215	0.464
Introspection value on life satisfaction	0.030	0.043	0.699	0.485	-0.055	0.115

Effects conditional on moderator values				
Chronic Cognitive Temporal Pressure	Effect	se	LLCI	ULCI
Low (3.2)	-0.042	0.064	-0.167	0.084
Medium (5.0)	0.148	0.047	0.056	0.240
High (6.08)	0.261	0.061	0.142	0.381

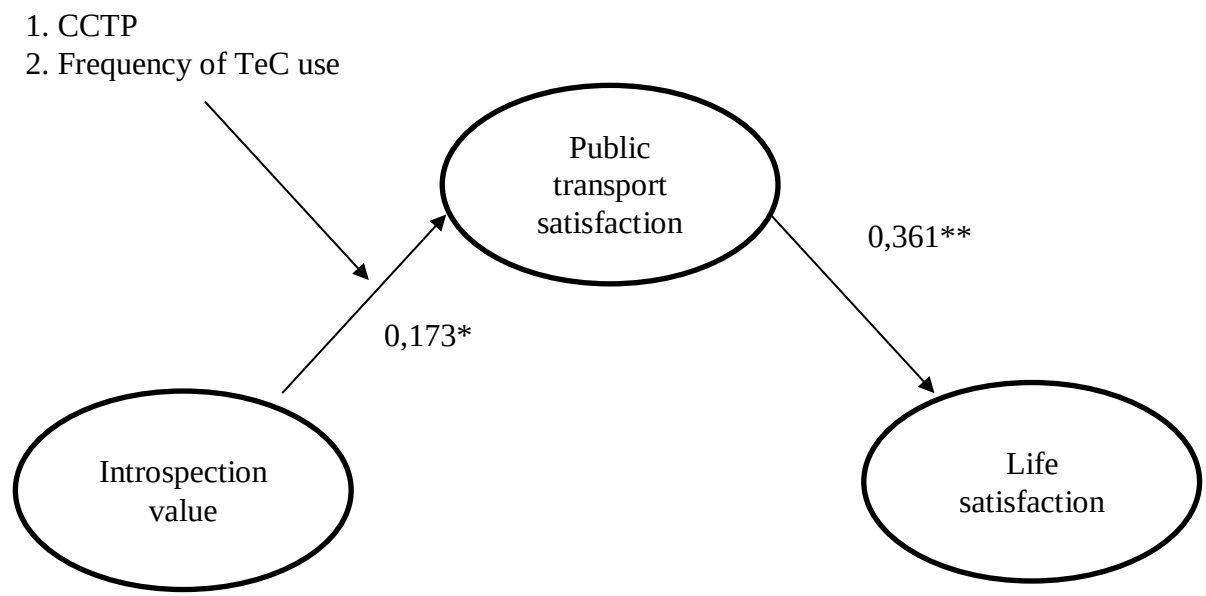
Tables 5 - Moderated Mediation Analyses – Frequency of Public Transport Use

Moderated Mediation Analyses – Frequency of Public Transport Use						
Predictors	coeff	se	t	p	LLCI	ULCI
Introspection value on PT satisfaction	-0.113	0.105	-1.075	0.284	-0.321	0.095
Frequency of PT use on PT satisfaction	-0.046	0.083	-0.555	0.579	-0.209	0.117
Chronic time pressure moderation	0.047	0.021	2.256	0.025	0.006	0.089
PT satisfaction on life satisfaction	0.339	0.063	5.364	0.000	0.215	0.464
Introspection value on life satisfaction	0.030	0.043	0.699	0.485	-0.055	0.115

Effects conditional on moderator values				
Frequency of PT use	Effect	se	LLCI	ULCI
Low (1.0)	-0.066	0.087	-0.238	0.106
Medium (5.0)	0.123	0.047	0.032	0.215
High (7.0)	0.218	0.069	0.082	0.354

Annexes

Figure 1 - Research model



*** : p < 0,001 ; ** : p < 0,01 ; * : p < 0,05

universität innsbruck
Institut für Management und Marketing

Carbon Conflict: Understanding Consumer Responses towards Corporate Offsetting and Emission Labels on Restaurant Menus

Eileen van Dongen, MA
PhD Researcher
University of Innsbruck - Faculty of Business and Management
Department of Management and Marketing
Universitaetsstr. 15, 6020 Innsbruck, Austria
Eileen.van-Dongen@uibk.ac.at / +43 512/507 72507

Prof. Dr. Oliver Koll
Professor of Marketing
University of Innsbruck - Faculty of Business and Management
Department of Management and Marketing

Prof. Dr. Ir. Peeter Verlegh
Full Professor, School of Business and Economics, Marketing
Full Professor, Amsterdam Business Research Institute

Carbon Conflict: Understanding Consumer Responses towards Corporate Offsetting and Emission Labels on Restaurant Menus

Abstract:

As climate change intensifies, businesses and consumers face growing pressure to adopt sustainable practices. This study examines the impact of corporate carbon offsetting and carbon emission labels on consumer behaviour, exploring whether corporate carbon offsetting could serve as a tool to increase sustainable consumption. In a pre-study with a between-subjects experimental design, we find that emission labels lead to the most sustainable consumption behaviour, but this effect is nullified when presented alongside a corporate carbon offsetting label. Additionally, contrary to previous research, our findings suggest that corporate carbon offsetting labels alone do not necessarily trigger an environmental rebound effect.

Introduction

Temperatures are rising, glaciers are melting and while some cities are flooded, other areas are faced with extreme drought: Our planet is confronted with enormous challenges and the urgency of adaptive action is becoming evident to a growing number of people (Acharya & Gupta, 2018). This awareness typically leads to more sustainable purchase intentions and purchases amongst the growing segment of sustainable consumers (Zaikauskaitė et al., 2022). One way consumers can significantly decrease their carbon emissions is by reconsidering their eating habits: Opting to exclude meat and dairy from one's diet, for instance, could reduce annual emissions in the food sector by 49% (Poore & Nemecek, 2018). Therefore, this project looks at sustainability cues in the food sector. One of the cues explored in this study, is emission labelling, which uses colours or symbols to indicate the carbon emissions of dishes on, for example, restaurant menus, thus potentially helping consumers to make more sustainable choices (Rybak et al., 2023; Stillman et al., 2023). The second sustainability cue this project takes a closer look at is carbon offsetting: A programme, wherein an organisation or individual "contributes to a scheme that is projected either to remove carbon dioxide from the atmosphere or to deliver carbon dioxide emission reductions on the part of other organizations or individuals." (Hyams & Fawcett, 2013, p. 91) While consumers bear the responsibility in voluntary carbon offsetting (VCO) programmes, in the context of corporate carbon offsetting (CCO) businesses take on this responsibility to financially compensate for their CO2 emissions (Engler et al., 2023). The primary objective of this study is to analyse consumer responses towards these sustainability cues and provide insights as to whether these phenomena could serve as a potential corporate instrument to mitigate the climate crisis.

Theoretical framework and hypothesis development

Consumers are increasingly familiar with emission labelling and capable of evaluating these labels accordingly. Research has shown that labelling environmentally friendlier dishes has proven effective in changing consumer behaviour and brand perceptions (Rybak et al., 2023; Stillman et al., 2023). Brunner et al. (2018) found that a coloured climate label "had a small, but significant effect even in the short run" (p. 666). Beyer et al. (2023) showed that carbon labels helped customers to reduce their carbon footprint by 9.2%.

Carbon offset labels, however, may not be as effective in triggering more sustainable consumption amongst consumers: Multiple studies (Ritchie et al., 2021) have shown that consumers are often unaware of carbon compensation schemes, feel like they cannot see the forest for the trees (Haug & Hassinggaard, 2022), are generally sceptical whether it would even make a difference (Haug & Hassinggaard, 2022), or even refer to these schemes as "indulgence payments" (Dalsgaard, 2022). In addition, several studies have found that CCO may potentially lead to an environmental rebound effect (ERE) (Castro et al., 2022; Günther et al., 2020; Harding & Rapson, 2019), when consumers knowingly participated in such programmes. The ERE is defined as "the absolute or relative difference between the […] potential environmental benefits […] and the "actual" environmental benefits" (Font Vivanco et al., 2022, p. 1544) and emerges because, after engaging in sustainable behaviour to reduce carbon emissions, consumers feel as if they have "done their bit" (Seebauer, 2018, p. 312), which potentially results in even more detrimental behaviours afterwards (Günther et al., 2020; Harding & Rapson, 2019).

Individual traits, such as environmental identity, influence consumer behavioural responses to green marketing and are likely to determine whether a rebound effect occurs (Meijers et al., 2019). Therefore, consumers may perceive CCO labels differently and exhibit varying behaviours after having been subjected to them. On the one hand, the presence of a CCO label may act as a signal that consumption involves some environmental harm ("I am doing

something bad"), which could deter unsustainable choices. On the other hand, the same message may alleviate guilt by implying that the harm is being offset ("I don't need to feel bad"), potentially encouraging less sustainable behaviours. These conflicting interpretations may cancel each other out, resulting in no significant change in sustainable consumption overall.

Cue utilisation

One theory that could hold significant relevance to the examination of consumer behaviours in the context of CCO and carbon emission labels, is the cue utilisation theory. This theory suggests that consumers rely on both intrinsic and extrinsic cues when evaluating a product (Cox, 1973; Olson & Jacoby, 1972). Intrinsic cues are those inherent to the product and cannot be "manipulated without also altering physical properties of the product" (Richardson et al., 1994, p. 29) and are linked directly to its ingredients (Shiv et al., 2005). Carbon emission labels, for instance, could be considered intrinsic cues, because they reflect the environmental impact tied to the product itself. In contrast, extrinsic cues include external attributes and are unrelated to the product's physical characteristics (Cox, 1973; Konuk, 2019). Since CCO involves an external action or sustainability claim by the company, it is considered an extrinsic cue in this study. Extending the conceptual framework to consumer behaviour and marketing, emission labels directly convey the environmental impact of the product itself, allowing consumers to assess its sustainability based on the ingredients, whereas CCO labels communicate an effort by the company to compensate for the product's emissions, which does not directly relate to the product's physical characteristics.

Two critical dimensions of cue effectiveness are predictive value (PV) — the extent to which a cue reliably indicates product quality —and confidence value (CV) — the degree to which consumers trust and can interpret the cue (Cox, 1973). High-PV and high-CV cues typically dominate decision-making processes (Richardson et al., 1994). If, however, intrinsic cues are difficult to assess, extrinsic cues often take on greater importance in the decision-making process (Woodside, 2012).

Diagnosticity

Building on the cue utilisation theory, the cue diagnosticity framework, posits that the use of cues in consumer judgments depends on their perceived reliability (diagnosticity) in distinguishing between alternative interpretations: Diagnostic cues, suggesting a single interpretation, are more likely to influence quality assessments or predictions (Nisbett et al., 1981) than nondiagnostic cues, which suggest multiple interpretations (Purohit & Srivastava, 2001).

Emission labels

Emission labels (as intrinsic cues) have a higher CV, due to consumer familiarity with emission labels, and the cue directly relates to the inherent properties of the product (carbon emissions per dish), which leads to more confident cue evaluation and, thus, higher diagnosticity when compared to the control group without any labels. Therefore, we hypothesise that:

> **H1:** Compared to the control group, consumers presented with emission labels alone, will show a significant increase in sustainable consumption.

Carbon offset labels

Drawing on the cue utilisation theory and diagnosticity framework, CCO labels, as extrinsic cue, are expected to have a lower CV due to consumer scepticism or lack of familiarity with the offsetting process. According to Cox (1973), consumers are less likely to rely on cues, if they lack confidence in their ability to assess a cue. Due to the lower CV and opposing interpretations of CCO labels, we hypothesise that:

H2: Compared to the control group, consumers presented with a CCO label alone, will show no significant increase in sustainable consumption.

Combining emission and carbon offset labels

The diagnosticity framework also emphasises that the relevance of a cue is not assessed in isolation, but is influenced by other available cues, with consumers prioritising the most diagnostic cues when confronted with multiple options (Purohit & Srivastava, 2001). When two cues are presented together, their combined influence depends on their relative diagnosticity: if one cue is perceived as more reliable, it influences decision-making more significantly, while the other plays a secondary or even counteractive role. Van de Pol et al. (2024) found that a combination of both diagnostic and non-diagnostic cues led to a lower judgment accuracy, potentially complicating the consumer's ability to accurately assess the product's attributes (Cox, 1973).

The previously mentioned ERE offers an additional explanation for the potentially counterproductive outcomes of emission labels in combination with CCO labels. While the CCO label initially raises awareness of environmental harm, it may also provide a moral licence, which may, as highlighted earlier, encourage consumers to feel justified in engaging in less sustainable behaviours (Meijers et al., 2019).

This interplay between lower cue diagnosticity and a potential ERE reinforces the likelihood of reduced sustainable consumption in the presence of conflicting labels. We propose that the presence of a CCO label moderates the effectiveness of emission labelling: When both labels are shown, the positive effect of the emission label on sustainable consumption is weakened. We, therefore, hypothesise that:

H3: The positive effects of emission labelling on sustainable consumption are diminished, when the emission label is combined with a CCO label.

Empirical overview

We tested our theory in a laboratory experiment, using a between-subjects design. For a better overview of the conceptual model for this study, we refer to figure 1. The respondents were randomly allocated into four groups and received different surveys. The dishes on the menu all groups received were identical, but each group saw different additional information about those dishes:

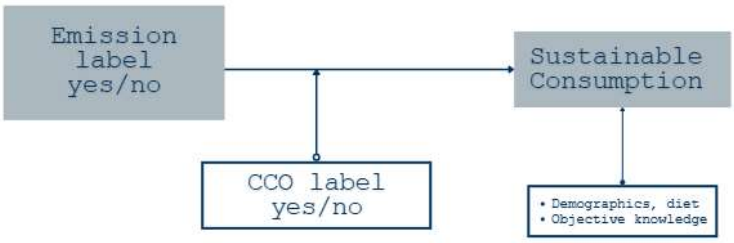


Figure 1. Conceptual model

- Group 1 chose from a menu with no CCO nor emission label (control group),
- Group 2 chose from a menu with a CCO label only,
- Group 3 chose from a menu with both emissions and CCO labels,
- Group 4 chose from a menu with an emission label only.

***Participants and design*.** In the study, a 2 (CCO label: present vs. absent) × 2 (emission label: present vs. absent) between-subjects experiment, we registered preferred dishes (starter, main and dessert), we collected measures of perceived brand loyalty (e.g. "I would recommend this restaurant to my family and friends", α=.91) and perceived behavioural control (e.g., "Everyone is responsible for contributing to climate change mitigation", α=.66) and recorded environmental awareness as a control variable ("I see myself as environmentally aware", one item) and demographics (e.g., age, gender, diet, allergies). All items were measured using a 7-point Likert scale ("I fully disagree – I fully agree").

300 German, Austrian and Swiss participants (age range 18-60+, 60% male), participated in the study on the platform Clickworker, which they were monetarily compensated for. Attention and manipulation check questions were included, and participants who failed these tests or left questions unanswered (n = 152) were excluded from the final sample. The final dataset consisted of 148 participants. A chi-square test of independence showed that the proportion of subjects who reported being environmentally aware (χ^2 (18, N=142) = 18.89, p =.399) did not differ per group.

Results. A two-way ANOVA was conducted with sustainable consumption as the dependent variable. Levene's test for equality of variances was non-significant, F(3,144) = 0.35, p = .789, indicating that the assumption of homogeneity of variances was met. The overall model was significant, F(1,144) = 3.67, p = .014, η^2 = 0.071, suggesting that sustainable consumption differed between conditions. As predicted in H1, providing the dishes on the menu with emission labels ($M_{emissions}$ = 4.71, SD = 0.90) increased sustainable consumption in comparison to the control group ($M_{control}$ = 3.94, SD = 1.14; M_{diff} = 0.77, SE = 0.25, p = .014, 95% CI [0.11, 1.43]), which is in line with previous literature.

There was no significant difference between the control group ($M_{control}$ = 3.94, SD = 1.14) and the group that received a menu with information on CCO, indicating that CCO alone did not significantly influence sustainable consumption ($M_{offsetting}$ = 4.43, SD = 1.10; M_{diff} = 0.49, SE 0.25, p = .199, 95% CI [–0.15, 1.13]), thus confirming H2. Similarly, the group that received a menu with both CCO and emissions labels ($M_{offsetting+emissions}$ = 4.44, SD = 1.11) showed no significant influence on sustainable consumption in comparison to the control group (M_{diff} = 0.50, SE = 0.23, p = .14, 95% CI [–0.11, 1.11]).

However, we found a significant interaction between CCO and emission labelling, F(1,144) = 4.26, p = .041, η^2 = .029, indicating that the effectiveness of emissions labels depends on the presence of a CCO label. A follow-up simple effects analysis (EMMEANS, Bonferroni-adjusted) showed that when a CCO label was absent, emissions labels significantly increased sustainable consumption ($M_{control}$ = 3.94, SD = 1.14; $M_{emissions}$= 4.71, SD = 0.90), F(1,144) = 9.32, p = .003, η^2 = .061. In contrast, when a CCO label was present, emissions labels had no additional effect ($M_{offsetting}$ = 4.43, SD = 1.10; $M_{offsetting+emissions}$ = 4.44, SD = 1.11). This suggests that the positive effect of the emissions label is diminished when a CCO label is added. These results support H3.

General discussion and implications

The results of our study reveal that emission labels increase sustainable consumption, which is in line with previous literature, whereas CCO does not. However, the results also suggest that CCO did not lead to an increase in unsustainable consumption either, contradicting earlier findings about the ERE. Previous studies argued that CCO might legitimise unsustainable consumption behaviour — our findings imply this does not necessarily have to be the case.

Emission labels — as intrinsic, high-CV cues — significantly increased sustainable choices in the absence of a CCO label. However, this effect disappeared when emission labels were combined with a CCO label. This suggests that extrinsic, low-CV cues such as CCO may negatively influence the perceived diagnosticity of otherwise diagnostic cues, thereby reducing their positive impact on sustainable consumer behaviour.

These insights offer both theoretical and practical contributions. Theoretically, they confirm that sustainability cues in sustainable consumer behaviour follow the logic of cue utilisation and diagnosticity and provide first empirical evidence that non-diagnostic, extrinsic cues can undermine more diagnostic and intrinsic ones. Practically, using multiple sustainability cues to promote sustainable consumption can backfire if they are combined with the "wrong" ones.

With much of the existing literature to date focussing on VCO schemes, CCO remains a relatively underexplored strategy in corporate efforts to address climate change. By examining how consumers respond to CCO labels, this project extends sustainability marketing research and raises a broader question: Under what conditions can CCO serve as an effective tool to increase sustainable consumption?

Limitations and future research

We recognise that this study has several limitations. First, the exclusion rate was high, with over half of the original sample removed due to failed manipulation checks. This suggests potential issues with the clarity of the stimuli. A likely explanation is that the visual prominence of these cues (e.g., label size or placement on the menu) was insufficient to attract participants' attention. It is possible that the limited visibility of the CCO label affected participants' awareness of the cue, potentially suppressing an ERE. Improving the design of the visual cues (e.g., increasing icon size or using clearer language) may help ensure participants engage with the information as intended.

Second, the relatively small sample size limits the generalisability of the findings. Future studies should aim to replicate these results with larger, more diverse samples to assess robustness and external validity.

Lastly, while the cue utilisation theory and diagnosticity framework served as a strong theoretical foundation, we did not directly measure consumers' perceptions of PV or CV, nor the perceived diagnosticity of our cues. As a result, interpretations of cue effectiveness are based on theoretical assumptions rather than participants' self-reports. Future research could, therefore, incorporate pre-tests or survey items that explicitly assess this.

References

Acharya, A., & Gupta, M. (2018). Green Brand Personality: Its Relevance to the Green Marketing Practices. In F. Quoquab, R. Thurasamy, & J. Mohammad (Eds.), *Driving Green Consumerism Through Strategic Sustainability Marketing* (pp. 155–168). IGI Global. https://doi.org/10.4018/978-1-5225-2912-5.ch009

Beyer, B., Chaskel, R., Euler, S., Gassen, J., Großkopf, A.-K., & Sellhorn, T. (2023). How Does Carbon Footprint Information Affect Consumer Choice? A Field Experiment. *Journal of Accounting Research*, Article 1475-679X.12505. Advance online publication. https://doi.org/10.1111/1475-679X.12505

Brunner, F., Kurz, V., Bryngelsson, D., & Hedenus, F. (2018). Carbon Label at a University Restaurant – Label Implementation and Evaluation. *Ecological Economics*, *146*, 658–667. https://doi.org/10.1016/j.ecolecon.2017.12.012

Castro, C. G., Trevisan, A. H., Pigosso, D. C., & Mascarenhas, J. (2022). The Rebound Effect of Circular Economy: Definitions, Mechanisms and a Research Agenda. *Journal of Cleaner Production*, *345*, 131136. https://doi.org/10.1016/j.jclepro.2022.131136

Cox, D. F. (1973). The measurement of information value: A study in consumer decision-making. In J. A. Howard & L. E. Ostlund (Eds.), *Buyer behavior theoretical and empirical foundations* (pp. 210–216). Alfred A. Knopf.

Dalsgaard, S. (2022). Tales of Carbon Offsets: Between Experiments and Indulgences? *Journal of Cultural Economy*, *15*(1), 52–66. https://doi.org/10.1080/17530350.2021.1977675

Engler, D., Gutsche, G., Simixhiu, A., & Ziegler, A. (2023). On the Relationship Between Corporate CO2 Offsetting and Pro-Environmental Activities in Small- and Medium-Sized Firms in Germany. *Energy Economics*, *118*, 106487. https://doi.org/10.1016/j.eneco.2022.106487

Font Vivanco, D., Freire-González, J., Galvin, R., Santarius, T., Walnum, H. J., Makov, T., & Sala, S. (2022). Rebound Effect and Sustainability Science: A Review. *Journal of Industrial Ecology*, *26*(4), 1543–1563. https://doi.org/10.1111/jiec.13295

Günther, S. A., Staake, T., Schöb, S., & Tiefenbeck, V. (2020). The Behavioral Response to a Corporate Carbon Offset Program: A Field Experiment on Adverse Effects and Mitigation Strategies. *Global Environmental Change*, *64*, 102123. https://doi.org/10.1016/j.gloenvcha.2020.102123

Harding, M., & Rapson, D. (2019). Does Absolution Promote Sin? A Conservationist's Dilemma. *Environmental and Resource Economics*, *73*(3), 923–955. https://doi.org/10.1007/s10640-018-0301-5

Haug, J. O., & Hassinggaard, I. (2022). Young Consumers' Attitudes towards Voluntary Carbon Offsetting. *Business Strategy and the Environment*, Article 0964-4733. Advance online publication. https://doi.org/10.1002/bse.3271

Hyams, K., & Fawcett, T. (2013). The Ethics of Carbon Offsetting. *WIREs Climate Change*, *4*(2), 91–98. https://doi.org/10.1002/wcc.207

Konuk, F. A. (2019). The influence of perceived food quality, price fairness, perceived value and satisfaction on customers' revisit and word-of-mouth intentions towards organic food restaurants. *Journal of Retailing and Consumer Services*, *50*, 103–110. https://doi.org/10.1016/j.jretconser.2019.05.005

Meijers, M. H. C., Noordewier, M. K., Verlegh, P. W. J., Willems, W., & Smit, E. G. (2019). Paradoxical side effects of green advertising: how purchasing green products may instigate licensing effects for consumers with a weak environmental identity.

International Journal of Advertising, *38*(8), 1202–1223. https://doi.org/10.1080/02650487.2019.1607450

Nisbett, R. E., Zukier, H., & Lemley, R. E. (1981). The dilution effect: Nondiagnostic information weakens the implications of diagnostic information. *Cognitive Psychology*, *13*(2), 248–277. https://doi.org/10.1016/0010-0285(81)90010-4

Olson, J. C., & Jacoby, J. (1972). Cue Utilization in the Quality Perception Process.

Poore, J., & Nemecek, T. (2018). Reducing Food's Environmental Impacts Through Producers and Consumers. *Science (New York, N.Y.)*, *360*(6392), 987–992. https://doi.org/10.1126/science.aaq0216

Purohit, D., & Srivastava, J. (2001). Effect of Manufacturer Reputation, Retailer Reputation, and Product Warranty on Consumer Judgments of Product Quality: A Cue Diagnosticity Framework. *Journal of Consumer Psychology*, *10*(3), 123–134. https://doi.org/10.1207/s15327663jcp1003_1

Richardson, P. S., Dick, A. S., & Jain, A. K. (1994). Extrinsic and Intrinsic Cue Effects on Perceptions of Store Brand Quality. *Journal of Marketing*, *58*(4), 28. https://doi.org/10.2307/1251914

Ritchie, B. W., Kemperman, A., & Dolnicar, S. (2021). Which Types of Product Attributes Lead to Aviation Voluntary Carbon Offsetting Among Air Passengers? *Tourism Management*, *85*, Article 104276. https://doi.org/10.1016/j.tourman.2020.104276

Seebauer, S. (2018). The Psychology of Rebound Effects: Explaining Energy Efficiency Rebound Behaviours with Electric Vehicles and Building Insulation in Austria. *Energy Research & Social Science*, *46*, 311–320. https://doi.org/10.1016/j.erss.2018.08.006

Shiv, B., Carmon, Z., & Ariely, D. (2005). Placebo Effects of Marketing Actions: Consumers May Get What They Pay For. *Journal of Marketing Research*, *42*(4), 383–393. https://doi.org/10.1509/jmkr.2005.42.4.383

van de Pol, J., Rowan, E., Janssen, E., & van Gog, T. (2024). Effects of availability of diagnostic and non-diagnostic cues on the accuracy of teachers' judgments of students' text comprehension. *Metacognition and Learning*, *19*(2), 635–659. https://doi.org/10.1007/s11409-024-09383-0

Woodside, A. G. (2012). Consumer Evaluations of Competing Brands: Perceptual versus Predictive Validity. *Psychology & Marketing*, *29*(6), 458–466. https://doi.org/10.1002/mar.20534

Zaikauskaitė, L., Butler, G., Helmi, N. F. S., Robinson, C. L., Treglown, L., Tsivrikos, D., & Devlin, J. T. (2022). Hunt-Vitell's General Theory of Marketing Ethics Predicts "Attitude-Behaviour" Gap in Pro-environmental Domain. *Frontiers in Psychology*, *13*, Article 732661. https://doi.org/10.3389/fpsyg.2022.732661

INFLUENCE MARKETING: A CRITICAL REVIEW OF EFFECTIVENESS, SOCIETAL IMPACT, AND ETHICAL CHALLENGES

FABIO ANTONIALLI
PPA BUSINESS SCHOOL, 28-32 RUE DE L'AMIRAL MOUCHEZ, 75014 PARIS
GREMOG - GROUPE DE RECHERCHE EN MANAGEMENT DES ORGANISATIONS GLOBALISÉES
fantonialli@ppa.fr
07 69 86 18 76

MYRIAM MANZANO
UNIVERSITÉ DE PARIS CITÉ, 12 RUE DE L'ECOLE DE MÉDECINE, 75006 PARIS
CEDAG - CENTRE DE DROIT DES AFFAIRES ET DE GESTION (URP_1516)
myriam.manzano@u-paris.fr
06 38 38 54 03

INFLUENCE MARKETING: A CRITICAL REVIEW OF EFFECTIVENESS, SOCIETAL IMPACT, AND ETHICAL CHALLENGES

Abstract: This systematic review analyzes influence marketing through the theoretical lens of neo-institutional theory and performativity, examining how these marketing practices gain legitimacy and actively shape consumer reality. Through bibliometric and integrative analysis of 2,547 articles from Scopus, our study identifies the most effective elements of influencer marketing that impact consumer well-being and behavioral choices.

Purpose: To critically assess influencer marketing's effectiveness, societal impact, and ethical challenges, with particular focus on identifying which elements best encourage consumer choices that enhance well-being.

Methodology: A two-phase approach was carried out, combining bibliometric analysis (tracking publication evolution, determining leading countries and institutions) and integrative review (citation analysis, co-citation analysis, and bibliographic coupling) to identify key contributions and emerging trends.

Findings: Research interest in influence marketing has grown significantly since 2010, with 1826.67% growth in publications by 2024. The field is geographically concentrated, with 60.61% of studies originating from ten countries, led by the United States (19.43%). Key research clusters identified include: (1) Influencer Credibility, Brand Fit, and Consumer Trust; (2) Parasocial Relationships and Social Influence; and (3) Authenticity and Credibility.
Results indicate that influence marketing can promote healthier and more sustainable behaviors when properly aligned with consumer values, particularly through parasocial relationships, perceived authenticity, and credibility. However, significant challenges persist regarding transparency, misinformation, and overconsumption. The performative aspects of influencer marketing – how it shapes consumer identity and behaviors – reveal both opportunities and risks for consumer well-being.

Theoretical Contribution: This study applies neo-institutional theory to examine how influencer practices gain legitimacy through regulative, normative, and cultural-cognitive pillars. Additionally, performativity theory illuminates how influencer content not merely describes but actively constructs consumer reality.

Practical Implications: Findings highlight the importance of aligning influence marketing with consumer well-being to foster a more sustainable digital marketplace. Future research should focus on developing ethical frameworks, enhancing transparency, and empowering consumers to make informed choices.

Key words: Influence Marketing, Consumer Well-Being, Digital Consumption, Authenticity, Neo-Institutional Theory, Performativity, Ethical Marketing.

References

Appel, G., Grewal, L., Hadi, R., and Stephen, A. T. (2020). The future of social media in marketing. *Journal of the Academy of Marketing Science*, *48*(1), 79-95. https://doi.org/10.1007/s11747-019-00695-1

Arsenyan, J., and Mirowska, A. (2021). Almost human? A comparative case study on the social media presence of virtual influencers. *International Journal of Human-Computer Studies*, *155*, 102694. https://doi.org/10.1016/j.ijhcs.2021.102694

Audrezet, A., De Kerviler, G., and Moulard, J. G. (2020). Authenticity under threat: When social media influencers need to go beyond self-presentation. *Journal of Business Research*, *117*, 557-569. https://doi.org/10.1016/j.jbusres.2018.07.008

Breves, P. L., Liebers, N., Abt, M., and Kunze, A. (2019). The perceived fit between Instagram influencers and the endorsed brand: How influencer-brand fit affects source credibility and persuasive effectiveness. *Journal of Advertising Research*, *59*(4), 440-454.https://doi.org/10.2501/JAR-2019-030

Butler, J. (2010). Performative Agency. *Journal of Cultural Economy*, *3*(2), 147-161. https://doi.org/10.1080/17530350.2010.494117

Campbell, C., and Farrell, J. R. (2020). More than meets the eye: The functional components underlying influencer marketing. *Business Horizons*, *63*(4), 469-479. https://doi.org/10.1016/j.bushor.2020.03.003

De Veirman, M., Cauberghe, V., and Hudders, L. (2017). Marketing through Instagram influencers: The impact of number of followers and product divergence on brand attitude. *International Journal of Advertising*, *36*(5), 798-828. https://doi.org/10.1080/02650487.2017.1348035

DiMaggio, P. J., and Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147-160. https://doi.org/10.2307/2095101

Farivar, S., and Wang, F. (2021). Influencer marketing: Current knowledge and research agenda. In F. J. Martínez-López and D. López López (Eds.), *Advances in digital marketing and eCommerce. DMEC 2021*. Springer.

Gond, J. P., Cabantous, L., Harding, N., and Learmonth, M. (2016). What do we mean by performativity in organizational and management theory? The uses and abuses of performativity. *International Journal of Management Reviews*, *18*(4), 440-463. https://doi.org/10.1111/ijmr.12074

Greenwood, R., Raynard, M., Kodeih, F., Micelotta, E. R., and Lounsbury, M. (2011). Institutional complexity and organizational responses. *Academy of Management Annals*, *5*(1), 317-371. https://doi.org/10.5465/19416520.2011.590299

Hudders, L., De Jans, S., and De Veirman, M. (2021). The commercialization of social media stars: A literature review and conceptual framework on the strategic use of social media influencers. *International Journal of Advertising*, *40*(3), 327-375. https://doi.org/10.1080/02650487.2020.1836925

Jin, S. V., Muqaddam, A., and Ryu, E. (2019). Instafamous and social media influencer marketing. *Marketing Intelligence and Planning*, *37*(5), 567-579. https://doi.org/10.1108/MIP-09-2018-0375

Lawrence, T., Suddaby, R., and Leca, B. (2013). Institutional work: Refocusing institutional studies of organization. *Journal of Management Inquiry*, *20*(1), 52-58. https://doi.org/10.1177/1056492610387222

Lee, J. E., and Watkins, B. (2016). YouTube vloggers' influence on consumer luxury brand perceptions and intentions. *Journal of Business Research*, *69*, 5753-5760. https://doi.org/10.1016/j.jbusres.2016.04.171

Lou, C. (2022). Social media influencers and followers: Theorization of a trans-parasocial relation and explication of its implications for influencer advertising. *Journal of Advertising*, *51*(1), 4-21. https://doi.org/10.1080/00913367.2021.1880345

Lou, C., and Yuan, S. (2019). Influencer Marketing: How Message Value and Credibility Affect Consumer Trust of Branded Content on Social Media. *Journal of Interactive Advertising*, *19*(1), 58-73. https://doi.org/10.1080/15252019.2018.1533501

Martínez-López, F. J., Anaya-Sánchez, R., Giordano, M. F., and Lopez-Lopez, D. (2022). Behind influencer marketing: Key marketing decisions and their effects on followers' responses. *Journal of Marketing Management*, *36*(7-8), 579-607. https://doi.org/10.1080/0267257X.2020.1738525

Pan, M., Blut, M., Ghiassaleh, A., and Lee Z. (2025). Influencer marketing effectiveness: A meta-analytic review. *Journal of the Academy of Marketing Science*, *53*(1), 52-78. https://doi.org/10.1007/s11747-024-01052-7

Scott, W. R. (2014). *Institutions and organizations: Ideas, interests, and identities* (4th ed.). SAGE Publications.

Sokolova, K. and Kefi, H. (2020). Instagram and YouTube bloggers promote it, why should I buy? How credibility and parasocial interaction influence purchase intentions. *Journal of Retailing and Consumer Services*, *53*, 101742. https://doi.org/10.1016/j.jretconser.2019.01.011

Thornton, P. H., Ocasio, W., and Lounsbury, M. (2012). *The institutional logics perspective: A new approach to culture, structure, and process*. Oxford University Press.

Vrontis, D., Makrides, A., Christofi, M., and Thrassou, A. (2022). Social media influencer marketing: A systematic review, integrative framework and future research agenda. *International Journal of Consumer Studies*, *45*(6), 617-644. https://doi.org/10.1111/ijcs.12647

AI-powered Personalization in Autonomous Vehicles: Insights from Construal Level Theory and Transformative Privacy Calculus

Vincent Favarin*

vincent.favarin@tsm-education.fr

TSM-Research, Université Toulouse Capitole, CNRS, Toulouse, France

2 rue du doyen Gabriel Marty, 31 000 Toulouse - 06 95 79 93 24

Julien Cloarec

julien.cloarec@univ-lyon3.fr

iaelyon School of Management, Université Jean Moulin Lyon3, Magellan, Lyon, France

Marc Kuhn

Marc.Kuhn@dhbw-stuttgart.de

DHBW Corporate State University, Stuttgart, Germany

Lars Meyer-Waarden

lars.meyer-waarden@tsm-education.fr

TSM-Research, Université Toulouse Capitole, CNRS, Toulouse, France

*corresponding author

AI-powered Personalization in Autonomous Vehicles: Insights from Construal Level Theory and Transformative Privacy Calculus

Abstract:

This research investigates how the characteristics of autonomous vehicles influence user perceptions and behaviors. Through three empirical studies—two online experiments (N = 500 and N = 1,212) and a laboratory experiment with an autonomous vehicle simulation (N = 180)—we systematically examine the transformative privacy calculus users engage in when interacting with an autonomous vehicle. We integrate construal-level theory to explore how abstract versus concrete mental representations affect trust, risk beliefs, service personalization value and behavioral intentions to use. Our contributions extend the theoretical framework of the transformative privacy calculus and offer actionable implications for AI-powered personalization.

Keywords: Artificial intelligence; Construal level theory; Transformative privacy calculus; Autonomous vehicles; Social presence.

1. Background

Autonomous vehicles become accessible to users, thanks to technological advances and government regulations. They are intelligent vehicles equipped with an interconnectedness of sensors, captors, the internet of things, and AI, which automates driving systems and that provide services that respond to the needs of their drivers (Meyer-Waarden & Cloarec, 2022). The real marketing challenge of autonomous vehicles is the data they generate (Carey, 2022), which is attracting numerous new stakeholders (Paris, 2024). McKinsey & Co. (McKinsey, 2016) found that the potential revenue pool from car data monetization will be $750 billion by 2030 globally, helping to offset the long-term decline in car sales (Sterk et al., 2024). All is about the trade-off between marketers' desire to build a one-to-one buyer-seller relationship and user rights to protect their privacy (Markos et al., 2017). Modern vehicles are increasingly smart (Meyer-Waarden & Cloarec, 2022). In order to be able to drive for us, they need to be able to understand our environment, with the help of sensors, which leads to the creation of data. Autonomous vehicles represent a paradigm shift, transforming from independently owned devices to integral components of an interconnected shared mobility ecosystem. Data management becomes a critical factor as various business models emerge, some of which utilize data generated without the informed consent of users, thereby raising significant privacy concerns (Zhang et al., 2023). Understanding how the specific characteristics of autonomous vehicles influence individuals' willingness to share their data is essential. This includes both the initial data acquisition and management, as an input, and the subsequent reuse of data for personalized services, as a process (Haenlein & Kaplan, 2019; Cloarec, Macé, et al., 2024). Analyzing these aspects helps us gain deeper insights into the privacy calculus involved in adopting services that rely on data generated and managed by autonomous vehicles. From an academic standpoint, this situation exemplifies the application of the privacy calculus, where autonomous vehicles collect and use extensive user data to provide personalized services that enhance perceived value (Awad & Krishnan, 2006). This scenario creates a privacy dilemma, leading to an evolving research field centered on the transformative privacy calculus (Butori & Lancelot Miltgen, 2023; Cloarec, Meyer-Waarden, et al., 2024; Zhang et al., 2023). Our focus is on how the user's environment influences the outcome of this privacy calculus, specifically their intention to use personalized services based on their data.

While extensive research has explored the privacy calculus in online and e-commerce contexts (Sutanto et al., 2013), there is a notable gap in understanding how this calculus functions within the rapidly evolving ecosystem of autonomous vehicles. Specifically, the integration of AI, internet of things, and smart surveillance within autonomous vehicles introduces new dimensions to privacy issues, such as data sensitivity and social presence, which remain largely unexplored in the existing literature (Zhang et al., 2023). This study addresses this gap by examining how these unique features of autonomous vehicles influence the privacy calculus. Moreover, construal level theory provides a critical lens through which to understand how users' mental representations—whether abstract or concrete—affect their privacy-related decisions in this new context (Cloarec et al., 2022). By applying construal level theory, this research explores how the psychological distance associated with autonomous vehicles features, such as social presence and data sensitivity, shapes the privacy calculus. Specifically, it investigates whether an abstract construal, which emphasizes long-term benefits and broader outcomes, can mitigate privacy concerns and enhance the perceived value of personalization, thereby influencing users' willingness to share sensitive data.

Through this approach, construal level theory helps to elucidate the underlying psychological mechanisms that drive privacy decision-making in the context of autonomous vehicles, offering new insights that bridge the gap between traditional privacy calculus models and the unique challenges posed by smart, connected technologies. By addressing these gaps, we thus answer the following research question:

RQ: How do users' representations of AI-powered services, shaped by their characteristics, influence their adoption through the transformative privacy calculus?

2. Methods

In our research, we conducted three empirical studies to examine how autonomous vehicles influence user perceptions and behaviors regarding data collection, privacy, and personalization. Study 1 involved an online experiment with 500 participants in Germany, focusing on the sensitivity of data collected by autonomous vehicles and its impact on trust, risk beliefs, and personalization value. This scenario-based experiment revealed that highly sensitive data, when managed abstractly, increased personalization value and trust beliefs while reducing privacy risks. Study 2, with 1,212 participants, also conducted online, explored how autonomous vehicles' social presence and personalization processes affect the privacy calculus. Results showed that high social presence and abstract personalization processes enhanced trust and personalization value.

Study 3 replicated these findings in a controlled laboratory setting using an autonomous vehicle simulator and included an electroencephalographic study with 57 participants. The sample consists of 180 participants from the German population, with 44.4% women, 52.2% employed (MAge = 35.4, SD = 13.8). Respondents first selected the meal they were most likely to order for takeaway from the list generated in the pre-test, using the Food Preference Evaluation Test (Tuorila et al., 2008). We then screened respondents for eligibility to use the EEG, employing filter questions regarding recent use of neuro-perturbative substances, neurological conditions, and left-handedness. After eligibility was confirmed, respondents were guided into the simulator to participate in the experiment. We measured respondents' attitudes and behaviors using the same Likert scales as in Studies 1 and 2, along with neuronal data collected through an electroencephalograph (EEG). The driving simulator, equipped with three curved 4K screens, projected the driving simulation software (City Car Driving Enterprise Edition). All respondents experienced the same simulation, except for the specific manipulations. The simulator setup also included a steering wheel, pedals, touchscreen, and speakers to enhance the realism of the driving experience. For the experiment, we replicated one condition from each prior study: high vs. low social presence and abstract vs. concrete data collection from the autonomous vehicle. Social presence was manipulated through the vehicle's interaction method—using speakers in the high social presence condition and the touchscreen in the low social presence condition. Data collection was manipulated similarly to Study 1, by indicating the data broker as either the vehicle itself (abstract condition) or third-party entities like Google, Facebook, and Amazon (concrete condition). The manipulations were both successful. We employed the same manipulation checks as in Studies 1 and 2. Participants were asked to rate the social presence of the autonomous vehicle using the scale developed by Animesh et al. (2011). Respondents perceived more social presence in the high condition (Mhigh = 4.04, SD = 0.89) than in the low condition (Mlow = 3.74, SD = 0.91, $t(164.21) = -2.23$, $p < .05$). For the second condition (abstract vs. concrete data collection from the autonomous vehicle), as in Study 1, respondents perceived more difficulty to represent the entity in the abstract condition

(Mabstract = 4.48, SD = 1.28) than in the concrete condition (Mconcrete = 4.02, SD = 1.60, $t(171.38) = 2.14$, $p < .05$).

We also used an electroencephalograph (EEG) headset to measure the brain activity of participants who were deemed eligible based on the questionnaire and agreed to participate (N = 57). The EEG was utilized during interactions with the autonomous vehicle simulator, specifically to assess participants' acceptance or rejection of the data collection processes. The EEG measurements focused on activity in the left and right frontal lobes of the brain, which are areas known to be involved in decision-making and emotional processing. The asymmetry between these regions was calculated by comparing the activity levels of the left and right frontal lobes (Smith et al., 2017).

Alpha asymmetry = (ln[F4(right) alpha power]-ln[F3(left) alpha power])

Higher asymmetry scores reflect greater left frontal activity, based on the assumption that alpha activity is inversely related to cortical network activity (Allen et al., 2004; Smith et al., 2017). To begin, we established a baseline for each participant by measuring the asymmetry of brain activity at rest. We then assessed the differences between this baseline and the measurements taken during the experimental manipulations—referred to as activation (Smith et al., 2017). These manipulations included the presentation of data collected by the vehicle under different conditions (e.g., high vs. low social presence, abstract vs. concrete construal level about data collection). We standardized these differences to eliminate inter-individual variance and focus exclusively on the variations induced by the experimental manipulations (Hagemann et al., 2002). A positive standardized difference indicates that the manipulation induced a brain response more aligned with positive emotions or acceptance of the situation, as it results in relatively greater activation of the left hemisphere compared to the right (Allen et al., 2004). Conversely, a negative difference suggests a more negative emotion or rejection, indicated by relatively greater right hemisphere activation. We examine whether the data collection approach affects frontal asymmetry according to the level of social presence. A two-way ANCOVA (i.e., with covariates) revealed significant main effects of the data collection approach, $F(1.\ 53) = 10.403$, $p = 0.002$, $\eta^2 = 0.12$, and social presence, $F(1.\ 53) = 18.370$, $p < 0.001$, $\eta^2 = 0.12$ on the frontal asymmetry. Additionally, there was a significant interaction effect between the data collection approach and social presence, $F(1.\ 53) = 12.001$, $p = 0.001$, $\eta^2 = 0.18$. When the data collection approach was concrete (vs. abstract), frontal asymmetry was higher under high social presence (M = 0.136, SD = 0.014) than under low social presence (M = 0.115, SD = 0.016). In contrast, when the data collection approach was abstract (vs. concrete), frontal asymmetry was higher under low social presence (M = 0.129, SD = 0.011) than under high social presence (M = 0.124, SD = 0.013).

This study validated the behavioral results with physiological data, showing that high social presence in autonomous vehicles increased positive neural responses and improved user trust and well-being. Across these studies, we demonstrated that abstract data collection and strong social presence significantly enhance trust and personalization value, providing key insights into user-autonomous vehicles interactions.

This research offers several key theoretical contributions (Butori & Lancelot Miltgen, 2023; Cloarec et al., 2022; Liberman et al., 2007; Trope et al., 2007). First, it extends the application of construal level theory (Trope et al., 2007) by demonstrating its relevance in the adoption of smart technologies, particularly autonomous vehicles. By showing how abstract versus concrete thinking influences trust and personalization, the study highlights the importance of psychological distance in shaping user responses to emerging technologies.

Second, this research enriches the privacy calculus literature (Awad & Krishnan, 2006; Sutanto et al., 2013) by incorporating the concept of social presence in AI-powered environments. It demonstrates that a higher level of social presence—such as voice interactions—combined with abstract construal can enhance trust and increase the perceived value of personalization (Cloarec et al., 2022). This integration provides new insights into how users balance the benefits of personalization against privacy risks in the context of AI and autonomous vehicles technologies. Third, the study challenges traditional perspectives on privacy by showing that the use of highly sensitive data, when handled within a well-designed and transparent system, can paradoxically increase trust rather than heighten privacy concerns (Markos et al., 2017; Mothersbaugh et al., 2012). This finding contradicts the assumption that the more sensitive the data, the greater the privacy risk associated, highlighting the potential for companies to build trust through careful data management and clear communication. Finally, this research introduces well-being as a key psychological mechanism that mediates the relationship between privacy calculus and behavioral intention. By expanding the transformative privacy calculus framework (Cloarec, Meyer-Waarden, et al., 2024), the study emphasizes that user well-being is not only an outcome of effective personalization but also a driver of engagement with smart technologies. This novel inclusion of well-being deepens the understanding of how emotional and psychological factors influence technology adoption, adding a new dimension to privacy-related decision-making in AI contexts.

References

Allen, J. J. B., Coan, J. A., & Nazarian, M. (2004). Issues and assumptions on the road from raw signals to metrics of frontal EEG asymmetry in emotion. *Biological Psychology*, *67*(1-2), 183-218. https://doi.org/10.1016/j.biopsycho.2004.03.007

Awad, N. F., & Krishnan, M. S. (2006). The personalization privacy paradox : An empirical evaluation of information transparency and the willingness to be profiled online for personalization. *MIS Quarterly: Management Information Systems*, *30*(1), 13-28. https://doi.org/10.2307/25148715

Butori, R., & Lancelot Miltgen, C. (2023). A construal level theory approach to privacy protection : The conjoint impact of benefits and risks of information disclosure. *Journal of Business Research*, *168*, 114205. https://doi.org/10.1016/j.jbusres.2023.114205

Carey, N. (2022). *Your connected car knows you. The tussle for that data's hitting high gear*. Reuters. https://www.reuters.com/business/autos-transportation/your-connected-car-knows-you-tussle-that-datas-hitting-high-gear-2022-03-14/

Cloarec, J., Macé, S., & Pauwels, K. (2024). L'intelligence artificielle au service de la prise de décision en marketing: *Décisions Marketing*, *N° 112*(4), 5-6. https://doi.org/10.3917/dm.112.0005

Cloarec, J., Meyer-Waarden, L., & Munzel, A. (2022). The personalization–privacy paradox at the nexus of social exchange and construal level theories. *Psychology & Marketing*, *39*(3), 647-661. https://doi.org/10.1002/mar.21587

Cloarec, J., Meyer-Waarden, L., & Munzel, A. (2024). Transformative privacy calculus : Conceptualizing the personalization-privacy paradox on social media. *Psychology & Marketing*, *41*(7), 1574-1596. https://doi.org/10.1002/mar.21998

Haenlein, M., & Kaplan, A. (2019). A Brief History of Artificial Intelligence : On the Past, Present, and Future of Artificial Intelligence. *California Management Review*, *61*(4), 5-14. https://doi.org/10.1177/0008125619864925

Hagemann, D., Naumann, E., Thayer, J. F., & Bartussek, D. (2002). Does resting electroencephalograph asymmetry reflect a trait? An application of latent state-trait

theory. *Journal of Personality and Social Psychology*, *82*(4), 619-641. https://doi.org/10.1037/0022-3514.82.4.619

Liberman, N., Trope, Y., & Wakslak, C. (2007). Construal Level Theory and Consumer Behavior. *Journal of Consumer Psychology*, *17*(2), 113-117. https://doi.org/10.1016/S1057-7408(07)70017-7

Markos, E., Milne, G. R., & Peltier, J. W. (2017). Information Sensitivity and Willingness to Provide Continua : A Comparative Privacy Study of the United States and Brazil. *Journal of Public Policy & Marketing*, *36*(1), 79-96. https://doi.org/10.1509/jppm.15.159

McKinsey. (2016). *Monetizing car data*.

Meyer-Waarden, L., & Cloarec, J. (2022). "Baby, you can drive my car" : Psychological antecedents that drive consumers' adoption of AI-powered autonomous vehicles. *Technovation*, 102348. https://doi.org/10.1016/j.technovation.2021.102348

Mothersbaugh, D. L., Foxx, W. K., Beatty, S. E., & Wang, S. (2012). Disclosure Antecedents in an Online Service Context : The Role of Sensitivity of Information. *Journal of Service Research*, *15*(1), 76-98. https://doi.org/10.1177/1094670511424924

Paris, M. (s. d.). *Waymo Has $5 Billion, Google AI And Super Fans : Can Amazon, Tesla And Uber Compete*. Forbes. Consulté 26 août 2024, à l'adresse https://www.forbes.com/sites/martineparis/2024/08/24/waymo-has-5-billion-google-ai-and-super-fans-can-amazon-tesla-and-uber-compete/

Smith, E. E., Reznik, S. J., Stewart, J. L., & Allen, J. J. B. (2017). Assessing and conceptualizing frontal EEG asymmetry : An updated primer on recording, processing, analyzing, and interpreting frontal alpha asymmetry. *International Journal of Psychophysiology*, *111*, 98-114. https://doi.org/10.1016/j.ijpsycho.2016.11.005

Sterk, F., Stocker, A., Heinz, D., & Weinhardt, C. (2024). Unlocking the value from car data : A taxonomy and archetypes of connected car business models. *Electronic Markets*, *34*(1), 13. https://doi.org/10.1007/s12525-024-00692-5

Sutanto, J., Palme, E., Tan, C.-H., & Phang, C. W. (2013). Addressing the Personalization-Privacy Paradox : An Empirical Assessment from a Field Experiment on Smartphone Users. *MIS Quarterly*, *37*(4), 1141-1164. https://doi.org/10.25300/MISQ/2013/37.4.07

Trope, Y., Liberman, N., & Wakslak, C. (2007). Construal Levels and Psychological Distance : Effects on Representation, Prediction, Evaluation, and Behavior. *Journal of Consumer Psychology*, *17*(2), 83-95. https://doi.org/10.1016/S1057-7408(07)70013-X

Zhang, F., Pan, Z., & Lu, Y. (2023). AIoT-enabled smart surveillance for personal data digitalization : Contextual personalization-privacy paradox in smart home. *Information & Management*, *60*(2), 103736. https://doi.org/10.1016/j.im.2022.103736

EMOTIONAL ARTIFICIAL INTELLIGENCE AS A CATALYST FOR POSITIVE USER BEHAVIOUR: EVIDENCE FROM HUMOROUS CONVERSATIONAL AI

DAPHNE GREINER

P.H.D STUDENT

BEEVI & UNIVERSITÉ PARIS I, PANTHÉON-SORBONNE, PRISM

daphne.t.greiner@gmail.com

EMOTIONAL ARTIFICIAL INTELLIGENCE AS A CATALYST FOR POSITIVE USER BEHAVIOUR: EVIDENCE FROM HUMOROUS CONVERSATIONAL AI

Abstract: Emotional Artificial Intelligence (EAI) is reshaping human-AI interactions, offering new opportunities while presenting ethical and design challenges. While prior research has explored EAI's role in fostering user satisfaction, its potential to actively influence positive consumer behaviours remains underexamined. This study investigates how EAI can drive behavioural change through affective cues, using humour as a case study. Based on 19 expert and 22 consumer interviews, findings reveal that EAI has the potential to foster engagement, motivation, and adherence in contexts like health and education. However, effectiveness depends on contextual appropriateness and user receptiveness. The study contributes to the EAI marketing literature and to consumer behaviour in an AI context, by offering insights into designing ethical, behaviourally influential EAI systems.

Key words: Emotional Artificial Intelligence Marketing, Consumer Behaviour, Affective Computing, Humour, Conversational Artificial Intelligence

Introduction

AI is increasingly integrated into daily interactions, shaping how individuals engage with digital technologies across various sectors. Within this evolution, EAI has emerged as a field dedicated to equipping AI systems with the ability to recognise, interpret, respond to, and even evoke emotions. Historically overshadowed by advancements in computational efficiency and automation, EAI is now recognised for its potential to improve user experience and shape behavioural outcomes (Hermann, E., 2022). While prior research has explored EAI's role in fostering inspiration, enthusiasm, and user satisfaction (Pantano, E., & Scarpi, D., 2022), no study thus far has studied how it affects the adoption of positive user behaviour for instance by increasing motivation and reducing stress. Hence, we asked ourselves **under what conditions can EAI actively encourage positive behaviours, and what mechanisms drive this influence?**

One of the keyways EAI may shape behaviour is through its ability to modulate emotional states and perceptions. By incorporating affective cues—such as empathetic responses, personalised encouragement, or affective nudges—AI can potentially foster beneficial habits in areas such as health, education, and consumer engagement. However, as expert and consumer interviews in this study reveal, the effectiveness of these interactions depends on multiple factors, including contextual appropriateness, user receptiveness, and ethical considerations.

Among the various strategies for enhancing engagement, humour serves as a compelling case study of EAI's potential to influence behaviour. As a universal yet culturally nuanced form of communication, humour has been shown to increase engagement, alleviate stress, and enhance motivation (Ceha, J., *et al*., 2021, May; Bartzik, M., & Peifer, C., 2021; Akbar, T. A., & El-Gohary, H., 2022). To systematically explore EAI's behavioural impact, this study examines the role of **humorous conversational AI** through 19 semi-structured expert interviews and 22 semi-structured consumer interviews. Experts provided theoretical and industry insights, while consumers assessed AI humour's impact on its users, their concerns and expectations. This methodological approach enables a comprehensive understanding of both the theoretical and practical implications of emotionally intelligent AI.

Findings indicate that EAI-driven interactions, particularly through humour, can positively influence user behaviour in key areas such as health and education. Participants reported that humour reduced stress levels, helped sustain motivation for health-related activities, and encouraged adherence to medical regimens. It was also reported to facilitate the understanding of complex information and increase engagement. However, our findings also underscore the importance of **contextual sensitivity** as some users may not be seeking or receptive to EAI.

By juxtaposing expert analyses with consumer experiences, this study contributes to the emerging literature on EAI marketing (Velmurugan, R., *et al*., 2024) and behavioural influence. It signals that EAI, when strategically implemented, can serve as a subtle yet powerful tool for encouraging positive behavioural outcomes (e.g., adherence to medication). The findings also highlight key **design and ethical considerations** for developing AI systems that effectively integrate emotional intelligence while remaining cognisant of **user expectations** and ethical boundaries. Ultimately, this research refines our understanding of how EAI can transition from passive engagement to **actively shaping positive behavioural change**.

Conceptual Background

EAI is a subset of affective computing that encompasses systems capable of recognizing, interpreting, and responding to human emotions. Beyond simple detection, EAI often involves anthropomorphism—that is, the simulation or evocation of human-like emotional responses. In this dual role, EAI can both provide analytical insights (by monitoring genuine emotional reactions) and actively influence user behaviour by simulating affect (thereby enhancing engagement or empathy) (Pantano, E., & Scarpi, D., 2022).

In marketing, EAI is emerging as a powerful tool that bridges technology with the rich traditions of consumer behaviour research rooted in psychology, anthropology, and sociology. For instance, some brands now use EAI to analyse consumer emotional responses to content in real time, enabling them to optimize campaigns to enhance engagement and effectiveness through start-ups such as Hume AI and Datakalab recently brought by Apple. However, the extent to which EAI can influence positive behaviours requires further investigation. This study aims to address this gap by identifying the conditions under which EAI actively encourages positive behaviours and the underlying mechanisms that drive this influence.

The mechanisms intertwining EAI and consumer behaviour are not well known as most research focus on analysing consumer reactions rather than driving behaviour change. Nonetheless, two key mechanisms seem to be at play, one being purely technical functions of the AI for instance of detecting and adapting to its human counterpart. The second, draws from anthropomorphism and the Computers Are Social Actors (CASA) framework suggesting that humans inherently apply social norms to interactions with AI, particularly when AI exhibits human-like characteristics (Lee, J. E. R., & Nass, C. I., 2010).

The effectiveness of EAI in shaping consumer behaviour may depend on several key conditions. One fundamental prerequisite is trust, as consumers are more likely to engage with AI-driven systems when they perceive them as reliable and transparent. Trust is influenced by various antecedents, including prior experience with AI, perceived autonomy, and the extent to which the AI's operations are explainable to users (Greiner, D., & Lemoine, J. F., 2024, June). Transparency is particularly crucial, as opaque AI-driven emotional interactions can raise ethical concerns and potentially backfire if consumers feel manipulated. Another critical condition is contextual relevance (Hernandez, J., *et al*., 2023), as consumers may not always be open to EAI.

Humour, as a specific emotional stimulus, offers a compelling case study for examining EAI's capacity to encourage positive behaviours as it has been shown to enhance user engagement, reduce stress, and increase motivation (Ceha, J., *et al*., 2021, May; Bartzik, M., & Peifer, C., 2021; Akbar, T. A., & El-Gohary, H., 2022). It also serves as a good example of how EAI can be a double-edged sword if used inappropriately it might result in negative effects.

Methodology

Research Design and Data Collection

This qualitative study examines how EAI fosters positive behaviours and the mechanisms underlying this effect, using humour as a stimulus. To achieve this, we conducted semi-structured interviews with experts and consumers, balancing flexibility with methodological

rigor (Young J. C., *et al*., 2018; Shaik, M., 2023). All interviews were recorded and transcribed with participant consent.

Using purposive and snowball sampling, we selected 19 experts from three domains: first, marketing professionals specialising in customer experience and digital marketing, second, humour specialists, including researchers, historians, and comedians, and third, AI experts focusing on conversational AI and anthropomorphism. Each 45-minute interview followed a structured guide covering definitions, perceptions, benefits, drawbacks, and applications of AI humour in the context of EAI.

To complement expert insights, we recruited 22 consumers from diverse backgrounds to examine their expectations and reactions to EAI. The interviews combined open-ended questions with structured exposure to three chatbot conversations, each featuring distinct humour styles and intensity levels. This approach enabled an in-depth analysis of participants' emotional engagement and behavioural responses, drawing on methodologies established in prior marketing research (Shin, H., *et al*., 2023; Roy, R., & Naidoo, V., 2021).

The expert interview guide focused on the following core questions: *What does a EAI such as through humour evoke for you? In what contexts could such an agent be used? What are the perceived advantages and disadvantages? What limitations do you foresee? How do you believe consumers would react?* The consumer interview guide included similar but more context-specific questions, such as *in which situations do you think EAI such as humorous AIs would be appropriate, and why?* Participants were also shown three example screenshots of EAI interactions illustrating humour, empathy, and friendliness, followed by questions exploring their reactions and potential behavioural responses.

Data Analysis and Presentation of Findings

Data were analysed thematically through vertical (within-case) and horizontal (cross-case) approaches to identify key themes and recurring insights. A semantic analysis ensured minimal interpretative bias, with theme frequency recorded to improve saturation assessment (Naeem, M., *et al*., 2024). Findings are presented narratively, following best practices in qualitative research. This method, influenced by anthropological and sociological traditions, contextualizes insights and highlights theoretical implications through structured themes and illustrative examples derived from verbatims rather than the interview guide.

Key Findings

Expert 14 (doctor of philosophy): "*if the virtual agent manages to make the other person laugh or smile (sometimes considered to be over-laughing, an inner laugh), this will have a positive impact on their health*".

The findings suggest that humorous EAI can effectively promote positive behavioural outcomes by **modulating emotional states, reducing cognitive load, and increasing engagement**. However, its success depends on contextual appropriateness, user receptiveness, and ethical considerations. Experts and consumers noted that different sectors and situations shape receptiveness to emotional cues. Additionally, personalisation can enhance EAI's effectiveness, but safeguards are necessary. For instance, consumer TV (25, man) explains he believes EAI such as humour could be implemented in: "*the leisure sector, tourism. And again, it depends*

on the overall context. No, that's the only sectors I can think of. Maybe also, home assistants, virtual assistants, that could be nice too...".

Experts raised ethical concerns about user dependency on emotionally engaging AI, cautioning that highly personable AI could lead to over-reliance and reduced human-to-human interactions in critical service sectors. Transparency regarding AI's nature was also identified as essential in mitigating ethical risks and fostering user trust in EAI. Expert FW (professional comedian) adds that emotional interactions by nature may be manipulative even if not intended, it can be: "*a means of seduction to win someone over, there may be a manipulation bias behind it*".

Beyond these findings, insights into the mechanisms through which EAI influences consumer behaviour were identified. Affective modulation emerged as a key factor, with experts highlighting AI's potential to reduce stress, enhance engagement, and foster motivation. By incorporating affective strategies such as humour, empathy, or encouragement, EAI can create emotionally engaging experiences that sustain consumer attention and improve long-term interactions. For instance, consumer FM (33, woman) relates how EAI could increase perceived anthropomorphism and decrease anxiety to calm users in tense situations, she explains "*the three main advantages (to EAI such as humour), as I see them, are that: it defuses potentially tense situations, makes the robot feel more human, and reinforces the brand's image*".

Cognitive load reduction was another critical mechanism identified. Experts noted that humour can simplify complex information, improving comprehension and adherence to recommendations. This was particularly relevant in domains such as financial planning, education and health-related AI applications, where humour alleviates anxiety and aids knowledge retention which in turn can positively affect user behaviour (e.g., adherence to medication, exercising consistency, and improved focus). For instance, expert BR (professor of computer science) states "*just before, I was using the example of medical applications, or anything to do with health, EAI such as humour could be used to help people take their medication*". Consumers similarly reported that well-placed humour improved their ability to process information and engage with AI-generated content.

Table I: Summary of Key Themes on Humour and Their Broader Applicability in EAI

Key Themes	**Findings on Humour Applicable to Other EAI Contexts**
Trust & Transparency	Users engage more with AI when emotional engagement strategies are clearly labelled and transparently implemented. Ethical concerns arise if emotions are misinterpreted or perceived as manipulative.
Contextual Relevance	User openness to emotional AI is influenced by emotional state and urgency of request. Empathy seems effective in healthcare and crisis management, while motivation and encouragement work well for productivity and e-learning.
Personalization & Ethical Considerations	Personalized emotional responses are more effective but carry risks of reinforcing biases. They can be especially helpful in health, education, and personalized AI coaching.
Affective Modulation	Humour, empathy, and motivation in AI reduce stress, enhance engagement, and foster motivation. This is particularly applicable to AI-driven mental health support, virtual assistants, and interactive educational tools.
Cognitive Load Reduction	Emotionally aware AI helps simplify complex information, making it easier to comprehend and improving adherence to recommendations.

Challenges & Ethical Concerns	Emotional AI must balance engagement with efficiency to avoid distracting users. Overuse or poorly calibrated emotional responses can lead to negative user experiences. Concerns exist regarding user dependency on emotionally engaging AI.

Conclusion and Discussion

Findings reveal both opportunities and challenges in integrating emotional intelligence into AI-driven consumer interactions, addressing our research question on the conditions and mechanisms through which EAI can foster positive behaviours. Although humour is used here as a case study, the insights extend to other EAI applications such as empathy, motivational reinforcement, and stress reduction. Behavioural changes appear to hinge on psychological mechanisms like anthropomorphism (Lee, J. E. R., & Nass, C. I., 2010) and on contextual factors including user trust and system design (Hernandez, J., *et al*., 2023; Greiner, D., & Lemoine, J. F., 2024, June). Future research could further examine the ethical dimensions of EAI, particularly the long-term impact of emotionally intelligent AI on user behaviour, well-being, and trust in AI systems through interdisciplinary studies.

References

Velmurugan, R., Sudarvel, J., Bhuvaneswari, R., Jayanthi, N., Ganesh, R. S., & Mariyappan, M. S. R. (2024). Artificial Intelligence and Emotional Intelligence in Marketing. In *Balancing Automation and Human Interaction in Modern Marketing* (pp. 82-95). IGI Global.

Akbar, T. A., & El-Gohary, H. (2022). Brand Humour Advertisements on a Social Network Platform and Their Impact on Online Consumer Engagement: The Case of Instagram. In *Research Anthology on Social Media Advertising and Building Consumer Relationships* (pp. 1048-1073). IGI Global.

Bartzik, M., & Peifer, C. (2021). On the relationships between humour, stress and flow experience—Introducing the humour-flow model. *The Palgrave Handbook of Humour Research*, 479-496.

Hermann, E. (2022). Anthropomorphized artificial intelligence, attachment, and consumer behavior. *Marketing Letters*, *33*(1), 157-162.

Young, J. C., Rose, D. C., Mumby, H. S., Benitez-Capistros, F., Derrick, C. J., Finch, T., ... & Mukherjee, N. (2018). A methodological guide to using and reporting on interviews in conservation science research. *Methods in Ecology and Evolution*, *9*(1), 10–19.

Shaik, M. (2023). Impact of artificial intelligence on marketing. *East Asian Journal of Multidisciplinary Research*, *2*(3), 993-1004.

Greiner, D., & Lemoine, J. F. (2024, June). Understanding Chatbot End-Users to Improve Their Design: Antecedents of Trust, Adoption Motivations, and Expectations. In *International Conference on Human-Computer Interaction* (pp. 194-204). Cham: Springer Nature Switzerland.

Lee, J. E. R., & Nass, C. I. (2010). Trust in computers: The computers-are-social-actors (CASA) paradigm and trustworthiness perception in human-computer communication. In *Trust and*

technology in a ubiquitous modern environment: Theoretical and methodological perspectives (pp. 1-15). IGI Global.

Roy, R., & Naidoo, V. (2021). Enhancing chatbot effectiveness: The role of anthropomorphic conversational styles and time orientation. *Journal of Business Research*, 126, 23-34.

Shin, H., Bunosso, I., & Levine, L. R. (2023). The influence of chatbot humour on consumer evaluations of services. *International Journal of Consumer Studies*, *47*(2), 545-562.

Pantano, E., & Scarpi, D. (2022). I, robot, you, consumer: Measuring artificial intelligence types and their effect on consumers emotions in service. *Journal of Service Research*, *25*(4), 583-600.

Ceha, J., Lee, K. J., Nilsen, E., Goh, J., & Law, E. (2021, May). Can a humorous conversational agent enhance learning experience and outcomes?. In *Proceedings of the 2021 CHI conference on human factors in computing systems* (pp. 1-14).

Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2024). Demystification and actualisation of data saturation in qualitative research through thematic analysis. *International Journal of Qualitative Methods*, *23*, 16094069241229777.

Hernandez, J., Suh, J., Amores, J., Rowan, K., Ramos, G., & Czerwinski, M. (2023). Affective Conversational Agents: Understanding Expectations and Personal Influences. *arXiv preprint arXiv:2310.12459*.

The relational impacts following a violation of the General Data Protection Regulation (GDPR)

Pauline Roques
MRM, Université de Montpellier, Montpellier, France
pauline.roques@umontpellier.fr

David Vidal
MRM, Université de Montpellier, Montpellier, France
david.vidal@umontpellier.fr

Anne-Sophie Cases
MRM, Université de Montpellier, Montpellier, France
anne-sophie.cases@umontpellier.fr

The relational impacts following a violation of the General Data Protection Regulation (GDPR)

Abstract: Although the General Data Protection Regulation is a legal requirement, its implementation by companies remains inconsistent. This study aims to (1) categorize GDPR violations through a qualitative study with digital marketing professionals and (2) assess their impact on customer relationships through an experimental study. Five violation types are identified and classified as intentional/unintentional and active/passive. Results show that unintentional failures (due to error or incapacity) lead to weaker retaliation intentions than omissions or malicious acts. However, ignorance is not considered more acceptable than omissions. Consumers expect companies to stay informed about data regulations, highlighting the need for tools supporting GDPR compliance.

Keywords: personal data; privacy; violation; GDPR; retaliation; customer relationship

1. Context and interest of the research

On June 15, 2023, the French Data Protection Authority (CNIL) fined Criteo 40 million euros for failing to verify user consent[1], while Doctissimo faced a 380,000 euros penalty for non-compliance with health data and cookie regulations[2]. These cases are not isolated—CNIL's enforcement surged in 2023, issuing 42 sanctions and 168 formal notices (in France), with total fines exceeding 80 million euros[3]. In this context, this research analyzes cases of non-compliance with the General Data Protection Regulation (GDPR) which ensure the protection and management of consumer information by brands. The study has two main objectives: (1) to explore and categorize the forms of GDPR violations through a qualitative study conducted with digital marketing professionals; (2) and to analyze the impact of these various types of violations on customers' relational responses to the brand through an experimental study.

2. Theoretical background

2.1. Sources of GDPR Violations. Privacy failures, often linked to data breaches, raise significant concerns among consumers. Bansal and Zahedi (2015) distinguish external breaches from internal ones. In the literature, external breaches are typically attributed to unintentional causes (e.g., hacking, cyberattacks), while internal breaches are linked to intentional causes (e.g., unauthorized data sharing). Indeed, although companies implement security measures, external data breaches remain inevitable and are not directly caused by violations of regulations. Only internal threats, which we focus on, can result from non-compliance with the law. An internal violation is generally considered to be an immoral practice of manipulation or deception, characterized by an intentional or deliberate act (Nguyen et al., 2022). However, it seems unfair to adopt this imbalanced view without considering the potential challenges companies face (N'Goala, 2015). Therefore, the question remains whether instances of non-compliance are always intentional. Furthermore, it is important to explore whether consumers' reactions differ depending on the type of violation.

2.2. Consumer reactions to a violation. When personal data is misused, some consumers react. Privacy research has mostly focused on individual data protection behaviors, examining how people safeguard their personal information (Lwin et al., 2007). However, service failure literature (Hirschman, 1970) suggests that coping strategies also include consumer reactions toward the brand to mitigate the harm caused by a violation. While some consumers quietly end their relationship with the company, others engage in retaliatory actions to restore fairness for an injustice they perceive (Funches et al., 2009). Feeling wronged, they may seek revenge, often through negative word-of-mouth, a key form of retaliation we will focus on. By sharing their negative experiences, they aim to damage the company's reputation and discourage others from engaging with it (Grégoire et al., 2009). Beyond simply severing ties to avoid future harm, retaliation is a deliberate effort to inconvenience or harm the company.

2.3. Relational impacts. Following a privacy-related incident, academic research has predominantly focused on the financial repercussions. For companies, financial performance, such as market value and stock returns, is negatively impacted by a data breach (Malhotra et Malhotra, 2011). Beyond financial aspects, other research examines the relational repercussions, which we will focus on. For example, Bansal and Zahedi (2015) analyze how a privacy incident affects trust. Wanjugu et al. (2022) take a broader view of the quality of the customer-company relationship. However, to our knowledge, no study has differentiated the relational impacts based on the type of infraction.

[1] https://www.cnil.fr/fr/sanction-criteo
[2] https://www.cnil.fr/fr/sanction-doctissimo
[3] https://www.cnil.fr/fr/sanctions-et-mesures-correctrices

3. Exploratory qualitative study: types of GDPR violations

3.1. Objectives and Methodology. The objective of this initial study is to identify the various forms of violations of privacy regulations. We aim to better understand corporate practices, the challenges they face, and the potential causes of these infractions. To achieve this, fourteen interviews were conducted with experts in the field of digital marketing. Additionally, we analyzed secondary data derived from sanctions published by the CNIL.

3.2. Results. The analysis reveals two key dimensions for categorizing different types of violations. The first, consistent with existing literature, differentiates between intentional and unintentional violations. The second distinguishes between active and passive violations. Based on these dimensions, five types of violations have been identified and categorized. Malicious intent represents a deliberate act of non-compliance with regulations designed to protect consumer privacy. Professionals intentionally violate the rules, believing that the benefits of data collection and exploitation outweigh the perceived risks. Omission, also intentional, is characterized by the deliberate choice not to take any action to comply with regulations. While in cases of malice, professionals knowingly implement illegal practices to maximize their gains, omission occurs when professionals consciously decide not to act, despite knowing they are in violation. On the other hand, ignorance and incapacity are passive and unintentional violations, arising from difficulties in understanding or applying the laws. Lastly, error refers to an unintentional act of non-compliance with privacy protection regulations.

4. Experimental study: relational responses toward the brand

4.1. Objectives and hypotheses. Whether a violation is intentional or unintentional, active or passive, consumer data can be compromised in similar ways. However, since companies' intentions differ, we question whether the relational impacts on the brand are uniform. To explore this, we propose a conceptual model to analyze the impact of different types of violations on consumers' retaliatory intentions (Figure 1).

The effect of violation types on retaliatory intentions. In a context where data protection is a major concern, corporate privacy violations trigger negative reactions from consumers. Specifically, we posit that the nature of the infraction influences the intensity of retaliation intentions. The more an infraction is perceived as intentional, the greater the sense of injustice it generates, fueling punitive behaviors toward the offending company (Grégoire et al., 2009). Additionally, uncertainty regarding corporate intentions leads individuals to judge passive infractions less harshly than active ones (Cushman et al., 2016). Thus, we suggest that intentional and active infractions provoke stronger retaliatory responses compared to unintentional and passive infractions. More precisely, retaliation intentions are highest when the infraction is both intentional and active. They decrease in cases of so-called mixed infractions, whether intentional and passive or unintentional and active. Finally, retaliation intentions are lowest when the infraction is both unintentional and passive.

H1: Retaliation intentions are higher when the infraction results from malice rather than (a) an error, (b) an omission, (c) an incapacity, or (d) ignorance.

H2: An infraction caused by an error leads to (a) a similar level of retaliation as an omission and (b) a higher level of retaliation than an incapacity or (c) ignorance.

H3: The level of retaliation is higher in the case of an omission than (a) an incapacity or (b) ignorance.

The effect of retaliation intentions on customer relationship quality. The consequences of these negative reactions can be significant for brands and their customer relationship management. A privacy failure can lead to a deterioration in the relationship, for example,

through a decline in trust (Bansal et Zahedi, 2015), satisfaction, or engagement—commonly defined as the customer's willingness to maintain the relationship (Dwyer et al., 1987).

H4: The higher the retaliation intentions, the lower the levels of (a) satisfaction, (b) trust, and (c) relational or (d) behavioral engagement.

4.2. Data collection and design. This study employs a one-factor experimental design, in which the form of the infraction is manipulated using five fictional scenarios developed based on our exploratory qualitative study (Figure 2). A total of 281 respondents (mean age: 45.5; 54.4% female) provided by an online panel and representative of the French demographic were randomly distributed across the five experimental conditions. Scenario credibility and realism are comparable among the four scenarios ($p>.10$). After reviewing their assigned infraction scenario, participants were asked to assess their retaliation intentions and indicate any potential relational impacts on the brand. All the variables measured in the model were estimated using validated instruments with 7-point Likert scales.

4.3. Results. The proposed model was tested using Hayes' (2013) PROCESS macro (Model 4), with 5,000 bootstraps and the "multi-categorical" option for scenario comparisons.

The effect of infraction type on retaliation intentions. Scenarios involving error ($a = -1.23$; $t = -4.64$; $p < .01$), ignorance ($a = -0.56$; $t = -2.00$; $p = .05$), and incapacity ($a = -0.79$; $t = -2.95$; $p < .01$) significantly reduce retaliation intentions, supporting hypotheses H1a, H1c, and H1d. No significant difference is found between malice and omission scenarios ($p = .50$), so hypothesis H1b is rejected. Compared to an error scenario, omission ($a = 1.05$; $t = 3.92$; $p < .01$) and ignorance ($a = 0.68$; $t = 2.50$; $p = .01$) increase retaliation intentions, while no significant difference is found between error and incapacity ($p = .09$), leading to the rejection of hypotheses H2a, H2b, and H2c. Finally, compared to omission, incapacity significantly reduces retaliation ($a = -0.60$; $t = -2.25$; $p = .03$), supporting hypothesis H3a, but no significant difference is found between omission and ignorance ($p = .19$), so hypothesis H3b is rejected.

The effect of retaliation on customer relationship quality. High retaliation significantly reduces satisfaction ($b = -0.39$, $t = -9.77$, $p < .01$), trust ($b = -0.39$, $t = -8.96$, $p < .01$), relational engagement ($b = -0.42$, $t = -8.41$, $p < .01$), and behavioral engagement ($b = -0.31$, $t = -6.88$, $p < .01$). These results confirm hypothesis H4.

5. Conclusion

5.1. Theoretical contributions. This research advances privacy failure literature in two key ways. (1) Regarding the nature of data breaches, existing literature often attributes external breaches to unintentional causes and internal breaches to intentional causes (Bansal et Zahedi, 2015). By adopting the perspective of professionals, we contribute to a better understanding of the causes of privacy failures, which have typically focused on external data leaks. We propose a refined typology distinguishing five types of infractions based on whether they are intentional or unintentional, and active or passive. (2) Concerning the reactions to data breaches, existing research has primarily focused on individual privacy protection behaviors (Wanjugu et al., 2022). By considering the impact of a data breach on the brand-consumer relationship, we examine retaliation intentions toward the brand and propose a theoretical model that differentiates the impact of various types of infractions on these intentions. Contrary to our initial hypothesis, it seems that omission, despite being a passive infraction, provokes retaliation intentions similar to those triggered by acts of malice. These findings could suggest that passive infractions may not necessarily be seen as less severe than active ones, challenging the notion that deliberate actions lead to harsher penalties (DeScioli et al., 2011). Moreover, the study indicates that errors are judged more leniently than omissions, even though both fall within the mixed category of infractions. Thus, unintentional failures, whether due to human error or

material incapacity, tend to be more tolerated than omissions or malice, which involve deliberate intent to harm. However, this logic does not appear to apply to ignorance. Although unintentional, ignorance might not be considered more acceptable than omission. If consumers were to believe that companies have a responsibility to stay informed about current regulations, especially concerning personal data management, ignorance of the law might not be viewed as a valid excuse and would not reduce the severity of the judgment against them.

5.2. Managerial contributions. To reduce retaliation risks and preserve customer relationships, companies should enhance transparency and communication when infractions occur due to error or incapacity. Taking responsibility, explaining challenges, and implementing preventive solutions can foster consumer acceptance. However, since unintentional infractions due to ignorance are judged as harshly as deliberate omissions, businesses may fear non-compliance and its legal, financial, or relational consequences. Consulting firms offer tailored services to help companies navigate evolving regulations, but high costs can be a barrier. To improve accessibility, government initiatives could introduce assessment tools such as a privacy compliance score modeled on the Nutri-score used in the food industry. Adapted to digital data governance, this tool would enable organizations to quickly identify compliance gaps and benefit from targeted support from the CNIL.

5.3. Limitations and avenues for future research. As these results are based on a preliminary study, further research is required to confirm and refine their scope and generalizability. While this study explores consumers' reactions to violations, there remains a gap in understanding the most effective remediation strategies companies should implement following a privacy-related incident to mitigate negative relational impacts (Wanjugu et al., 2022). In this context, the proposed typology of violations could serve as a valuable framework for investigating how companies can restore and maintain the overall quality of their relationship with consumers, depending on the nature of the violation—whether intentional or unintentional, active or passive.

References

Bansal G et Zahedi FM (2015) Trust violation and repair: The information privacy perspective. *Decision Support Systems*, 71, 62-77.

Cushman F, Young L et Hauser M (2006) The role of conscious reasoning and intuition in moral judgment: Testing three principles of harm. *Psychological science* 17(12): 1082-1089.

DeScioli P, Christner J et Kurzban R (2011) The omission strategy. *Psychological science* 22(4): 442-446.

Dwyer FR, Shurr PH et Oh S (1987) Developing buyer-seller relationships, *Journal of Marketing*, 51, 11-27.

Funches V, Markley M et Davis L (2009) Reprisal, retribution and requital: Investigating customer retaliation. *Journal of Business Research*, 62(2), 231-238.

Grégoire Y, Tripp TM et Legoux R (2009) When customer love turns into lasting hate: The effects of relationship strength and time on customer revenge and avoidance. *Journal of marketing*, *73*(6), 18-32.

Hayes AF (2013) *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* Guilford publications.

Hirschman AO (1970) *Exit, voice, and loyalty: Responses to decline in firms, organizations, and states* (Vol. 25). Harvard university press.

Lwin M, Wirtz J et Williams JD (2007) Consumer online privacy concerns and responses: a power–responsibility equilibrium perspective. *Journal of the Academy of Marketing Science*, *35*, 572-585.

Malhotra A et Kubowicz Malhotra C (2011) Evaluating customer information breaches as service failures: An event study approach. *Journal of Service Research*, 14(1), 44-59.
Martin KD, Borah A et Palmatier RW (2017) Data privacy: Effects on customer and firm performance. *Journal of marketing*, *81*(1), 36-58.
N'Goala G (2015) Opportunism, transparency, manipulation, deception and exploitation of customers' vulnerabilities in CRM. *The dark side of CRM: Customers, relationships and management*, *122*.
Nguyen B, Jaber F et Simkin L (2022) A systematic review of the dark side of CRM: the need for a new research agenda. *Journal of strategic marketing*, *30*(1), 93-111.
Wanjugu S, Moulard JG et Sinha M (2022) The paradoxical role of relationship quality on consumer privacy: Its effects on relinquishing and safeguarding information. *Journal of Consumer Behaviour* 21(5): 1203-1218.

Figures

Figure 1. Research Model

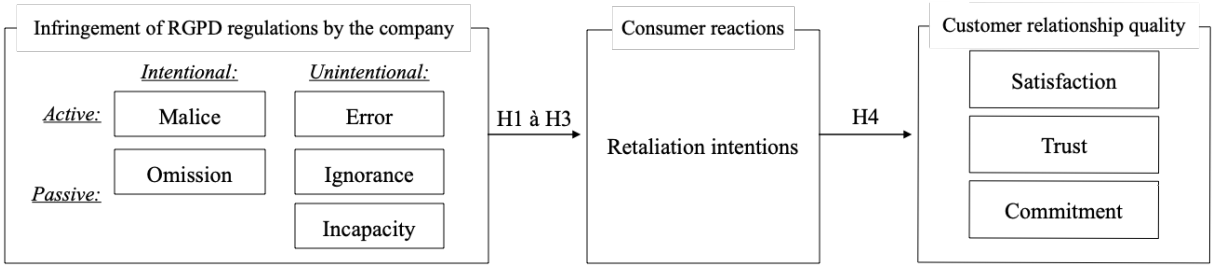
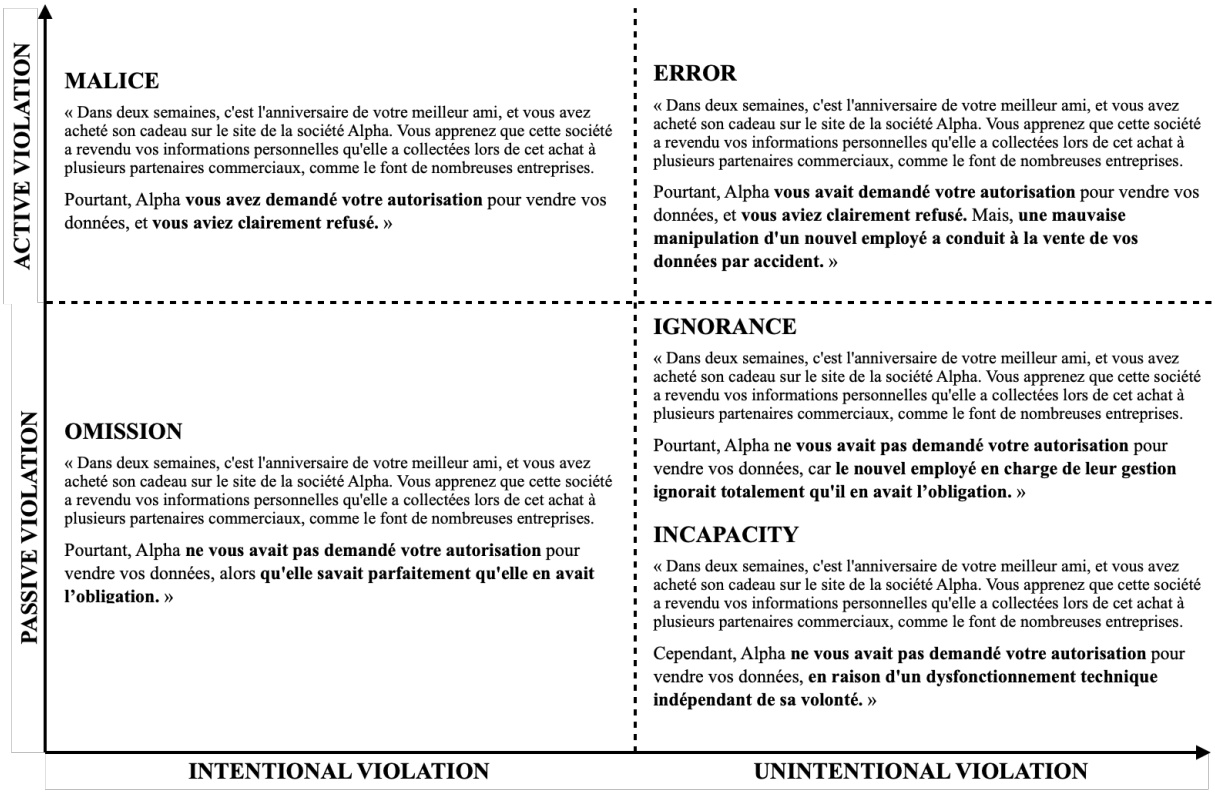


Figure 2. Scenarios of GDPR Regulation Violations (submitted in French)



When AI Goes Wrong: Assessing the Impact of AI Errors on Employee Experience

Author:

Theresa Pescolderung

Ingolstadt School of Management/ Catholic University of Eichstätt-Ingolstadt / Toulouse School of Management

Submission for:

9th French-Austrian-German Workshop on Consumer Behavior

June 25th to 27th, 2025

Montpellier, France

"Encouraging consumers to change for greater well-being:new challenges for consumer behavior research?"

Submission Date: 20.02.2025

Contact Information:

Email: Theresa.pescolderung@gmail.com

Address: Krumbacherstraße 11, 80798 Muni ch

Phone: +49 15782485447

Abstract

Generative AI assistants are increasingly used to enhance employee productivity, yet they pose risks, such as hallucinations that generate false data. This study examines how AI failures impact continuance intention, focusing on two failure severity levels. A 1×2 between-subjects experiment with 110 white-collar employees reveals that while AI failures influence continuance intention, AI familiarity plays a greater role in shaping user perceptions. Higher AI familiarity improves service quality perception but also heightens sensitivity to failures, leading to a stronger decline in continuance intention. Notably, trust in AI is not directly affected by failures, nor does it drive continuance intention, though it declines as familiarity increases post-failure. These findings contribute to AI adoption research by highlighting the dual role of AI familiarity and provide practical insights for organizations seeking to increase AI acceptance. Future research should further explore the complex interplay between AI familiarity and failure response.

Keywords: artificial intelligence, AI failure, AI familiarity, AI adoption, employee behaviour, continuance intention

1. Introduction

Artificial Intelligence (AI) refers to systems that perform tasks requiring human intelligence (Huang & Rust, 2018). Since the introduction of ChatGPT in 2022, Generative AI (Gen AI) has expanded rapidly, with estimates suggesting it could contribute between $2.6 and $4.4 trillion annually to the global economy (McKinsey, 2023). Organizations have adopted Gen AI at an accelerated pace, leveraging its natural language capabilities to automate up to 70% of employee tasks, improving workplace efficiency by 40% (Deloitte, 2024; Somers, 2024). AI assistants integrated with enterprise systems, such as SAP's Joule and Salesforce's Einstein Copilot, are transforming how employees interact with business data, enhancing decision-making and operational efficiency (SAP, 2023; Salesforce, 2024).

Despite these advancements, AI's widespread adoption depends on trust and user engagement (Wirtz & Zeithaml, 2018). Employees often struggle with trusting AI due to a lack of transparency in its decision-making processes (Budhwar et al., 2023; Weber et al., 2024). Without trust, even the most advanced AI systems risk underutilization, limiting their impact on employee productivity and internal service quality (Cvetkovic et al., 2024). Additionally, AI systems are prone to errors, such as hallucinations—incorrect outputs that compromise reliability (Durach & Gutierrez, 2024). With hallucination rates ranging from 3% to 27%, AI failures pose a significant challenge to adoption (Parsons, 2023; Weise & Metz, 2023). While prior research has explored consumer reactions to AI errors, the impact of these failures on employees remains underexamined (Pavone et al., 2023; Srinivasan & Sarial-Abi, 2021).

This study investigates how AI failures influence employees' intention to continue using AI assistants, emphasizing the mediating role of perceived service quality and trust. Additionally, it examines AI familiarity as a moderating factor, exploring whether employees with greater exposure to AI react differently to failures. Through an experimental study involving 110 office employees, this research tests the effects of minor and major AI failures. Findings indicate that while failures negatively impact continuance intention, AI familiarity plays a dual role: it enhances service perceptions but increases sensitivity to failures. These insights contribute to the understanding of AI adoption in workplaces and inform strategies for organizations to optimize AI deployment and mitigate failure-related risks.

2. Conceptual Background

AI adoption in organizations is driven by its ability to automate tasks, enhance decision-making, and improve service quality (van den Broek et al., 2021). AI assistants are increasingly integrated into business systems, yet their success depends on user trust and service reliability (Blaurock et al., 2024). While AI offers efficiency gains, failures such as incorrect outputs and hallucinations threaten adoption by undermining trust and perceived service quality (Durach & Gutierrez, 2024). Previous research shows that employees tend to be less forgiving of AI errors than human mistakes, leading to negative perceptions that hinder AI adoption (Dietvorst et al., 2015; Pavone et al., 2023).

Trust is a crucial factor in AI adoption, influencing whether employees continue using AI assistants after a failure (Cvetkovic et al., 2024). However, AI trust is fragile due to the opacity of AI decision-making processes (Budhwar et al., 2023). Employees often struggle to understand how AI generates outputs, making them more cautious about relying on AI-based decisions (Weber et al., 2024). Studies suggest that AI failures significantly reduce trust, particularly when errors involve critical business functions (Sun et al., 2022). Moreover, service

quality perceptions play a key role in AI acceptance. High service quality is linked to greater willingness to continue using AI assistants, while failures that reduce perceived service quality can lead to lower adoption rates (Mamun et al., 2020).

AI familiarity—users' prior experience with AI—emerges as a key moderator in shaping responses to AI failures. Employees familiar with AI often hold higher expectations, which makes them more sensitive to failures (Horowitz et al., 2023). While familiarity can improve trust and service quality perceptions, it can also amplify negative reactions to AI errors (Blaurock et al., 2024). Research suggests that AI-experienced users are more critical of failures, which can reduce their willingness to continue using AI tools (Mahmud et al., 2024). However, familiarity also enhances adaptability, as experienced users are more likely to contextualize AI errors and adjust their usage accordingly (Vázquez-Casielles et al., 2007).

This study examines how AI failures impact employee adoption of AI assistants, emphasizing the roles of trust and service quality. It further investigates how AI familiarity moderates these effects, providing insights for organizations seeking to enhance AI reliability and user acceptance.

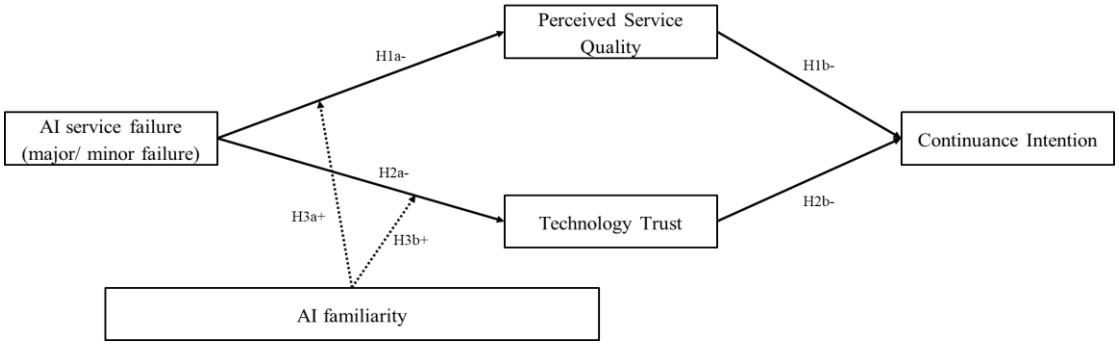


Figure 1: Conceptual model and hypotheses

3. Methodology

This study employed a 1x2 between-subjects experimental design to examine how AI service failures influence employees' continuance intention, with a focus on trust, service quality, and AI familiarity as moderating factors. Participants interacted with a fictional generative AI assistant, NEXUS, designed to assist in retrieving company-specific business data.

In the experiment, participants engaged in a simulated chat interaction with NEXUS, requesting a business report on sales data. They were then randomly assigned to one of two failure conditions: minor failure (spelling errors in product names, report remained usable) or major failure (AI-generated fictional products, rendering the report unusable). Following the interaction, participants completed a standardized questionnaire measuring continuance intention, trust, service quality, and AI familiarity. The survey was administered in English or German, ensuring consistency across language versions.

A pretest with 17 participants validated the failure severity and AI familiarity measurements, leading to refinements in the failure conditions. The main study was conducted over two weeks in July 2024, targeting office employees through social media and a network of business transformation consultants at SAP.

A total of 134 participants completed the survey, with 111 valid responses (82%) passing an attention check. Participants were evenly distributed across conditions (48% minor failure, 52% major failure). The sample demographics included:

- Age: 80% between 18-35 years (Mean = 30.5, Median = 27)
- Gender: 50% male, 50% female
- Education: 45% held a master's degree, 38% a bachelor's degree
- Job Roles: 51% in frontline roles (customer-facing), 48% in back-end positions
- Industries: 32% marketing and sales, 23% finance and accounting

By using a controlled experimental setup, this study ensures robust findings on how AI failures impact employee adoption behaviors in workplace settings.

4. Results

The findings confirm that AI service failures significantly impact service quality, trust, and continuance intention, with more severe failures leading to greater declines in user engagement. As shown in Table 4, participants who experienced a major failure, where the AI assistant generated fictional product data, reported significantly lower trust (M = 2.52, SD = 1.24) and service quality (M = 3.15, SD = 1.31) compared to those in the minor failure condition, where the AI only made spelling errors (trust: M = 3.30, SD = 1.24; service quality: M = 4.43, SD = 1.09). A repeated-measures ANOVA further revealed a significant drop in continuance intention after AI failures ($F(1, 109) = 141.93$, $p < .001$), with a greater decline in the major failure group (M = 3.35, SD = 1.60) compared to the minor failure group (M = 4.71, SD = 1.59). These results demonstrate that when AI systems make more severe errors, employees perceive them as significantly less reliable, leading to lower service quality perceptions and reduced willingness to continue using them.

Mediation analysis, presented in Table 5, further explores the mechanisms driving this effect. The results indicate that perceived service quality fully mediates the relationship between AI failure severity and continuance intention (B = -0.55, 95% CI [-0.85, -0.31]), confirming that users discontinue AI usage primarily due to diminished service quality. In contrast, trust does not significantly mediate this relationship (B = -0.10, 95% CI [-0.24, 0.03]), suggesting that while AI failures negatively impact trust, this alone does not directly drive discontinuance. The findings suggest that when AI errors occur, employees primarily base their decision to continue using the system on whether they still perceive it as a useful and high-quality tool, rather than solely on their level of trust in the system.

		Base Model		Interaction Model		
Hypothesis	Structural paths	ß (T-statistic)	Hypothesis supported	AI familiarity Level	ß (T-statistic)	Hypothesis supported
Direct effects						
H1a	AI Failure → SQ	-0.9427***	Yes		-0.3710	No
H2a	AI Failure → TT	-0.6146**	Yes		0.4886	No
Indirect effects						
H1b	AI Failure → SQ → CI	-0.5545**	Yes	Low (3.0)	-0.6764**	Yes
				Medium (5.25)	-0.9839***	
				High (6.25)	-1.1206***	
H2b	AI Failure → TT → CI	-0.0991	No	Low (3.0)	-0.0553	No
				Medium (5.25)	-0.1664	
				High (6.25)	-0.2158	
Interaction effects						
H3a	AI Failure x AI familiarity → SQ		-		-0.1904	No
H3b	AI Failure x AI familiarity → TT		-		-0.2598*	No

*p < 0.10. **p < 0.05. ***p < 0.001

Table 1: Results of mediation and moderation analysis

Beyond these direct effects, AI familiarity plays a moderating role in shaping user responses to AI failures. The analysis reveals a dual effect of familiarity: while higher familiarity with AI correlates with overall higher service quality perceptions ($B = 0.26$, $p = 0.02$), it also increases sensitivity to failures, leading to a stronger decline in continuance intention after AI errors ($B = -0.33$, $p = 0.045$). The Johnson-Neyman technique further illustrates that when AI familiarity exceeds a threshold (≥ 5.8 on a 7-point scale), AI failures significantly reduce continuance intention. This suggests that highly AI-savvy users, who may have greater experience with AI-generated outputs, hold AI systems to a higher standard and react more negatively when failures occur. Unlike less experienced users who may attribute errors to general technological limitations, more knowledgeable users appear to expect AI assistants to perform at near-human accuracy.

The results provide several insights into the impact of AI failures on adoption behavior. AI service failures significantly reduce trust, service quality, and continuance intention, with major failures having a greater impact than minor ones. Service quality fully mediates the relationship between AI failures and discontinuance, while trust does not emerge as a decisive factor in whether users continue using the AI assistant. AI familiarity moderates user responses in two contrasting ways: it enhances overall service quality perceptions but also amplifies the negative effects of failures. These findings highlight the importance of managing employee expectations regarding AI capabilities, as well as the need for organizations to ensure high reliability in AI systems. By fostering AI familiarity through targeted training while simultaneously minimizing severe AI errors, organizations can enhance adoption and mitigate the negative effects of failures on employee engagement.

5. Discussion of the findings

The findings of this study contribute to a deeper understanding of how AI service failures impact employee adoption and highlight the dual role of AI familiarity in shaping user responses. While familiarity with AI generally improves perceptions of service quality and enhances employees' ability to integrate AI into their workflow, it also increases sensitivity to failures. Employees with higher AI familiarity tend to set higher performance expectations for AI assistants, which leads to a stronger negative reaction when the system fails. This suggests that while AI familiarity fosters confidence in the technology, it also raises the risk of frustration and disengagement when AI does not perform as expected.

From a managerial perspective, these findings emphasize the importance of balancing AI training with realistic expectation management. Organizations must ensure that employees gain sufficient exposure to AI to improve their ability to work with such systems while simultaneously acknowledging AI's inherent limitations. Training programs should not only increase familiarity but also set clear expectations regarding the potential for errors, thereby mitigating the disappointment and disengagement that may arise from failures. AI literacy initiatives should educate employees on the strengths and weaknesses of AI, helping them develop a more nuanced understanding of when AI can be relied upon and when human oversight is necessary.

Beyond training and expectation management, the study underscores the need for organizations to prioritize AI system reliability and failure mitigation strategies. Since AI service failures significantly impact employees' willingness to continue using AI tools, companies must focus on minimizing major errors, such as hallucinations, which cause a sharp decline in perceived service quality. This can be achieved by refining AI models, improving the accuracy of training data, and implementing robust validation processes to detect and correct system errors before they impact end users. Additionally, ensuring greater transparency in AI decision-making can

help build resilience against trust erosion. When employees understand how AI arrives at its outputs, they may be more forgiving of errors and more willing to engage with the system after a failure.

Another key takeaway from this study is that different levels of AI familiarity require different forms of support. Less experienced users may need comprehensive onboarding to develop confidence in AI tools, whereas highly familiar users may benefit from advanced customization options that allow them to fine-tune AI-generated outputs. Designing AI systems that provide varying levels of user control—such as allowing experienced users to review and modify AI-generated data—can help accommodate these differences and ensure broader adoption across different employee groups.

Ultimately, AI adoption in organizations depends on two key factors: fostering user familiarity while minimizing disruptive failures. Companies must adopt a dual strategy that enhances AI literacy while continuously improving system reliability. By implementing AI solutions that are transparent, adaptable, and resistant to major failures, organizations can increase employee trust, sustain engagement, and ensure long-term AI adoption.

6. Limitations and future research

This study contributes to the understanding of AI adoption in workplace settings by demonstrating the dual role of AI familiarity in shaping employee responses to AI service failures. While familiarity enhances perceptions of service quality and trust, it also increases sensitivity to failures, leading to stronger negative reactions when AI errors occur. These findings suggest that AI familiarity is a double-edged sword—it facilitates adoption but also raises expectations, making failures more disruptive. Organizations must carefully balance AI training with strategies to minimize errors to ensure sustainable AI adoption.

Despite these insights, the study has several limitations. The experimental design relied on a controlled scenario-based approach, which, while useful for isolating key variables, does not fully replicate the complexities of AI interactions in real workplace environments. Future research should conduct longitudinal studies to track AI adoption over time, assessing how repeated exposure to failures influences employee behavior. Additionally, exploring AI-human collaboration—particularly how employees and AI assistants can effectively complement each other—would provide valuable insights into maximizing AI's benefits while minimizing its risks.

Further studies should also investigate how organizational culture and leadership approaches influence employee responses to AI failures. Understanding whether trust in AI can be restored after failures and what recovery mechanisms are most effective would help refine AI implementation strategies. As AI continues to evolve, research should focus on dynamic AI adoption behaviours, ensuring that organizations can develop AI systems that are both highly functional and resilient to failures, ultimately fostering more effective human-AI collaboration in the workplace

References

Blaurock, M., Büttgen, M., & Schepers, J. (2024). Designing Collaborative Intelligence Systems for Employee-AI Service Co-Production. Journal of Service Research. https://doi.org/10.1177/10946705241238751

Budhwar, P., et al. (2023). Human resource management in the age of generative artificial intelligence: Perspectives and research directions on ChatGPT. Human Resource Management Journal, 33(3), 606–659. https://doi.org/10.1111/1748-8583.12524

Cvetkovic, A., et al. (2024). Do We Trust Artificially Intelligent Assistants at Work? An Experimental Study. Human Behavior and Emerging Technologies, 2024(1), 1602237. https://doi.org/10.1155/2024/1602237

Deloitte (2024). Deloitte Generative AI Survey finds Adoption is Moving Fast, but Organizational Change is Key to Accelerate Scaling. Deloitte Insights. Available at: https://www2.deloitte.com/us/en/pages/about-deloitte/articles/press-releases/deloitte-generative-ai-survey-finds-adoption-is-moving-fast-but-organizational-change-is-key-to-accelerate-scaling.html

Dietvorst, B. J., Simmons, J. P., & Massey, C. (2015). Algorithm aversion: People erroneously avoid algorithms after seeing them err. Journal of Experimental Psychology: General, 144(1), 114–126. https://doi.org/10.1037/xge0000033

Durach, C. F., & Gutierrez, L. (2024). "Hello, this is your AI co-pilot" – Operational implications of artificial intelligence chatbots. International Journal of Physical Distribution & Logistics Management. https://doi.org/10.1108/IJPDLM-01-2024-0031

Horowitz, M. C., et al. (2023). Adopting AI: How familiarity breeds both trust and contempt. AI & SOCIETY. https://doi.org/10.1007/s00146-023-01666-5

Huang, M.-H., & Rust, R. T. (2018). Artificial Intelligence in Service. Journal of Service Research, 21(2), 155–172. https://doi.org/10.1177/1094670517752459

Mahmud, H., et al. (2024). Decoding algorithm appreciation: Unveiling the impact of familiarity with algorithms, tasks, and algorithm performance. Decision Support Systems, 179, 114168. https://doi.org/10.1016/j.dss.2024.114168

Mamun, M. R. A., et al. (2020). Emotional Satisfaction and IS Continuance Behavior: Reshaping the Expectation-Confirmation Model. International Journal of Human-Computer Interaction, 36(15), 1437–1446. https://doi.org/10.1080/10447318.2020.1752478

McKinsey (2023). Economic potential of generative AI. McKinsey Digital. Available at: https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-economic-potential-of-generative-AI-the-next-productivity-frontier#introduction

Parsons, L. (2023). What's the Future of AI in Business? Professional & Executive Development | Harvard DCE. Available at: https://professional.dce.harvard.edu/blog/whats-the-future-of-ai-in-business/

Pavone, G., Meyer-Waarden, L., & Munzel, A. (2023). Rage Against the Machine: Experimental Insights into Customers' Negative Emotional Responses, Attributions of Responsibility, and Coping Strategies in Artificial Intelligence–Based Service Failures. Journal of Interactive Marketing, 58(1), 52–71. https://doi.org/10.1177/10949968221134492

Salesforce (2024). Salesforce Einstein Copilot: Your trusted AI Assistant. Salesforce. Available at: https://www.salesforce.com/einsteincopilot

SAP (2023). The AI Copilot Joule | Artificial Intelligence. SAP. Available at: https://www.sap.com/products/artificial-intelligence/ai-assistant.html

Somers, M. (2024). How generative AI can boost highly skilled workers' productivity. MIT Sloan. Available at: https://mitsloan.mit.edu/ideas-made-to-matter/how-generative-ai-can-boost-highly-skilled-workers-productivity

Srinivasan, R., & Sarial-Abi, G. (2021). When Algorithms Fail: Consumers' Responses to Brand Harm Crises Caused by Algorithm Errors. Journal of Marketing, 85(5), 74–91. https://doi.org/10.1177/0022242921997082

Sun, Y., Li, S., & Yu, L. (2022). The dark sides of AI personal assistant: Effects of service failure on user continuance intention. Electronic Markets, 32(1), 17–39. https://doi.org/10.1007/s12525-021-00483-2

Vázquez-Casielles, R., del Río-Lanza, A. B., & Díaz-Martín, A. M. (2007). Quality of past performance: Impact on consumers' responses to service failure. Marketing Letters, 18(4), 249–264. https://doi.org/10.1007/s11002-007-9018-x

van den Broek, E., Sergeeva, A., & Huysman, M. (2021). When the Machine Meets the Expert: An Ethnography of Developing AI for Hiring. MIS Quarterly, 45(3), 1557–1580. https://doi.org/10.25300/MISQ/2021/16559

Weber, P., Carl, K. V., & Hinz, O. (2024). Applications of Explainable Artificial Intelligence in Finance—a systematic review of Finance, Information Systems, and Computer Science literature. Management Review Quarterly, 74(2), 867–907. https://doi.org/10.1007/s11301-023-00320-0

Weise, K., & Metz, C. (2023). When A.I. Chatbots Hallucinate. The New York Times. Available at: https://www.nytimes.com/2023/05/01/business/ai-chatbots-hallucination.html

Wirtz, J., & Zeithaml, V. (2018). Cost-effective service excellence. Journal of the Academy of Marketing Science, 46(1), 59–80. https://doi.org/10.1007/s11747-017-0560-7

Exploring the Role of Typography in Communicating Brand Responsibility

---

Ludivine GANDRILLE
Ph.D Student
Montpellier Management University
Espace Richter, Rue Vendémiaire, 34000
Montpellier ludivine.gandrille@umontpellier.fr
Tél : +33 (0)6 19 76 91 37

Marie-Christine LICHTLE
Full Professor
Montpellier Management University
Espace Richter, Rue Vendémiaire, 34000
Montpellier marie-christine.lichtle@umontpellier.fr

Véronique PLICHON
Full Professor
IUT - University of Tours
29, rue du Pont-Volant - 37082 TOURS Cedex 2
veronique.plichon@univ-tours.fr

Exploring the Role of Typography in Communicating Brand Responsibility

Theorical framework and lines of research

ABSTRACT

Recent studies have shown that typography plays a fundamental role in communication, influencing the readability, perception and impact of a message.
Through this theoretical article, we want to present a detailed literature review on typography and more precisely on emerging, so-called "responsible" fonts. Then, we want to highlight their impact on a communication strategy.
We will first present an overview of the subject, then explore the potential research axes and the methodology we are considering of our project.

Key words: typography, communication, responsible typography, consumer's perception, consumer's engagement

I- LITERATURE REVIEW: TYPOGRAPHY AS A TOOL FOR RESPONSIBLE COMMUNICATION

INTRODUCTION

Responsible communication has become a major challenge for companies, which must now adapt their strategies to meet increasing demands for transparency, ethics, and sustainability. Typography plays a fundamental role in this context: as a key component of brand identity, it contributes both to the sensory perception of messages and to the decoding of the brand's communication universe. In the context of digital marketing, Lemoine and Zafri (2020) have shown that typography affects users' cognitions, emotions, and behavioral intentions. Fonts are not merely aesthetic choices—they influence message perception, readability, and the overall user experience. Moreover, typography can have a tangible environmental impact. For example, the Ryman Eco font reduces ink usage by up to 33% compared to standard fonts (Özkal, 2017). At the same time, typographic accessibility is gaining momentum: 64% of designers now consider inclusivity a key criterion in font selection (Adobe, 2020), and demand for dyslexia-friendly typefaces continues to grow, with 10% of the global population affected (British Dyslexia Association, 2019). These developments reflect a broader shift toward more ecological, inclusive, and accessible design.

This article explores these emerging trends and examines the challenges they raise for brands and design professionals. Following a review of the existing literature, we will identify research gaps and consider the strategic opportunities offered by responsible typography in contemporary communication.

A- Typography: definition and strategic issues in marketing

1. Definition

Typography emerged with the invention of movable type printing by Gutenberg in the 15th century. It is defined as "*the art of formatting characters contained in a written message in order to convey an idea. This formatting, which involves the choice of a font style, the arrangement of spaces, and the harmonization of visual elements, aims to achieve an adaptation between typography and the advertisement*" (Amar, 2014). This definition emphasizes the importance of the graphic treatment of text as an integral part of message design. Several authors (McCarthy & Mothersbaugh, 2002) have stressed this multidimensional nature of typography, which has become increasingly complex due to the vast number of fonts available since the 20th century and the multiple classification systems developed to organize them (Thibaudeau, 1921; Laliberté, 2004; the Atypi classification initially presented by Maximilien Vox).

2. A key element for the marketing strategy of companies

Typography plays a central role in marketing by influencing message perception, consumer engagement, and brand credibility. As Drucker (2011) notes, writing is not limited to textual content—it also has a graphic dimension that fundamentally shapes the reader's experience. Douglas (2007) identifies several effects supported by research, including readability, emotional resonance, brand identification, and visual hierarchy.

More recent studies confirm the impact of typography on consumers' perceptions of brand personality, trustworthiness, and product quality (Kulczynski & Hook, 2024). Typography thus goes beyond aesthetics; it actively shapes consumer engagement and decision-making. Henderson, Giese, and Cote (2004), for instance, demonstrated that congruence between typeface style and brand positioning enhances message effectiveness and improves brand recall, highlighting the strategic value of typographic consistency.

Readability—an essential component of comprehension—can improve reading speed and memory retention by up to 30% (Dyson & Haselgrove, 2001), thereby increasing the

effectiveness of advertising content. Furthermore, typography influences consumers' emotional responses and attitudes toward brands (Giese et al., 2014). For example, some fonts are perceived as more friendly (e.g., Comic Sans), while others are seen as more professional (e.g., Helvetica) (Hyndman, 2016). Typography also contributes to brand perception by shaping judgments about credibility and authenticity (Shaikh & Chaparro, 2004).
While professional practice has clearly embraced the topic of typography in the context of responsible communication, academic research on the subject remains scarce. Yet, in striving for credible responsible communication, companies are expected to carefully design their communication materials (Parguel & Benoît-Moreau, 2007). Some brands, such as Patagonia and Unilever, have even reworked their visual identity to incorporate sustainability values while preserving brand recognition (Turafy, 2025).
Today, companies face new challenges related to inclusivity and sustainability. According to *e-marketing.fr*, companies that have adopted a CSR (Corporate Social Responsibility) strategy have seen their turnover increase by 20% and their performance improve by 13%. In this context, the rise of inclusive fonts—designed to facilitate reading for dyslexic individuals (Klein, 2010) or to support gender-neutral communication—and ecological fonts—aimed at reducing ink consumption or optimizing digital display (Bigelow et al., 2011)—illustrate a growing awareness that typography can be a meaningful lever for social and environmental engagement.
By integrating these new dimensions, typography no longer merely structures information; it actively contributes to the expression of brand responsibility and alignment with consumer values. These elements clearly demonstrate that typography is a powerful lever for influencing message perception and brand identity. Companies must rethink their typographic communication not only to strengthen visual and cognitive impact, but also to express their social and environmental commitments. In this sense, typography evolves into a true marker of values and a tool for more responsible communication.

B- Typography and Corporate Social Responsibility: towards more sustainable and inclusive communication

CSR strategies revolve around key pillars: environmental, social, ethical, and societal dimensions. Within this framework, designers and typographers have rethought typographic strategies by developing new fonts and layout recommendations aligned with responsible communication objectives:

1. Toward ecological typography

A study by Bigelow et al. (2011) explored how typographic choices can influence ink and paper consumption, thereby contributing to more environmentally friendly printing practices. The researchers demonstrated that adjusting margins, line spacing, and font sizes can reduce page count by 27% to 48%. Moreover, replacing bulky, ink-intensive fonts with more compact typefaces enables spatial optimization without compromising readability. For example, the DejaVu Sans font was modified to create a lighter version—DejaVu Sans Light Thesis—allowing significant ink savings while maintaining legibility.
Additionally, the study found that Times New Roman is more ink-efficient than Century Gothic. An analysis conducted by the University of Novi Sad in Serbia (Milošević et al., 2016) showed that using eco-friendly fonts can reduce toner consumption by up to 39%. Furthermore, research by Shaikh and Fox (2018) revealed that environmental campaigns employing eco-conscious typefaces such as Ecofont saw a 12% increase in audience engagement, highlighting the strategic role typography can play in promoting sustainability.

2. Typography: ensuring legibility for all readers

In October 2024, the French Dyslexia Federation[1] reported that nearly 7 million people in France—approximately 10% of the population—are affected by dyslexic disorders. A study conducted at the University of Ljubljana (Švajger, 2017) confirmed that certain typographic adjustments—such as increased word spacing or the use of fonts like OpenDyslexic—help improve reading fluency for dyslexic individuals, reducing fatigue and enhancing comprehension.

Russell-Minda et al. (2007) also demonstrated that increasing font size, using sans-serif typefaces, and optimizing contrast significantly improve readability for older adults and people with visual impairments. Similarly, the Luciole typeface was specifically designed by a team of professional designers and medical experts to meet the visual needs of people with low vision.

Žufić et al. (2019) examined how typography and contrast affect digital accessibility. They emphasized the importance of high contrast (e.g., black text on white background), avoiding problematic color combinations for colorblind users (e.g., red/green, blue/purple), and favoring sans-serif fonts such as Arial or Verdana. The researchers also recommended increasing line spacing, limiting line length, and offering personalization options for visually impaired users.

Finally, Pinheiro and Moreira da Silva (2013) studied readability among older adults and highlighted the importance of readable fonts (such as sans-serif or well-structured serif typefaces like Georgia), greater letter spacing, and high contrast. They advised against the use of italics, all caps, and overly light backgrounds, which can cause visual discomfort or glare.

3. Inclusive and gender-neutral typography: an ethical imperative

As CSR strategies increasingly incorporate ethical considerations, typography has emerged as a vector of inclusion and representation. Nedeljković et al. (2014) demonstrated that typography can increase both the perceived quality of a brand or product and its overall brand equity. A 2023 study further revealed that 79% of French consumers say they would “definitely” or “probably” stop purchasing from brands that fail to demonstrate sufficient ethical commitment. While several studies have shown that typefaces can carry gendered connotations—being interpreted as masculine or feminine (White, 1988; Baylis, 1955)—the Franco-Belgian typographic collective Bye Bye Binary (BBB)[2] is actively challenging this tradition. Their work focuses on developing new graphic and typographic forms adapted to the French language, notably through the creation of inclusive and non-binary glyphs. One notable project is BBB Baskervvol, a reinterpretation of the classic Baskerville typeface enriched with inclusive signs. By eliminating visual distinctions between uppercase and lowercase letters or adopting neutral glyphs, these typefaces challenge the gendered norms embedded in many languages and visual systems. As such, they become valuable tools for brands seeking to reflect evolving social norms and engage with diverse audiences without excluding any identities.

In a context where accessibility and diversity are becoming essential pillars of responsible communication, gender-neutral and non-binary typefaces offer brands a concrete way to embody their values. They help foster inclusivity and build trust with a broader audience. Supporting this idea, a study on brand equity and gender perception conducted by Lieven (2018) concluded that androgynous brands tend to benefit from higher brand equity.

II- PROPOSAL FOR RESEARCH AXES: CAN TYPOGRAPHY SERVE SOCIETAL AND RESPONSIBLE COMMUNICATION PURPOSES?

Birth et al. (2008) define CSR communication as "communication designed and disseminated by the company for its stakeholders and society, based on its investment in the sustainable

[1] https://www.ffdys.com

[2] https://typotheque.genderfluid.space/fr

development of its activities." According to them, responsible communication includes elements such as the company's mission, vision and values, working conditions, social dialogue, human rights, societal involvement, local economic development, environmental concerns, market relations, and ethics. ADEME outlines five essential principles for responsible communication: sobriety, transparency, awareness of impacts, stakeholder integration, and clarity of evidence.

For Van de Ven (2008), it is crucial for companies to communicate about their CSR efforts to avoid discrepancies between their actual sustainable practices and stakeholders' perceptions. Gallais (2010) also argues that companies must align their communication strategies with consumers' expectations, which are increasingly influenced by cultural and political awareness of global challenges. Similarly, Parguel (2010) suggests that a company failing to communicate about its responsible initiatives may be perceived as lacking engagement in sustainable development. Moreover, poorly managed communication can lead to serious reputational risks, including accusations of greenwashing or credibility loss (Du & Bhattacharya, 2010; Marens & Wicks, 1999; Smith & Palazzo, 2011).

These perspectives underscore the importance of adopting a multidimensional approach to "responsible communication," which integrates societal, ethical, and ecological values into the corporate strategy.

This paper opens the door to several avenues for future research. Each axis is grounded in a specific theoretical framework, offering the opportunity for targeted and nuanced investigations:

- **Can the use of gender-neutral typography by a brand enhance perceptions of inclusivity, credibility, or authenticity?**

It would be relevant to examine consumer responses to the use of gender-neutral typographic design—particularly regarding purchase intention and emotional engagement. Prior studies have shown that typography influences consumers' emotional responses and purchasing behavior when aligned with a brand's perceived values (Henderson, Giese & Cote, 2004). Thus, gender-neutral typography, which avoids visual cues traditionally associated with masculinity or femininity, could improve brand credibility among consumers sensitive to inclusion and diversity, especially younger generations.

Furthermore, the perceived gender of a brand influences its "added value" (Farquhar, 1989, p. 24), suggesting that typographic neutrality may align with contemporary expectations of brand equity and fairness. This line of inquiry invites a deeper exploration of the intersection between typographic design and societal values regarding gender and inclusivity.

- **Could the widespread use of "responsible" typography backfire—leading to perceptions of greenwashing or woke-washing?**

Research indicates that typography shapes both emotional and cognitive responses (Velasco et al., 2015). However, the strategic use of typography to visually signal responsibility or inclusivity may also be perceived as superficial or manipulative—especially when unaccompanied by substantive commitments. This opens the possibility of backlash in the form of accusations of greenwashing or woke-washing.

Marquis, Glynn, and Davis (2007) analyze how CSR strategies may align with broader institutional norms, while Banet-Weiser (2012) explores how brands co-opt social causes without sacrificing profitability. In this context, it would be worthwhile to investigate whether the use of gender-neutral or eco-conscious typefaces is interpreted as genuine commitment or strategic signaling, and how this affects consumer trust.

- **Typography and transparency in CSR: Can typographic choices be a reliable indicator of genuine CSR engagement, or do they risk masking unsustainable practices under a veneer of authenticity?**

According to the 2020 Responsible Influence Observatory report by the ARPP[3], more than one in four communications lacked transparency regarding CSR partnerships. This raises the question of whether typography—used as a semiotic and semantic tool—can truly reflect a brand's CSR commitments or simply create an illusion of authenticity.
Typography affects perceptions of message credibility and clarity (Brumberger, 2003), and conveys personality traits that shape trust and perceived sincerity (Shaikh, Chaparro & Fox, 2006). Consequently, research could examine whether certain typographic styles reinforce or undermine transparency in CSR communications, particularly when companies operate in industries facing environmental or ethical scrutiny.

- **Ethical typography and accessibility: Do typefaces designed as "ethical" or "responsible" truly enhance accessibility and message retention across all audiences? Should their use be generalized?**

This final research question explores whether so-called ethical or responsible typefaces effectively improve communication accessibility. This issue is especially relevant in marketing, where readability directly influences message clarity and retention. Some minimalistic or ecologically optimized fonts—despite their aesthetic appeal—may compromise legibility for visually impaired users, individuals with DYS disorders, or children.
In contexts such as product labeling, advertisements, or digital content, poorly chosen typography may exclude vulnerable populations and reduce message effectiveness. Therefore, it is crucial to assess whether responsible typographic design can reconcile ecological, ethical, and accessibility goals—and whether its broader adoption would contribute to more inclusive communication practices.

III- DISCUSSION AND CONCLUSION

Typography is not merely an aesthetic element—it plays a pivotal role in shaping perceptions of credibility, authenticity, and brand personality. While its influence on consumer perception is well-documented in marketing and design literature (Brumberger, 2003; Velasco et al., 2015; Shaikh, Chaparro & Fox, 2006), its specific contribution to the communication of social and environmental responsibility remains relatively underexplored. Yet, in a context where CSR communication has become critical for fostering trust, stakeholder engagement, and brand reputation (Isenmann, 2006), typography—an essential component of visual identity (Barros & Martins, 2008)—warrants closer scrutiny within the framework of responsible branding.
Our doctoral research seeks to address this gap by investigating how certain typographic features may be perceived as "responsible" by consumers, and how such design choices can contribute to authentic CSR communication. This includes examining the extent to which typography can reinforce ethical brand narratives without triggering consumer skepticism or accusations of greenwashing and woke-washing (Banet-Weiser, 2012).
The theoretical contribution of this work will be anchored in a qualitative methodology combining a critical literature review, the development of a taxonomy of "responsible" typographies, and an in-depth analysis of CSR-oriented branding strategies with a particular focus on typographic and visual tools. To consolidate the academic foundations, a systematic literature review or bibliometric analysis is also under consideration.
Empirical research will begin with semi-structured interviews involving graphic designers, typographers, and communication professionals to capture current practices and professional perceptions. A subsequent quantitative phase is planned to assess consumer reactions to various typographic choices perceived as aligned—or misaligned—with principles of responsibility and sustainability. Ultimately, this research aims to produce a set of strategic recommendations and good practices for organizations seeking to align their typographic choices with values of sustainability, inclusion, and ethics. These guidelines will support companies in enhancing the clarity, credibility, and authenticity of their responsible communication strategies.

[3] https://www.arpp.org

REFERENCES

Amar, J. (2014). Vers une meilleure compréhension des effets de la typographie en comportement du consommateur : de la lisibilité de l'information à la persuasion publicitaire, Université de Bretagne Sud.

Banet-Weiser, S. (2012). Authentic™: The Politics of Ambivalence in a Brand Culture. New York University Press.

Barros, T., Martins, F. (2008). Corporate brand identity–a conceptual redefinition.

Bigelow, C., Dowd-Hinkle, D. J., Horowitz, D., & Voorhees, G. (2011). Sustainable by Design: An Investigation into Ecologically Friendly Typography. Rochester Institute of Technology.

Birth, G., Illia, L. Lurati, F., Zaparini, A. (2008). Communicating CSR: practices among Switzerland's Top 300 Companies.

Brumberger, E. R. (2003). The rhetoric of typography: The awareness and impact of typeface appropriateness, technical communication, 50, 2, 224-231.

Celhay, F. (2014). Impact du design du logo et du nom de la marque : un effet du double ancrage.

Chaparro, Barbara & Shaikh, A. & Chaparro, Alex. (2006). The legibility of cleartype fonts.

Douglas, K. (2007). Design for Communication: Conceptual Graphic Design Basics.

Drucker, J. (2011). Graphesis: Visual Forms of Knowledge Production. Harvard University Press.

Du, S., & Bhattacharya, C. B. (2010). Doing well by doing good: Corporate social responsibility and brand attitude. Journal of Consumer Marketing, 27(4), 395-404.

Dyson, M. C., & Haselgrove, M. (2001). The influence of reading speed and line length on the effectiveness of reading from screen. International Journal of Human-Computer Studies

Farquhar, P. (1989). Managing Brand Equity. Marketing Research.

Gallais, V. (2010), Du marketing à la consommation responsable. Écologie & politique n°39.

Giese, Joan L., Keven Malkewitz, Ulrich R. Orth, and Pamela W. Henderson. (2014). Advancing the aesthetic middle principle: Trade-offs in design attractiveness and strength. Journal of Business Research, 67 (6), 1154–61.

Henderson P. W., Giese, J. L. et Cote J. A. (2004). Impression management using typeface design, Journal of marketing, 68, 4, 60-72.

Hyndman, S. (2016). Why Fonts Matter. Virgin Books, Londres.

Klein, V (2010). Influence de la typographie sur l'aisance de lecture d'une population d'enfants dyslexiques.

Isenmann, R. (2006). CSR online: Internet based communication. In J. Jonker & M. De White (Eds.), Management models for corporate social responsibility (pp. 246–253).

Kulczynski, A., & Hook, M. (2024). Typography Talks: Influencing Vintage Anemoia and Product Safety Perceptions with Vintage Typography. Journal of Marketing, 88(4), 129-153. https://doi.org/10.1177/00222429231215357

Laliberté J. (2004). Formes typographiques : historique, anatomie, classification. Laval, Presses Université Laval, 2004.

Lemoine J-F et Zafri R (2020). Typographie des sites web marchands et réactions des internautes : le cas de la taille de caractère.

Lieven, T. (2018). Brand Gender. Increasing Brand Equity through Brand Personality.

Lupton, Ellen (2010). Thinking with Type: A Critical Guide for Designers, Writers, Editors, & Students. New York: Princeton Architectural Press.

Marens, R., & Wicks, A. C. (1999). Getting real: Stakeholder theory, managerial practice, and the general irrelevance of fiduciary duties owed to shareholders. Business Ethics Quarterly, 9(2), 273-293.

Marquis, C., Glynn, M. A., & Davis, G. F. (2007). Community isomorphism and corporate social action. Academy of Management Review, 32(3), 925-945.

McCarthy M.S. et Mothersbaugh D.L. (2002), Les effets de la typographie sur la persuasion publicitaire : un modèle général et des tests empiriques préliminaires, Recherche et Applications en Marketing, 17, 4, 67-89.

Milošević, R., Nedeljković, U., Banjanin, B., Novaković, D., & Kašiković, N. (2016). The analysis of ink jet printed eco-font efficiency. Journal of Graphic Engineering and Design.

Nedeljković, U. Pintjer, I. Puškarević, I. (2014). Typeface Persona: A Review Study.

Özkal, O. (2017). Letters against letters: typography as a mean for design activism

Parguel B. (2010). La communication sociétale vs communication responsable. 50 fiches sur le marketing durable, Bréal, 120-123.

Pinheiro, C. and Moreira Da Silva, F. Colour. (2013). Typography & Aged Vision -An Inclusive Design approach. AIC 2013 Bringing colour to Life - 12th International AIC Colour Congress, Volume 3 (pp 1225-1228), Newcastle.

Rello, L., et Baeza-Yates, R. (2013). Good fonts for dyslexia.

Russell-Minda, E., Jutai. J., Strong G., Kent A., Gold, D., Pretty, L., and Wilmot, L. (2007). The Legibility of Typefaces for Readers with Low Vision: A Research Review.

Shaikh, A. D. et Chaparro, B. S. (2004). The Impact of Typeface Appropriateness on Perceptions of Document Quality and Readability. Usability News, 6(2).

Shaikh, A. et Fox, L. (2018). Typography and Public Engagement in Environmental Campaigns. Journal of Environmental Psychology, 60, 15-22.

Smith, N. C., & Palazzo, G. (2011). "The moral legitimacy of CSR initiatives: Lessons from the global financial crisis." Business Ethics Quarterly, 21(2), 297-322.

Švajger, A. (2017). Readability of typography for dyslexics.

Thibaudeau F. (1921). La lettre d'imprimerie. Origine, développement, classification, Paris, Bureau de l'Édition.

Turafy, A. (2025). Integrating sustainable design features with visual identity of the brand. The Arab International Journal of Digital Art and Design, 4(Special Issue), 103–122. Proceedings of the International Conference on Green Design and Smart Cities, El Gouna, Egypt, 24–26 January 2025.

Van de Ven, B., (2008). An ethical framework for the marketing of corporate social responsibility. Journal of Business Ethics 82 (2):339-352.

Velasco et al. (2015). The taste of typefaces. Department of experimental psychology, Oxford.
Zufic, J. and Pogarcic, I. (2019) Colors, Contrasts and Typography in the Design of ecourses. Journal of Multimedia Processing and Technologies.

Branding with Letters: The Impact of Typography on Perceived Brand Longevity

Weixi Kou
Université de Lorraine, CEREFIGE, F-54000 Nancy, France

Franck Celhay
MBS School of Business

Mathieu Kacha
Université de Lorraine, CEREFIGE, F-57000 Metz, France

Fabien Pecot
TBS Business School, Barcelona, Spain

CORRESPONDING AUTHOR :

Weixi Kou
Université de Lorraine, CEREFIGE, F-54000 Nancy, France

CEREFIGE
23-25 Rue Baron Louis
54000 Nancy
France

weixi.kou@univ-lorraine.fr
+33 (0) 7 67 38 99 96

Branding with Letters: The Impact of Typography on Perceived Brand Longevity

ABSTRACT :

Choosing brand typography is a key challenge for companies aiming to convey an accurate sense of brand longevity. Prior research has linked typography to perceived brand longevity, showing that “vintage” typefaces evoke nostalgia, foster emotional connections, and convey security. This study examines the role of type design variables, particularly the presence or absence of serifs, in shaping these perceptions. It also identifies the design dimensions that contribute to brand longevity. By analyzing the influence of Serif and Sans Serif typefaces, this research offers valuable insights and practical tools for understanding the impact of typography on brand perception.

KEYWORDS :

Perceived longevity, Typography, Branding, Design, Communication

Branding with Letters: The Impact of Typography on Perceived Brand Longevity

BACKGROUND

Typography plays an important role in brand communication (Childers & Jass, 2002; McCarthy & Mothersbaugh, 2002; Pan & Schmitt, 1996; Tantillo et al., 1995). It transfers meanings resulting both from the words it allows to transcribe and from the visual aspect of these words (Celhay et al., 2020; Rose et al., 2017).

Prior research has shown that typography as a part of the brand visual elements, allows in particular to suggest an impression of brand longevity (Celhay et al., 2020; Kulczynski & Hook, 2024; Pecot et al., 2018). Brand longevity refers to the duration of a brand's existence and continued presence in the marketplace over time (Desai et al., 2008; Pecot et al., 2022). Previous research has confirmed the "older is better" effect; that is, perceived brand longevity has a positive impact on consumers' preference (Baumert & de Obesso, 2021; Desai et al., 2008; Eidelman et al., 2010; Jie, 2020; Kim & Srivastava, 2024; Pecot et al., 2022). Celhay, Magnier, *et al.* (2020) focused on Neo-retro style packaging and found that combining various typographic styles enhances the brand's retro perception. Pecot *et al.* (2018) discovered that using Serif typefaces in brand logos can serve as a subtle cue for consumers to perceive longevity. Kulczynski & Hook (2024) compared typographies from different historical artistic periods and found that typography evokes feelings of vintage anemoia and enhances perceived product safety.

Design research established that people perceive Serif typefaces as older than Sans Serif typefaces (Blanchard, 1998). Surprisingly, no marketing research has checked whether this perception of a typeface's oldness in a logo is transferred to the brand, and through which dimension of the typeface design dimension. Yet, this information will help researchers interested in visual branding, and managers willing to communicate longevity without using a specific date.

THEORETICAL BACKGROUND AND PROPOSITIONS

Theory of meaning

Building on Meyer's (1956) foundational work, marketing research has extensively examined how aesthetic stimuli like music or color influence consumers' interpretation of abstract meanings through two pathways: referential and embodied (Labrecque, 2020; Zhu & Meyers-Levy, 2005). Referential meanings arise from a network of semantic associations triggered by the stimulus. These associations are not inherent to the stimulus itself but are attached to it through repeated exposure in specific cultural contexts (Labrecque & Milne, 2012; Meyer, 1956). Embodied meanings, in contrast, were originally defined as intrinsic to the stimulus, tied to its physical characteristics (Meyer, 1956).

This paper proposes that typography serves as an aesthetic stimulus conveying both referential and embodied meanings. For example, blackletter typefaces symbolize seniority due to their cultural history (referential meaning), while bold fonts evoke robustness based on our physical experience of sturdy, thick objects (embodied meaning). Applying these considerations to this research, the question here is whether the meaning of longevity (vs. modernity) associated with Serif (vs. Sans Serif) typefaces is of the embodied or referential type.

Meaning of Serif and Sans Serif typefaces

Fig. 1. Illustration of serif elements

The presence (vs. absence) of serif elements is a typographic variable that allows to distinguish two sub-categories of non-script typefaces (see fig. 1). Serif typefaces, on the one hand, retain in their design visual attributes such as serif elements, but also more contrasting solids and strokes, bringing them closer to their calligraphic origins than Sans Serifs. Sans Serif typefaces, on the other hand, have more geometric and simplified forms, which make them more akin to the principle of machine-making standardization. Henderson et al. (2005; 2004) proposed a classification system for typefaces based on six design dimensions: elaborateness, harmony, naturalness, flourish, weight, and compression. The former three pertain to artistic aspects of typeface design, the later three describe font variations within a typeface family. In this research, we focus on elaborateness, harmony, and naturalness.

From a holistic perspective, Serif typefaces are slightly more elaborate and natural than Sans Serifs, being both more complex and closer in design to handwritten letters (Henderson et al., 2004). These traits are logically linked to a more traditional, older style of writing, which may contribute to an impression of brand longevity. Pecot et al. (2018) found that Serif logos conveys a sense of longevity. However, the logos generated in that study were also decorated with various illustrations, which may have influenced perceptions. To our knowledge, limited research has explored the isolated effects of the serif versus sans serif style of typeface on perceived brand longevity.

Thus, does the choice of a serif versus sans serif style of typeface in a brand logo influence perceived brand longevity? If so, what design dimensions drive these perceptions? We are going to explore this question with a series of empirical studies.

STUDY 1

Methodology

In this study, we aimed to examine whether the serif elements influence consumers' perception of brand longevity. We used the measure of perceived longevity developed by Pecot et al. (2018, 2022), and adapted it to a five-item Likert scale to assess the perceived longevity of a fictitious consumable brand's logo. Two versions of the logo, one in Serif and the other in Sans Serif, were designed. Each participant was randomly exposed to only one of the two logos according to a between-subject experimental design (Serif vs. Sans Serif). Participants from the UK were informed that a French confectionery would be setting up in their country and opening a local store. They were then asked to express their opinion of the logo design in terms of the five statements relating to the brand's perceived longevity, by selecting from a 5-point scale ranging from "strongly disagree" to "strongly agree". The average score of the five statements was then calculated. The scores thus obtained reflect the respondents' perception of the brand's longevity.

Independent t-tests were then used to compare the mean scores for perceived brand longevity in the Serif and Sans Serif conditions in the two countries.

Results

152 respondents (67.11% female; M_{age} = 40.26) were recruited and exposed to one of the logos. A significant difference was observed between the mean score for logos in Sans Serif (M = 3.20; SD = 0.66) versus Serif (M = 3.62; SD = 0.83), t(150) = 3.437; p < 0.001 (one-tailed). These results suggest that the use of a Serif typeface does increase the perception of brand longevity compared to a Sans Serif typeface.

STUDY 2

Methodology

In the second study, we aimed to verify the effect of Sans Serif vs. Serif typographies on perceived longevity, as well as to explore whether this effect is driven by the typeface perceived elaborateness, naturalness, and harmony. Two visual stimuli were generated for this study. Each stimulus is one table of uppercase and lowercase alphabet letters, either in Sans Serif or in Serif. Respondents were instructed to give their opinions toward the typography designs on four series of four statements regarding perceived longevity, elaborateness, naturalness, and harmony, by selecting from a 9-point scale ranging from "strongly disagree" to "strongly agree". Statements were adapted from previous researches of Pecot et al (2018, 2022) and other researches on typography (Henderson et al., 2004; Henderson & Cote, 1998; Liu et al., 2019; Moszkowicz, 2011; Pieters et al., 2010; Schroll et al., 2018). Subsequently, the mean score for each series of four items was calculated. Independent t-tests and mediation analysis were then employed to compare the mean scores of perceived brand longevity across Sans Serif and Serif conditions.

Results

250 respondents (69.20% female; M_{age} = 41.40) from the UK participated in the study. Each respondent was exposed to one of the typography designs. A series of mediation analysis was conducted using the Hayes PROCESS macro (Model 4), where perceived longevity served as the dependent variable (DV), perceived design dimensions (elaborateness, naturalness and harmony) as mediators, and typography designs (Sans Serif vs. Serif) as independent variables (IV).

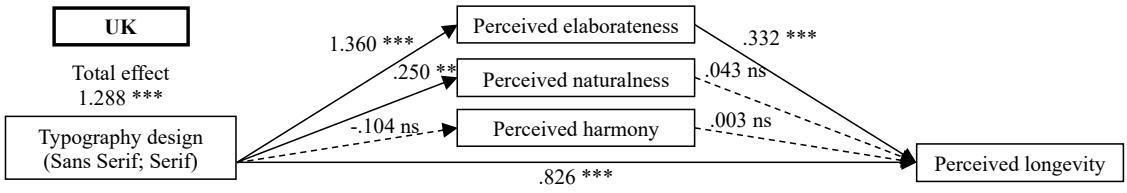


Fig. 2. Study 2: Mediation analysis (**=sig at the 0.01 level ***= sig at the 0.001 lever)

The analysis revealed a significant direct effect of typography design on perceived longevity (b = .826, t = 3.950, p = .000), as well as a total effect of typography design on perceived longevity (b = 1.288, t = 6.918, p = .000), mediated by perceived elaborateness. The results align with previous findings that Serif typography enhances perceived brand longevity. Moreover, this

effect is partially mediated by perceived elaborateness. While the two typefaces differ significantly in perceived naturalness, this difference does not influence perceptions of brand longevity.

CONCLUSION AND FUTURE RESEARCH

The results from the comparisons of logo designs and typeface sets illustrate the significant impact of typeface choices on perceived brand longevity. These findings underscore the importance of carefully selecting brand typography and encourage both scholars and practitioners to consider typeface design dimensions in their decision-making processes.

This work is of theoretical interest for several reasons. First, it crosses the typeface design dimensions with the perceived brand longevity. While scholars previously mentioned this articulation, there is still a gap on the literature about the influence of typography design on perceived longevity, both culturally and aesthetically, from referential and embodied meaning aspects. Second, it contributes to the measure of perceived longevity, elaborateness, naturalness, and harmony in brand typographic logo design context, through the development of new scales and the extension of existing scales. In addition to its theoretical contributions, this work also offers a framework for marketers to better adapt the brand typography and to communicate correctly the brand longevity to the audience. Despite these contributions, this research has certain limitations. First, only two types of typefaces were examined, limiting the scope of the findings. Second, the results remain general and do not provide detailed, actionable insights. Future research could address these limitations by exploring a wider variety of typefaces inspired by different art styles or by focusing on specific business sectors to uncover more nuanced implications.

REFERENCES

Baumert, T., & de Obesso, M. de las M. (2021). Brand antiquity and value perception: Are customers willing to pay higher prices for older brands? *Journal of Business Research*, *123*, 241–254. https://doi.org/10.1016/j.jbusres.2020.09.060

Blanchard, G. (1998). *Aide au choix de la typographie*. Atelier Perrousseaux.

Celhay, F., Magnier, L., Schoormans, J., & Last, F. (2020). Hip and Authentic. Defining Neo-Retro Style in Package Design. *International Journal of Design*, *14*(1).

Childers, T. L., & Jass, J. (2002). All Dressed up with Something to Say: Effects of Typeface Semantic Associations on Brand Perceptions and Consumer Memory. *Journal of Consumer Psychology*, *12*(2), 93–106.

Desai, P. S., Kalra, A., & Murthi, B. P. S. (2008). When Old Is Gold: The Role of Business Longevity in Risky Situations. *Journal of Marketing*, *72*(1), 95–107.

Eidelman, S., Pattershall, J., & Crandall, C. S. (2010). Longer is better. *Journal of Experimental Social Psychology*, *46*(6), 993–998. https://doi.org/10.1016/j.jesp.2010.07.008

Henderson, P. W. (2005, April 1). Just My Type. *Harvard Business Review*, *April 2005*. https://hbr.org/2005/04/just-my-type

Henderson, P. W., & Cote, J. A. (1998). Guidelines for selecting or modifying logos. *Journal of Marketing*, *62*(2), 14–30. https://doi.org/10.2307/1252158

Henderson, P. W., Giese, J. L., & Cote, J. A. (2004). Impression management using typeface design. *Journal of Marketing*, *68*(4), 60–72. https://doi.org/10.1509/jmkg.68.4.60.42736

Jie, Y. (2020). Older is better: Consumers prefer older drugs: Psychology & Marketing. *Psychology & Marketing*, *37*(11), 1498–1510. https://doi.org/10.1002/mar.21395

Kim, Y., & Srivastava, J. (2024). The "Achilles Heel" of Established Brands: The Effect of Brand Age on Consumers' Brand Choice: Journal of Marketing Research (JMR). *Journal of Marketing Research (JMR)*, *61*(2), 290–306. https://doi.org/10.1177/00222437231178544

Kulczynski, A., & Hook, M. (2024). Typography talks: Influencing vintage anemoia and product safety perceptions with vintage typography. *Journal of Marketing*, 1–25. https://doi.org/10.1177/00222429231215357

Labrecque, L. I. (2020). Stimulating the senses: An introduction to part two of the special issue on sensory marketing. *Psychology & Marketing*, *37*(8), 1013–1018. https://doi.org/10.1002/mar.21366

Labrecque, L. I., & Milne, G. R. (2012). Exciting red and competent blue: The importance of color in marketing. *Journal of the Academy of Marketing Science*, *40*(5), 711–727. https://doi.org/10.1007/s11747-010-0245-y

Liu, S. Q., Choi, S., & Mattila, A. S. (2019). Love is in the menu: Leveraging healthy restaurant brands with handwritten typeface. *Journal of Business Research*, *98*, 289–298. https://doi.org/10.1016/j.jbusres.2019.02.022

McCarthy, M. S., & Mothersbaugh, D. L. (2002). Effects of typographic factors in advertising-based persuasion: A general model and initial empirical tests. *Psychology & Marketing*, *19*(7–8), 663–691. https://doi.org/10.1002/mar.10030

Meyer, L. B. (1956). *Emotion and meaning in music*. The University of Chicago Press. https://archive.org/details/emotionmeaningin0000meye_y9x1

Moszkowicz, J. (2011). Gestalt and Graphic Design: An Exploration of the Humanistic and Therapeutic Effects of Visual Organization. *Design Issues*, *27*(4), 56–67.

Pan, Y., & Schmitt, B. (1996). Language and Brand Attitudes: Impact of Script and Sound Matching in Chinese and English. *Journal of Consumer Psychology*, *5*(3), 263–277. https://doi.org/10.1207/s15327663jcp0503_03

Pecot, F., Merchant, A., & De Barnier, V. (2022). Why and when is older better? The role of brand heritage and of the product category in the evaluation of brand longevity. *Journal of Business Research*, *140*, 533–545. https://doi.org/10.1016/j.jbusres.2021.11.021

Pecot, F., Merchant, A., Valette-Florence, P., & De Barnier, V. (2018). Cognitive outcomes of brand heritage: A signaling perspective. *Journal of Business Research*, *85*, 304–316. https://doi.org/10.1016/j.jbusres.2018.01.016

Pieters, R., Wedel, M., & Batra, R. (2010). The Stopping Power of Advertising: Measures and Effects of Visual Complexity. *Journal of Marketing*, *74*(5), 48–60.

Rose, M., Rose, G. M., & Merchant, A. (2017). Is Old Gold? How Heritage "Sells" The University to Prospective Students: The Impact of a Measure of Brand Heritage On Attitudes toward the University. *Journal of Advertising Research*, *57*(3), 335–351. https://doi.org/10.2501/JAR-2017-038

Schroll, R., Schnurr, B., & Grewal, D. (2018). Humanizing Products with Handwritten Typefaces. *Journal of Consumer Research*. https://doi.org/10.1093/jcr/ucy014

Tantillo, J., Lorenzo-Aiss, J. D., & Mathisen, R. E. (1995). Quantifying perceived differences in type styles: An exploratory study. *Psychology & Marketing*, *12*(5), 447–457. https://doi.org/10.1002/mar.4220120508

Zhu, R. (Juliet), & Meyers-Levy, J. (2005). Distinguishing between the Meanings of Music: When Background Music Affects Product Perceptions. *Journal of Marketing Research*, *42*(3), 333–345.

DOES THE TYPE OF AUGMENTATION AFFECT INTERNET USERS' REACTIONS IN A VIRTUAL TRY-ON SITUATION? A QUALITATIVE STUDY.

JEAN-FRANÇOIS LEMOINE
FULL PROFESSOR
PRISM - UNIVERSITÉ PARIS 1 PANTHÉON-SORBONNE
ESSCA SCHOOL OF MANAGEMENT
Jean-François.Lemoine@univ-paris1.fr

SARRA MSAKNI
P.H.D RESEARCHER
PRISM - UNIVERSITÉ PARIS 1 PANTHÉON-SORBONNE
Sarra.Msakni@univ-paris1.fr

DOES THE TYPE OF AUGMENTATION AFFECT INTERNET USERS' REACTIONS IN A VIRTUAL TRY-ON SITUATION? A QUALITATIVE STUDY

Abstract :
To enhance the online shopping experience, a growing number of companies are implementing immersive technologies such as augmented reality. This study investigates how augmented reality features influence web user behavior, drawing on an exploratory approach that includes 30 individual semi-structured interviews and utilizes the protocol method. Our findings indicate that users often experience irritation with photo-based augmentation, while real-time augmentation is crucial for creating a sense of immersion. As for purchase intentions, these differ based on the type of augmentation: video or real-time augmentation tends to encourage purchase , whereas photo-based augmentation may result in negative purchase intentions.

Key words : Augmented reality; Affective reactions; Behavioral intentions; Augmentation; Virtual try-on.

Introduction

The adoption of immersive technologies, particularly augmented reality (AR), is expanding significantly across sectors like education, healthcare, and marketing. According to Fortune Business Insights (2024), the global AR market was valued at $62.75 billion in 2023, with projected growth from $93.67 billion in 2024 to $1,869.40 billion by 2032. This growth is largely driven by AR's ability to enhance customer experiences in both brick-and-motar settings—through the integration of augmented content and gamification tools—and digital environments, where virtual try-on features are increasingly popular (Javornik, 2014; Flavián et al., 2019). As a result, AR has become one of the fastest-evolving technologies in today's commercial landscape (Kumar, 2021). Nonetheless, despite this rapid expansion, research on its distinct characteristics remains limited (Kumar et al., 2023).

From a theoretical perspective, this research aims to provide a deeper understanding of the effects of augmented reality (AR) characteristics. Based on the existing literature on AR, we observe that augmentation, defined as the addition of virtual elements to the real world, is its distinctive feature (Javornik, 2016). Therefore, we have focused on different types of augmentation, such as photo or video augmentation and real-time augmentation.

From a managerial perspective, this study aims to offer an operational tool for professionals during the implementation phase of AR, particularly in the form of virtual try-on. It also provides managers with recommendations on selecting the type of augmentation to use, which should be chosen based on the desired effects during AR implementation.

In this context, we aim to address the following research question: What is the influence of varying the augmentation type of augmented reality on users' affective, cognitive, and behavioral responses?

Background

Augmented reality can be explored through the concept of web atmospherics, defined as "the conscious designing of web environments to create positive effects (e.g., positive affect, positive cognitions, etc.) in users in order to increase favorable consumer responses (e.g., site revisiting, browsing, etc.)" (Dailey, 2004).

So, in order to better understand its mechanisms and how it's capable of influencing users' behavior, often researchers employ the SOR model (Stimulus-Organism-Response) proposed by Mehrabian and Russel in 1974. This model is considered the most suitable when it comes to digital environments. To deepen the understanding of web atmospherics, Lemoine (2008) proposes a classification of its components into three categories:

- Ambient Cues: Encompassing sensory elements that may be part of a website, such as typography, color, images, music, etc.
- Design Cues: Incorporating elements that shape the structure and usability of a website, including navigability, readability, and more.
- Social Cues: Bringing together all features that enable interaction between the user and the website or between users themselves. Recently, a fourth atmospheric category has been introduced in the literature (Lemoine, 2022). According to Roggeveen et al. (2020), this new dimension refers to digital tools that allow users to try out the product or service offered during online shopping (Lemoine, 2022) and is primarily composed of virtual and augmented reality technologies.

According to Azuma et al. (2001), *"Augmented reality is the convergence of the real and virtual worlds within a shared space, characterized by interactivity and the alignment of virtual and real objects.*" Augmented reality is positioned closer to the real world, while augmented virtuality leans more toward the virtual environment. Consequently, augmented reality enhances the real world with virtual elements, whereas augmented virtuality incorporates more

real elements into the virtual space. Mixed reality, in turn, occupies a central position within this continuum, where real and virtual elements intertwine to bridge the two worlds. It brings the online and offline domains closer together by narrowing the gap between them (Hilken et al., 2018). There are various classifications of augmented reality characteristics. In this section, we highlight the most relevant attributes of AR, representing a consensus among authors (Azuma, 1997; Yim et al., 2017; McLean et al., 2019).

- Interactivity: The ability to control the user's perceived outcome by overlaying real and virtual worlds (Azuma, 2001).
- Vividness: The clear and detailed representation of the combined real and virtual worlds, made possible through 3D projection (McLean et al., 2019).
- Novelty: A personalized experience unique to each use, tailored to the individual user (McLean et al., 2019).

As its name suggests, augmented reality technology enhances or augment the physical environment with virtual features (Javornik, 2015). Thus, we identify a characteristic in the literature regarded as the essence of AR (Poushneh, 2018): Augmentation: The capacity to overlay real elements with virtual ones (Billinghurst et al., 2002), considered a defining feature unique to AR (Javornik, 2016b).

This characteristic can take various forms, including environmental augmentation (e.g., IKEA Place), product augmentation (e.g., image recognition that unlocks additional content), and self-augmentation (e.g., virtual fitting rooms), which is the primary focus of our study (Javornik, 2015; Kumar et al., 2023). Thus, augmentation represents a relevant concept for understanding the effects of augmented reality on users (Javornik, 2015). Existing literature highlights the influence of different AR characteristics on consumer responses, particularly satisfaction (Chiu et al., 2021), reuse intention influenced by interactivity and vividness (Yim et al., 2017), and the intention to recommend AR (Javornik, 2016a; Hilken et al., 2017).

Among these characteristics, augmentation holds a central role. According to Javornik (2015), it captures users' perceptions of AR. Additionally, Rauschnabel et al. (2019) demonstrated that augmentation influences consumer attitudes toward the brand through inspiration. Du et al. (2022) also highlight that augmentation is key to the sense of immersion experienced by consumers. However, how does the variation in types of AR augmentation impact users' online responses?

Methodology

We conducted an exploratory qualitative study to understand the different affective, cognitive, and behavioral intentions elicited by the use of AR. This study focused specifically on variations in the type of augmentation, a distinctive characteristic of AR compared to other immersive technologies. The methodology combined semi-structured interviews with the protocol method, a technique frequently used to study cognitive processes and facilitate their verbalization (Ericsson, 2006).

The study was conducted with 30 participants, allowing for the attainment of semantic saturation. Respondents were selected to ensure a diversity of profiles, considering sociodemographic characteristics, frequency of online shopping, and prior experience with technology. This last criterion was assessed through a direct question inviting respondents to share their past experiences with AR. All experimental groups were carefully matched to maintain equivalent compositions across all demographic variables. This element was verified in order to mitigate any potential biases that might come from differences due to the participants profiles during the scenario-based part of the interview.

The interviews lasted an average of 53 minutes. Topics covered during the interviews began with online shopping habits, followed by discussions on augmented reality and respondents'

previous experiences with the technology. Finally, questions focused on affective reactions and behavioral intentions related to their interactions with AR following a scenario-based prompt.
To effectively prepare our qualitative study, a preliminary benchmarking study was conducted. This allowed us to identify the modalities of the augmentation characteristic for our main study and to clearly define our research scope. Therefore, our choice to use an eyewear website is based on the benchmark results, indicating that the fashion industry, particularly the eyewear sector, benefits most from AR technology, being a pioneer in its commercial integration. The findings related to augmentation modalities allowed us to identify three relevant types of augmentation for our main study. Accordingly, our sample was divided into three sub-samples, each corresponding to a group matched to a specific type of augmentation for the situational task.

1. First type: Static photo augmentation. The respondent uses a photo uploaded from their device or taken at the time of the virtual try-on, onto which virtual glasses are overlaid.
2. Second type: Recorded video augmentation. The respondent records a video following the website's instructions to showcase the virtual glasses in motion.
3. Third type: Real-time augmentation. The respondent grants camera access and can instantly see themselves with the virtual glasses applied.

During the situational task, we employed the protocol method: respondents were invited to simulate a shopping experience, select a pair of glasses, and try them on using the AR feature available on the chosen multi-brand websites (optician sites showcasing the same collection of glasses). After transcribing the interviews, we conducted a thematic content analysis, as recommended by Bardin (2003). This manual content analysis enabled us to derive several findings.

Results And Discussion

The analysis of the qualitative study allowed us to associate various types of AR augmentation with specific affective reactions. The analysis of participant responses suggests that video or real-time augmentation has the potential to evoke pleasure among respondents. As one participant noted, "What's really enjoyable is when you tilt or move your head, the glasses adjust to the position of your head, so it doesn't feel static" (Female, 53 yo). This result highlights that video or real-time augmentation, characterized by a higher level of interactivity, generates pleasure. This finding supports the conclusions of Yim et al. (2017).
A second affective reaction identified was irritation, with respondents likening their experience to feeling like a meme. This reaction was expressed exclusively by those who tested the photo-based augmentation: "Honestly, it made me a bit irritated. I was expecting something, maybe a bit more high-quality... not to see myself with this, like a Snapchat filter that didn't even move. The glasses were stuck to my face; I looked like a meme." (Female, 24 yo).
Among the affective reactions identified, we also observed amusement. Contrary to the findings of Du et al. (2022), the amusement expressed may not be associated with entertainment but rather with negative emotions and intentions, as one respondent noted: "I found it funny, a bit absurd, but mostly amusing like on social media. I didn't take it seriously; I couldn't really think, 'Wow!' I don't see how people can buy something based on these kinds of images." (Male, 24 yo).
Regarding cognitive reactions, our findings align with those of Daassi et al. (2021), who suggest that augmentation acts as a stimulus, evoking a sense of immersion for the consumer. We observed that real-time augmentation can enhance the sensation of immersion. This relationship may be explained by the inherently interactive nature of the real-time virtual try-on experience, which is free from interruptions or waiting times. As one respondent noted, "I was completely absorbed in the experience; I moved around to see if it would track my

movements and everything, and I really wanted to try another pair to see the difference." (Male, 26 yo). We also observe perceived realism and a sense of product presence, both linked to real-time augmentation. As one respondent noted, "It's impressive in the sense that it's very realistic and well-positioned. I can fully imagine my face with this pair of glasses, so I don't even need to go to the store." (Male, 61 yo). This verbatim, along with findings from Daassi et al. (2021), suggests that the perceived realism of the virtual try-on experience strengthens the relationship between the sense of product presence and the user's behavioral intentions.

The fourth cognitive reaction identified is ease of use, observed across all three types of augmentation: photo, video, and real-time. Real-time augmentation appears to offer greater ease of use compared to the other two types. We also identified three behavioral intentions: purchase intention, the intention to reuse augmented reality, and the intention to revisit the website. It was observed that respondents exposed to video or real-time augmentation expressed a positive purchase intention. One respondent noted, "If I visit this site with the intent to buy, I wouldn't need anything more. Why would I go to a store when I've just tried on the pair live?" (Female, 26 yo).

In contrast, photo-based augmentation was identified as generating a negative purchase intention: "It feels like someone just edited a photo by sticking on some stickers for fun. I find it amusing, but I wouldn't make a purchase if I had to take it seriously because I can't picture myself with it." (Female, 23 yo). Thus, photo augmentation may compromise the main function of augmented reality—its capacity for projection—due to its entertaining aspect. This contradicts the findings of Uribe et al. (2021), which indicate that the positive effect of augmented reality on consumers' purchase intentions is partly mediated by their perception of entertainment.

Similarly, the intention to reuse augmented reality varies depending on the type of augmentation. For photo-based augmentation, the intention to reuse AR appears to be primarily hedonic, with amusement as the main motivation: "I'd play around with it a bit more, but just for fun with a friend, not seriously" (Male, 23 yo). In contrast, for video or real-time augmentation, perceived realism leads to a utilitarian intention to reuse: "I can see myself using the tool more, actually, maybe checking if other brands offer it to take advantage of it" (Female, 41 yo).

Conclusions And Implications For Theory And Practice

This study makes both theoretical and managerial contributions. From a theoretical perspective, this work enables the association of specific affective and behavioral reactions with different types of augmentation. Additionally, it highlights behavioral particularities based on the type of augmentation selected. It provides a better understanding of the fourth dimension of web atmosphere and enriches the literature on the effects of augmented reality characteristics, particularly augmentation, its key attribute. The benchmark also enabled us to propose manipulation modalities for this characteristic. These theoretical contributions are complemented by managerial insights. The choice of augmentation type to implement in augmented reality should be determined based on the intended effects. According to our findings, a high level of amusement during online try-ons can negatively impact the user experience. Despite the rich information provided by the exploratory nature of this study, there are certain limitations. The study's external validity is limited due to the specific composition of our sample and the selected product. Therefore, further quantitative experimentation is needed to assess the impact of varying types of augmented reality augmentation on users' emotional, cognitive, and behavioral responses. Additionally, our focus was solely on virtual try-on, a form of self-augmentation, though other types of augmented reality exist, such as

product augmentation and environmental augmentation (Kumar et al., 2023). Thus, it would be beneficial to replicate this study using different types of augmentation and devices. It would also be valuable to examine the interaction of augmented reality with other elements of the web atmosphere. For example, the interaction between the fourth dimension of the web atmosphere—augmented reality—and design elements, particularly the placement of the virtual try-on button, warrants special attention. This button, which technically falls under the navigation elements of a website, may be located on the product page, the e-catalog page, or even as a pop-up. Given the wide variation in practices, analyzing these differences is essential.

References Available Upon Request.

Safe space or insecure place? – Consumer's motives for escaping in immersive virtual realities like the Metaverse

Timo Koch
PhD Candidate
Chair for Marketing & Consumer Behavior
University of Bayreuth
Universitätsstraße 30
95447 Bayreuth
Germany
timo.koch@uni-bayreuth.de
+49 (0)921 / 55-6133

Michael Stangner
Alumnus at the Chair for Marketing & Consumer Behavior University of Bayreuth
Universitätsstraße 30
95447 Bayreuth
Germany
michael.stangner@uni-bayreuth.de

Claas Christian Germelmann
Professor of Marketing & Consumer Behavior
Chair for Marketing & Consumer Behavior
University of Bayreuth
Universitätsstraße 30
95447 Bayreuth
Germany
c.c.germelmann@uni-bayreuth.de

Safe space or insecure place? – Consumer's motives for escaping in immersive virtual realities like the Metaverse

ABSTRACT

The Metaverse is an evolving digital space where users can transition between physical and virtual worlds, engaging in various activities. Despite its potential, the Metaverse lacks clear definition and understanding. This study explores consumer motivations for using the Metaverse in leisure contexts but also highlights barriers by employing semi-structured interviews. Results show intellectual curiosity, social interaction, stimulus avoidance, and competency/mastery as key motives. Findings suggest gender differences in usage patterns, with men favoring intellectual and competency motives, and women leaning towards social and stimulus avoidance motives. The study aims to inform brand communication strategies, emphasizing the alignment with consumer motivations to enhance engagement.

INTRODUCTION

The Metaverse represents a significant evolution in digital interaction, described as a "digital playground" where users can seamlessly transition between physical and virtual worlds, engaging in a myriad of activities without physical constraints (Terdiman 2007). While there is a general understanding of its potential, the technological capacities and open-mindedness necessary for its implementation are not yet available. Thus, despite the enthusiasm, the term "Metaverse", remains nebulous, lacking a unified definition and clear understanding of its benefits (Giang Barrera & Shah 2023; Park & Kim 2022). However, for this research the Metaverse is understood as "A massively scaled and interoperable network of real-time rendered 3D virtual worlds that can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and payments" (Ball 2022, p. 29). This definition includes only 3D virtual worlds, that are accessible through Virtual Reality (VR) applications, so that a certain, rather high level of immersion is presumed. Although Ball (2022) argues that any virtual platform, including 2D applications might be part of the Metaverse, this more differentiated approach allows us to focus on the highly immersive consumer experiences.

The Metaverse concept has garnered substantial interest across various sectors, including work, medicine, and education, due to its potential to enhance experiences in these fields (Ball 2022). To harness the Metaverse's potential, it is crucial to understand the motivations and corresponding motives driving consumer engagement, particularly in leisure contexts. Motivations are fundamental to human behavior, representing the underlying reasons for actions (McClelland 1985). Recognizing these motivations is essential for effective brand communication (Batra & Keller 2016).

Moreover, leisure activities, driven by intrinsic motivation, are undertaken for their inherent interest, novelty, and moderate challenge (Ryan & Deci 2000a). This intrinsic motivation is pivotal in understanding why consumers immerse themselves in virtual worlds via technologies like VR headsets, contributing to their well-being.

So, this work sets out to answer the following research question:

What motivates consumers to use the Metaverse in their leisure time?

While Human-Computer Interaction (HCI) literature has repeatedly demonstrated that technological devices such as smartphones, laptops, personal computers, or smart watches can shape technology experiences, well-being, and social interaction (e.g., Peters et al. 2018; Yaden et al. 2018), the Metaverse represents a departure from physical reality. With its heightened interactivity and increased user agency it constitutes a qualitatively different digital environment than 2D-digital Worlds. One that remains insufficiently understood and therefore calls for a more exploratory approach to uncover consumers' underlying motivations for its utilization. Therefore, in this study semi-structured interviews are conducted to address this gap in existing research that has predominantly focused on the outcomes of Metaverse usage (e.g., Dwivedi et al. 2022; Dwivedi et al. 2023). The findings aim to inform brand communication strategies based on a qualitative deduction of motive categories within the Metaverse, emphasizing the importance of aligning with consumer motivations to enhance engagement and communication.

This research is the first step of a research process and aims to offer new insights into the motives behind Metaverse usage and its potential for integrated marketing communication through a quantitative content analysis. Moreover, a qualitative posteriori analysis was

outlined to identify new categories that on the one hand motivate users to enter the Metaverse in their leisure time and on the other hand are hindering them to enter the Metaverse.

THEORY

Volition, a central concept in psychology, involves the cognitive process of forming, maintaining, and realizing intentions and goals (Kuhl 1984). This process starts with motivation, continues with goal setting and planning, and finally leads to action (Haggard 2008). However, environmental changes and action consequences iteratively influence the salience of motivation in a given situation, so that repeated motivation checks become part of this process.

Common theories posit that motivation is influenced by the expected probability of achieving a goal and the value of that goal (Atkinson 1957). These theories incorporate sociogenic motives, which are learned and influenced by social contexts (McClelland 1985).
Consequently, the Self-Determination Theory (SDT) identifies autonomy, competence, and relatedness as fundamental motives (Ryan & Deci 2000b). In contrast to the motives that can be derived from typical technology acceptance models, SDT motives are the drivers for intrinsic motivation and are crucial for understanding human behavior in various contexts, including digital environments. Specifically, as leisure is supposed to be driven by intrinsic motivation, a focus on these SDT motives fits best as the basis for leisure motives. Beard and Ragheb (1983) categorized leisure motives into intellectual, social, competency/mastery, and stimulus avoidance. These categories align with the fundamental SDT motives (Ryan & Deci 2000b). Thus, (1) intellectual motives involve mental activities like learning and creativity, (2) social motives include the need for friendship and interpersonal relationships, (3) competency/mastery motives involve achieving and mastering challenges, often physical in nature, and (4) Stimulus avoidance involves the need for relaxation and avoiding overstimulation.

Understanding consumer motives is crucial for marketing, especially for digital marketing when looking at the Metaverse as it offers new opportunities for consumer engagement and value co-creation (Vargo & Lusch 2004). Its immersive experiences that blend physical and virtual realities provide unique opportunities for brands to engage with consumers.
Furthermore, immersive experiences have the capacity to encourage consumers to engage in escapist behaviors to foster their well-being. The degree to which consumers are able to disassociate from their physical environment is directly proportional to the extent of their immersion (Saleem et al. 2024). Thus, brands can leverage the Metaverse to create immersive experiences, enhance customer engagement, and develop new business models (Tan et al. 2022). For example, brands can create virtual stores, offer virtual product trials, or host virtual events. The integration of digital and physical touchpoints is essential for a cohesive brand experience (Ahn et al. 2022). This integration facilitates the establishment of a seamless experience for consumers, irrespective of their interaction with the brand being online or offline. Consequently, the Metaverse empowers brands to engage consumers in novel ways, thereby fostering deeper connections and co-creating value. By comprehending and addressing consumer motives for utilizing VR headsets, brands can generate more relevant and engaging experiences. This is not solely due to the digital and immersive nature of the Metaverse, but also because it is most frequently used during consumers' leisure time (e.g., in consumers' homes, museums, or supermarkets) (Loureiro et al. 2019). If companies apply these consumer motives correctly, consumer satisfaction and brand connection could increase, and therefore pay off in terms of long-term success.

METHOD

To investigate the motives driving consumers to use the metaverse in a leisure context, semi-structured interviews were employed. We argue that this method allows the use of a deductive category model for traditional leisure motives, while providing the opportunity to explore new motives specific to the metaverse. A pretest was conducted in October 2023 with two male participants aged 31 and 33, to test the interview flow and sensitivity to potential motives. The final interview guide consists of various thematic areas, starting with icebreaker questions (1-4) about virtual worlds and the metaverse. In order to facilitate a uniform comprehension of virtual worlds and the metaverse, the participants were now provided with simplified explanations of the meanings of each term. This was followed by questions (5-6) focusing on activities in the metaverse and their underlying benefits, goals, or rewards. Question (7) compares these activities with their physical world counterparts, emphasizing sensory perceptions and emotional experiences. Questions (8-10) address social motivations and self-presentation in the virtual space, while questions (11-12) explore consumption possibilities and the fulfillment of desires and needs better met by the metaverse. The interviews concluded with questions (13-14) about general expectations and motivations for using the metaverse.

Interviews were conducted from December 16, 2023, to February 29, 2024, in private homes, offices, and via Microsoft Teams, ensuring a comfortable environment. Participants were selected based on their experience with VR headsets and virtual worlds, using a combination of criterion, network, and snowball sampling strategies. Following the saturation principle the sample included a total of twelve participants (six male, six female) primarily aged between 25 and 34, with one outlier aged 53. In terms of user behavior, the majority of participants could be classified as belonging to a “gamer” profile, characterized by frequent interaction with digital games and virtual environments. The average interview length was 1 hour and 22 minutes, Resulting in a total of 16 hours and 24 minutes of recorded material.

Based on the qualitative data a content analysis was conducted using MAXQDA, coding text segments according to the leisure motive categories defined by Beard and Ragheb (1983). The analysis included both positive and negative mentions of motives, allowing for a comprehensive understanding of the motivational landscape.

The study adheres to Mayring's (2022) criteria for semantic validity, with coded text examples provided. The sampling strategy and demographics are documented, ensuring sample validity. The use of established leisure motives supports construct validity. Although intercoder reliability was not assessed, intracoder reliability was ensured through an intermediate repeated coding process (O’Conner & Joffe 2020).

RESULTS

The identification and categorization of motives based on the qualitative data resulted in a quantitative analysis that yielded initial noteworthy results, drawing upon Beards and Ragheb's (1983) leisure motivation factors, with an additional motivation category emerging in a posteriori analysis:

Intellectual Motives: Intellectual motives emerged as the dominant drivers, accounting for 51% of mentions per participant. These motives are primarily driven by curiosity and a desire to stay updated with technological advancements. Male gamers, in particular, exhibit a strong inclination towards these motives, using the Metaverse to engage in immersive gaming, virtual exploration, and learning experiences. Users emphasized the Metaverse’s capacity to enable unique forms of cognitive stimulation unconstrained by real-world limitations.

Social Motives: Social motives constitute 24% of all mentions. Users highlighted the Metaverse's potential for virtual socialization through platforms like VRChat, enabling presence, shared activities, and communication with geographically distant friends and family. Notably, 38% of social-related mentions were negative or ambivalent, reflecting skepticism about the quality and depth of virtual social interactions. While some participants – particularly women – valued the opportunity for communal engagement, others expressed doubts about the authenticity of social presence in VR.

Stimulus Avoidance Motives: Stimulus avoidance motives account for 18% of total mentions and involve using the Metaverse as a means of escaping real-world stressors. Use cases included spontaneous virtual travel, to safely explore dangerous activities, and to participate in events spontaneously without the associated real-world costs and risks. This category highlights the Metaverse's potential to provide a psychological refuge offering functional relief from the pressures of everyday life.

Competency/Mastery Motives: Competency and mastery motives were mentioned in 6% of all cases and related to physical or cognitive skill development through VR. Examples included active games like Beat Saber or fitness applications. The integration of physical movement and immersive feedback was described as engaging and motivating, particularly by male users.

Ecological Motives (a posteriori): An additional motivational factor was revealed by a posteriori analysis. A subset of participants viewed the Metaverse as a sustainable alternative to real-world activities that involve travel and a reduced resource consumption, as they would be replaced by digital resources. These users appreciate that participation in events, experiences, or social activities could take place without generating emissions or waste.

Although less frequently mentioned, this factor reflects the growing social relevance of environmental awareness in digital contexts.

In addition to motivations to use the Metaverse, three key barriers were identified through a posteriori analysis that may limit user adoption and sustained engagement:

Mental Health and Child Protection: Several participants expressed concern about the psychological effects of immersive technologies, particularly for children and adolescents. Risks mentioned included the alienation from reality through addictive patterns of use, social isolation as real-world interactions may be reduced, or overexposure to stimuli. It was mentioned that prolonged VR usage might negatively affect emotional well-being if not moderated appropriately.

Economical Change and Urban Disruption: Some participants expressed concern that moving retail and social activities into the Metaverse could undermine the existing economic and urban fabric. They feared that physical stores and public spaces would become less relevant, weakening local commerce and spontaneous urban life.

Data Security and Privacy: Trust concerns were raised regarding how personal and biometric data are collected, stored, and utilized in Metaverse-like environments. Participants expressed fears about a lack of anonymity due to insufficient transparency on the part of the platform providers.

Together, these findings reveal a complex motivational structure for Metaverse usage, alongside tangible structural and psychological obstacles that may inhibit its wider adoption. These results especially provide a foundation for further theoretical interpretation and practical application, which are discussed in the following section.

DISCUSSION

The motivational patterns identified in this study underscore the potential of the Metaverse as a cognitively and emotionally stimulating environment. From a theoretical perspective, the prominence of intellectual motives can be interpreted through the lens of the Leisure Motivation Scale (Beard & Ragheb, 1983) and sensation-seeking theory (Roberti, 2004). For technologically inclined users-especially male gamers-the Metaverse functions as a virtual playground for exploration, innovation, and immersive engagement, satisfying both curiosity and novelty-seeking behaviors.

Gendered usage tendencies have also emerged and can be understood in terms of the psychological constructs of agency and community (Hsu et al., 2021). While men typically gravitate toward goal-oriented, competitive, and exploratory experiences, women show a greater inclination toward communal, emotionally rich interactions. Female users' preference for immersive story worlds-such as the Harry Potter universe-reflects a desire for meaningful connection and narrative engagement, regardless of physical proximity.

In addition, a posteriori analysis revealed an emergent ecological motivation, highlighting users' awareness of the metaverse as a potentially more sustainable alternative to physical activities that require extensive travel or resource-intensive consumption. This finding is consistent with growing consumer demand for sustainable digital experiences and opens up opportunities for eco-conscious brand positioning in virtual environments.

Despite the motivational potential of the Metaverse, several barriers have been identified that may hinder wider adoption: (1) Mental health and child protection concerns: A number of participants expressed skepticism about prolonged use, especially among younger users. Fears of social isolation, psychological overstimulation, and addictive behavior underscore the need for protective design frameworks and ethical use guidelines. These concerns reflect a growing societal emphasis on digital well-being and echo the need for self-regulation and parental control mechanisms. (2) Economical change and urban Disruption: Beyond individual accessibility, participants expressed skepticism about the potential societal consequences of a widespread shift to the metaverse. In particular, the shift of commerce and social life to virtual environments was seen as a threat to physical retail infrastructure and urban spaces. Fears included the decline of brick-and-mortar stores, the erosion of local economies, and the weakening of spontaneous social life in city centers. These concerns point to the need for critical reflection on how immersive technologies may reshape the socio-economic fabric of everyday life. (3) Data security and privacy risks: As immersive environments collect sensitive behavioral and biometric data, users have expressed distrust regarding surveillance, data misuse, and identity protection. These fears can limit deeper engagement and require transparent data policies, user consent mechanisms, and privacy-centric design as prerequisites for trusted brand interactions.

Notably, the motivational landscape observed in this study appears to be shaped by the participant profile: the majority of users identified as gamers, a group that is generally characterized by a high level of digital fluency, openness to technological novelty, and an existing affinity for immersive environments. This may explain the dominance of intellectual and stimulation-related motives, as well as the relatively low threshold for engaging wit the metaverse.

However, this user group represents only a segment of the broader consumer base. Drawing on the leisure constraints framework (Crawford & Godbey, 1987), it becomes clear that non-

gamer audiences may face structural, interpersonal, or intrapersonal barriers to engaging with the Metaverse. These can include a lack of technological confidence, financial constraints, or limited perceived relevance. Yet, such barriers are surmountable by fostering the respective motivations (Jackson, Crawford & Godbey 1993). Thus, current Metaverse experiences may inadvertently cater to the preferences and capabilities of digitally savvy users while excluding others who might value different affordances – such as guided exploration, social support, or practical functionality.

These barriers point to a dual imperative: brands and platform providers must not only inspire users, but also reassure them. Any successful metaverse strategy must therefore balance inspiration (motivational pull) with protection (barrier mitigation). In terms of protection, the reduction of leisure barriers by broadening the range of experiences and thus facilitating the entry of more diverse user profiles beyond the gaming community seems inevitable. (1) Curiosity-driven design: Activate cognitive engagement through exploratory environments, gamification, and novel interactions that tap into users' desire to learn and discover. (2) Narrative Immersion & Gender Responsiveness: Provide emotionally resonant storytelling and collaborative experiences, especially for female audiences. Leveraging existing story universes or creating co-creative experiences can increase emotional investment. (3) Eco-positioning & digital sustainability: Brands should consider positioning their virtual offerings as low-carbon, resource-efficient alternatives to physical experiences. This environmental angle resonates with values-driven consumers and can support long-term brand equity. (4) Barrier-Free Engagement: Embed features that address ethical concerns (e.g., well-being dashboards, age filters), affordability (e.g., freemium models), and privacy (e.g., local data storage, transparency layers). Such features promote psychological safety and trust, which are critical for sustained user engagement.

However, as this study was conducted to initiate the process of enhancing our understanding of consumer behavior in the metaverse and how consumers experience the metaverse in terms of their usage motives, subsequent research is underway to attain a more profound comprehension of this phenomenon. In a secondary step, it is imperative to gain a more profound understanding of consumer motives through qualitative thematic content analysis and proposing more diverse user profiles to formulate specific marketing strategies tailored to them. Moreover, a completion of the presented sample is planned to also include information about non-user motivations and obstacles to enter the Metaverse. Furthermore, additional studies are necessary to assess the motives in various moderating metaverse contexts (e.g., gaming, shopping, or networking) by implementing experimental approaches.

REFERENCES

Ahn, S. J., Kim, J. & Kim, J. (2022). The Bifold Triadic Relationships Framework: A Theoretical Primer for Advertising Research in the Metaverse. *Journal of Advertising, 51*(5), 592–607.

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review*, *64, Part 1*(6), 359–372.

Ball, M. (2022). *The Metaverse. And how it will revolutionize everything* (First edition). New York, NY: Liveright Publishing Corporation a Division of W.W. Norton & Company.

Batra, R. & Keller, K. L. (2016). Integrating Marketing Communications: New Findings, New Lessons, and New Ideas. *Journal of Marketing*, *80*(6), 122–145.

Beard, J. G. & Ragheb, M. G. (1983). Measuring Leisure Motivation. *Journal of Leisure Research*, *15*(3), 219–228.

Crawford, D. W. & Godbey, G. (1987). Reconceptualizing Barriers to Family Leisure. Leisure Sciences, 9(2), 119–127.

Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M. et al. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, *66*, 102542.

Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J., Balakrishnan, J. et al. (2023). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology & Marketing*, *40*(4), 750–776.

Giang Barrera, K. & Shah, D. (2023). Marketing in the Metaverse: Conceptual understanding, framework, and research agenda. *Journal of Business Research*, *155*, 113420.

Haggard, P. (2008). Human volition: towards a neuroscience of will. *Nature Reviews. Neuroscience*, *9*(12), 934–946.

Hsu, N., Badura, K. L., Newman, D. A. & Speach, M. E. P. (2021). Gender, "masculinity," and "femininity": A meta-analytic review of gender differences in agency and communion.

Psychological bulletin, 147(10), 987–1011.

Jackson, E. L., Crawford, D. W., & Godbey, G. (1993). Negotiation of Leisure Con-straints. Leisure Sciences, 15(1), 1–11.

Kuhl, J. (1984). Volitional Aspects of Achievement Motivation and Learned Helplessness: Toward a Comprehensive Theory of Action Control1 1I wish to thank Dr. Charles S. Carver and Dr. Franz E. Weinert for helpful comments on a previous draft of this article. In Normal Personality Processes (Progress in Experimental Personality Research, Bd. 13, S. 99–171). Elsevier.

Loureiro, S. M. C., Guerreiro, J., Eloy, S., Langaro, D. & Panchapakesan, P. (2019). Understanding the use of Virtual Reality in Marketing: A text mining-based review. Journal of Business Research, 100, 514–530.

Mayring, P. (2022). Qualitative Inhaltsanalyse. Grundlagen und Techniken (Beltz Pädagogik, Neuausgabe). Weinheim: Julius Beltz GmbH & Co. KG.

McAlister, L. & Pessemier, E. (1982). Variety Seeking Behavior: An Interdisciplinary Review. Journal of Consumer Research, 9(3), 311.

McClelland, D. C. (1985). Human motivation. Glenview, Ill.: Scott Foresman and Co.

O'Connor, C. & Joffe, H. (2020). Intercoder Reliability in Qualitative Research: Debates and Practical Guidelines. International Journal of Qualitative Methods, 19.

Park, S.-M. & Kim, Y.-G. (2022). A Metaverse: Taxonomy, Components, Applications, and Open Challenges. IEEE Access, 10, 4209–4251.

Peters, D., Calvo, R. A. & Ryan, R. M. (2018). Designing for Motivation, Engagement and Wellbeing in Digital Experience. Frontiers in psychology, 9, 797.

Ryan, R. M. & Deci, E. L. (2000a). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. Contemporary Educational Psychology, 25(1), 54–67.

Ryan, R. M. & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. The American Psychologist, 55(1), 68–78.

Saleem, T., Talpur, Q., Ishaq, M. I., Raza, A. & Junaid, M. (2024). Exploring the effect of telepresence and escapism on consumer post-purchase intention in an immersive virtual reality environment.

Journal of Retailing and Consumer Services, 81, 104014.

Tan, Y.-C., Chandukala, S. R. & Reddy, S. K. (2022). Augmented Reality in Retail and Its Impact on Sales. Journal of Marketing, 86(1), 48–66.

Terdiman, D. (2007, 16. April). Meet the metaverse, your new digital home. CNET. Available at: https://www.cnet.com/culture/meet-the-metaverse-your-new-digital-home/

Vargo, S. L. & Lusch, R. F. (2004). Evolving to a New Dominant Logic for Marketing. Journal of Marketing, 68(1), 1–17.

Yaden, D. B., Eichstaedt, J. C. & Medaglia, J. D. (2018). The Future of Technology in Positive Psychology: Methodological Advances in the Science of Well-Being. Frontiers in psychology, 9, 962.

The Impact of Social Familiarity and Network Size on Social Influences and Trust in Metaverse Adoption: A SEM Analysis

Léonie Principe*
leonie.principe@tsm-education.fr
TSM, Université Toulouse Capitole, Toulouse, France
2 rue du doyen Gabriel Marty, 31 000 Toulouse - 06 11 25 93 04

Vincent Favarin
vincent.favarin@tsm-education.fr
TSM-Research, Université Toulouse Capitole, CNRS, Toulouse, France

Lars Meyer-Waarden
lars.meyer-waarden@tsm-education.fr
TSM-Research, Université Toulouse Capitole, CNRS, Toulouse, France

*corresponding author

The Impact of Social Familiarity and Network Size on Social Influences and Trust in Metaverse Adoption: A SEM Analysis

Abstract:

This study aims to investigate the social influences shaping users' acceptance of the metaverse by applying an extended version of the Unified Theory of Acceptance and Use of Technology (UTAUT). The framework incorporates additional constructs, including Subjective Norms, Critical Mass, and Technology Trust, alongside the manipulations of Social Familiarity and Network Size. Data was collected through an online survey and analysed using Structural Equation Modelling (SEM). The findings reveal the significant impact of Performance Expectancy, Effort Expectancy, Facilitating Conditions, and Technology Trust on users' intention to adopt the metaverse. Moreover, the results underscore the importance of Social Familiarity in shaping social influences within the metaverse context.

Keywords:

Metaverse; Technology Adoption; Technology Acceptance; Social Influences; Social Familiarity; Network Size; Subjective Norms; Critical Mass; Technology Trust; Structural Equation Modelling.

1. Background

The metaverse has emerged as a future major transformative technology that can be considered as the next chapter of the Internet by Mark Zuckerberg (Newton, 2021). The metaverse describes a spatial computing platform enabling immersive digital experiences by replicating or providing alternatives to the real world. It combines fundamental societal elements such as social interactions, economies, and property ownership (BasuMallick, 2022). The wide range of possible uses in various industries (education, banking, marketing, sales; tourism, gaming) shows how applicable the metaverse is and then can contribute by many possibilities to consumer's well-being.

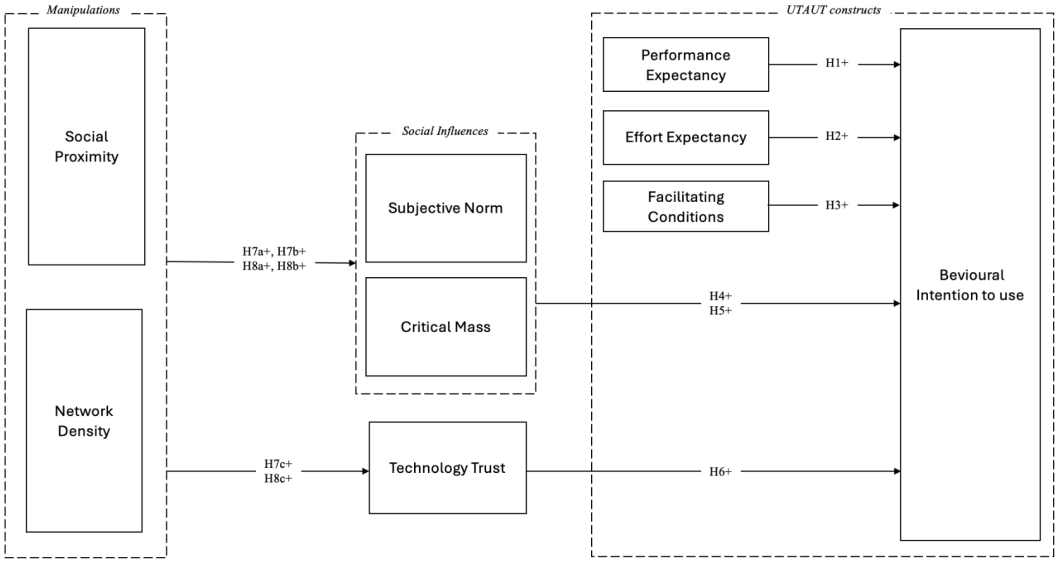
Several successes highlight the growing influence and potential of the metaverse. Second Life, launched in 2003, pioneers the concept of a virtual world for social interaction and commerce. In 2016, Pokémon GO demonstrated the effective mix of augmented reality with gaming, underscoring the metaverse's ability to bridge the physical and digital worlds. Moreover, Fortnite, famously known for being a gaming platform, has evolved into a social platform hosting virtual events of large scale, such as concerts by Ariana Grande and Travis Scott in 2022, each drawing millions of viewers (Barrera et al., 2023; Deutsche Bank, 2024). Major technology companies like Meta, Epic Games, Unity, Microsoft, NVIDIA, Google, or Qualcomm are making significant investments, suggesting a strong belief in the metaverse's future (McKinsey & Company, 2022). Zuckerberg (CEO of Meta, previously Facebook) in particular views the metaverse as a revolutionary platform poised to redefine social interaction and digital engagement. Governments have also begun recognising the metaverse's potential. Shanghai, for instance, plans to build 30 Metaverse attractions by 2025 as part of its "smart tourism" initiative, demonstrating the use of Metaverse in urban development (Zuo, 2023). Projections for metaverse growth are equally optimistic: by 2026, 30% of global organisations are expected to have developed metaverse-related products or services, says Resnick, Vice President at Gartner. By 2030, 20% of Metaverse users in developed markets may interact with virtual environments using advanced metasuits, particularly for work or social purposes (Gartner, 2022). By 2030, similarly, it is projected that there will be 2,633.0 million users in the Metaverse market (Statista, 2024). These forecasts emphasise the increasing integration of the metaverse into multiple industries. Moreover, consumer interest continues to flow. In a recent study, 9 out of 10 consumers worldwide are interested in the topic, but only a few have experienced the metaverse themselves (Capgemini, 2022).

However, the lack of corresponding scholarly research leaves a significant gap. As of 2022, only 12 academic articles addressed Metaverse adoption specifically, indicating a substantial need for further investigation into the factors influencing its acceptance and utilisation (Lee et al., 2022). Most existing studies on the metaverse primarily focus on its definition and potential applications across various fields, often neglecting the behavioural and social dimensions critical for widespread adoption from an end-user perspective. While prior research has examined social influences on technology adoption, these studies have not integrated the theoretical frameworks employed in this research. Specifically, the interplay between Social Learning Theory (Bandura, 1977) and Metcalfe's Law (Gilder, 1993) remains underexplored in the context of metaverse adoption. Previous studies on the metaverse and online social networks have predominantly assessed social influence through constructs such as Subjective Norms and Technology Trust. However, these constructs have often been examined in isolation, without explicitly linking them to broader social influence mechanisms. Moreover, Critical Mass has frequently been employed as a singular variable to measure social influence within online social networks, yet its relationship with other social

influence constructs in the metaverse context remains insufficiently investigated. This study seeks to address these research gaps by examining the role of social influences in metaverse adoption, extending the UTAUT model to incorporate Subjective Norms, Critical Mass, and Technology Trust. Additionally, it introduces the experimental manipulation of Network Size and Social Familiarity to empirically integrate Metcalfe's Law and Social Learning Theory. By doing so, this research aims to provide a more comprehensive understanding of the social mechanisms driving metaverse adoption and contribute to the refinement of theoretical models in the field. By extending the UTAUT model and integrating these variables, we thus answer the following research question:

RQ: How the Social Familiarity and Network Size impact Social Influences and Trust in Metaverse Adoption?

Figure 1: Conceptual Framework



H1: Performance Expectancy has a positive impact on the Behavioural Intention to Use the metaverse.
H2: Effort Expectancy has a positive impact on the Behavioural Intention to Use the metaverse.
H3: Facilitating Conditions have a positive impact on the Behavioural Intention to Use the metaverse.
H4: Subjective Norms have a positive impact on the Behavioural Intention to Use the metaverse.
H5: Critical Mass has a positive impact on the Behavioural Intention to Use the metaverse.
H6: Trust in metaverse technology has a positive impact on the Behavioural Intention to Use.
H7a: The Social Familiarity in the metaverse positively impacts Subjective Norms.
H7b: The Social Familiarity in the metaverse positively impacts Critical Mass.
H7c: The Social Familiarity in the metaverse positively impacts Technology Trust.
H8a: The Network Size of the metaverse positively impacts Subjective Norms.
H8b: The Network Size of the metaverse positively impacts Critical Mass.
H8c: The Network Size of the metaverse positively impacts Technology Trust.

2. Methodology

We conducted a convenience sample online survey from June to August 2024 in many different countries, mainly in Europe. The sample comprised 183 valid respondents, 48.6% women and 52.4% men (88 women, 93 men, 2 preferred not to say). Before answering the survey, respondents were asked to read a description of the metaverse with a one-minute video showing the metaverse imagined and pictured by the company Meta, representing different social interactions. Then respondents had a scenario presented with our two manipulations (Low Social Familiarity Vs. High Social Familiarity and Low Network Size

Vs. High Network Size). All measurement scales were based on and adapted from previous studies. Responses were collected based on a seven-point Likert scale. Behavioural Intention to Use, Performance Expectancy, Effort Expectancy, and Facilitating Conditions were measured using established scales from Venkatesh et al. (2012). Subjective Norms were adapted from Davis et al. (1989) and Critical Mass from Hsu & Lu (2004) and Slyke et al. (2007). Technology Trust was measured using items from McKnight et al. (1998). In our analysis, we conducted exploratory factor analyses and confirmatory factor analyses, revealing that all the scales demonstrated satisfactory psychometric properties for reliability (all Cronbach's Alphas are > 0.70), the convergent validity (all Convergent Validities are > 0.50), and the discriminant validity (r^2 < convergent validity). Our measurement model achieves a good fit according to standard fit indices: RMSEA < 0.08, CFI > 0.90, and TLI < 0.90.

Figure 2: Constructs & Measurement Items

Construct	Items Used in the Study
Performance Expectancy (PE) *Venkatesh et al. (2012)*	- PE1: The Metaverse would be a good assistant in my daily life - PE2: The Metaverse would save me useful time in my daily life - PE3: The Metaverse would make my daily life easier - PE4: The Metaverse would increase my efficiency in my daily life
Effort Expectancy (EE) *Venkatesh et al. (2012)*	- EE1: I would find it easy to use the Metaverse - EE2: I would easily become proficient in the use of the Metaverse - EE3: I would quickly learn to use the Metaverse
Facilitating Conditions (FC) *Venkatesh et al. (2012)*	- FC1: I have the resources necessary to use the Metaverse - FC2: I have the knowledge necessary to use the Metaverse - FC3: The Metaverse is compatible with other technologies I use - FC4: I can get help from others when I have difficulties using the Metaverse
Subjective Norms (SN) *Davis et al. (1989)*	- SN1: People I am influenced by think I should use the Metaverse - SN2: My friends think I should use the Metaverse - SN3: People who are important to me think that I should use the Metaverse
Critical Mass (CM) *Hsu & Lu (2004) and Slyke et al. (2007)*	- CM1: Of the people I am in contact with regularly, many use the Metaverse - CM2: Of the people I network with, many use the Metaverse - CM3: Of the people I am in contact with using the Metaverse, many use it frequently - CM4: Many people I know in my university/school use the Metaverse
Technology Trust (TT) *McKnight et al. (1998)*	- TT1: I would trust that the Metaverse is safe - TT2: I would trust that the Metaverse is reliable - TT3: I would trust that the Metaverse is not failing
Behavioral Intention to Use (BIU) *Venkatesh et al. (2012)*	- BIU1: In view of its advantages, I intend to use the Metaverse in the future in a social environment - BIU2: Considering its advantages, if I had access to the

	Metaverse, I intend to use it in a social environment - BIU3: I am likely to use the Metaverse in the future in a social environment

3. Results

A Structural Equation Modeling (SEM) analysis was conducted using R software with the lavaan procedure, employing Maximum Likelihood estimation. The SEM analysis confirmed that Performance Expectancy was the strongest predictor of Behavioral Intention to Use the metaverse, with a significant positive effect ($\beta = 0.584$, $p < 0.000$). Effort Expectancy ($\beta = 0.212$, $p < 0.026$) and Facilitating Conditions ($\beta = 0.258$, $p < 0.002$) also positively influenced adoption, indicating that users perceive the metaverse as beneficial and relatively easy to use when access to resources is provided. Technology Trust significantly impacted Behavioral Intention to use ($\beta = 0.181$, $p < 0.042$), reinforcing the importance of security and reliability in digital adoption. Contrary to expectations, Social Influence factors, including Subjective Norms ($\beta = 0.093$, $p < 0.185$) and Critical Mass ($\beta = -0.001$, $p < 0.987$), did not directly influence Behavioral Intention to Use the metaverse. However, a low Social Familiarity decreased perceptions of Subjective Norms ($\beta = 0.422$, $p < 0.000$) and Critical Mass ($\beta = 0.260$, $p < 0.001$*)* but not on Technology Trust ($\beta = 0.273$, $p < 0.183$), indicating that while familiar peers enhance perceived social influences, they do not necessarily lead to adoption and that Social Familiarity does not impact the Trust consumers have for the metaverse. Network Size had no significant effect on either Subjective Norms ($\beta = 0.038$, $p < 0.873$), Critical Mass ($\beta = 0.023$, $p < 0.927$) or Technology Trust ($\beta = 0.064$, $p < 0.743$), contradicting traditional network effect theories.

4. Contributions

This study makes a significant contribution to Information Systems research by enhancing our understanding of Social Influences and Trust in the context of metaverse adoption. By incorporating constructs that have been infrequently examined within the UTAUT framework— namely Subjective Norms, Critical Mass, and Technology Trust—this research provides novel insights into the mechanisms that shape the adoption of emerging, complex technologies such as the metaverse. First, this study advances the technology adoption literature, particularly within the UTAUT framework, by applying it to the metaverse, a technology that remains underexplored. While UTAUT has proven to be a robust theoretical model, the unique characteristics of the metaverse necessitate its refinement and extension. This research addresses this gap by integrating three additional constructs: Subjective Norms, Critical Mass, and Technology Trust. By doing so, it reinforces the critical role of trust in the adoption of innovative and complex technologies, contributing to a broader understanding of technology acceptance in digital environments. Second, this study develops a universal end-user framework for metaverse adoption, which remains largely unexplored in existing research. This framework enhances the limited body of literature on metaverse adoption by providing a structured approach to examining the role of social and trust-related factors in user adoption behaviour. Third, this research contributes to social theories, specifically Metcalfe's Law and Social Learning Theory, within the domain of technology adoption. The findings confirm that peer influence from familiar individuals (e.g., friends or family) plays a crucial role in shaping user perceptions and generating social pressure, thereby amplifying Subjective Norms and perceptions of Critical Mass. These results align with Social Learning Theory (Bandura, 1977), which posits that individuals are more likely to adopt behaviours modeled by those in their close social circles. However, Social Familiarity did not significantly impact Technology Trust, suggesting that trust in the system itself is more critical than interpersonal trust when adopting complex, data-intensive platforms such as the

metaverse (Lankton et al., 2015). Conversely, this study challenges Metcalfe's Law, which posits that larger networks drive network effects and enhance perceived value. The results indicate that Network Size did not significantly influence social influence constructs or Technology Trust. This lack of significance may be attributed to the early stage of metaverse adoption; as the platform evolves, the role of network size may become more pronounced. At present, users appear to prioritize the quality of interactions over the sheer number of participants, a phenomenon also observed by Chesney & Lawson (2015) in other social technologies. Finally, this study contributes to the Technology Trust literature by emphasizing the critical role of trust in the adoption of new technologies, particularly those that remain unfamiliar to the broader public. By highlighting the importance of security, reliability, and functionality in the adoption process, this research offers valuable insights for both academia and industry on the factors that influence user confidence in emerging digital environments. These findings further enrich the growing body of metaverse research and underscore the necessity of fostering trust to drive widespread adoption.

5. Limitations and Future Research Directions

This study, while providing valuable insights into the adoption of the metaverse, acknowledges several limitations that open avenues for future research. Firstly, the sample may not fully represent the broader metaverse market, as many participants might not have been familiar with or used the metaverse, potentially limiting the generalizability of the findings. Future research could expand the sample to include participants from diverse geographical and cultural backgrounds where the metaverse is more widely recognized. Secondly, the study introduced new variables to explore social influences, which, although not directly contributing to the intention to use the metaverse, offer potential for further investigation into their effects on other constructs within the model. Additionally, the concise description of the metaverse provided to participants might have been insufficient for those unfamiliar with the technology, suggesting a need for more detailed contextual descriptions in future studies. Lastly, as the metaverse is a rapidly evolving concept, ongoing research is essential to capture the evolving dynamics and behaviors associated with its adoption, ensuring more robust insights into its integration into daily life.

References:

Ahmad Samed Al-Adwan & Mutaz M. Al-Debei. (2023). The determinants of Gen Z's metaverse adoption decisions in higher education: Integrating UTAUT2 with personal innovativeness in IT. *Education and Information Technologies: Official Journal of the IFIP Technical Committee on Education.* https://doi.org/10.1007/s10639-023-12080-1

Bandura, A. (1977). *Social Learning Theory.* Canadian Journal of Sociology-Cahiers Canadiens De Sociologie, 2(1), 321. https://doi.org/10.2307/2065952

Barrera, K. G., Shah, D., & Shah, D. (2023). Marketing in the Metaverse: Conceptual understanding, framework, and research agenda. *Journal of Business Research, 155,* 113420. https://doi.org/10.1016/j.jbusres.2022.113420

BasuMallick, C. (2022). What Is the Metaverse? Meaning, Features, and Importance. *Spiceworks.* Retrieved from https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-metaverse/

Capgemini. (2022). Welcome to The Metaverse. Retrieved from: https://www.capgemini.com/about-us/who-we-are/innovation-ecosystem/metaverse/

Chesney, T., & Lawson, S. (2015). Critical Mass and Discontinued Use of Social Media. *Systems Research and Behavioral Science, 32(3),* 376–387. https://doi.org/10.1002/sres.2231

Fred D. Davis, Fred D. Davis, & Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information. *MIS Q.* https://doi.org/10.2307/249008

Deutsche Bank. (2024). *Metaverse - Is there anybody in there?* Retrieved from: https://www.db.com/what-next/digital-disruption/Metaverse/virtual-reality-virtuelle-Realitaet/index?language_id=1

Gartner. (2022). Gartner Predicts 25% of People Will Spend At Least One Hour Per Day in the Metaverse by 2026. Retrieved from https://www.gartner.com/en/newsroom/press-releases/2022-02-07-gartner-predicts-25-percent-of-people-will-spend-at-least-one-hour-per-day-in-the-metaverse-by-2026

Gilder, G. (1993, September 13). *Metcalfe's Law and Legacy.* Forbes ASAP.

Janssen, J., Erkens, G., Kirschner, P. A., & Kanselaar, G. (2009). Influence of group member familiarity on online collaborative learning. *Computers in Human Behavior, 25(1),* 161–170. https://doi.org/10.1016/j.chb.2008.08.010

Lars Meyer‐Waarden, Meyer-Waarden, L., Lars Meyer-Waarden, Julien Cloarec, & Cloarec, J. (2021). "Baby, you can drive my car": Psychological antecedents that drive consumers' adoption of AI-powered autonomous vehicles. Technovation, 102348. https://doi.org/10.1016/j.technovation.2021.102348

Lankton, N. K., McKnight, D. H., & Tripp, J. (2015). Technology, Humanness, and Trust: Rethinking Trust in Technology. *Journal of the Association for Information Systems, 16(10),* 880–918. https://doi.org/10.17705/1jais.00411

Lee, U.-K., Kim, H., & Kim, H. (2022). UTAUT in Metaverse: An "Ifland" Case. *Journal of Theoretical and Applied Electronic Commerce Research, 17(2),* 613–635. https://doi.org/10.3390/jtaer17020032

Liu, Y., Gan, Y., Song, Y., & Liu, J. (2021). What Influences the Perceived Trust of a Voice-Enabled Smart Home System: An Empirical Study. *Sensors, 21(6),* 2037. https://doi.org/10.3390/s21062037

Markus, M. L. (1994). *Electronic Mail as the Medium of Managerial Choice.* Organization Science, 5(4), 502–527. https://doi.org/10.1287/orsc.5.4.502

McKinsey & Company. (2022). Value creation in the metaverse: The real business of the virtual world. Retrieved from: https://www.mckinsey.com/~/media/mckinsey/business%20functions/marketing%20and%20sales/our%20insights/value%20creation%20in%20the%20metaverse/Value-creation-in-the-metaverse.pdf

McKnight, D. H., Cummings, L. L., & Chervany, N. L. (1998). Initial Trust Formation in New Organizational Relationships. *Academy of Management Review, 23(3),* 473–490. https://doi.org/10.5465/amr.1998.926622

McKnight, D. H., Carter, M., Thatcher, J. B., & Clay, P. F. (2011). Trust in a specific technology: An investigation of its components and measures. *TMIS, 2(2),* 12. https://doi.org/10.1145/1985347.1985353

Newton, C. (2021). Mark in the metaverse. Retrieved from https://www.theverge.com/22588022/mark-zuckerberg-facebook-ceo-metaverse-interview

Statista. (2024). Metaverse Worldwide. Retrieved from: https://www.statista.com/outlook/amo/metaverse/worldwide#market-size

Thanh, L. N., Đức, Đ. T. V., Quan, T. D., & Nguyễn, D. H. (2023). Metaverse Banking Service: Are We Ready to Adopt? A Deep Learning-Based Dual-Stage SEM-ANN Analysis. *Human Behavior and Emerging Technologies, 2023,* 1–23. https://doi.org/10.1155/2023/6617371

Venkatesh, V., Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Sciences, 46(2),* 186. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *Management Information Systems Quarterly.* https://doi.org/10.2307/41410412

Zuo, T. (2023). Shanghai targets US$6.9 billion metaverse revenue from culture, tourism projects. Retrieved from https://forkast.news/shanghai-culture-tourism-metaverse/

WHEN TECHNOLOGY IS IMPOSED ON SALESPEOPLE: BETWEEN COMPLIANCE, IDENTIFICATION AND INTERNALIZATION

MADIHA BENDJABALLAH

ASSISTANT PROFESSOR OF MARKETING

UNIVERSITÉ DE LORRAINE, CEREFIGE

madiha.bendjaballah@univ-lorraine.fr

SANDRINE HEITZ-SPAHN

ASSOCIATE PROFESSOR OF MARKETING

UNIVERSITÉ DE LORRAINE, CEREFIGE

sandrine.spahn@univ-lorraine.

CHRISTIAN DIANOUX

EMERITUS PROFESSOR OF MARKETING

UNIVERSITÉ DE LORRAINE, CEREFIGE

Christian.dianoux@univ-lorraine.fr

WHEN TECHNOLOGY IS IMPOSED ON SALESPEOPLE: BETWEEN COMPLIANCE, IDENTIFICATION AND INTERNALIZATION

Abstract:

This research investigates the evolution of salespeople's reluctance to the use of Mobile Sales Assistants (MSAs) by salespeople almost 10 years after the seminal article by Spreer and Rauschnabel (2016). Analysis of 21 interviews conducted with salespeople reveals that resistance remains, particularly in relation to the dehumanization of the customer relationship. Drawing on Kelman's theory of social influence (1958), this research presents three processes explaining differentiated usage strategies: minimalist usage (compliance with managerial directives), usage by imitation of peers (identification), intrinsic usage (internalization) when salespeople recognize the intrinsic benefits of MSA (time savings, better inventory management). The study recommends personalized support and modulated adoption of MSAs, enabling salespeople to comply with managerial expectations while preserving congruence with their professional values, in order to reduce reluctance to use MSAs by salespeople.

Key words: Mobile Service Assistant; Social Influence Theory; In-Store technologies; Usage strategies

Introduction

In 2016, Spreer and Rauschnabel highlighted salespeople's many misgivings about using Mobile Sales Assistants (MSAs), an in-store technology in the form of professional tablets or smartphones designed to accompany them during their interactions with customers. The reluctance mentioned by these authors was linked mainly to technical concerns, or their fear of appearing rude, incompetent, disrespectful of the customer, or not reflecting "*who they are*" or *"who their employer is*" (Spreer and Rauschnabel, 2016; p.256). Today, however, the number of salespeople equipped with an MSA at the store has increased considerably, as attested by the trade press, which presents the tool as a relevant solution for reconciling salespeople's commercial performance (Chenevoy, 2021), and the quality of the relationship with the customer (Crown Heights, 2017).

Ten years on, it seems appropriate to examine the reasons and mechanisms that led to this change in salespeople's attitudes and behavior. How can we explain the fact that MSAs, initially viewed with suspicion by sales staff, have now been integrated into their professional practices? It is precisely this change in attitude and behavior that this research proposes to analyze, by mobilizing the theory of social influence (Kelman, 1958) which explores the mechanisms of attitude and behavior change. This theoretical framework considers the nature of change, and in particular three mechanisms: compliance or submission, identification and internalization. In the specific context of MSA, we could expect that salespeople use MSA to comply with managerial requirements (conformity). This use is not necessarily based on real conviction, but rather on a desire to avoid sanctions or meet expectations. Another assumption could be that the MSA is used by salespeople to be perceived positively by their peer colleagues (identification). Finally, MSA may be used by salespeople because the tool is deemed relevant and in line with their personal and professional values (internalization). The aim of this research is thus to identify the nature of the change in attitude and behavior, but also the more or less lasting and more or less internalized nature of MSA use by salespeople.
Thus, this research raises the following question: **How can we explain the possible reduction in resistance to MSA use by salespeople?**

The originality of our research lies in its approach to salespeople analysis of technology. Unlike conventional models of technology adoption, such as the Technology Acceptance Model (TAM) (Davis, 1989), which is based on a binary vision (acceptance or rejection of the technology), or the Post-Acceptance Model (PAM) (Bhattacherjee, 2001), which is based on voluntary adoption and post-use evaluation relying on confirmation of initial expectations, our research explores the specific context of incentivized or compulsory use of MSAs by retailers. In this context, we do not limit ourselves to an analysis in which retailers have no choice but to undergo this imposed use. On the contrary, we highlight their freedom of choice, particularly with regard to the intensity and manner in which they use the MSA (Davlembayeva *et al.*, 2025).

This paper starts with an analysis of salespeople's resistance to the use of in-store technology. We then ground on Kelman's (1958) theory of social influence to examine how these resistances evolve and shape the use of MSA through the processes of compliance, identification and internalization. The methodological approach used is then outlined, followed by the results and elements for discussion. Finally, we conclude by highlighting the theoretical and managerial contributions of this research.

I. Literature review

I.1 Salespeople's resistance to in-store technology

While a number of studies focus on the use of in-store technologies by customers (Bitner *et al.*, 2000; Cao *et al.*, 2022; Djelassi, 2018), literature remains rather limited when it comes to salespeople in-store technologies and particularly those used during customer interactions (De Keyser *et al.*, 2019; Rafaeli *et al.*, 2017). Regarding the use of MSA, the few studies identified deal with the resistance factors of salespeople to their use (Spreer and Rauschnabel, 2016). The authors mention 21 resistance factors, including factors linked to the perception of technology (perceived complexity, low perceived usefulness, dependency, technostress...), factors linked to customer relations (dehumanization, negative perception of the customer...) or factors linked to the professional image they may convey (perception of amateurism, stigmatization...). While interesting, the way in which these resistances evolve over time and with user experience remains little explored. And yet, the number of salespeople using MSA at the store is constantly increasing (Chenevoy, 2021, 2022), suggesting that certain initial resistances have probably been overcome or mitigated. These elements therefore invite us to better understand the mechanisms that have enabled this change in attitude and behavior, while identifying the resistance that persists and influences the way salespeople use MSA in their interactions with customers. Indeed, despite the increasingly frequent use of MSA by salespeople, it is necessary to question the nature of the changes that explain the intensity and manner in which salespeople use MSA.

II. The theoretical framework of social influence (Kelman, 1958)

The theory of social influence (Kelman, 1958) explains how individuals modify their attitudes and behaviors in response to social pressures. This theory distinguishes three mechanisms of influence: conformity, identification and internalization. Conformity occurs when an individual adopts a behavior to avoid punishment or obtain a reward, without necessarily adhering to the imposed norm. Identification occurs when an individual adopts a behavior to fit in with a group or to be perceived positively by reference figures. Finally, internalization occurs when the behavior adopted is in line with the individual's personal values and beliefs, leading to longer-lasting adoption. These mechanisms are interesting for analyzing changes in salespeople's attitudes and behaviors towards the use of MSAs. Indeed, salespeople may be highly inclined, sometimes imposed to use these tools by their superiors to comply with company directives (conformity), use them to conform to group standards, i.e. those of peers colleagues (identification), or fully integrate them into their practice because they consider them genuinely useful and in line with their values (internalization). Moreover, recent research on social influence (Davlembayeva *et al.*, 2024) shows that these mechanisms are not exclusive and that, depending on the nature of the influence mechanism, the change in attitude and behavior is more or less intense and more or less lasting. The aim of this research is therefore to explore how resistance to the use of MSA by salespeople has been overcome.

III. Methodology

An exploratory qualitative approach was designed. 21 interviews lasting an average of 50 minutes were conducted with MSA-equipped salespeople. The selection of this sample was guided by a concern for diversity, in terms of business sector, professional profile, gender and age. After recording and transcribing each interview in full, a content analysis was carried out, enabling us to identify the different uses of the MSA (Gavard-Perret *et al.*, 2012). To guarantee the quality of our study and limit subjectivity, coding was carried out with another researcher,

independently of each other. Coding was then carried out using Nvivo software (version 1.7.1), adopting *an a priori* and a posteriori approach.

IV. Results presentation

The results examine salespeople's behaviors toward MSA use, which are analyzed through the prism of the three social influence processes (Kelman, 1958).

Compliance: for all the salespeople interviewed, the MSA is used in response to managerial directives that encourage, or even impose, its use, as Virginie explains*: "We're obliged to. They (the hierarchical superiors) would like us to stop using computers. So, the Zebra is imposed, and we have statistics on it*" or Vincent *"They (the hierarchical superiors) tell me we have to work with it, so if they have decided that we should work with it at head office, we'll work with it. My priority in this company is my clientele, not disappointing my boss who pays me, and the more money they make, the more stable my salary becomes".*
However, while salespeople emphasize this incentive, they point out that they have no guidelines as to how to use MSA.

Identification: Identification with peers is, in theory, a mechanism that can reinforce the intensity of MSA use. However, the results show that this aspect plays a limited role in the way MSA can be used. Identification is mainly observed when salespeople use MSA by imitating their more experienced colleagues. Kristel illustrates this phenomenon by declaring: "*I learn on the job*" and "*Mathieu showed me once*", testifying to a progression in her mastery of the tools thanks to the influence of her peers. Beyond simple imitation, this identification enables salespeople to collectively construct meaning around the technology, as Valentin testifies when he talks about collective appropriation: "*We took it under our arm [...] We said to ourselves*: '*This could be useful to us at some point'. It's not imposed. We try to put it forward because we find [...] that it's a real solution, that it really has something to offer a customer*"

Internalization
Internalization implies that individuals adhere to a practice because they recognize its intrinsic value. In the case of MSA, the results show that salespeople's adherence to the tool is conditioned by a "test and learn" logic, where the experience accumulated during interactions with customers enables salespeople to assess the value of MSA. With the gradual use of MSA, we can see that some of the salespeople's initial reluctance tends to diminish, particularly as a result of an objective assessment of the MSA's benefits. In this way, the discovery of MSA's features and functionalities enables a reassessment of perceived benefits. For example, salespeople realize that MSA can facilitate certain tasks (rapid access to information, time savings, etc.)
"Today, it's extraordinary, we have a little device called the Zebra which is terrible, because in the end we have the sign at our fingertips" (Vincent).
"Yes, and to know it right away in the aisle, I think it saves time for the customer too. [...] In that respect, I think it's super practical for inventory" (Virginie)

Salespeople develop different adaptation strategies, ranging from minimal use (for basic tasks like stock checking or checkout) to comply with managerial requirements (compliance), to selective use mainly to project an image of professionalism and modernity to customers, and up to full usage by those who are convinced of the AVM's usefulness. While all interviewed salespeople comply with managerial expectations, several user profiles emerge. Some were

immediately convinced of the tool's benefits, while others appreciate some of its practical features but remain cautious about how customers might perceive them:

"It means the salesperson is focused on what they're doing on their phone, while the customer is standing next to them, waiting to ask a question." (Géraldine)
Others have moved from initial resistance to enthusiastic use, a shift explained by their direct experience with the tool. Finally, some remain hesitant and prefer to avoid using it as much as possible: *"So it's not easy [...] We do it because we're told to." (Vincent).*

Discussion, theoretical and managerial implications
Our research contributes to the literature on technology acceptance in contexts where usage is either mandated or strongly encouraged (Barki and Benbasat, 2007). By drawing on social influence theory (Kelman, 1958), we show that salespeople seek to strike a balance between conforming to managerial expectations and staying true to their own values. While compliance represents the minimum threshold of AVM usage, driven by managerial expectations, it does not predict the intensity of use. Identification with perceived customer expectations and internalization appear to be the primary drivers, emerging through a gradual evaluation process that is both objective (based on observed tangible benefits) and subjective (shaped by the salesperson's perception of how the AVM affects the customer relationship and the legitimacy of their expert role).

Our findings also show that the salesperson's experience with the technology enables a shift from mere compliance with managerial demands to more engaged and convinced usage. Remaining concerns are primarily related to how they may be perceived by customers. On this point, opinions vary and are largely explained by the salesperson's perception of how customers perceive them.
Finally, our results add to the literature that often contrasts technology with the quality of in-store interactions (Giebelhausen et al., 2014). Our study shows that salespeople agree on the benefits of the AVM when used for functional tasks. Thus, our findings suggest that a balance can be achieved when salespeople adjust the intensity of their use, allowing them to meet managerial expectations while aligning with their own values and those of the customers.

From a managerial perspective, our research highlights that the salesperson's user experience plays an important role in how the benefits of the AVM are evaluated. Therefore, rather than enforcing a uniform use of the tool, it seems essential to acknowledge salespeople's concerns and support a gradual process of appropriation. While training is necessary, it should not be limited to technical mastery of the AVM but should also include strategies for modulated use. This would enable salespeople to comply with managerial expectations while maintaining alignment with their professional values.

Bibliography

Barki, H., & Benbasat, I. (2007). Quo Vadis, TAM? *Journal of the Association for Information Systems*, *8*(4), 211-218.

Bhattacherjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly*, *25*(3), 351.

Bitner, M. J., Meuter, M. L., Ostrom, A. L., & Roundtree, R. I. (2000). Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters. *Journal of Marketing*, *64*(3), 50-64.

Cao, Z., Xiao, Q., Zhuang, W., & Wang, L. (2022). An empirical analysis of self-service technologies: Mediating role ofcustomer powerlessness. *Journal of Services Marketing*, *36*(2), 129-142.

Chenevoy, C. (2021, January 21). *Louis Pion has developed its sales thanks to sales tablets*. Républik Retail.

Chenevoy, C. (2022, May 6). *Tape à L'Oeil rethinks itself around salesperson mobility*. Républik Retail. https://www.republik-retail.fr/solutions-techno/omnicanal/pratiques/tape-a-l-oeil-se-repense-autour-de-la-mobilite-vendeurs.html

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(3), 319-340.

Davlembayeva, D., Chari, S., & Papagiannidis, S. (2025). Virtual Influencers in Consumer Behaviour: A Social Influence Theory Perspective. *British Journal of Management*, *36*(1), 202-222.

De Keyser, A., Köcher, S., Alkire (née Nasr), L., Verbeeck, C., & Kandampully, J. (2019). Frontline Service Technology infusion: Conceptual archetypes and future research directions. *Journal of Service Management*, *30*(1), 156-183.

Djelassi, S. (2018). How self-service technology experience evaluation affects waiting time and customer satisfaction? A moderated mediation model. *Decision Support Systems*, 10.

Giebelhausen, M., Robinson, S. G., Sirianni, N. J., & Brady, M. K. (2014). Touch versus Tech: When Technology Functions as a Barrier or a Benefit to Service Encounters. *Journal of Marketing*, *78*(4), 113-124.

Kelman, H. C. (1958). Compliance, identification, and internalization three processes of attitude change. *Journal of Conflict Resolution*, *2*(1), 51-60.

Rafaeli, A., Altman, D., Gremler, D. D., Huang, M.-H., Grewal, D., Iyer, B., Parasuraman, A., & de Ruyter, K. (2017). The Future of Frontline Research: Invited Commentaries. *Journal of Service Research*, *20*(1), 91-99.

Spreer, P., & Rauschnabel, P. A. (2016). Selling with technology: Understanding the resistance to mobile sales assistant use in retailing. *Journal of Personal Selling & Sales Management*, *36*(3), 240-263.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425-478.

The Effect of Pride on B2B Deciders' Willingness to Buy

Sam Schweickhardt[ab*], Alexander Grohmann[a], Christophe Fournier[b]

[a]*Aalen University, International Sales Management and Technology, Germany*

[b]*Université de Montpellier, Institut d'Administration des Entreprises IAE Montpellier, France*

Aalen University
Sam Schweickhardt
Beethovenstraße 1
73430 Aalen
Germany
+49 1575 2905 655
samschweickhardt@gmail.com

Aalen University
Prof. Dr. Alexander Grohmann
Beethovenstraße 1
73430 Aalen
Germany
+49 1767 0096 756
alexander.grohmann@hs-aalen.de

Université de Montpellier
Prof. Dr. Christophe Fournier
641 Avenue du Doyen Gaston Giraud
34000 Montpellier
France
+33 6749 3533 1
christophe.fournier@umontpellier.fr

Abstract

Using data from 363 b2b decision-makers, this article questions the effect of authentic pride on willingness to buy (WtB) in a hypothetical CRM acquisition scenario. The findings show a positive effect, depending on the intensity of pride. A quadratic model provides a better fit, challenging the assumption of linearity of emotional effects in decision making. The results are discussed against the background of Thaler's idea of mental accounts, emphasizing the role of emotional thresholds in decision making. Authentic pride may increase b2b decision makers' willingness to buy, while fostering emotional awareness in buyers may mitigate this effect.

Keywords: Pride, B2B, Decision-Making, Purchasing

The Effect of Pride on B2B Deciders' Willingness to Buy

Introduction

Emotions impact decisions by shaping perception or encouraging heuristic thinking (Lerner, Li, Valdesolo, & Kassam, 2015). Research on emotions in b2b decision-making remains scarce, despite growing evidence that managers are influenced by emotions (Grayot, 2020; Ribas & Almeida, 2021; Zehetner, Engelhardt-Nowitzki, Hengstberger, & Kraigher-Krainer, 2012).

The fairness appraisal was proposed as a particularly influential factor in decision-making (Watson & Spence, 2007). For example, fairness-related emotions have been shown to have a significant influence on acceptance, rejection and retaliation in economic decision-making experiments such as the ultimatum game (Güth & Kocher, 2014; Matarazzo, Pizzini, & Greco, 2020; Park, van Oyen-Witvliet, Barraza, & Marsh, 2021; Xiao & Houser, 2005).

In addition, self-conscious emotions in particular have a greater influence on self-control decisions than hedonistic basic emotions (Kotabe, Righetti, & Hofmann, 2019) and scholars speak of stronger effects emanating from positive than from negative emotions (Zehetner et al., 2012).

A variety of emotions (e.g. interest, excitement, hope, expectation, surprise, fear, anxiety) were identified along the b2b buying cycle (Kemp, Borders, Anaza, & Johnston, 2018). While all of these emotions play a role in recognizing needs, trust, hope, expectation and pride are particularly evident in the actual decision.

Pride is a fairness-related, self-conscious and positive emotion that has been identified as particularly influential in the buying cycle when placing an order. It is therefore assumed that pride influences the decision-making of protagonists in economic purchasing.

A hypothetical scenario places participants in an imagination that focuses on achieving professional status, social recognition and personal values through competent performance. Using data from an unpublished dissertation, we analyze whether pride influences the willingness to buy of b2b deciders and what role the intensity of pride plays in this.

Hypotheses

Pride is a fairness-related emotion arising from self-focused appraisals tied to identify and attributions (Bagozzi, Sekerka, & Sguera, 2018). In contrast to hubristic pride, authentic pride is not based on the self-assessment of being, but of doing and is characterized by a feeling of recognition (Tracy & Robins, 2007). Authentic pride leads to lower construal levels and focus on feasibility (Yang & Zhang, 2018). In addition, pride is negatively linked to the perception of risk (Lerner & Keltner, 2000), which could result in an increased willingness to buy among b2b deciders. Hypothesis 1: *Pride has a significantly positive effect on willingness to buy.*

The intensity of an emotion strongly influences its behavioral effects (Bagozzi, Gopinath, & Nyer, 1999). Moderate levels of pride are expected to positively influence willingness to buy and high levels additionally impair rational considerations due to overconfidence, thereby increasing the effect. Hypothesis 2: *The effect of pride on willingness to buy increases with higher levels of pride.*

Additionally, it is assumed that quadratic modeling explains the effect more precisely. Hypothesis 3: *A quadratic model explains the relationship between Pride and WtB better than a linear model.*

Methods

Data and Context

The present study refers to data from an unpublished dissertation on the influence of discrete emotions on decision-making and focuses exclusively on the effect between pride and willingness to buy. Data was collected with Prolific.com and analyzed with SPSS 23.

Specifically, data was collected as part of a cross-sectional experiment with online self-reports in a between-subject design. In a standardized questionnaire, participants were informed about the scope of the study (purpose of the study, procedure, time required, possible risks, data protection, financial compensation) and first checked for compliance with the participation requirements (current employment in b2b purchasing and authority to make purchase decisions on behalf of a company). After a query on socio-demographic data (gender, age, experience, company size, industry), participants were motivated to put themselves in a hypothetical situation. Participants were then asked about cognitive appraisals (outcome desirability, agency, certainty and fairness), emotions (anger, fear, pride, surprise), risk perception, benefit perception and willingness to buy. In addition, two attention checks with simple arithmetic tasks were used at the beginning and end of the experiment.

The scenario was a professional success situation in which a purchasing manager takes responsibility for a strategically important investment decision (see vignette used in the appendix). The protagonist reflects on successful work over the past few years, is explicitly praised by colleagues and superiors for performance and receives recognition from the executive board. The pride triggered is therefore based on deserved, competence-based performance, professional status gain, social recognition and alignment with personal values. It is not an arrogant or narcissistic form of pride, but an authentic sense of earned pride that is the result of hard work.

Measures

According to Robins and colleagues (Robins, Noftle, & Tracy, 2007, pp. 461–462) pride was operationalized as authentic pride and assessed on a unipolar 5-point scale (*not at all - extremely*) in seven items (*accomplished*, *like I am achieving*, *confident*, *fulfilled*, *productive*, *like I have self-worth*, *successful*), which were aggregated as mean to the variable Pride (α = 0.954; AVE = 0.751). Willingness to buy was measured based on established indicators (Dodds, Monroe, & Grewal, 1991), with slight modifications for this study. Willingness to buy was assessed with three items (*likelihood of purchasing*, *probability to consider buying*, *willingness to buy*) on a bipolar 7-point scale (*very low - very high*) and merged as a mean to the variable WtB (α = 0.838; AVE = 0.641).

Analysis *Methods*

Pride and WtB were tested for correlation. Bias corrected and accelerated (BCa) bootstrapping (n=1000) was used to robustly estimate standard errors and significance levels. A simple

regression was performed for linear effect modeling. To assess the effect size for changes in Pride, data were divided into eight groups by Pride level. For each group ANOVA and simple linear regressions were compared. Finally, the linear and the quadratic models were compared using coefficient of determination and effect size.

Findings

Sample Description

The sample included 363 b2b decision-makers, with 55.37% identifying as female and 44.63% as male, who stated that they had the authority to make purchasing decisions on behalf of a company. The mean age was 31.74 years (SD = 8.96) and subjects were experienced in purchasing (M = 5.33 years; SD = 4.84 years). Subjects worked for medium (34.44%), large (32.51%), small (18.73%) and micro enterprises (14.33%) in technology (19.01%), financial services (15.15%), retail (9.92%), healthcare (8.54%), manufacturing (6.61%), consumer goods (5.79%), transportation and logistics (3.58%), telecommunications (2.20%), energy (1.93%) and automotive (1.65%). Subjects worked in middle management (31.68%), support functions (25.34%), senior management (11.02%), as entrepreneurs or business owners (7.99%), as business executives (7.71%) and as consultants (6.06%).

Positive moderate Effect of Pride on Willingness to Buy

A significant positive correlation was observed between Pride and WtB ($r = 0.433$, $p < 0.001$). Simple regression indicated a moderate and positive linear effect of Pride on WtB (see Appendix: *Table 1*).

The Effect of Pride on Willingness to Buy is only significant at high Pride Levels

The estimation of the linear modeling of Pride on WtB only showed significant results for the ANOVA and the regression coefficient at high pride levels >= 4.5 (see Appendix: *Table 2*).

Quadratic Model explains more of WtB's Variance

The quadratic model showed a moderate effect and a better fit than the linear model. The linear coefficient must at least be questioned due to a non-significant result (see Appendix: *Table 3*).

Discussion

Summary of the Findings

For the first time, this study examined the effect of pride on b2b decision-makers' willingness to buy in a strategic purchasing scenario. Findings support a significant and moderate, positive effect of pride on willingness to buy (H1). Contrary to expectations, this effect was not significant for moderate pride levels. However, the effect became significant at high pride levels (H2). Curve estimation showed that a quadratic model provided a better explanation for this relationship than a linear model (H3).

Theoretical Meaning

This study identifies and quantifies authentic pride as a driver of b2b decisions. Linking emotional intensity to decision outcomes, the study bridges discrete emotion research with

strategic purchasing theory, challenging the assumption of linearity in emotion-driven decision models.

The findings support Thaler's thesis of *mental accounts*, according to which individuals categorize and evaluate events, gains, losses or expenses subjectively (Thaler, 1999). This is because the emotional "return" (status, recognition) is included in the decision to make a CRM purchase, although this is irrelevant from a rational perspective. The pride reaction could therefore facilitate a purchase decision, as the decision-makers perceive an additional benefit.

Thaler also criticizes the fact that classic economic models ignore psychological influences on decisions. The findings contradict the assumption that b2b deciders rationally weigh benefits and costs and demonstrates that pride influences the decision-making process. In Thaler's sense, this can be interpreted as evidence for the necessity of an extended utility function, in which not only objective economic variables but also authentic pride is included as utility component.

While an effect could be demonstrated for hypothesis 1, a non-significant effect for low and medium levels of pride in hypothesis 2 indicates a superimposition of the effect by as yet unexplained influences. This may illustrate that decision-making behavior does not react continuously to emotional inputs and supports Thaler's *decision frame*, in which emotional thresholds must be crossed before behavior is triggered (analogous to mental budget limits in loss aversion).

Managerial Implications

Marketers aiming to boost willingness to buy should consider emotion-priming strategies that induce authentic pride, particularly when purchasing situations concern professional status, social recognition and personal values of deciders in customer organizations. Because emotional awareness attenuates the intensity of emotions (Herwig, Kaffenberger, Jäncke, & Brühl, 2010), awareness of pride may nullify the effect. This suggests that promoting emotional awareness could also serve as a strategy to mitigate effects of intense pride on strategic purchasing. Organizations may therefore wish to train decision-makers in the own company in emotional self-awareness to avoid exaggerated or biased valuations resulting from intense pride, particularly in high stake decisions.

Limitations

This study has several limitations that warrant consideration. The interplay of multiple emotions (e.g., mixed emotions) may have influenced the findings, an aspect not accounted for in the present analysis. Additionally, the reliance on self-reported data and individual-level assessments limits the generalizability of the findings to group decision-making contexts, such as those commonly observed in buying centers. While the highly simplified conceptual model neglected moderation and mediation influences, variables such as age or seniority in purchasing roles may act as moderators that shape how pride influences behavior. For instance, more senior decision-makers may rely less on affective cues or possess greater emotional regulation skills, thereby weakening pride's influence. We therefore recommend that future research include such moderating variables explicitly. Scholars are also invited to investigate the broader applicability of (non-linear) emotional effects on willingness to buy across emotions, industries and decision types.

The authors declare to provide data on request.

References

Bagozzi, R. P., Gopinath, M., & Nyer, P. U. (1999). The role of emotions in marketing. *Journal of the Academy of Marketing Science, 27*(2), 184–206, from https://doi.org/10.1177/0092070399272005.

Bagozzi, R. P., Sekerka, L. E., & Sguera, F. (2018). Understanding the consequences of pride and shame: How self-evaluations guide moral decision making in business. *Journal of Business Research, 84*, 271–284, from https://www.sciencedirect.com/science/article/pii/S0148296317304824.

Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of Price, Brand, and Store Information on Buyers' Product Evaluations. *Journal of Marketing Research, 28*(3), 307–319.

Grayot, J. D. (2020). Dual Process Theories in Behavioral Economics and Neuroeconomics: a Critical Review. *Review of Philosophy and Psychology, 11*(1), 105–136.

Güth, W., & Kocher, M. G. (2014). More than thirty years of ultimatum bargaining experiments: Motives, variations, and a survey of the recent literature. *Journal of Economic Behavior & Organization, 108*, 396–409, from https://www.sciencedirect.com/science/article/pii/S0167268114001759.

Herwig, U., Kaffenberger, T., Jäncke, L., & Brühl, A. B. (2010). Self-related awareness and emotion regulation. *NeuroImage, 50*(2), 734–741.

Kemp, E. A., Borders, A. L., Anaza, N. A., & Johnston, W. J. (2018). The heart in organizational buying: marketers' understanding of emotions and decision-making of buyers. *Journal of Business & Industrial Marketing, 33*(1), 19–28.

Kotabe, H. P., Righetti, F., & Hofmann, W. (2019). How Anticipated Emotions Guide Self-Control Judgments. *Frontiers in psychology, 10*, 1614.

Lerner, J., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition and Emotion, 14*(4), 473–493.

Lerner, J. S., Li, Y., Valdesolo, P., & Kassam, K. S. (2015). Emotion and decision making. *Annual review of psychology, 66*, 799–823.

Matarazzo, O., Pizzini, B., & Greco, C. (2020). Influences of a Luck Game on Offers in Ultimatum and Dictator Games: Is There a Mediation of Emotions? *Frontiers in psychology, 11*(13), 1–15.

Park, G., van Oyen-Witvliet, C., Barraza, J. A., & Marsh, B. U. (2021). The Benefit of Gratitude: Trait Gratitude Is Associated With Effective Economic Decision-Making in the Ultimatum Game. *Frontiers in psychology, 12*, 1–9.

Ribas, A. C., & Almeida, L. de (2021). The role of emotions in B2B context: A systematic literature review. *Proceedings of the European Marketing Academy*, 1–10, from https://proceedings.emac-online.org/pdfs/A2021-93404.pdf.

Robins, R. W., Noftle, E. E., & Tracy, J. L. (2007). Assessing self-conscious emotions: A review of self-report and nonverbal measures. In *The self-conscious emotions: Theory and research* (pp. 443–467). New York, NY, US: The Guilford Press.

Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making, 12*(3), 183–206.

Tracy, J. L., & Robins, R. W. (2007). The psychological structure of pride: a tale of two facets. *Journal of Personality and Social Psychology, 92 3*, 506–525.

Watson, L., & Spence, M. T. (2007). Causes and consequences of emotions on consumer behaviour. *European Journal of Marketing, 41*(5/6), 487–511.

Xiao, E., & Houser, D. (2005). Emotion expression in human punishment behavior. *Proceedings of the National Academy of Sciences of the United States of America, 102*(20), 7398–7401.

Yang, P., & Zhang, Q. (2018). How pride influences product evaluation through construal level. *European Journal of Marketing, 52*(7/8), 1750–1775.

Zehetner, A., Engelhardt-Nowitzki, C., Hengstberger, B., & Kraigher-Krainer, J. (2012). Emotions in Organisational Buying Behaviour: A Qualitative Empirical Investigation in Austria. In I. Jodlbauer, J. Olhager, & R. J. Schonberger (Eds.), *Modelling Value. Selected Papers of the 1st International Conference on Value Chain Management* (pp. 207–229). Heidelberg: Physica.

Appendix

Table 1. *Simple Linear Regression for Pride on WtB*

Coefficients	*b*	*SE(BCa)*	*β*	*t*	*p*
Constant	4.406	0.156		28.244	0.001
PRID	0.394	0.042	0.433	9.380	0.001

Note. N = 363; r^2 = 0.187; F(1,361) = 83.130; p < 0.001; f^2 = 0.230

Table 2. *Effect on Willingness to Buy when changing the Pride Level*

Group	*Pride Level*	*N*	*Coefficients*	*b*	*SE(BCa)*	*β*	*t*	*p*
Group 1	<1.5	37	Constant	4.511	1.475		3.058	0.010
			PRID	0.412	1.171	0.061	0.352	0.707
Note. r^2 = 0.004; F(1,35) = 0.132; p = 0.718								
Group 2	>=1.5; <2.0	31	Constant	3.550	2.922		1.215	0.236
			PRID	1.022	1.692	0.120	0.604	0.573
Note. r^2 = 0.014; F(1,29) = 0.421; p = 0.522								
Group 3	>=2.0; <2.5	41	Constant	2.957	2.119		1.395	0.162
			PRID	0.984	0.937	0.156	1.050	0.309
Note. r^2 = 0.024; F(1,39) = 0.969; p = 0.331								
Group 4	>=2.5; <3.0	30	Constant	2.165	3.683		0.588	0.564
			PRID	1.268	1.369	0.167	0.926	0.379
Note. r^2 = 0.028; F(1,28) = 0.803; p = 0.378								
Group 5	>=3.0; <3.5	51	Constant	4.430	3.462		1.280	0.221
			PRID	0.299	1.048	0.045	0.285	0.768
Note. r^2 = 0.002; F(1,49) = 0.098; p = 0.755								
Group 6	>=3.5; <4.0	41	Constant	3.422	3.874		0.883	0.387
			PRID	0.579	1.039	0.082	0.557	0.582
Note. r^2 = 0.007; F(1,39) = 0.264; p = 0.610								
Group 7	>=4.0; <4.5	73	Constant	3.008	2.189		1.374	0.234
			PRID	0.740	0.522	0.144	1.418	0.223
Note. r^2 = 0.021; F(1,71) = 1.510; p = 0.223								
Group 8	>=4.5; <5.0	59	Constant	-1.662	2.783		-0.597	0.489
			PRID	1.687	0.565	0.414	2.986	0.001
Note. r^2 = 171; F(1,57) = 11.770; p = 0.001								

Table 3. *Quadratic Model for the Effect of Pride on WtB*

Coefficients	*b*	*SE(BCa)*	*β*	*t*	*p*
Constant	5.368	0.415		12.935	0.000
PRID	-0.342	0.277	-0.376	-1.235	0.161
$PRID^2$	0.120	0.042	0.821	2.857	0.002

Note. N = 363; adjusted R^2 = 0.204; F(2,360) = 47.253; p < 0.001; f^2 = 0.256

Pride Vignette:

I lead procurement at BGD Inc. and am responsible for a team of 35 people who make up the global strategic sourcing team to support our digital transformation. Faced with supply chain bottlenecks and increased pricing pressure, we spent four months evaluating management software to improve customer care. My team and I have now come to a recommendation of a new customer relationship management system that meets all the technical requirements. I absolutely trust my team and fully endorse their recommendation. Although costly, it is a necessary investment that is already tailored to our workflows. With a full implementation within two months and round-the-clock services, the offer sounds tempting. The decision is a long-term decision for a provider, which may entail dependencies, but is comparable with alternatives. Today, the final negotiations are taking place and the contract is to be signed. I'm going through the impact of the decision in my mind again:

...This morning my partner wished me a good day and assured me that I had always followed the right values. I reflect upon the last three years during which I have been able to achieve significant cost savings for the company. As a result, we have strongly established ourselves in the industry and are considered an exemplary division. I am sitting at my desk when my supervisor approaches me. He tells me that the supervisory board has highly praised me, specifically my performance in the upcoming deal, which has set new standards for the industry. And there's no end to it – my phone rings. I receive a call from a colleague who attended the supervisory board meeting and congratulates me. He expresses his admiration for me and I realize that my reputation has noticeably improved thanks to my hard work.

Consumer Information Processing in Food-Decoding Applications: An Investigation into Aggregation and Evaluation of Health Scores

GUILLAUME LE BORGNE

ASSOCIATE PROFESSOR

INRAE, UMR MOISA - UNIVERSITÉ SAVOIE MONT BLANC, IREGE

INRAE - BÂTIMENT 26 - 2 PLACE PIERRE VIALA - 34000 MONTPELLIER

guillaume.le-borgne@univ-smb.fr,

+33675367071

CAROLINE MORRONGIELLO

ASSOCIATE PROFESSOR

UNIVERSITÉ SAVOIE MONT BLANC, IREGE

MARJOLAINE BEZANÇON

ASSOCIATE PROFESSOR

UNIVERSITÉ SAVOIE MONT BLANC, IREGE

Consumer Information Processing in Food-Decoding Applications:

An Investigation into Aggregation and Evaluation of Health Scores

Context and research goals

Food-decoding mobile applications such as Yuka have gained widespread popularity, offering consumers simplified evaluations of food products based on aggregated health scores. For an application like Yuka, the total score is a weighted sum of sub-scores for additives, nutrients and organic labeling. These sub-scores often take the form of coloured discs (red, yellow, or green), and are based on different calculation logics: for additives, a lexicographical logic is applied (other, non-risky additives do not compensate for a risky additive), while for nutrients, the Nutriscore - and its compensatory logic - is used directly. However, as the authors of the Nutriscore point out: "In terms of public health, it is essential to inform consumers about each of the three health aspects of food: nutritional quality, degree of processing, presence of pesticides. A number of initiatives have recently been launched, proposing to combine at least two, if not all three, of these dimensions in a single indicator. However, the weightings used between each of these dimensions are not yet based on solid scientific foundations, and there is no scientific consensus on the trade-offs made when they are discordant. As a result, it seems impossible to combine them into a single synthetic indicator that would sum up the overall 'health' value of foods."[1]

It therefore seems ontologically impossible to define an indisputable aggregate health score. However, such aggregations do exist, either explicitly in these mobile applications, or latently in the minds of consumers when confronted with detailed and, possibly, different kinds of information. It is even reasonable to think that the scores affixed to packaging and the use of nutritional mobile applications influence consumers' representations and the way in which they aggregate information. However, little research has examined how consumers process these aggregated and disaggregated grades and/or scores when making food choices. This research investigates how consumers interpret and use these evaluations, particularly focusing on the aggregation of nutritional and additive information in the perception of product healthfulness.

Literature Review and Conceptual Background

Consumer decision-making around food labels frequently relies on two primary heuristics: lexicographic (negative-signal prioritization) and compensatory (e.g., weighted sum).

Lexicographic processing (negative-signal prioritization)

Under a lexicographic rule, consumers rank attributes by importance and stop evaluating a product as soon as they encounter a decisively negative cue. Rozin and Royzman (2001) describe a general "negativity bias" whereby negative information carries more weight than equally strong positive information, leading people to treat any threat or "contamination" as a stop-rule trigger. In the context of food labels, this means that a salient warning (e.g., a dark-orange or red interpretive alert) immediately dominates all other considerations.

Research suggests that consumers prioritize negative signals, such as the presence of harmful additives, over positive nutritional attributes, demonstrating a lexicographic heuristic in certain contexts (Bearth et al., 2014). Mérigot and Nabec (2016) tested interpretive "alert" logos (e.g.,

[1] Hercberg et al., https://nutriscore.blog/2021/11/28/le-nutri-score-et-les-autres-dimensions-sante-des-aliments-informer-au-mieux-les-consommateurs/

a dark-orange "5C" traffic-light style) versus descriptive Guideline Daily Amount logos on breakfast cereals. They found that when a cereal displayed a dark-orange alert for excessive sugar or saturated fat, subjects rated it significantly less healthy and expressed almost no purchase intention—regardless of any fiber or protein claims on the same package. In other words, the dark-orange alert acted as a lexicographic "one-strike" cue: once consumers saw the negative signal, they rejected the product outright.

Together, Rozin and Royzman (2001), Bearth et al. (2014), and Mérigot and Nabec (2016) show that consumers frequently recourse to a lexicographic mode whenever a highly negative signal—especially a "contaminant" cue like an additive warning or a red signal—appears on-pack.

Compensatory processing (averaging cues)

Conversely, compensatory processing involves mentally offsetting negative attributes (e.g., high sugar) with positive ones (e.g., high fiber). Compensation (by weighted sums) is one of the aggregation methods used in multi-attribute models to explain consumer choices. Payne, Bettman & Johnson (1993) and Chernev (2009) supply the theoretical underpinnings of compensatory decision rules, demonstrating that, when permitted, people naturally average across attributes (including nutritiousness cues).

In the domain of nutrition, Wansink and Chandon (2006) showed that, when a product is labeled "low-fat," consumers infer a larger appropriate portion size and experience lower anticipated guilt, leading them to consume more—even if the low-fat claim coexists with other negative cues (e.g., high sugar). In laboratory and field-setting studies, participants served themselves more snack foods labeled "low fat" than identical items labeled "regular," reflecting on-the-fly trade-off reasoning rather than outright rejection.

Finally, it appears that nutritional scores such as France's Nutri-Score are calculated using a compensatory approach (a weighted sum where, for example, a high fibre content can 'compensate' for a fairly high sugar content, resulting in a score such as C). However, if the sum of negative elements (sugar, fat, salt, etc.) in a product exceeds a certain threshold, the protein content is disregarded in the nutritional score calculation[2] and cannot therefore compensate for the negative elements. Thus, we can see that the Nutri-Score algorithm combines compensatory and lexicographic logic.

These dual heuristics—lexicographic stop-rules when encountering a red/orange alert versus compensatory nutrient trade-offs—indicate that aggregated global scores (e.g., Nutri-Score) will not uniformly guide purchasing behavior. Red warning marks about risks of additives often invoke a lexicographic "one-strike" rule, while nutrient sub-indicators may generally lead to trade-offs among "green-", "yellow-", and "red-rated" attributes. Distinguishing between these strategies of aggregation is therefore essential when designing food-decoding applications or public-health labeling policies.

Hypotheses:

These dual heuristics indicate that aggregated global scores (e.g., NutriScore) may not uniformly guide purchasing behavior: additive warnings often invoke a lexicographic "one-

[2] https://www.santepubliquefrance.fr/content/download/150257/file/Nutriscore_reglement_usage_FR_310122_VDEF.pdf

strike" rule, while nutrient indicators encourage trade-offs. These findings highlight the necessity of distinguishing between different strategies of aggregation when designing food-decoding applications. This leads us to start with three hypotheses:

H1: Individuals do not aggregate nutritional information in the same way as information on the risks associated with food additives.

H2nut: Individuals predominantly use compensatory logic to aggregate nutritional signals

H2add: Individuals predominantly use a lexicographic logic (the worst signal predominates) to aggregate signals about the risks associated with additives

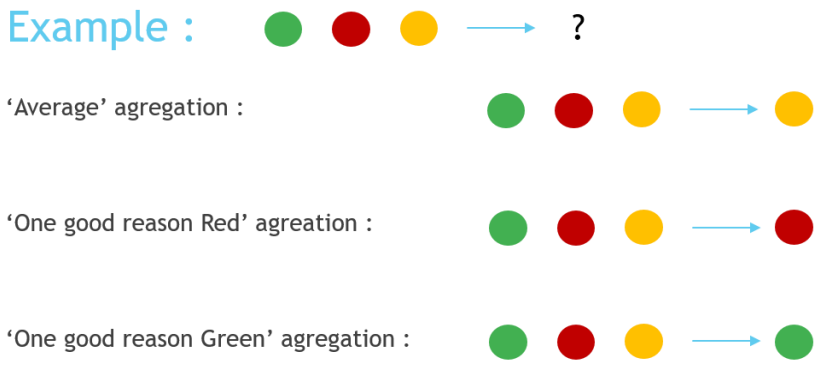
Methodology

Using a series of online experiments with representative consumer panels (n = 1400 per study), we analyze different aggregation strategies employed by users when presented with distinct sets of food information. First, we study the aggregation of detailed information of the same nature: (1a) detailed nutrient scores (sugar, salt, saturated fats) and (1b) detailed additive scores (texturants, preservatives, artificial flavors). Then, we study the aggregation of information of different nature: (2) combination of a single nutrient signal and a single additive signal and (3) combined indicators of nutritional quality, food processing, and environmental impact.

Participants evaluated (through a 0-100 analogic scale) the healthfulness of food products (pizzas) based on:

- **Study 1a:** Aggregation of detailed nutrient signals (sugar, salt, saturated fats).
- **Study 1b:** Aggregation of additive signals (texturants, preservatives, artificial flavors).

Signals are green (good), yellow (medium), and red (bad) discs. Here are examples of different ways to aggregate these signals (with a ponderation of 0 for red, 1 for yellow, 2 for green for the weighted sum corresponding to the 'average' aggregation):



In our experiments, participants are asked to estimate a health score (ranging from 0 to 100), allowing more precision than a 3-levels scale (green, yellow, red). Example of experimental stimulus is presented in Appendix (A1). The information presentation format (global rating, detailed rating, colours and vocabulary) was largely inspired by the Yuka app. Respondents could view the global and detailed ratings simultaneously (unlike on packaging, where the global rating often appears on the front). The time allowed for each evaluation was 10 seconds,

which was deemed sufficient in previous pre-tests and also encourages participants to answer intuitively (thus favouring heuristics). However, no external source was mentioned regarding how the colours were determined. We indicated that the coloured dots were based on the product's nutritional information and explained how the colour was determined, without going into detail about the calculation rules.

[To date (May 2025), all four studies have been completed and data collected, but only data from Study 1a and Study 1b have been analyzed and have led to hypotheses testing.]

Results of Studies 1a / 1b

To determine each respondent's aggregation process, three Pearson's correlation coefficients were calculated. They were used to assess the similarity between respondent's evaluations and the three theoretical aggregation processes presented earlier. CorrAV indicates the correlation between the respondent's 27 evaluations of pizzas and the 'Average' aggregated ratings of the 27 pizzas. CorrOGRred indicates the correlation between the respondent's 27 evaluations of pizzas and the 'One good negative reason' (lexicographic order, priority to worst color i.e. red) aggregated ratings of the 27 pizzas. CorrOGRgreen indicates the correlation between the respondent's 27 evaluations of pizzas and the 'One good positive reason' (lexicographic order, priority to best color i.e. green) aggregated ratings of the 27 pizzas. To calculate 'Average' aggregated ratings and quantify 'One good negative/positive reason' ratings for each pizza, colors were set to 0 for green, -1 for amber, -2 for red. To each respondent was then assigned a 'closest aggregation process'. This process is the one with the highest correlation coefficient. For instance, a respondent's aggregation process is said to be 'Average' if CorrAV>CorrOGRred and CorrAV>CorrOGRgreen. It turns out that no respondent had an 'OGRgreen' aggregation process in any condition. Table 1 shows the proportion of each aggregation process, for each information type.

Nutrients		**Additives**	
Average	Red Lexicographic	Average	Red Lexicographic
Eff. : 36 / *84%*	Eff. : 7 / *16%*	Eff. : 37 / *63%*	Eff. : 22 / *37%*

Table 1 –Aggregation process for each condition

A Fisher exact test (odds ratio = 0.33, p=0.026) leads to **accept H1**: aggregation/notation style does depend on the type of information displayed (the lexicographical style "One good negative reason" (Red Lexicographic) is significantly more present in the additive condition).

Comparison of proportions tests shows that the "average" style is significantly more prevalent in each of the two conditions. Thus, **H2nut is accepted**, while **H2add is rejected**. However, as seen above, a higher proportion of respondents use the lexicographic aggregation "one good negative reason" for additives than for nutrients, which is in line with the considerations that led to H2nut and H2add.

Implications of the research

The implications extend to both policymakers and food-labeling technology developers. While mobile apps aim to simplify food choices, their effectiveness depends on consumer cognitive diversity and the potential limitations of relying solely on aggregated indicators (Chalamon & Nabec, 2016).

Previous research has shown that consumer aggregation strategies vary depending on the type of information presented:

- **Consumers prioritize additive risk over nutrient-based assessments.** When presented with both nutrient and additive information, many consumers prioritize avoiding harmful additives over evaluating nutritional quality (Laporte, 2019; Flaherty et al., 2017).
- **Aggregated scores do not always override disaggregated information.** Despite the prominence of synthetic scores in food apps, consumers tend to integrate detailed information in their evaluations, particularly when signals are conflicting (Watson & Ghosh, 2019).
- **Cognitive and dietary profiles influence aggregation.** Different consumer segments display varying degrees of reliance on global scores versus individual attributes (Steptoe & Pollard, 1995).

Our research reinforce these results, and extends the understanding of mobile food applications by showing that different heuristics emerge among consumers, depending of information type and [to be shown] consumer characteristics. These insights have important implications for food labeling policies and app development strategies.

Conclusion & Future Directions

This research (work in progress) highlights the complexity of consumer decision-making in the context of mobile food applications. While these apps offer valuable guidance, they do not replace individual cognitive processes and heuristics. Policymakers and app developers should consider:

- Allowing users to customize score weighting based on their dietary priorities.
- Providing greater transparency in the calculation of aggregated scores.
- Investigating the long-term impact of food apps on dietary habits.

Following on from this work, studies 2 and 3 were conducted:

- **Study 2:** Combination of a single nutrient signal and a single additive signal.

The last study asked respondents to evaluated a global score of quality (instead of healthfulness), given that the EcoScore appeals to environmental concerns (in addition to health concerns).

- **Study 3:** Integration of three different signals (NutriScore, EcoScore, additive risk).

Study 2 aims to understand how consumers aggregate (in different ways) health signals relating to nutrients and additives respectively. This objective echoes our introduction to the existence of different ways of aggregating such information, in parallel with the ontological impossibility of an indisputable mode of calculation.

Study 3 adds the environmental dimension with the EcoScore (which, like any environmental signal, is likely to have a halo effect on health).

The different aggregation styles of respondents that will be identified will most likely depend on individual variables, such as dietary goals, health regulatory orientation, or socio-economic

variables. We measured these variables in surveys 2 and 3. [Analyses on data of Study 2 and 3 will be made in June 2025]

Studies 2 and 3 will provide important information on how a) consumers merge health information (additives and nutrients) whose combined effects are not yet sufficiently known, and b) consumers merge health information (additives and nutrients) and environmental information (ecoscore) to assess a product overall. Multi-attribute evaluation (study 3) is commonplace in marketing, but in a context where mobile applications and packaging are progressively integrating these attributes side by side, it is necessary to specifically study this combination of attributes.

Future research should explore real-world app usage and its effects on purchasing behaviors beyond controlled experimental settings. Additionally, further investigation into how different consumer groups (e.g., those with high nutritional knowledge versus novices) process these scores will be valuable for refining digital food labeling strategies. By addressing these gaps, mobile food applications can be optimized to better support informed and healthier food choices.

References

Bearth A., Cousin M. and Siegrist M. (2014) The consumer's perception of artificial food additives: influences on acceptance, risk and benefit perceptions. *Food Quality Preference* 38: 14-23.

Chalamon I. and Nabec L. (2016) Why do we read on-pack nutrition information so differently? A typology of reading heuristics based on food consumption goals. *Journal of Consumer Affairs* 50(2): 403–429.

Chemev, A., & Hamilton, R. (2009). Compensatory reasoning in choice. In *Social psychology of consumer behavior* (pp. 131–147). Psychology Press.

Flaherty SJ, McCarthy MB, Collins AM and McAuliffe FM (2019). A different perspective on consumer engagement: exploring the experience of using health apps to support healthier food purchasing. *Journal of Marketing Management* 35(3-4): 310-337.

Ikonen I., Sotgiu F, Aydinli A and Verlegh (2019) Consumer effects of front-of-package nutrition labeling: an interdisciplinary meta-analysis. *Journal of the Academy of Marketing Science* 48(3): 360-383.

Laporte M.E. (2019) Distinguer les risques sanitaire et nutritionnel perçus pour améliorer les comportements alimentaires. *Décisions Marketing* 96: 53-68.

Mérigot, P., & Nabec, L. (2016). Les effets d'alerte et de promotion des logos nutritionnels sur la face-avant des produits agroalimentaires. *Décisions Marketing*, 83(3), 29–47. https://doi.org/10.7193/DM.083.29.47

Nabec L., Mérigot P., Julia C. (2017) Les logos nutritionnels sont-ils légitimes ? Analyse de l'effet de leur format selon l'expertise nutritionnelle des consommateurs. 33ème congrès international de l'AFM (Association Française du Marketing), May 2017, Tours, France. https://hal.archives-ouvertes.fr/hal-02310782/

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). The adaptive decision maker (pp. xiii, 330). Cambridge University Press. https://doi.org/10.1017/CBO9781139173933

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. Personality and Social Psychology Review, 5(4), 296–320. https://doi.org/10.1207/S15327957PSPR0504_2

Steptoe A., Pollard T. M. and Wardle J. (1995). Development of a Measure of the Motives Underlying the Selection of Food: The Food Choice Questionnaire. Appetite, 25(3), 267–284.

Wansink, B., & Chandon, P. (2006). Can "Low-Fat" Nutrition Labels Lead to Obesity? Journal of Marketing Research, 43(4), 605–617. https://doi.org/10.1509/jmkr.43.4.605

Watson JJ., Ghosh AP. (2019) Ratings And/Or Reviews: the Effects of Aggregate and Disaggregate Product Information in Product Evaluations, iin NA - *Advances in Consumer Research* Volume 47, eds. Bagchi R, Block L, and Lee L, Duluth, MN : Association for Consumer Research, Pages: 68-72.

Appendix

A1: Stimuli for Study 1a

For the stimuli, the order of the nutrients and the order of the additives were randomly permuted across participants.

[Respondents could click anywhere on this segment to place a cursor]

Translation :

saturated fats - high quantity
salt - low amount
sugar - moderate amount

This pizza is very unhealthy / average / healthy

A2 – Display conditions and descriptive statistics (mean, s.d.) of the scores (Table 1: Nutrition condition, Table 2: Additives condition)

	Nutrition condition																											
N°	**Pizza n°1**			**Pizza n°2**			**Pizza n°3**			**Pizza n°4**			**Pizza n°5**			**Pizza n°6**			**Pizza n°7**			**Pizza n°8**			**Pizza n°9**		
Sugar/Fat/Salt**	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt
AV/OGred/OGgreen																											
Average score (/100)	91.6			66.3			63.3			68			50.2			49.3			52.1			43.2			54.8		
Average score - Mean*	51.7			26.4			23.4			28.1			10.4			9.4			12.2			3.3			14.9		
s.d.	14.6			16.2			18.4			15.5			15.9			15.5			16.2			12.4			15.2		
N°	**Pizza n°10**			**Pizza n°11**			**Pizza n°12**			**Pizza n°13**			**Pizza n°14**			**Pizza n°15**			**Pizza n°16**			**Pizza n°17**			**Pizza n°18**		
Sugar/Fat/Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt
AV/OGred/OGgreen																											
Average score (/100)	46.5			51.5			40.1			38.8			37.2			37.9			38.6			38.9			26.5		
Average score - Mean*	6.6			11.6			0.2			-1			-2.6			-2			-1.3			-0.9			-13.4		
s.d.	16.8			16.7			13.5			13.9			14.6			14.4			14.2			14			13.3		
N°	**Pizza n°19**			**Pizza n°20**			**Pizza n°21**			**Pizza n°22**			**Pizza n°23**			**Pizza n°24**			**Pizza n°25**			**Pizza n°26**			**Pizza n°27**		
Sugar/Fat/Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt	Sug	Fat	Salt
AV/OGred/OGgreen																											
Average score (/100)	25.4			27.9			25.5			26.6			24.5			15.5			17			16			2.8		
Average score - Mean*	-14.5			-12			-14.3			-13.3			-15.3			-24.4			-22.8			-23.8			-37.1		
s.d.	12.6			12.3			15.3			13.5			13.5			12.4			11.9			11.2			5.5		

**Sugar / Saturated Fat / Salt

*Mean of mean scores : 39.9

	Additives condition																										
N°	**Pizza n°1**			**Pizza n°2**			**Pizza n°3**			**Pizza n°4**			**Pizza n°5**			**Pizza n°6**			**Pizza n°7**			**Pizza n°8**			**Pizza n°9**		
Text/Pres/Flav**	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav
AV/OGred/OGgreen																											
Average score (/100)	91.8			64.8			61.8			61.9			46.4			46.8			48.4			39.7			46.1		
Average score - Mean*	54.8			27.9			24.8			24.9			9.4			9.8			11.5			2.7			9.1		
s.d.	14.5			16.2			16.9			17.3			14.4			13.1			15.2			11.6			17.5		
N°	**Pizza n°10**			**Pizza n°11**			**Pizza n°12**			**Pizza n°13**			**Pizza n°14**			**Pizza n°15**			**Pizza n°16**			**Pizza n°17**			**Pizza n°18**		
Text/Pres/Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav
AV/OGred/OGgreen																											
Average score (/100)	44.6			47.4			37.0			34.7			34.2			32.6			34.6			36.7			23.3		
Average score - Mean*	7.6			10.4			0.0			-2.3			-2.8			-4.4			-2.4			-0.3			-13.7		
s.d.	18.9			17.3			15.2			14.4			14.2			13.7			13.8			15.7			13.3		
N°	**Pizza n°19**			**Pizza n°20**			**Pizza n°21**			**Pizza n°22**			**Pizza n°23**			**Pizza n°24**			**Pizza n°25**			**Pizza n°26**			**Pizza n°27**		
Text/Pres/Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav	Text	Pres	Flav
AV/OGred/OGgreen																											
Average score (/100)	23.9			24.1			21.5			24.8			22.5			16.1			15.2			13.3			3.9		
Average score - Mean*	-13.1			-12.9			-15.5			-12.2			-14.5			-20.9			-21.7			-23.7			-33.1		
s.d.	13.0			12.9			12.5			14.0			12.9			13.7			11.4			10.2			12.5		

** Texturing agent / Preservative / Artificial Flavor *Mean of mean scores : 37

Consumption Experiences of Food Aid Beneficiaries: Using Brands as Symbolic Resources in Identity Negotiation

ANIS JOUNAID
ASSISTANT PROFESSOR OF MARKETING,
CRIEG-REGARDS
UNIVERSITÉ DE REIMS CHAMPAGNE ARDENNE
57 BIS, RUE PIERRE TAITTINGER
51096 REIMS CEDEX, FRANCE
anis.jounaid@univ-reims.fr

ABDELMAJID AMINE
FULL PROFESSOR OF MARKETING
INSTITUT DE RECHERCHE EN GESTION
UNIVERSITÉ PARIS-EST CRÉTEIL
4 ROUTE DE CHOISY
94010 CRÉTEIL CEDEX, FRANCE

Consumption Experiences of Food Aid Beneficiaries: Using Brands as Symbolic Resources in Identity Negotiation

Abstract

Drawing on the results of a qualitative research project that studies different aspects of the consumption experiences of beneficiaries inside Food Aid Organizations (FAO), we explore the meaning they attribute to branded commodities, both market and FAO-related ones. Through a 20-month ethnographic immersion, we gathered data indicating that these branded products are associated with meanings (1) depending on the consistency of the brands with the consumption spaces they are exhibited in and (2) are used as by beneficiaries as resources to negotiate their identities inside and outside these spaces.

Introduction

Due to a difficult socio-economic situation aggravated by the coronavirus pandemic, the number of food aid beneficiaries in France is estimated at 2.4 million people at the end of 2022[1]. For these beneficiaries, attending Food Aid Organizations (FAO) signals a situation of vulnerability that can be stigmatizing (Baker et al., 2005). In this paper, we focus on the role of consumption elements that pertain to the domain of consumables, clothing and accessories as levers for identity negotiation. Our informants rely on certain commodities to pass (Goffman, 1963) as normal consumers, while rejecting a devalued identification to poverty at the same time. Furthermore, our results point to the fact that these commodities have different meanings depending on their use and display either inside or outside the constrained spaces of FAO. The symbolic potential of these commodities varies therefore depending on their exhibition, perception and interpretation either in a conventional (market) space or constrained (FAO). Brands can either include or exclude consumers from groups of consumers and, therefore, constitute important identity resources (Elliott and Wattanasuwan, 1998).

An interesting example is that of shopping bags given by some FAO to beneficiaries. The former consider them to hold devaluing connotations, mainly because it constitutes a revealing element that lays bare his socio-economic condition. To avoid this exposure, these bags are replaced by others considered "normal", mainly branded ones. Therefore, beneficiaries use branded shopping bags bearing the logo of major retailers to show that they belong to the normal consumption sphere. This trick aims to reduce the sense of shame they feel about going there. On the other hand, conventional branded clothes, when exhibited inside FAO spaces are disqualifying for certain beneficiaries, in the sense that they signal wealth and reveal the illegitimacy of the latter to access the distributed products through aid. This interplay between consumption spaces and exhibited branded commodities (both conventional and stigmatizing) is central in the consumption experience of FAO beneficiaries, being that it engages with (dis)identification to (non)valued branded commodities (Hogg, Banister & Stephenson, 2009). FAO beneficiaries manage said interplay to negotiate social identity (identify with/reject (non)valued elements) both inside and outside the conventional marketplace.

Our research question is hence formulated as follows: How do brands meanings change according to consumption space? And how do FAO beneficiaries use them to negotiate their identities? In the following we will present our conceptual framework that revolves around the concept of social identity, the methodological approach to gather and analyze data, after which we will present detailed accounts of two interviewees through excerpts that underline the symbolic potential of commodities to negotiate social identities that in(ex)clude consumers from consumption spaces they navigate.

Conceptual framework

The perspective adopted in this research regarding identity considers it as a social construct (Mead, 1934), requiring relationships with others (Jenkins, 2008). Linking identity and interaction results in a negotiation process that implicates oneself dynamic with others. Following Goffman (1963) the self is thought of a set of social actors obeying rules and a social order of interaction (Collins, 1986), that aims to maintain the sacredness of the individual's face in a context of social interactions (Goffman, 1959). Based on this characterization, interactions between beneficiaries of food helping organizations and these potentially devaluing consumer spaces (Garthwaite, 2016) take on important identity dimensions for these vulnerable consumers. Affiliation with these organizations can be seen as a stigmatizing symbol that refers to poverty and assistance (Chase and Walker, 2013) in a society where the perception of self

[1] https://www.banquealimentaire.org/etudes-profils-2023-qui-sont-les-personnes-accueillies-laide-alimentaire

and others is intimately tied to the ability to consume (Hill, 2002). Consumption's symbolic potential can serve for "social identification with (approach) groups, and distinction from less desirable (avoidance) groups" (Banister & Hogg, 2004: 859).

One way to reject the stigma (Goffman, 1963) is to present oneself as a full-fledged consumer (Arnould and Thompson, 2005) through elements of clothing and accessories that are not directly linked to the consumption activity that beneficiaries engage in with FAO, both during and after the activity (i.e. inside the constrained space and in other conventional spaces afterwards).Therefore, beneficiaries resort to consumption commodities to save face (Goffman, 1959). More particularly, they use the symbolic potential of conventional branded products to avoid a devaluating identification, that of a flawed consumer (Bauman, 2005). In order to do so, they exhibit signs of inclusion to consumption spaces and hide those of exclusion to pass as normal consumers. Goffman defines passing as the "management of undisclosed discrediting information about self" (1963: 42). Undisclosed discrediting information in this case are brands that are exhibited in one consumption space, while referring to another one (e.g. conventional branded products inside distribution centers and vice versa). Put simpler, when branded commodities are exhibited in certain consumption spaces, they can potentially act as (disqualifying) markers when they are inconsistent (Baker, 2006) with these consumption spaces, whereas they go unnoticed in other ones (Schlagdenhauffen, 2015). The dynamic between branded commodities and consumption spaces is therefore a key factor in (dis)identification for consumers in general, and FAO beneficiaries in particular. Our results indicate that the identification process operates both inside and outside the constrained space.

Method

This paper presents a portion of the empirical results of a larger ethnographic research project that aims to understand the consumption experience of food aid beneficiaries both inside and outside of FAO. We conducted 35 interviews that lasted over 1 hour both with beneficiaries and volunteers of FAO in which we immersed ourselves for a total of 20 months to observe the lived experience inside these consumption spaces. We enrolled as volunteers in these FAO, which proved to be of the utmost importance as we are studying sensitive subjects (social identity) with a vulnerable population (Hill, 1995).

The status of volunteers allowed us to blend in (Hill, 1991)to limit the influence that a researcher's presence could have on the behaviors and discourse of beneficiaries. On the other hand, this status facilitated access to a volatile population, by means of a proximity established during distributions in which we participated. During the interviews, we explored different dimensions linked to consumption both inside and outside the FAO consumption spaces. We have recorded, transcribed and analyzed our data through thematic content (Spiggle, 1994) analysis that consisted of double coding for a portion of the data (Hirschman, 1986).

The data analysis points out the symbolic dimension that underlies the meanings beneficiaries attribute to commodities both inside and outside FAO spaces, for themselves and for other consumers. This symbolic dimension emerged more clearly in the discourses of some respondents than others. In order to highlight it, we'll, like Ahuvia (2005), concentrate the data analysis on two emblematic cases who expanded largely on the subject. Other excerpts, from other informants, addressing the symbolic dimension from the collected data will not be mentioned in the present paper for space constraints.

In the following, we present excerpts of the two informants' views on symbolic consumption, used by them as a strategy to escape identity devaluation and pass as normal in the conventional space and, at the same time, appear as legitimate in the constrained space. In the following

elaborate on the signification of a FAO-related symbol/commodity in the conventional spaces and that of a normal symbol\commodity in the FAO (i.e. constrained space).

Results

Inside the constrained space: Legitimate beneficiaries and imposters

Upon spending time inside, and outside (e.g. queueing) in the distribution centers, beneficiaries interact and, more importantly, observes each other. Doing so, they make sense of markets (i.e. conventional space) related symbols that are introduced in the perimeter of FAO centers (i.e. constrained space). Mainly branded products and commodities exhibited by some beneficiaries signaling an economic situation comfortable enough for them to do without FAO. An interesting case in point is that of Assia (Female, 38 years old, mother of three), for whom the display of branded commodities reveals a certain level of economic capital. In the following excerpt, she particularly points out the appearance of certain beneficiaries' clothing and/or their vehicles that expose their financial situation

> **Assia**: Some of them [beneficiaries] are very well dressed to come over there (...) and I don't understand how they're in such dire straits, I can see, then I can see jewelry, make-up, nail varnish, and you come here, are you sure you're in dire straits? Levi's jeans and all that, their sneakers are the ones I see at Foot Locker, Gucci sneakers, but wait, Louis Vuitton handbags, I see, I look, and then they have big cars, it' [Citroën]308, C4, you're sure you're in dire straits. Well, you've got a 308 and you come to Secours Populaire, I'd like to understand how you managed to pay for your 308, you've got a C4, it's unbelievable (..), so yeah it shocks me a little bit".

The accessories and branded clothes that make up the attire of some FAO beneficiaries, alongside the fact that they come by car, lead Assia to believe that they are not in financial difficulty and that they are perhaps less legitimate or even have no place at the FAO. For Assia, showing signs of wealth, is a divisive element that separates those who are truly "in dire straits" from those who are not. She goes even further in her claim, as she recognizes some of the beneficiaries she has crossed in conventional spaces of consumption, such as supermarkets, and whose shopping carts consolidate her allegation:

> **I**: Does it shock you that they're dressed like that and come to ask...?
> **Assia** : Well, you see them, manicures, make-up, blow-dry, It's not that I'm shocked, it's that you can see they're not in dire straits, wait you can see them, you live well, then you see them at the Leclerc (...) you see them with their shopping carts, it's fine, and then you see their children dressed in brands from head to toe, well yes, so nice little Adidas jogging suits, little Nike, a nice little Scott jacket, it's not cheap eh, when I buy clothes for my children, I go to Primark or when they give them to me at the Secours Populaire, that's it, well yes, it's really when I find a pair of Adidas or a pair of Kappa or, I buy that for 20 euros, or 10 euros, or 14 euros for my children, otherwise I go to Carrefour to buy shoes".

It's noteworthy that Assia differentiates herself from these beneficiaries, who are not "in dire straits" according to her, giving the example of the contrasting possibilities for clothing, hers being limited at best to a cheap brand like Primark, if not to FAO donations, while theirs are significantly more developed, citing several well-known brands. Finally, Assia marks the difference in terms of the said possibilities of clothing consumption, and consequently of navigating the conventional space, by specifying that her relationship with brands is conditioned by the occasional opportunities that arise in this respect, unlike the other

beneficiaries she mentions. Doing so, she separates "deserving" or legitimate beneficiaries from those who are not (Cohen 1997).

Outside the constrained space: Passing as full-fledged consumers through conventional commodities

Some beneficiaries feel ashamed and embarrassed to be affiliated with FAO, so much that they resort to trickery to hide it. The mainly do so by deploying information control strategies, such as concealment, to hide their affiliation and save face (Goffman, 1959). To this end, they simulate normality by displaying market symbols, notably branded products. Using skills they have acquired through their previous consumption experience, they appropriate and make the most of such banal resources as shopping bags bearing the logo of a major retailer, in order to "blend in" and maintain normal appearances not for themselves, but of themselves.

Baptiste (Male, 21, college student) describes how he feels about the bags provided to beneficiaries by OAs, in this case a distribution organized by Linkee[2]. the latter has a devaluing connotation for Baptiste, because it constitutes a revealing element that exposes and reveals his socio-economic condition and possibly assign him to a devaluated status. The discomfort caused by other people's gaze forces him to deploy a ruse enabling him to appear normal in the eyes of others. Baptiste uses a branded shopping bag bearing the logo of a major retailer to fake belonging to the normal consumption sphere. Baptiste's ruse is rooted in his experience at FAO, insofar as it aims to reduce the feeling of shame generated from going there, as he narrates in the following:

> "For example, when I have the [shopping] bags on me, when I carry them, I feel ashamed. And it had their name [Linkee] on it, you know? Yes, and I was afraid of the looks [of others], you know (...) It's a shame. It's a feeling of shame in fact (...) because for me... there's a help logo. For example, there's the Red Cross logo, the Linkee logo" (Baptiste).

To avoid this exposure, Baptiste replaces the bags donated to the distribution with others he deems "normal". Baptiste uses trickery to simulate a normality that allows him to remain below the threshold of visibility (Schlagdenhauffen, 2015) of outsiders :

> **Baptiste**: I recently started taking bags for myself and my girlfriend, you know (...) from home (...) Carrefour bags (...) You know, normal bags, shopping bags.

The following excerpt shows an exchange where Baptiste explains the underlying motivation of his trickery strategy:

> **Baptiste:** Yes, I think it [the Linkee bag] is a bit abnormal, yes (...) It's a bit advertising, you see (...) it's like Zara, you see Zara on it and uh... it's Linkee... there's the logo.
> **I**: Does it bother you that it's Linkee or that it's associated with a [food aid] distribution?
> **Baptiste**: Not that it's associated with a [food aid] distribution
> (...)
> **I**: So what do you do, take a ... uh Carrefour bag?
> **Baptiste**: Just a normal bag, Carrefour, I don't know ... just a normal bag, a shopping bag. Plastic (...) Something that ... basically that blends in everywhere, it's a normal bag. A shopping bag, something out of the ordinary [Linkee's], you're curious, you see the logo, you think, what's that?

Discussion and Research Avenues

[2] Name of an FAO

Our results show that normalcy is perceived, sensed "when something is not normal, it is perceived as inconsistent with the way things are supposed to be" (Baker, 2006: 39). This perception goes beyond a certain visibility threshold (Schlagdenhauffen, 2015) that separates the marked from the unmarked (Brekhus, 1998). The definition of the threshold that is the limit of the wat things are supposed to be is social and physical at the same time, it depends on, and is circumscribed to, a space, that of consumption. Both conventional and constrained spaces are categories that define the meanings associated with how things should be, and how individual should act, interact and appear. These meanings are (re)negotiated by individuals according to the consumption spaces they are cruising and play a part in how they negotiate their multiple identities (legitimate beneficiaries inside FAO spaces and full-fledged consumers inside the conventional space).

This raises the question of what is normal in the consumption realm and, furthermore, how is this normalcy constructed, communicated/shared and maintained. The excerpts and informant's accounts that we presented in this paper give insights about the changing meaning of branded commodities. The symbolic potential they carry varies depending on the consumption space where they are exhibited, recognized and interpreted. Branded products carrying conventional labeled products have the potential to inscribe people in normalcy inside the conventional space or, on the contrary, give them away as "impostors" or illegitimate beneficiaries inside FAO distribution centers. In contrast, FAO (i.e. constrained space) related symbols hold a practical dimension inside distribution centers (as a item to help carry food), whereas they are can be exposing elements once they are introduced (i.e. exposed) in conventional space. Building from the previous elements, we propose a figure (Table.1) that sums up these our findings.

	Conventional space	FAO
Market-related signs	Inclusion Full-fledged consumer	Exclusion Imposter
Visibility Threshold	Unmarked → Marked Marked ← Unmarked	
FAO-related signs	Exclusion/ Exposure Flawed consumer	Inclusion (*entre-soi*) Beneficiary status

Table.1 Symbolic meaning of branded products across consumption spaces

Our results point out to the perception-related conception normality, what Goffman calls appearance of normality (Goffman, 1971). Appearing normal depends not only on what consumers exhibit but also, and mostly, on where they do so. An interesting follow-up to our research, that addresses on of its main limits, would be to ask non-FAO beneficiaries about FAO-related commodities such as shopping bags, using photo-elicitation to have a detailed account about the meaning they associate with such non-conventional branded commodities. These additional interviews with FAO beneficiaries would be very useful to lay the groundwork for a social design perspective (Dubost, 2023) where informants participate actively, through relating their past and present experiences, in the proposition and design of solutions. Mainly on how the consumption experience can be less stigmatizing in comparison to shopping in

"normal" consumption venues (e.g. conventional supermarkets). A first insight can be drawn from the informants' perception of the use of reusable "*neutral"* (i.e. non-marked) shopping bags offered for free by FAO and the observation of their use inside and outside these constrained consumption spaces.

References

Ahuvia AC (2005) Beyond the Extended Self: Loved Objects and Consumers' Identity Narratives. *Journal of Consumer Research* 32(1): 171–184.

Arnould EJ and Thompson C (2005) Consumer culture theory (CCT) : Twenty Years of Research. *Journal of Consumer Research* 31(4): 868–882.

Baker SM (2006) Consumer normalcy: Understanding the value of shopping through narratives of consumers with visual impairments. *Journal of Retailing* 82(1). JAI: 37–50.

Baker SM, Gentry JW and Rittenburg TL (2005) Building Understanding of the Domain of Consumer Vulnerability. *Journal of Macromarketing* 25(2): 128–139.

Banister EN and Hogg MK (2004) Negative symbolic consumption and consumers' drive for self-esteem. European Journal of Marketing 38(7): 850–868. DOI: 10.1108/03090560410539285.

Bauman Z (2005) *Work, Consumerism and the New Poor*. 2nd ed. Maindenhead: Open University Press.

Brekhus W (1998) A Sociology of the Unmarked : Redirecting Our Focus Author. *Sociological Theory* 16(1): 34–51.

Chase E and Walker R (2013) The Co-construction of Shame in the Context of Poverty: Beyond a Threat to the Social Bond. *Sociology* 47(4): 739–754.

Collins R (1986) The Passing of Intellectual Generations: Reflections on the Death of Erving Goffman. *Sociological Theory* 4(1): 106.

Elliott R and Wattanasuwan K (1998) Brands as symbolic resources for the construction of identity. *International Journal of Advertising* 17(2): 131–144.

Dubost, N. (2023). Innovation inclusive et handicap : les apports du design social. Entreprendre & Innover, 55(2), 31-39. https://doi.org/10.3917/entin.055.0031.

Garthwaite K (2016) Stigma, shame and 'people like us': an ethnographic study of foodbank use in the UK. *Journal of Poverty and Social Justice* 24(3): 277–289.

Goffman E (1959) *The Presentation of Self in Everyday Life.* Gar- den City, NY: Doubleday Anchor Books. DOI: 10.2307/2089106.

Goffman E (1963) *Stigma : Notes on the Management of Spoiled Identity*. Englewood Cliffs. NJ: Spectrum. DOI: 10.1017/CBO9781107415324.004.

Goffman E (1971) *Relations In Public*. New York: Basic Books.

Hill RP (1991) Homeless Women, Special Possessions, and the Meaning of 'Home': An Ethnographic Case Study. *Journal of Consumer Research* 18(3): 298–310. DOI: 10.1086/209261.

Hill RP (1995) Researching sensitive topics in marketing: The special case of vulnerable populations. *Journal of Public Policy & Marketing* 14(1). American Marketing Association: 143–148.

Hill RP (2002) Consumer Culture and the Culture of poverty: Implications for Marketing theory and Practice. *Marketing Theory* 2(3): 273–293.

Hirschman EC (1986) Humanistic Inquiry in Marketing Research: Philosophy, Method, and Criteria. *Journal of Marketing Research* 23(3): 237. DOI: 10.2307/3151482.

Hogg MK, Banister EN and Stephenson CA (2009) Mapping symbolic (anti-) consumption. Journal of Business Research 62(2). Elsevier B.V.: 148–159. DOI: 10.1016/j.jbusres.2008.01.022.

Jenkins R (2008) *Social Identity*. New York: Routledge. DOI: 10.4324/9780203292990.

Mead GH (1934) *Mind, Self and Society*. Chicago: The University of Chicago Press. DOI: 10.1080/01463376009385121.

Schlagdenhauffen R (2015) Visibilité, attributs et déploiement identitaire, un aperçu de la

sociologie de l'identité sociale de Wayne Brekhus.
Spiggle S (1994) Analysis and Interpretation of Qualitative Data in Consumer Research. *Journal of Consumer Research* 21(3): 491–504. DOI: 10.1086/209413.

CONSUMER ACCEPTANCE OF FUNGUS-RESISTANT VARIETIES IN RED WINES BLENDS : INSIGHTS FROM THE CONSUMER REJECTION THRESHOLD METHOD.

CAROLINE PAIRE
MOISA, UNIVERSITÉ DE MONTPELLIER, INSTITUT AGRO MONTPELLIER,
2 PLACE PIERRE VIALA, 34000 MONTPELLIER, FRANCE
caroline.paire@supagro.fr
+3371084138

FOUED CHERIET
MOISA, UNIVERSITÉ DE MONTPELLIER, INSTITUT AGRO MONTPELLIER,
2 PLACE PIERRE VIALA, 34000 MONTPELLIER, FRANCE

ALAIN SAMSON
INRAE, UNITÉ EXPÉRIMENTALE DE PECH ROUGE, 11430 GRUISSAN, FRANCE

CHRISTIAN CHERVIN
LRSV, UNIVERSITÉ DE TOULOUSE, INP-ENSAT, AVENUE DE L'AGROBIOPÔLE,
31326 AUZEVILLE-TOLOSANE, FRANCE

AUDREY ARINO
LES VIGNOBLES FONCALIEU, DOMAINE DE CORNEILLE, 11290 ARZENS,
FRANCE

GABRIEL RUETSCH
LES VIGNOBLES FONCALIEU, DOMAINE DE CORNEILLE, 11290 ARZENS,
FRANCE

ESTELLE ITHURRALDE
LES GRANDS CHAIS DE FRANCE, DOMAINE DE LA BAUME, 34290 SERVIAN,
FRANCE

OLIVIER GEFFROY
PPGV, UNIVERSITÉ DE TOULOUSE, ECOLE D'INGÉNIEURS DE PURPAN,
75 VOIE DU TOEC, 31076 TOULOUSE, FRANCE

CONSUMER ACCEPTANCE OF FUNGUS-RESISTANT VARIETIES IN RED WINES BLENDS : INSIGHTS FROM THE CONSUMER REJECTION THRESHOLD METHOD.

Abstract

Fungus resistant varieties (FRV) offer a promising solution to reduce pesticide use in viticulture. However, their incorporation into traditional red wine blends may affect consumer acceptance due to higher acidity, lower tannin content, and stability issues. This study applied the Consumer Rejection Threshold (CRT) method to assess FRV acceptability in red wine blend. Detection thresholds for untrained panellists were 24.9 % for Artaban and 14.1 % for Vidoc, while lower values were observed for experts. Artaban blends were less preferred below 60 % of incorporation, while Vidoc blends were neutrally perceived. Consumers' segmentation revealed that 21 % of them significantly preferred Merlot. Overall, results support FRV wine integration into red blends or their use in single cuvées.

Key words : fungus resistant variety, red blends, Merlot, Vidoc, Artaban, consumer acceptability

1. Introduction

Sustainability has become a major concern in the wine industry (Wei et al., 2023). Fungus-resistant varieties (FRVs) are the result of interspecific hybridization, combining the organoleptic qualities of *Vitis vinifera* with the natural resistance of American or Asian species (Töpfer et al., 2011). These varieties can reduce fungicide use by up to 80% and are seen as a promising solution for more sustainable viticulture (Guimier et al., 2019). Their availability on the French market is rapidly increasing**,** due to recent regulatory changes (Borrello et al., 2021).

Despite this growing interest, the French wine industry remains sceptical about the organoleptic quality of FRV, particularly red ones (C. Paire, unpublished). Unlike most sectors of the food industry, the wine sector has traditionally guided its production based on sensory quality standards defined by experts, rather than by consumer tastes (Meillon et al., 2010). However, consumers' desires and needs are increasingly shaping the wine market (Lockshin & Corsi, 2020). In a literature review, Francis and Williamson (2015) highlighted the importance of applying consumer sensory science to wine research, noting that sensory aspects may play a crucial role in consumer acceptance, particularly for wines made from fungus-resistant grape varieties (FRG). Several studies have explored the relationship between consumer appreciation and quality or preference judgments made by experts. Findings consistently show that expert evaluations of wine quality are not necessarily correlated with consumer preferences. In fact, numerous studies have repeatedly demonstrated a general disconnect between these two dimensions. Ordinary wine consumers, except for highly involved and experienced individuals who behave more like experts, tend to respond differently than wine professionals such as winemakers. This highlights the need for a better integration of consumer preference insights into wine development, in order to enhance acceptability and market success.

One approach is blending FRV wines with traditional varieties, but this may negatively impact consumer liking, especially in red blends, as FRV wines often have higher acidity, lower tannin content, and reduced stability due to their high protein levels (Tesseidre, 2018; Duley et al., 2023).

This study applies the Consumer Rejection Threshold (CRT) method to determine the acceptable incorporation level of red FRV wines in blends. Two red FRVs, namely Vidoc

and Artaban, were blended with Merlot. The study first identified detection thresholds for FRV wines among untrained and expert panellists, followed by paired preference tests using the CRT method with untrained panellists.

2. Materials and methods

The methodology used for this study is illustrated in Figure 1. The first step was to choose the base wines. Artaban and Vidoc, French FRV from the ResDur 1 program were selected as being the most planted red FRV cultivars in France in 2024 (Dolet et al., 2024). *Vitis vinifera* Merlot was chosen as the base wine, as the most planted grape variety in 2022 to make red wine within the protected geographical indication (PGI) Pays d'Oc in Occitanie region, south of France (https://www.paysdoc-wines.com). The three wines from the 2023 vintage were sourced from a cooperative cellar in the Occitanie region. Wines were sensory characterised during an informal tasting session by three experts, and classical oenological analyses were conducted using Winecan FT-120 technic.

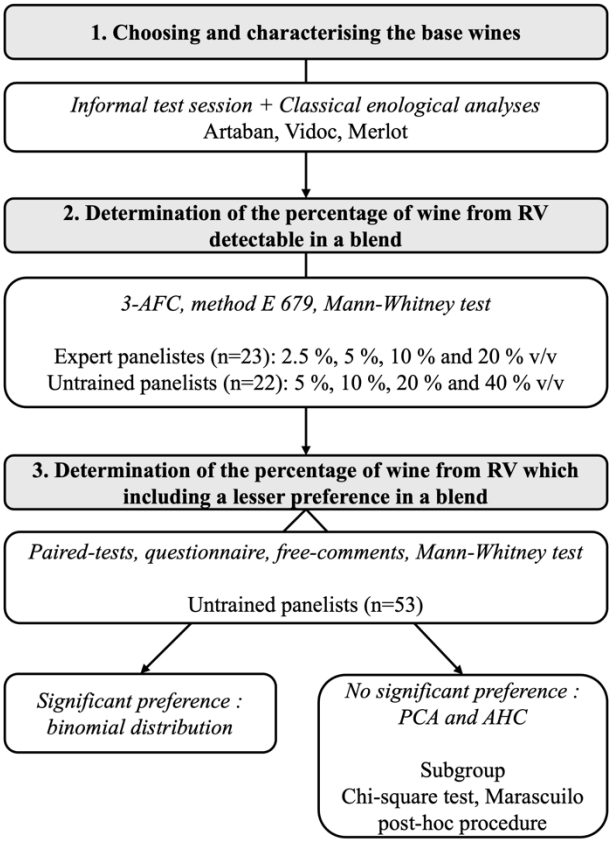


Figure 1 : Schematic representation of the methodology used

The second step was to determine the percentage of wine from FRV detectable in a blend, for untrained and expert panelists. Detection thresholds of FRV in a red blend were determined according to the American Society of Testing and Materials (ASTM) method E 679 (ASTM, 2004). Blend samples were prepared with a step of two between each level of incorporation. FRV wines were included in the blend at 2.5 %, 5 %, 10 % and 20 % v/v for trained panelists, and at 5 %, 10 %, 20 % and 40 % v/v for untrained panellists, for each tested FRV. Samples were served in clear 25 mL INAO tasting glasses at 18°C in increasing order of FRV incorporation, and the position of the blend sample within each test was randomised. The judges spaced out in a neutral room were asked to make visual and olfactory assessment, taste and then reject it. Then they were asked to indicate on a questionnaire which sample of the trio was differently perceived.

The untrained panellists (n = 22) were recruited based on regular consumption of red and were mainly staff and students from the Institut Agro Montpellier. The trained panelists (n = 23) who had previous experience with wine sensory testing, were working in the wine industry and self-declared being regularly trained.

A Mann-Whitney test was conducted on the individual data to identify any differences in threshold according to FRV and level of training.

The third step consists in determining the percentage of wine from FRV which induced a lesser preference in a blend by untrained panelists. The panel was composed of 53 wine consumers recruited during a wine event held at the Ecole d'Ingénieurs de Purpan in Toulouse, and from the staff of Institut Agro Montpellier. The panellists did not receive remuneration for participating, self-declared regular red wine consumers, and were not given any information about the wines. They were asked to respond to a post-tasting questionnaire to collect demographic, and wine knowledge and purchase behaviour information. The procedure was based on replicate series of paired preference tests (Prescott *et al.*, 2005). Each pair was composed of a wine sample of pure Merlot, and a sample of the blend of Merlot with one FRV. Presentation order was randomised, and each pair was presented in ascending order of percentage of FRV wine incorporation in the blend. For both FRV, the first level of incorporation was chosen based on the detection threshold experiment previously described for untrained panellists, with a step of two between each series. The general procedure was the

same as described for the 3-AFC except that the panelists directly responded on their mobile phone using FIZZ Nomad v2.7 (BioSystemes, France). There was also space for free comments to correlate consumers' perception and liking. The percentage of FRV in the blend that induced a significant lesser or higher preference compared to the control Merlot sample, was determined using the binomial distribution for the pairwise preference test (Roessler *et al.*, 1978).

When no significant preference was observed across all tested incorporation percentages, preference data were analysed using Principal Component Analysis (PCA), followed by Agglomerative Hierarchical Clustering (AHC) as proposed by Geffroy et al. (2018).

All the statistical treatments were performed using XLSTAT software (Addinsoft, Paris, France).

3. Results dans discussion

3.1.Detection thresholds

Detection thresholds for untrained panellists were 24.9 % for Artaban, and 14.1 % for Vidoc, while experts exhibited lower thresholds of 6.9 % and 7.7 %, respectively (Table 1). This indicates higher expert sensitivity, with detection differences ranging from a factor of two for Vidoc to nearly 3.5 for Artaban. However, a significant difference between groups ($P < 0.05$) was only observed for Artaban ($P = 0.0187$), supporting the hypothesis of greater expert sensitivity which is accordance with previous studies (Hughson & Boakes, 2002; Tempère et al., 2009).

Table 1 : Comparaison of the individual difference threshold concentration of resistant varieties in Merlot blends according to the ASTM E 679 method (n = 22) for untrained and trained panelists (n=23). The Mann-Whitney test was performed.

	Trained pannelistes	**Untrained panelists**	**P**
Percentage of Artaban incorporation (%v/v)	6,9	24.9	**< 0,05***
Percentage of Vidoc incorporation (%v/v)	7.7	14.1	0,076
P	0.804	**0. 019***	

For untrained panelists, Vidoc had a significant lower detection threshold than Artaban (P = 0.019), while no difference was found among experts (P = 0.804). In the initial expert sensory assessment, the tannins of the Vidoc base wine were notably characterized as 'sticky'. Vidoc's sensory features may have contributed more to astringency, a negative characteristic for inexperienced consumers (Francis & Williamson, 2015).

Detection thresholds were close to or above the 15% limit set by European regulation N° 270/2002, which states that a varietal wine must not contain more than 15% of another variety. This suggests that winemakers can blend Fungus resistant varieties with Merlot up to this limit while maintaining the Merlot label, benefiting from its strong market reputation, an important factor in consumer acceptance towards new varieties (Geffroy et al., 2024).

CRT study percentages were selected to ensure the first incorporation level was detectable. Sample blends included Vidoc at 15%, 30%, 60%, and 100% v/v (four paired-test series) and Artaban at 25%, 50%, and 100% v/v (three paired-test series).

3.2. Appreciation of Artaban in Merlot blends

The CRT results for Artaban are somewhat surprising, showing a preferences shift at a 50 : 50 blend ratio. Our results indicate that the blends with less than 60 % Artaban, down to the 25 % detection limit, are significantly less preferred than the Merlot control. However, when Artaban exceeds 60 %, the blend is neutrally perceived with a preference percentage close to the significance threshold of greater preference.

Consumers describes Artaban-containing samples in the free comment space left on the questionnaire as *more* or *less fruity*, *more* or *less acidic*, *more* or *less astringent* or *less balanced* compared to Merlot. This lack of consensus illustrates their difficulty to describe their perception. Despite fruitiness being a key driver of liking (Francis and Williamson, 2015), the neutral perception for pure Artaban is astonishing, is now also valued by consumers for its role in enhancing the freshness and balance of red wines (Regnerová & Hes, 2016). Since the 50% Artaban blend was perceived as more acidic and less fruity, two traits usually linked to lower preference, it was the least favoured. Non parametric tests showed no significant preference influence from gender, purchasing habits, wine consumption frequency or preference. However, age played a role : younger panelists (18-24) compared to older one (> 65), preferred

the 50% Artaban blend, which had a less fruity aroma, contradicting prior findings that frutiness is a key driver of liking for young consumers in red wines (Geffroy et al,. 2024).

3.3.Appreciation of Vidoc in Merlot blends

Surprisingly, Vidoc incorporation did not significantly reduce preference compared to the Merlot control at any tested percentage, contradicting our initial hypothesis. As expected, adding Vidoc increased acidity perception non-linearly, similar to Artaban. Consumers described Vidoc blends using terms *like more fruity, less fruity, sweeter, rounder, and more pleasant*, with only the latter showing a linear relationship with incorporation level.

Preference for Vidoc blends appeared influenced by experience and wine knowledge. Indeed, studies show that new consumers favour sweet, fruity wines initially but develop a preference for bitterness (a noted characteristic of Vidoc) and green aromas over time (Lesschaeve, 2008). Four subgroups of Vidoc consumers were identified by PCA followed by AHC (C1, C2, C3, C4).

C1 consumers (n = 16) perceived Vidoc blends neutrally, preferring blends with 15–39% Vidoc. This group was mainly female (62.5%), under 50 (75%), and regular wine consumers (at least once a week). Most (87.5%) expressed an interest in wine, with diverse preferences and experience levels.

C2 (n = 13) had a more complex preference pattern, favouring Merlot over blends with 27.7–37.5% Vidoc but preferring blends with less than 17.3% Vidoc. Given the 14.1% detection threshold for untrained panelists, Vidoc was likely not perceived at lower levels. However, responses showed inconsistencies, suggesting possible random choices. Most (92.3%) were under 65, and 77.0% consumed wine at least weekly.

C3 (n = 13) had clearer sensory preferences, favoring pure Merlot when Vidoc was below 21%, close to its detection threshold in blends. Most (92.3%) were under 65, and 84.6% were regular wine consumers. A majority (84.6%) identified as beginners or wine enthusiasts, with 30.8% spending over €15 per bottle.

C4 (n = 11) had a strong preference for Merlot, representing "Merlot lovers." Mostly male (72.7%), 30.8% were over 65, 27.3% consumed wine daily, and 81.8% preferred red wine.

Nearly half (45.5%) spent over €15 per bottle, and 54.6% had over 20 years of experience. They valued familiarity and balance, favoring traditional profiles like Merlot over acidic, astringent wines like Vidoc. The most cited terms for Vidoc blends were "more acidic" and "more astringent," with citation frequencies reaching 23.1% for the 60% Vidoc blend and pure Vidoc sample.

To summarise, Vidoc consumers can be divided into two main groups of preferences: “the neutral” (79 % of panellists, C1, C2, C3) for whom it appears feasible to incorporate Vidoc ; and “Merlot lovers” (21% of panellists, C4), who consistently preferred Merlot. The latter group consisted mainly of older men with regular or daily wine consumption, a strong preference for red wine, and extensive experience.

However, these findings should be interpreted with caution, as the subgroups (11–13 panelists) are smaller than the typical 50–60 panelists used in CRT studies (Prescott et al., 2005; Geffroy et al., 2018).

4. Discussion

Our findings suggest overall good acceptance of FRV industry preconceptions. However, these results apply only to the three specific base wines used in this study. Despite their representativity, Vidoc and Artaban wines came from young vineyard, meaning their sensory profiles may evolve as vines mature. The 2023 vintage was Vidoc’s first commercial harvest and Artaban’s fourth. Additionally, heavy June rainfall led to high downy mildew pressure, elevated acidity, and an early harvest (G. Ruetsch, unpublished). A higher-quality vintage could yield different results, possibly increasing RW wine acceptability in blends.

The Merlot base wine, very ripe with ethanol above 14% v/v, may also have influenced results. The role of alcohol content in perception should be further explored. Our methodology focused on red FRV wines and may not be applied on white FRV wines. White FRV blends would likely not face significant preference reduction compared to *Vitis vinifera* controls. White RVs are generally seen as superior (Torregrosa et al., 2024) and are gaining popularity in Southern France, as shown by the rapid rise in Floreal plantings, a ResDur1 variety recognised for its aromatic profile (Dolet et al., 2024).

Trained panelists were more sensitive to FRV wines than untrained panelists, which could influence their preferences, an aspect not evaluated in our study. However, assessing expert preferences would require mobilizing 50 specialists for CRT testing. Importantly, consumer responses better reflect market acceptance, as expert perceptions often diverge from those of the general public (Cardello, 1995).

Future research should assess sensory acceptance across a broader range of pure FRV wines and examine how consumer information impacts acceptance. Indeed, these new wines challenge the established codes of the market, breaking away from traditional consumer purchasing criteria, which are still largely structured around grape variety and appellation of origin (Mueller & Szolnoki, 2010). While previous studies explored the effect of environmental benefits via experimental auctions (Espinoza et al., 2018), the influence of terms like "resistant" or "hybrid" on consumer perception remains to be investigated.

5. Conclusion

Our study enabled to apply the CRT methodology to binary red blends containing FRV wines. Panel detection thresholds for VR wines in a Merlot blend were 24.9 % for Artaban and 14.1 % for Vidoc for untrained panellists. Consumer preferences indicated that blends with over 60% Artaban were neutrally perceived compared to Merlot. For Vidoc, no significant lesser preference was observed across all tested blends, suggesting good sensory acceptance and distinct consumer clusters. Four subgroups emerged, with varied and complex preferences. Only one, comprising 21% of consumers, mainly older, regular, and experienced wine drinkers, strongly preferred Merlot and rejected Vidoc as a single-variety wine or in blends. Given the lack of strong sensory barriers and overall consumer acceptance, winemakers should feel encouraged to incorporate fungus resistant varieties in blends or even single cuvées.

Further research should explore the sensory perception of pure FRV wines and the impact of information on consumer acceptance to guide producers and wine professionals in developing and marketing these new products.

6. References

Abric, J.-C. (2005). La recherche du noyau central et de la zone muette des représentations sociales. In *Méthodes d'étude des représentations sociales* (pp. 59-80). Érès.

ASTM (2004). Standard practice E 679–04. Standard practice for determination of odor and taste thresholds by a forced-choice ascending concentration series method of limits. Philadelphia, PA: American Society for Testing and Materials.

Borrello, M., Cembalo, L., & Vecchio, R. (2021). Consumers' acceptance of fungus resistant grapes : Future scenarios in sustainable winemaking. *Journal of Cleaner Production*, *307*, 127318. https://doi.org/10.1016/j.jclepro.2021.127318

Cardello, A. V. (1995). Food quality : Relativity, context and consumer expectations. *Food Quality and Preference*, *6*(3), 163-170. https://doi.org/10.1016/0950-3293(94)00039-X

Duley, G., Ceci, A., Longo, E., & Boselli, E. (2023). Oenological potential of wines produced from disease-resistant grape cultivars. *Comprehensive Reviews in Food Science and Food Safety*, *22*. https://doi.org/10.1111/1541-4337.13155

Espinoza, A. F., Hubert, A., Raineau, Y., Franc, C., & Giraud-Héraud, É. (2018). Resistant grape varieties and market acceptance : An evaluation based on experimental economics. *OENO One*, *52*(3), Article 3. https://doi.org/10.20870/oeno-one.2018.52.3.2316

Francis, I. l., & Williamson, P.O. (2015). Application of consumer sensory science in wine research. *Australian Journal of Grape and Wine Research*, *21*(S1), 554-567. https://doi.org/10.1111/ajgw.12169

Geffroy, O., Descôtes, J., Serrano, E., Li Calzi, M., Dagan, L., & Schneider, R. (2018). Can a certain concentration of rotundone be undesirable in Duras red wine? A study to estimate a consumer rejection threshold for the pepper aroma compound: Consumer rejection threshold for rotundone in Duras wine. *Australian Journal of Grape and Wine Research*, *24*(1), 88-95. https://doi.org/10.1111/ajgw.12299

Geffroy, O., Pasquier, G., Pagès, M., & Violleau, F. (2022). Exploring the response to a new range of ethanol reductions in Chardonnay and Syrah wines using a Consumer Rejection Threshold approach. *OENO One*, *56*(4), 147-155. https://doi.org/10.20870/oeno-one.2022.56.4.7112

Geffroy, O., Cheriet, F., Chervin, C., Hannin, H., Olivier, V., Samson, A., & Vanden Heuvel, J. (2024). Opportunities and challenges in the adoption of new grape varieties by producers: a case study from the Northeastern United States. *IVES Conference Series, OIV 2024*.

Guimier, S., Delmotte, F., Miclot, A. S., Fabre, F., Mazet, I., Couture, C., Schneider, C., & Delière, L. (2019). OSCAR, a national observatory to support the durable deployment of disease-resistant grapevine cultivars. *Acta Horticulturae*, 21-34. https://doi.org/10.17660/ActaHortic.2019.1248.4

Hughson, A. L., & Boakes, R. A. (2002). The knowing nose: The role of knowledge in wine expertise. *Food Quality and Preference*, 13(7-8), 463-472. https://doi.org/10.1016/S0950-3293(02)00051-4

Lesschaeve I. Wine consumer flavour preferences, in Chassagne D (ed.), *1st Wine Active Compounds Symposium*. Beaune, France, OenoPluri Media. 2008:71–74.

Mueller, S., & Szolnoki, G. (2010). The relative influence of packaging, labelling, branding and sensory attributes on liking and purchase intent : Consumers differ in their responsiveness. *Food Quality and Preference*, *21*(7), 774-783. https://doi.org/10.1016/j.foodqual.2010.07.011

Prescott, J., Norris, L., Kunst, M., & Kim, S. (2005). Estimating a "consumer rejection threshold" for cork taint in white wine. *Food Quality and Preference*, 16(4), 345-349. https://doi.org/10.1016/j.foodqual.2004.05.010

Regnerová, O., & Hes, A. (2016). Current trends in the global wine market. *In International Scientific Days 2016*: The Agri-Food Value Chain—Challenges for Natural Resources Management and Society (pp. 820-827). Slovak University of Agriculture in Nitra. https://doi.org/10.15414/isd2016.s10.07

Roessler, E., Pangborn, R., Sidel, J., & Stone, H. (1978). Expanded statistical tables for estimating significance in paired—preference, paired–difference, duo–trio and triangle tests. *Journal of Food Science*, 43(3), 940-943. https://doi.org/10.1111/j.1365-2621.1978. tb02458.x

Teissedre, P. L. (2018). Composition of grape and wine from resistant vines varieties. *OENO One*, *52*(3), 211-217. https://doi.org/10.20870/oeno-one.2018.52.3.2223

Töpfer, R., Hausmann, L., Harst, M., Maul, E., Zyprian, E., & Eibach, R. (2011). New horizons for grapevine breeding. *Fruit, Vegetable and Cereal Science and Biotechnology*, 5(1), 79-100.

Torregrosa, L., Lacombe, T., & Ojeda, H. (2024). Vignes tolérantes aux maladies fongiques : des variétés à fruits pour une viticulture en transition agroécologique (1st ed.). Editions France Agricole.

Wei, R., Wang, L., Ding, Y., Zhang, L., Gao, F., Chen, N., ... & Wang, H. (2023). Natural and sustainable wine: a review. *Critical Reviews in Food Science and Nutrition*, *63*(26), 8249-8260. https://doi.org/10.1080/10408398.2022.2055528

Extended Abstract :
Mighty, Buddy or Body tracker? A qualitative analysis of relationships typologies between users and their smartwatch using a Fine-tuned LLM

Nachit Oussama
Oussama.nachit@tsm-education.fr
Post-doc Researcher - TSM Research

Balbo Laurie
Laurie.balbo@grenoble-em.com
Associate Professor of Marketing – Grenoble Ecole de Management

The rise of smartwatches has transformed their role, evolving from mere technological tools to everyday partners. This study investigates the relational typologies users develop with their smartwatches, drawing on self-expansion theory (Aron & Aron, 1986) and self-extension theory (Belk, 1988, 2013), as well as the symbiotic model proposed by Connell and Schau (2013), which explains the interdependence between these two processes through the relational positions of "giver" and "receiver." While existing literature on connected objects has primarily focused on their functionalities and adoption, the relational dynamics between humans and machines remain underexplored. This research aims to identify and classify these relationships by analyzing both user narratives and large-scale textual data. To this end, a mixed-methods approach was employed, combining 20 semi-structured interviews with current and former smartwatch users and the analysis of 161,178 user reviews collected through web scraping from the Garmin Connect platform. The data were analyzed using thematic analysis, methodological triangulation, and automated classification of relational interactions using a fine-tuned language model (RoBERTa-large). The results reveal three main relationship typologies, along with a fourth profile in which no significant relationship is perceived.

The first typology is the "coach." In this relationship, the smartwatch assumes the role of the "giver" (Connell & Schau, 2013), while the user takes the role of the "receiver." Hierarchically, the watch is positioned above the user ("It sends me programs to work my whole body" – Charles). The second typology presents the watch as an "assistant" in the user's physical activity routine. Here, the smartwatch becomes the "receiver," while the user takes on the "giver" role. Hierarchically, the watch is positioned below the user ("I ask it to give me a summary of my physical activity for the week" – Claudia). Finally, the watch can take on the role of a "partner/friend" in the user's journey. In this configuration, both parties act as "givers" and "receivers." The relationship is grounded in a collaborative spirit, where the user and the watch exchange data to achieve shared goals. Hierarchically, both stand on equal footing ("I activate running mode so it switches to sport mode, and it sends me notifications to tell me how much time I have left, where I stand in terms of calorie burning…" – Ali). On the other hand, some users were unable to establish a relationship with their smartwatch. This is primarily due to the watch's incompatibility with the user's existing assemblage of connected devices (Hoffman & Novak, 2018; 2019), which prevents its integration ("My new Garmin doesn't sync the data—what's the problem!" – Review No. 16361).

These findings highlight the diversity of relational experiences with smartwatches by identifying three main relational typologies : the coach, the assistant, and the partner. Grounded in self-expansion theory (Aron & Aron, 1986) and self-extension theory (Belk, 1988, 2013), these typologies enrich theoretical understanding and provide practical insights for the development of connected objects. The results confirm and extend Connell and Schau's (2013) symbiosis model, which describes the interdependence of self-expansion and self-extension processes. Moreover, the integration of machine learning techniques (RoBERTa) within a qualitative framework opens new methodological perspectives for investigating complex phenomena.

By adopting a mixed-methods approach, this research demonstrates how large-scale data, when combined with robust theoretical frameworks, can offer a more nuanced analysis of relational dynamics. From a practical standpoint, these findings provide valuable guidance for smartwatch designers. Understanding users' expectations may allow for the customization of features and interfaces to match each relational profile. For instance, watches perceived as coaches could benefit from integrating personalized motivation algorithms, while those adopted as assistants would gain from offering streamlined interfaces and automated analytics. Furthermore, these insights open up new marketing opportunities by enabling firms to develop segmentation strategies based on consumers' relational expectations rather than traditional demographic criteria.

Finally, this research calls for a deeper exploration of long-term human–machine interactions. A longitudinal approach could examine how relationships between users and their smartwatches evolve over time and whether users transition from one type of relationship to another.

Bibliography

Abele, A. E., & Wojciszke, B. (2007). Agency and communion from the perspective of self versus others. Journal of personality and social psychology, 93(5), 751.

Akputu, O. K., Dumzo-Ajufo, D., Okafor, C. C., Abayomi, A. D., & Ape, T. M. (2024). Towards Development of a Multilingual Mobile Chat Application for Enhanced Global Communication. Teknika, 13(1), 86-91.

Aron, A., & Aron, E. N. (1986). Love and the EXPansion of self: Understanding attraction and satisfaction. Hemisphere Publishing Corp/Harper & Row Publishers.

Aron, A., & Aron, E. N. (1996). Self and self-EXPansion in relationships. Knowledge structures in close relationships: A social psychological approach, 325-344.

Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. Journal of personality and social psychology, 63(4), 596.

Aron, A., Lewandowski Jr, G. W., Mashek, D., & Aron, E. N. (2013). The self-EXPansion model of motivation and cognition in close relationships.

Aron, A., Melinat, E., Aron, E. N., Vallone, R. D., & Bator, R. J. (1997). The experimental generation of interpersonal closeness: A procedure and some preliminary findings. Personality and Social Psychology Bulletin, 23(4), 363-377.

Aron, A., Norman, C. C., Aron, E. N., McKenna, C., & Heyman, R. E. (2000). Couples' shared participation in novel and arousing activities and experienced relationship quality. Journal of personality and social psychology, 78(2), 273.

Baek, S., Lee, S., & Seok, J. (2024, July). Strategic Insights in Korean-English Translation: Cost, Latency, and Quality Assessed through Large Language Model. In 2024 Fifteenth International Conference on Ubiquitous and Future Networks (ICUFN) (pp. 551-553). IEEE.

Barbera, G., Araujo, L., & Fernandes, S. (2023). The value of web data scraping: An application to TripAdvisor. Big Data and Cognitive Computing, 7(3), 121.

Belk, R. W. (1988). Possessions and the extended self. Journal of consumer research, 15(2), 139-168.

Belk, R. W. (2013). Extended self in a digital world. Journal of consumer research, 40(3), 477- 500.

Boegershausen, J. O. H. A. N. N. E. S., Borah, A. B. H. I. S. H. E. K., & Stephen, A. T. (2020). Fields of gold: Web scraping for consumer research. Marketing Science Institute Working Paper Series.

Carpenter, C. J., & Spottswood, E. L. (2013). Exploring romantic relationships on social networking sites using the self-EXPansion model. Computers in Human Behavior, 29(4), 1531-1537.

Clawson, J., Pater, J. A., Miller, A. D., Mynatt, E. D., & Mamykina, L. (2015, September). No longer wearing: investigating the abandonment of personal health-tracking technologies on craigslist. In Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing (pp. 647-658).

Connell, P. M., & Schau, H. J. (2013). Self-EXPansion and self-EXTension as distinct strategies. The Routledge companion to identity and consumption, 21.

Cushing, A. L. (2011). Self EXTension and the desire to preserve digital possessions. Proceedings of the American Society for Information Science and Technology, 48(1), 1- 3.

Dai, B., Larnyo, E., Tetteh, E. A., Aboagye, A. K., & Musah, A.-A. I. (2020). Factors Affecting Caregivers' Acceptance of the Use of Wearable Devices by Patients With Dementia: An Extension of the Unified Theory of Acceptance and Use of Technology Model. American Journal of Alzheimer's Disease & Other Dementias®, 35, 153331751988349. https://doi.org/10.1177/1533317519883493

Dan Ledger, Principal, Endeavour Partners, Daniel McCalrey, Endeavour Partners LLC. How the Science of Human Behavior Change Offers the Secret to Long-Term Engagement(www.endeavourpartners.net). 2014

de Kerviler, G., & Rodriguez, C. M. (2019). Luxury brand experiences and relationship quality for Millennials: The role of self-EXPansion. Journal of Business Research, 102, 250- 262.

Diesendruck, G., & Perez, R. (2015). Toys are me: Children's EXTension of self to objects.Cognition, 134, 11-20

Dys-Steenbergen, O., Wright, S. C., & Aron, A. (2016). Self-EXPansion motivation improves cross-group interactions and enhances self-growth. Group Processes & Intergroup Relations, 19(1), 60-71

Han, Y. J., Nunes, J. C., & Drèze, X. (2010). Signaling status with luxury goods: The role of brand prominence. Journal of marketing, 74(4), 15-30.

Hoffman, D. L., & Novak, T. P. (2018). Consumer and object experience in the internet of things: An assemblage theory approach. Journal of Consumer Research, 44(6), 1178- 1204

Hoffner, C. A., Lee, S., & Park, S. J. (2016). "I miss my mobile phone!": Self-EXPansion via mobile phone and responses to phone loss. New Media & Society, 18(11), 2452-2468.

Jarusriboonchai, P., & Häkkilä, J. (2019, November). Customisable wearables: exploring the design space of wearable technology. In Proceedings of the 18th International Conference on Mobile and Ubiquitous Multimedia (pp. 1-9).

Jiang, K., & Lu, X. (2020, November). Natural language processing and its applications in machine translation: A diachronic review. In 2020 IEEE 3rd International Conference of Safe Production and Informatization (IICSPI) (pp. 210-214). IEEE.

Jyrinki, H., & Leipamaa-Leskinen, H. (2005). Pets as extended self in the context of pet food consumption. ACR European Advances.

Kao, Y.-S., Nawata, K., & Huang, C.-Y. (2019). An Exploration and Confirmation of the Factors Influencing Adoption of IoT-Based Wearable Fitness Trackers. International Journal of Environmental Research and Public Health, 16(18), 3227. doi:10.3390/ijerph16183227

Kiesler, T., & Kiesler, S. (2005). My pet rock and me: An experimental exploration of the self EXTension concept. ACR North American Advances.

Lazar, A., Koehler, C., Tanenbaum, J., & Nguyen, D. H. (2015, September). Why we use and abandon smart devices. In Proceedings of the 2015 ACM international joint conference on pervasive and ubiquitous computing (pp. 635-646).

Lewis, Z. H., Pritting, L., Picazo, A. L., & JeanMarie-Tucker, M. (2020). The utility of wearable fitness trackers and implications for increased engagement: An exploratory, mixed methods observational study. Digital Health, 6, 2055207619900059.

Mao, J., Chiu, C. Y., Owens, B. P., Brown, J. A., & Liao, J. (2019). Growing followers: Exploring the effects of leader humility on follower self- EXPansion, self- efficacy, and performance. Journal of Management Studies, 56(2), 343-371.

Michel, G., Torelli, C. J., Fleck, N., & Hubert, B. (2022). Self-brand values congruity and incongruity: Their impacts on self-expansion and consumers' responses to brands. Journal of Business Research, 142, 301-316.

Noll, R., Berger, A., Facchinello, C., Güngöze, O., von Wagner, M., Hoehl, S., ... & Schaaf, J. (2024). Translation of Ontological Concepts from English into German Using Commercial Translation Software and Expert Evaluation. In MEDINFO 2023—The Future Is Accessible (pp. 89-93). IOS Press.

Novak, T. P., & Hoffman, D. L. (2019). Relationship journeys in the internet of things: a new framework for understanding interactions between consumers and smart objects. Journal of the Academy of Marketing Science, 47(2), 216-237.

Qian, T. Y., Li, W., Gong, H., Seifried, C., & Xu, C. (2024). Experience is all you need: a large language model application of fine-tuned GPT-3.5 and RoBERTa for aspect-based sentiment analysis of college football stadium reviews. Sport Management Review, 1-25.

Reimann, M., & Aron, A. (2009). Self-EXPansion motivation and inclusion of brands in self. Handbook of brand relationships, 65-81.

Sabbir, M. M., Akter, S., Khan, T. T., & Das, A. (2020). Exploring Factors Affecting Consumers' Intention to Use Smartwatch in Bangladesh : An Empirical Study. Asia Pacific Journal of Information Systems, 30(3), 636–663. https://doi.org/10.14329/apjis.2020.30.3.636

Schweitzer, F., Belk, R., Jordan, W., & Ortner, M. (2019). Servant, friend or master? The relationships users build with voice-controlled smart devices. Journal of Marketing Management, 35(7-8), 693-715.

Talukder, M. S., Sorwar, G., Bao, Y., Ahmed, J. U., & Palash, M. A. S. (2020). Predicting antecedents of wearable healthcare technology acceptance by elderly: A combined SEM- Neural Network approach. Technological Forecasting and Social Change, 150(October 2019), 119793. https://doi.org/10.1016/j.techfore.2019.119793

Wu, Q., Sum, K., & Nathan-Roberts, D. (2016). How Fitness Trackers Facilitate Health Behavior Change. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 60(1), 1068–1072

TOWARDS CLARIFYING TERMINOLOGIES AND PROPOSING A NEW DEFINITION OF AN INTELLIGENT CONVERSATIONAL TOOL: THE CASE OF CHATBOTS

JEAN-FRANÇOIS LEMOINE

FULL PROFESSOR

UNIVERSITÉ PARIS 1 PANTHÉON-SORBONNE (PRISM SORBONNE) / ESSCA

SCHOOL OF MANAGEMENT

Jean-Francois.Lemoine@univ-paris1.fr

MERIEM OUERGHI

UNIVERSITÉ PARIS 1 PANTHÉON-SORBONNE (PRISM SORBONNE)

Meriem.Ouerghi@univ-paris1.fr

Phone: +33 06 51 26 44 53

TOWARDS CLARIFYING TERMINOLOGIES AND PROPOSING A NEW DEFINITION OF AN INTELLIGENT CONVERSATIONAL TOOL: THE CASE OF CHATBOTS

Abstract

The present study took as its research object chatbots, which are an intelligent conversational tool currently shaping e-commerce activities thanks to technological developments. The aim of this study is to propose a new definition of chatbots, given the lack of consensus in the literature regarding the definition of chatbots and the appropriate terminology to use. Through a qualitative study involving 12 experts in intelligent conversational tools, we propose that a complete definition of what a chatbot is should take into account three aspects: technical, experiential and operational, while retaining two distinctive criteria, namely the exchange space and the exchange medium.

Key words: Intelligent conversational tools; Chatbots; Definition; Terminologies.

Introduction

Artificial intelligence (AI) technologies are capturing the interest of managers and scholars in various domains. Thus, artificial intelligence can be seen as the flagship technology trend of the current era. Based on a recent study published by the Fevad in 2024, 97% of the main e-commerce sites' managers in France, consider the AI as a very promising technology that they intend to integrate into their activities over the next 3 years. Another study conducted recently by Zendesk, a leading provider of customer support software across the world, indicate that, by 2026 generative AI will highly impact the online client experience notably through the customer support via chat (57%), (Zendesk, 2024). AI technologies will clearly change and transform the online customer experience (Hoyer *et al.*, 2020). Consequently, these technologies lead to the development of a new form of commerce in the online context, namely the conversational commerce, thanks to the tools they enable such as chatbots and voice-bots. According to Lim *et al.* (2022) conversational commerce stands for "*the use of conversational agents to interact with brands and the services that they provide*" (p. 1132). The present paper focuses on AI powered tools, in particular chatbots to contribute to a better understanding of this conversational tool. Some researchers consider that chatbots refer to a purely textual exchange (Mozafari *et al.*, 2022; Ramesh & Chawla, 2022), while others extend the scope of the exchange to voice interactions while using the same terminology (Shin *et al.*, 2023). There are also divergences in the literature as to whether chatbots are considered as virtual assistants or not (Hoyer *et al.*, 2020; Kull *et al.*, 2021). Finally, there is no consensus among researchers regarding the chatbot definition, which leads to conceptual confusion between the various intelligent conversational tools. This situation justifies the theoretical interest of conducting a qualitative study among conversational tools' experts to respond to the discrepancies existing in the literature. From a managerial point of view, these ambiguities regarding the comprehension of what a chatbot is, can have a negative repercussion on companies' conversational strategies.

Conceptual background

In this section, we go over different definitions and terminologies attributed to chatbots in the literature. Thus, scholars in marketing, information systems and human-computer interactions are interested in intelligent conversational tools, including chatbots. As a result, a whole range of definitions and terminologies exist in the academic literature on chatbots. According to Rese *et al.* (2020), chatbots are "*any software application that engages in a dialog with human using natural language*" (p. 2). For Mozafari *et al*. (2022), chatbots are "*text-based virtual robots that emulate human-to-human conversation through natural language processing*" (p. 221). Similarly, for Ramesh and Chawla (2022) chatbots are "*artificially intelligent agents capable of having turn-based conversations with users through the medium of text*" (p. 474). Compared to Rese *et al*. definition in 2020, these definitions provided further information on the medium of interaction used, which is the text. However, some authors state that this medium of interaction can be text or voice based. For example, for Zogaj *et al.* (2023) chatbots are "*mainly based on artificial intelligence and tend to be voice-driven or text-based dialog systems that enable consumer interactions by using natural language*" (p.1). Consequently, the term chatbot can be used to nominate as well voice-based agents. From the above presented definitions of chatbots, we note that there is no consensus on a single, common definition to distinguish the various intelligent conversational tools. Moreover, some definitions address the notion of assistance. Indeed, Nguyen *et al*. (2023) refer to chatbot or virtual assistants as simulating human conversations using text and natural language processing. In the same vein, Hoyer *et al*. (2020, p. 59) define chatbots as "*a type of virtual assistant software programs that conduct conversations with users through audio or text*". For Luo *et al*. (2019) "*chatbots are computer programs that simulate human conversations through voice commands or text chats and serve*

as virtual assistants to users" (p.937). However other authors distinguish between chatbot and virtual assistants. For example, for shin *et al.* (2023, p. 547) chatbots are "*automated programs that simulate human conversations and interact with humans through text chats or voice commands*". Whereas virtual assistants are considered as "*computer programs that respond to voice commands and complete routine tasks such as creating to-do lists, managing schedules, and placing phone calls (e.g., Siri and Alexa)*" (p.547). Similarly, Kull *et al.* (2021) do not consider chatbots to be virtual assistants, which are seen as personal assistants performing everyday tasks, such as Alexa or Siri. Therefore, this notion of assistance seems problematic when talking about chatbots. In addition, other terms can be found in the chatbot literature, namely conversational agents (Kull *et al.*, 2021; Nguyen *et al.*, 2022 ; Rese *et al.*, 2020), e-service agents (Chung et *al.*, 2020) and virtual agents (Lin & Wu, 2023; Przegalinska *et al.*, 2019). One possible way to interpret and explain these differences in terms of definition and terminologies could be attributed to the specificities of each field of study (Marketing, IS, HCI) that has taken the chatbot as its research object. Consequently, each field focuses on a specific aspect of this intelligent conversational tool.

However, this explanation does not seem valid, as the discrepancies mentioned were observed even when focusing exclusively on the same field, namely marketing.

This situation regarding the definitions of chatbots and the different terminologies associated with them can, therefore, be qualified as ambiguous and lacking in consensus among scholars and needs to be clarified. This is why, we return to chatbot experts to improve our understanding of this intelligent conversational tool, and the various terminologies associated with it.

Methodology

The current study aims to improve the understanding of chatbots. Thus, the central goal is to propose a new definition of chatbots that overcome the various inconsistencies identified in the literature. To do so, semi-structured interviews were conducted using a pre-prepared interview guide to structure the discussions (Blanchet & Gotman, 2007).

In total, 12 experts, all working in the chatbot field in France and having different profiles were interviewed, as shown in the table 1 below. These experts were recruited using non-probabilistic sampling methods (convenience and snowball sampling) via the LinkedIn professional network. The interviews were conducted online via Zoom and lasted an average of 57 minutes. The discussions focused on three main themes: chatbots' definitions, terminologies associated with chatbots, and the differences between chatbots and other intelligent conversational tools.

Table 1: Sample description

Respondents	Gender	Position held	Type of company
1	Man	CEO and Founder	Bot Editor
2	Women	Marketing Director	Bot Editor
3	Man	GD and Co-founder	Bot Editor
4	Women	AI Project Manager	Bot Editor
5	Man	Founder	Bot Editor
6	Women	Marketing Director	Bot Editor

7	Man	Conversational Designer	*Freelance*
8	Man	Conversational Designer	In-house developer
9	Man	UX Writer	In-house developer
10	Women	Conversational Designer	Bot Editor
11	Women	Conversational Designer	Bot Editor
12	Women	Conversational Designer	Bot Editor

Results and discussion

To analyse the collected data, a manual thematic content analysis was carried out using the method of Bardin (2013).

Experts' understanding of chatbots

When defining chatbots the interviewed experts adopted 3 different perspectives as follows:

A technical perspective: within this perspective, experts address the technical and technological nature on which a chatbot is based. Thus, the foundation of a chatbot is computer programming, a human-machine system that, using machine learning technologies or artificial intelligence technologies such as Natural Language Processing (NLP), can receive inputs (a request) and automatically, autonomously, and intelligently producing an output (a response). In some cases, where it is impossible to respond to the user's request, the output may be a reference to a human (an advisor) or simply an error message.

*"It can be defined as **software**, a **computer system** whose interface is a conversation"* (Expert 12).
*"At its core, it's a **program trained with data**, a lot of data, that **uses artificial intelligence technologies** like **NLP** and **machine learning** to learn"* (Expert 3).

An experiential perspective: within this perspective, the chatbot is considered as a vector of experience through a conversational interface between a human entity and a non-human entity such as a brand, or an organization through a written text. Indeed, most of the experts interviewed agree to retain text as a medium of interaction (91.66%), while identifying other experiential elements likely to enrich this mainly textual exchange, such as buttons, hypertext links and images and sometimes the voice.

*"To me, any **human-machine interface** relying on a **text-based conversation** system can be qualified as a chatbot"* (Expert 9).
*"The term chatbot refers to what we would more broadly call a **written** conversational service*" (Expert 7).
*"[...] the chatbot receives this interaction and then decides to respond to the user. This response can take multiple forms: **generally it is a written text**, but **it could also be audio if the interaction is in audio format**. It could also be **a response that we qualify as a rich, with elements like images, hyperlinks, clickable buttons**, all aimed at helping the user meet their need"* (Expert 6).

An operational perspective: in this perspective, experts shed light on marketing actions that a chatbot can ensure such as communication, satisfaction of consumer needs, lead generation,

sales, and after-sales service. They present elements of definition that go beyond the concrete aspect, and replace it with a more abstract, user-oriented aspect. A chatbot can thus be considered as a virtual agent, a conversational agent, a conversational service agent or even a virtual assistant, since it is there to assist and accompany users throughout their journey, help them to meet their needs and enable a direct relationship between a company and its customers or prospects.

*"A **virtual assistant** or a bot that **aims to accompany a client or a lead** in a conversational manner*" (Expert 1).

*"It's primarily a **communication tool** and a **virtual assistant**, since it's digitalized; it's a line of code that will **help the consumer find some answers***" (Expert 2).

Experts' understanding of the existing terminologies associated with chatbots

Based on discussions with experts, we identified two approaches explaining and clarifying the existing ambiguities in terms of chatbot' terminologies. Firstly, a conceptual approach that distinguish between the different terminologies according to criteria based on experiential and design aspects. This study among experts identified two criteria for distinction between AI conversational tools namely the medium of exchange and the space of exchange. We denote by "medium of exchange", the means of transmission of interactions between the bot as a non-human entity and the user as a human entity. Moreover, by space of exchange we mean the environment in which this interaction takes place. However, we distinguish between "exchange space" and "exchange support". Thus, the exchange support is the technical equipment that makes it possible to dispose of an exchange space, such as the computer or the smartphone. For most interviewed experts, a chatbot refers to an interaction experience transmitted by means of text, via a chat window. Secondly, a 'Product construction' approach which no longer consider the chatbot as a simple AI tool, but rather as a product of the company that implements it as part of its marketing strategy. So, following this approach, we go beyond the design boundaries of the chatbot tool to move on to the construction of a product by considering it as a virtual agent or a virtual assistant. The table 2 below sum up the differences between AI conversational tools and the appropriate terminology to use.

Table 2: Comparison of different AI-based conversational tools

<table>
<tr><th colspan="3">Areas of divergence</th><th>Areas of convergence</th></tr>
<tr><th rowspan="2">Exchange space</th><th colspan="2">Medium of exchange</th><th rowspan="2">The notion of assistance</th></tr>
<tr><th>Text</th><th>Voice</th></tr>
<tr><td>Chat window</td><td>Chatbot</td><td>_</td><td rowspan="4">Virtual assistant
Virtual agent
E-service agent
Conversational agent</td></tr>
<tr><td>Phone call</td><td>_</td><td>Call-bot</td></tr>
<tr><td>Connected speaker</td><td>_</td><td>Voice-bot</td></tr>
<tr><td>Inbox</td><td>E-mailbot</td><td>_</td></tr>
</table>

The proposition of a new definition of chatbot

Based on the presented results, we believe that a complete chatbot' definition, is one where the three technical, experiential, and operational perspectives overlap and where the distinctive naming criteria determined in this study, namely the medium of exchange and the space of exchange, are specified. We therefore propose the following definition:

A chatbot is technically a human-machine system based on NLP technologies or on machine learning. It offers a user experience via the exchange space of a chat window and uses text as a main medium of exchange. Beyond the design aspects, it can be considered as a virtual assistant or agent capable of carrying out various operational marketing actions, such as assistance or information functions, in order to achieve a company's marketing objectives.

Although this new definition may be similar to that of Shin *et al.* (2023), which seems to be the most elaborate definition in the literature. The latter retains two 'Mediums of exchange' on an equal footing, which we will nuance. Thus, we retain a main 'medium of exchange', namely text, which can be augmented by other elements such as voice, carousels, or predefined buttons, while specifying the interaction environment and the functions that a chatbot can provide and enable for a company.

Conclusion

In summary, this exploratory qualitative study among experts focused on chatbots, given the proliferation of AI technologies and the growing interest in this type of tool that enables a new form of commerce: conversational commerce. The objective of this study is to improve the understanding of this tool, considering the divergences observed in the literature regarding the definitions and terminologies used for chatbots. This study has made a theoretical contribution to existing literature by identifying potential perspectives for a chatbot definition, explaining why certain terms are used interchangeably with the term "chatbot", comparing various intelligent conversational tools, and establishing distinguishing criteria to differentiate them, and proposing a new definition that deals with the identified discrepancies in the literature. From a managerial perspective, by clearly defining and distinguishing these tools, managers will find it easier to set their conversational marketing strategy and determine the positioning of their chatbots. For example, should they develop a product or limit themselves to a conceptual approach? Companies should therefore bear in mind that these two approaches are different and that one of them should be chosen according to the objective underlying the development of the chatbot and their constraints. Finally, knowing the chatbot's potential in terms of the actions it can carry out internally or externally also enables companies to stand out from the competition.

As with any research, this study has limitations that may serve as directions for future research. We acknowledge the conceptual limitations inherent to the methodology used, particularly the limited sample size and limited scope of the study, so it would be beneficial to extend this study to other markets that are more developed in terms of intelligent conversational tools.

Furthermore, this study was limited to the definition and terminologies associated with chatbots, so it would be interesting to look as well at the types of chatbots, their advantages and disadvantages, to better understand this intelligent conversational tool.

References

Bardin, L. (2013). L'analyse de contenu (2e éd.). *Paris, France: PUF*.

Blanchet, A., & Gotman, A. (2007). *L'enquête et ses méthodes : L'entretien*. Armand Colin.

Chung, M., Ko, E., Joung, H., & Kim, S. J. (2020). Chatbot e-service and customer satisfaction regarding luxury brands. *Journal of Business Research*, *117*, 587-595.

Fevad. (2024). *Enquête sur le moral des e-commerçants français en 2024 - Fevad, la Fédération du e-commerce et de la vente à distance*. https://www.fevad.com/enquete-sur-le-moral-des-e-commercants-francais-en-2024/

Hoyer, W. D., Kroschke, M., Schmitt, B., Kraume, K., & Shankar, V. (2020). Transforming the customer experience through new technologies. *Journal of interactive marketing*, *51*(1), 57-71.

Kull, A. J., Romero, M., & Monahan, L. (2021). How may I help you? Driving brand engagement through the warmth of an initial chatbot message. *Journal of business research*, *135*, 840-850.

Lim, W. M., Kumar, S., Verma, S., & Chaturvedi, R. (2022). Alexa, what do we know about conversational commerce? Insights from a systematic literature review. *Psychology & Marketing*, *39*(6), 1129-1155.

Lin, J. S. E., & Wu, L. (2023). Examining the psychological process of developing consumer-brand relationships through strategic use of social media brand chatbots. *Computers in Human Behavior*, *140*, 107488.

Luo, X., Tong, S., Fang, Z., & Qu, Z. (2019). Frontiers: Machines vs. humans: The impact of artificial intelligence chatbot disclosure on customer purchases. *Marketing Science*, *38*(6), 937-947.

Mozafari, N., Weiger, W. H., & Hammerschmidt, M. (2022). Trust me, I'm a bot–repercussions of chatbot disclosure in different service frontline settings. *Journal of Service Management*, *33*(2), 221-245.

Nguyen, M., Casper Ferm, L. E., Quach, S., Pontes, N., & Thaichon, P. (2023). Chatbots in frontline services and customer experience: An anthropomorphism perspective. *Psychology & Marketing*, *40*(11), 2201-2225.

Nguyen, Q. N., Sidorova, A., & Torres, R. (2022). User interactions with chatbot interfaces vs. Menu-based interfaces: An empirical study. *Computers in Human Behavior*, *128*, 107093.

Przegalinska, A., Ciechanowski, L., Stroz, A., Gloor, P., & Mazurek, G. (2019). In bot we trust: A new methodology of chatbot performance measures. *Business Horizons*, *62*(6), 785-797.

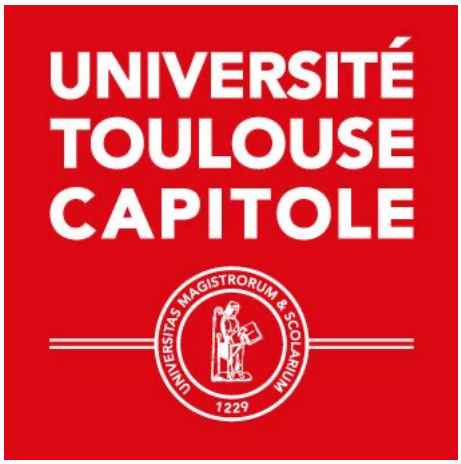
Ramesh, A., & Chawla, V. (2022). Chatbots in marketing: A literature review using morphological and co-occurrence analyses. *Journal of Interactive Marketing*, *57*(3), 472-496.

Rese, A., Ganster, L., & Baier, D. (2020). Chatbots in retailers' customer communication: How to measure their acceptance?. *Journal of Retailing and Consumer Services*, *56*, 102176.

Shin, H., Bunosso, I., & Levine, L. R. (2023). The influence of chatbot humour on consumer evaluations of services. *International Journal of Consumer Studies*, *47*(2), 545-562.

Zendesk. (2024). *Libérer toute la puissance d'une CX intelligente*.

Zogaj, A., Mähner, P. M., Yang, L., & Tscheulin, D. K. (2023). It'sa Match! The effects of chatbot anthropomorphization and chatbot gender on consumer behavior. *Journal of Business Research, 155*, 113412.



Exploring Psychological Determinants of Technology Acceptance for ANN-Based Financial Advisory Applications

What psychological preliminary variables influence consumers' behavioral intention to use financial advisory applications based on artificial neural networks?

Kirsten Meyer
Pfalzstraße 5
65329 Hohenstein, Germany
Kirsten.meyer.it@gmail.com
+49 177 3246576

Toulouse School of Management
Toulouse Capitole Université
2 rue du doyen Gabriel Marty
31042 Toulouse Cedex 9 France

Abstract

This study explores psychological determinants influencing the behavioral intention to use financial advisory applications based on Artificial Neural Networks (ANNs). Grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), the research focuses on constructs such as Performance Expectancy (PE), Effort Expectancy (EE), Privacy Concerns (PC), and Technology Trust (TT). A survey of 196 respondents was conducted, and the collected data were analyzed using Structural Equation Modeling (SEM). The findings highlight that PE and TT positively influence the intention to use ANN-based financial advisory applications, while PC has a significant negative impact on TT, indirectly reducing adoption likelihood. Interestingly, EE showed no significant influence, indicating that ease of use might be less relevant for tech-savvy users when trust and performance expectations are high. These results emphasize the need for developers to address privacy concerns and build user trust through transparent communication and robust data protection measures. The study contributes to understanding psychological drivers of technology acceptance in the financial sector.

Keywords: “Artificial Neural Networks”, “UTAUT”, “Technology Acceptance”, “Stock market forecasting”

Statement of Key Contributions

This research contributes to the academic marketing discipline by advancing the application of the UTAUT framework to the domain of Artificial Neural Network (ANN)-based financial advisory tools. By integrating constructs such as Privacy Concerns (PC) and Technology Trust (TT) into the established UTAUT model, the study identifies critical psychological and technological barriers to adoption. It provides empirical evidence that Performance Expectancy (PE) significantly influences Behavioral Intention to Use (BIU), while Effort Expectancy (EE) does not, challenging traditional assumptions within technology acceptance literature. Furthermore, the study's findings on the mediating role of Technology Trust in mitigating privacy-related fears offer new theoretical insights into trust-building strategies for emerging FinTech solutions.

Furthermore, the findings of this study hold relevance for various non-academic stakeholders. FinTech companies and developers can utilize the insights to focus on features such as data security and predictive accuracy, thereby addressing privacy concerns and building trust, which can ultimately facilitate broader market adoption. Non-profit organizations engaged in financial literacy initiatives can apply these findings to educate individual investors about the benefits of ANN-based tools, promoting more informed decision-making. Regulatory bodies and policymakers can leverage the results to design frameworks that ensure transparency, ethical data handling, and robust consumer protection, effectively mitigating key barriers to adoption. Additionally, private investors can benefit directly from the study's emphasis on the performance-enhancing capabilities of ANN-based applications, which can significantly optimize their investment decisions.

By bridging academic rigor with practical relevance, this study offers actionable insights for enhancing the adoption of intelligent financial advisory technologies, fostering a deeper understanding of consumer behavior in the rapidly evolving FinTech landscape.

Introduction

In today's digital age, investors are inundated with vast amounts of data and information, making it challenging to extract meaningful insights and make informed investment decisions (Siddiqui et al., 2024; Denwitthayanan, 2017). This complexity and volatility of financial markets highlight the need for advanced research to develop and introduce enhanced financial decision-making processes for investors. The last decade has witnessed exponential growth in financial technologies (FinTech), particularly Artificial Neural Networks (ANNs), which have demonstrated exceptional predictive accuracy in financial markets (Haykin, 1994; Atsalakis & Valavanis, 2009). While Corporate and investment banks (CIB) have been early adopters of such kind of AI, realizing significant benefits, not only much of the industry still lags, but especially private investors have limited access and/or usage of ANN based financial advisory applications (Giovine et al., 2023).

In addition to the well-documented benefits of using ANN for stock market predictions, Statista reports that the global online trading market, driven by private and individual investors, is expected to grow at a compound annual growth rate of 6.4 percent, reaching an estimated 13.3 billion U.S. dollars by 2026, up from about 10.21 billion U.S. dollars in 2022. Platforms like Robinhood, which target individual retail investors, have seen their user base expand dramatically, from just 500,000 users in 2014 to over 23 million in 2022. This reflects not only the growth of online trading but also a demographic shift toward younger generations (Millennials and Gen Z) becoming increasingly involved in trading, opening a huge market for digital financial advisory applications (Statista, 2022; 2023).

Considering the capabilities of ANNs (e.g., Kumbure et al., 2022; Enke & Thawornwong, 2005), alongside the growing demand for digital financial advisory solutions (Statista, 2023), it is essential to explore the psychological factors that shape consumers' behavioral intentions to adopt ANN-based financial advisory applications.

This research therefore focuses on identifying psychological and technological factors influencing user behavior. Constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT) are used as basis for the analyzed model. We aim to answer the following research question: „What psychological preliminary variables influence consumers' behavioral intention to use financial advisory applications based on artificial neural networks?”

Research Objectives:

1. Analyzation of the direct impact of Performance Expectancy (PE), Effort Expectancy (EE), and Technology Trust (TT) on the Behavioral Intention to Use (BIU) financial advisory application based on ANNs.
2. Analyzation of the direct impact of Privacy Concerns (PC) on Technology Trust (TT) and accordingly the indirect impact on the Behavioral Intention to Use (BIU) financial advisory application based on ANNs.
3. Testing of hypotheses using structural equation modeling (SEM) to understand ANN adoption drivers.
4. Examination of barriers and motivators affecting widespread usage.

Literature review

The stock market is inherently dynamic, nonlinear, complex, nonparametric, and chaotic, presenting significant challenges in financial time series prediction (Esfahanipour & Aghamiri, 2010; Knill et al., 2012). Artificial Neural Networks (ANNs), due to their learning capabilities and capacity to model non-linear relationships, offer potential solutions or improvements to these challenges (Atsalakis & Valavanis, 2009).

Stock market forecasting has traditionally relied on two main analytical approaches: fundamental and technical analysis (Lee, 2004; Cesar, 1996). Studies demonstrate that ANNs enhance these traditional methods by effectively modeling complex data patterns (Enke & Thawornwong, 2005; Gao & Chai, 2018). Over the last few decades, a variety of intelligent systems and AI techniques, including support vector machines (SVMs) (Cao & Tay, 2001; Huang et al., 2005), artificial neural networks (Rajihy et al., 2017; O'Connor & Madden, 2005), and their variants (Ebrahimpour et al., 2011; Enke & Thawornwong, 2005; Pan et al., 2017), have emerged as leading tools in decision-making tasks (Chen et al., 2005; Sharma et al., 2020). These systems have demonstrated remarkable success in prediction tasks (Kumbure et al., 2022).

Drawing inspiration from the structure and function of the human brain, ANNs consist of interconnected layers of artificial neurons that transmit information through activation signals (Kruse et al., 2015). Due to their ability to analyze complex, non-linear relationships between input and output variables, their learning efficiency (Zhang, 2003), and their high predictive

accuracy (Kara et al., 2011), they have turned out as particularly suitable for stock market forecasting (Hamid & Iqbal, 2004; Baba & Suto, 2000).

Numerous studies highlight the effectiveness of ANNs in capturing the intricate dynamics of financial data, outperforming traditional methods in predictive accuracy (e.g., Kumbure et al., 2022; Cao, 2022; Ebrahimpour et al., 2011; Enke & Thawornwong, 2005). Furthermore, deep learning techniques like Convolutional Neural Networks (CNNs) and Long Short-Term Memory Networks (LSTMs) have been found to excel in analyzing time-series data. Integrating ANNs with data mining and other machine learning approaches further enhances forecasting outcomes, cementing their role as a powerful tool for advanced financial forecasting systems (Long et al., 2019; McNally, 1997; White, 1988; Kamruzzaman & Sarker, 2003; Kiani & Kastens, 2008; Vanstone & Finnie, 2009; Chen et al., 2003; Hamid & Iqbal, 2004; Atsalakis & Valavanis, 2009; Walczak, 1999).

In the context of integrating advanced technologies like ANNs into decision-making, technology acceptance models provide valuable insights. The Unified Theory of Acceptance and Use of Technology (UTAUT) synthesizes eight prominent models, including the Technology Acceptance Model (TAM) (Davis, 1989), the theory of reasoned action (Ajzen & Fishbein, 1988), and the theory of planned behavior (Ajzen, 1991), among others (Venkatesh et al., 2003). These frameworks have become pivotal in understanding the factors influencing technology adoption (Kulviwat et al., 2007; Venkatesh et al., 2012; Ostrom et al., 2019).

In summary, ANNs and other AI techniques hold great promise for stock market forecasting, offering significant improvements over traditional methods. Simultaneously, the adoption and integration of these technologies are supported by robust acceptance models like TAM and UTAUT, which help navigate challenges in implementing intelligent systems in financial markets.

Conceptual framework and hypothesis development

Variable introduction : Effort Expectancy and Performance Expectancy

The TAM and the UTAUT are the predominant technology acceptance models in research (Davis, 1989; Kulviwat et al. 2007; Venkatesh et al. 2012; Ostrom et al., 2019). For our paper, we decided to use the UTAUT model (Venkatesh et al., 2003; 2012; 2016) as a basis, since it is more modern, more developed, and based on a review and consolidation of the constructs from multiple theories (King and He, 2006). Additionally, the UTAUT model was classified as one of the best models for analyzing Behavioral Intention to Use (BIU) and technological adoption (Venkatesh et al., 2012). According to Venkatesh et al. (2012), BIU refers to the motivation that leads to a defined behavior. Therefore, the higher the intention to behave a certain way is, the more likely the behavior is carried out. According to the UTAUT model, the BIU of a new technology is influenced by Performance Expectancy (PE) and Effort Expectancy (EE) (e.g., Venkatesh et al., 2012). PE refers to consumers' perception of how good the performance of a new technology is (Gao and Bai, 2014) and EE describes how easy or effortless the usage of the technology subjectively seems to the user (Venkatesh et al., 2003). PE and EE pertain to utilitarian values or benefits (Chaudhuri and Holbrook, 2001) linked to cognitive evaluation, product quality, rationality, decision effectiveness, goal orientation, economic value, and convenience (Meyer-Waarden & Cloarec 2022). Both variables are therefore relevant for the acceptance of a new technology, like an ANN based financial advisory application, and should influence an individual's BIU (Venkatesh et al., 2012). In the case of ANN based financial advisory applications, existing research suggests that some of the most important perceived utilitarian benefits are related to the accuracy of financial predictions, and thus to the economic performance and the overall efficiency of financial planning and analysis (Johari et al., 2024). Scientific research also suggests that ANN based forecasts, and therefore ANN based financial advisory applications, have superior prediction quality compared to traditional methods (Cao 2022). This indicates that ANN-based forecasts should achieve the desired utilitarian benefits. Through satisfying the most important perceived utilitarian benefits, the behavioral intention to use the application should increase (Venkatesh et al., 2012). Furthermore, the ability of ANNs to analyze unstructured data and model nonlinear relationships makes them significantly more effective than traditional methods of stock market forecasting (Kamalnath et al., 2023; Hamid & Iqbal, 2004; Baba & Suto, 2000; Cao 2022). This enhanced effectiveness not only improves prediction accuracy but also positively impacts EE.

Unlike traditional approaches, which often require extensive manual adjustments, fine-tuning and the active evaluation of available data by an individual, ANNs offer a more user-friendly and automated experience, reducing the overall effort required by investors to achieve reliable forecasts (Sonkavde et al., 2023). The UTAUT model posits that EE and PE significantly influence the BIU of a technology. The actual usage of the technology is then dependent on the BIU. Meaning, the higher the expected performance of the technology and the easier it is to use, the greater the likelihood of its adoption (Venkatesh et al., 2012). We conclude the following two hypotheses H1 and H2:

H1: Performance Expectancy (PE) has a positive effect on Behavioral Intention to Use (BIU) financial advisory applications based on artificial neural network technology.
H2: Effort Expectancy (EE) has a positive effect on Behavioral Intention to Use (BIU) financial advisory applications based on artificial neural network technology.

Variable introduction : Privacy Concerns and Technology Trust

Given the frequent occurrence of technological advancements, trust becomes a crucial factor in the acceptance of new technologies (Hernández-Ortega, 2011; Pavlou, 2003). This is especially true for technologies that aid in investment decisions. Trust is vital for encouraging household participation in financial markets and significantly impacts investment decisions. A lack of trust can discourage investors from engaging in financial markets (Guiso et al., 2008). Therefore, trust in technologies that provide forecasts and investment advice is a critical preliminary factor to explore when determining the likelihood of their adoption. Technology Trust (TT) can be broken down into three dimensions: functionality, helpfulness and reliability. The term "functionality" describes how well a technology can carry out its intended functions. The degree to which a technology is thought to be helpful in reaching anparticular goal is defined as its helpfulness. Reliability would be the degree to which a technology is thought to be dependable and consistent in its operation (McKnight et al., 2002). Trust is a crucial component of the acceptance of new technology as it may be particularly useful in overcoming the uncertainty that is frequently associated with technical advancements (Hernandez-Ortega, 2011; Pavlou, 2003). Trust can significantly influence an individual's intention to use new technologies, as it mitigates perceived risks (Bay, 2018). Based on the Social Cognitive Theory and its perception of risks and their influence on behavior, we examine Privacy Concerns as one of those potential

risks (Bandura, 1986). A primary obstacle to AI's mainstream acceptance appears to be how users and consumers see the technology (Bitkina et al., 2020). Al-Gasawneh et al. formulate the Hypothesis "Perceived Risk has a negative impact on financial AI services" based on studies by Nagy & Hajd., (2021), Masoud (2013), Amirtha, Sivakumar and Hwang (2021) and Hasan, Shams and Rahman (2021). Meyer-Waarden, L., & Cloarec, J. (2022) define different types of perceived risks using autonomous (AI-controlled) vehicles, based on literature by Featherman and Pavlou (2003). Especially the mentioned risks "functional risk" and "financial risk" seem to be relevant for our topic as well. If the technology does not perform according to the expectations of the user, or if it is not worth the original investment in the technology, if data can get leaked and threats for the individual user's private life can arise, fear regarding AI-based technologies persits (Kim et al., 2017; Koopman & Wagner, 2017; Meyer-Waarden & Cloarec, 2022).

Privacy concerns (PC), which encompass fears about data breaches and unauthorized access, pose a significant risk to the adoption of new technologies. Trust, as highlighted by Bay (2018), plays a crucial role in mitigating perceived risks, including those related to privacy. Therefore, it can be inferred that privacy concerns inversely affect the level of trust. When privacy concerns are high, trust in the technology diminishes, thereby impacting an individual's intention to adopt a technology. While the final adoption of a technology is closely tied to the behavioral intention to use it (Venkatesh et al., 2012), Technology Trust (TT) appears to significantly influence Behavioral Intention to Use (BIU) new technologies (Bay, 2018), while Privacy Concerns (PC) appear to primarily influence Technology Trust (TT), and therefore only indirectly Behavioral Intention to Use (BIU).

Although PC can be understood more as a fundamental individual concern or characteristic (in terms of a psychological disposition or state regarding privacy), and TT more as an individual psychological evaluation or belief about the attributes of an external object (the technology), both are considered in the study as psychological antecedents or cognitive factors that are therefore empirically tested for their influence on a user's behavioral intention.

The structure of the model and the theoretical rationale show that, in addition to perceptual and performance-based decision-making, cognitive factors like Technology Trust and Privacy Concerns are also important when it comes to openness toward using new AI-based technology in finance. This is especially relevant in the context of investment and financial decisions. Therefore, the inclusion of both variables as key psychological determinants of technology acceptance in the investigated context is justified (Guiso et al., 2008; Hernández-Ortega, 2011;

Pavlou, 2003). They reflect different but related psychological dimensions—concern/anxiety versus trust/evaluation—that shape behavior. We therefore formulate the following hypothesis:

H3: Privacy concerns (PC) have a negative effect on Technology Trust (TT) in financial advisory applications based on artificial neural network technology.
H4: Technology Trust (TT) has a positive effect on Behavioral Intention to Use (BIU) financial advisory applications based on artificial neural network technology.

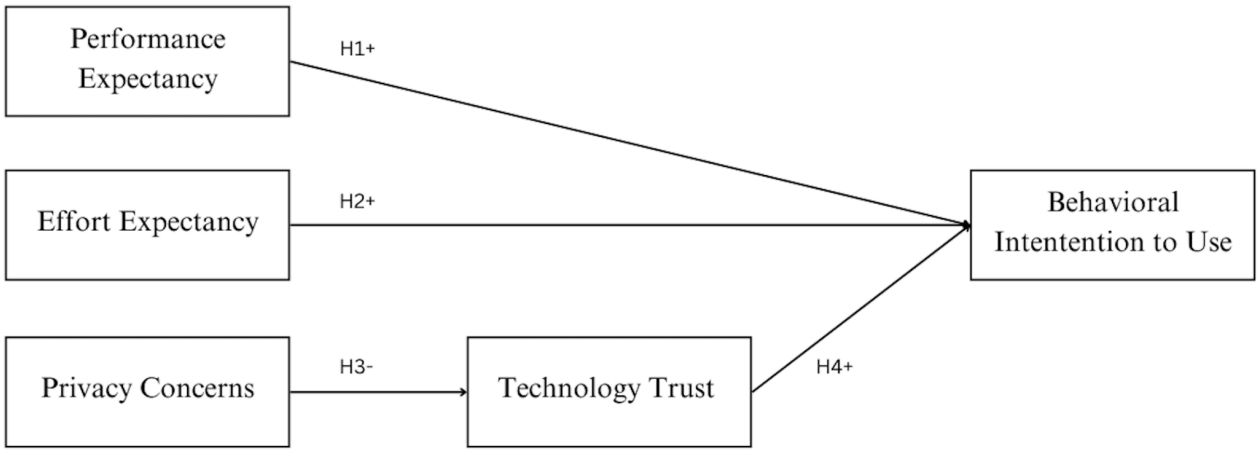
Methodology

A structured survey was distributed to 196 respondents, with 108 valid submissions analyzed using SEM. The gender of respondents is divided in 55.56% females and 44.44% males. The median age of respondents is 29,5 years. The responses were collected based on a seven-point Likert scale (1 = fully disagree, 7 = fully agree). The study measured Performance Expectancy (PE), Effort Expectancy (EE), and Behavioral Intention to Use (BIU) using UTAUT scales by Venkatesh et al. (2012), Privacy Concerns (PC) using scales by Hong and Thong (2013), and Technology Trust (TT) using scales by McKnight et al. (1998).

Key Variables:

- **Performance Expectancy (PE)**: Assessed user expectations of ANN utility.
- **Effort Expectancy (EE)**: Measured perceived ease of use.
- **Privacy Concerns (PC)**: Quantified user apprehensions regarding data security.
- **Technology Trust (TT)**: Evaluated reliability and safety perceptions.
- **Behavioral Intention to Use (BIU)**: Gauged likelihood of adoption.

Conceptual model for the adoption of an ANN based financial advisory applications



Analytical Tools:

The structural equation modeling (SEM) approach tested variable relationships. Fit indices adhered to benchmarks outlined by Hair et al. (2009).

To analyze our results, we conducted a confirmatory factor analysis to assess reliability and validity and tested our hypotheses using Structural Equation Modeling (SEM). In comparison with the AVE values of our analysis we can observe that the highest correlations between variables are less than the AVE values which indicates good Discriminant Validity (Fornell and Larcker, 1981). According to the usual fit indices, the measurement model achieved good fit: the chi-square/df (x^2/df) was less than 2.5 (x^2/df = 110.8 / 67 ≈ 1.65); the comparative fit index (CFI) was greater than 0.90; and the root mean square error of approximation (RMSEA) was not greater than 0.08 (Anderson and Gebering, 1988).

To test the hypothesis, we conducted a structural equation modeling (SEM) in Jamovi. The Table shows the results of the SEM. PE ($\beta = 0.6151$, $p < 0.001$) and TT ($\beta = 0.2417$, $p < 0.001$) have a positive and significant effect on BIU. PC ($\beta = -0.6285$, $p < 0.001$) has a confirmed negative and significant effect on TT. EE has no significant influence on BIU as the p-value (0.807) is well above the significance level of 0.05. Thus, Hypothesis H2 is rejected while the hypotheses H1, H3 and H4 are supported.

Results of the SEM

Relationships	β	*p*	Hypotheses
H1: PE → BIU	0.6151	< 0.001	Supported
H2: EE → BIU	-0.0216	0.807	Rejected
H3: PC → TT	- 0.6285	< 0.001	Supported
H4: TT → BIU	0.2417	0.006	Supported
Mediation	**β**	**95% confidence interval**	**Significant**
PC → PP → BIU	-0.152	Lower: -0.247 Upper: -0.034	Yes (p= 0.010)
PE: Performance Expectancy, EE: Effort Expectancy, TT: Technology Trust, PC: Privacy concerns, BIU: Behavioral Intention to Use			

The results show furthermore that PC have a significant negative indirect influence on BIU through TT, as indicated by the bootstrap confidence interval, which does not include zero.

Key Findings

1. **Performance Expectancy (PE):** A strong positive correlation ($\beta = 0.615$, $p < 0.001$) underscores its significance as the primary adoption driver.
2. **Effort Expectancy (EE):** Contrary to prior research, it did not significantly impact BIU, possibly due to the tech-savviness of the sample population.
3. **Privacy Concerns (PC):** Demonstrates a negative influence on Technology Trust ($\beta = -0.628$, $p < 0.001$), indirectly reducing BIU.
4. **Technology Trust (TT):** Acts as a mediator, improving adoption rates by alleviating privacy-related fears ($\beta = 0.2417$, $p = 0.006$).
5. **Demographics:** Age and gender played minor roles, with younger respondents showing higher adoption propensity.

Discussion

This study aimed to investigate the psychological factors influencing the intention to use ANN based financial advisory applications for predicting stock prices. The results therefore offer insights into the factors that influence the acceptance of such technologies and provide important findings for practice. Although there are numerous studies examining the effectiveness of ANNs in improving stock market forecasts (e.g., Chen et al., 2003; Ebrahimpour et al., 2011; Enke & Thawornwong, 2005; Kamruzzaman & Sarker, 2003; Kiani & Kastens, 2008; Kumbure et al., 2022; Vanstone & Finnie, 2009), the process of adopting ANN-based applications as financial advisors remains under-researched. Technology acceptance models, such as the UTAUT (Venkatesh, 2012), have significantly advanced our understanding of the adoption process for new technologies, thus providing a foundation for our research. Given the complexity of new technologies, users simultaneously assess their potential benefits and opportunities, as well as the associated risks and threats (Venkatesh et al., 2012). In conclusion, this necessitates, for our findings to analyze not only both common variables like Effort Expectancy and Performance Expectancy to comprehensively understand user acceptance but also to consider more underexplored cognitive, social, and affective variables such as Trust and Privacy Concerns (Meyer-Waarden & Cloarec, 2022). In line with the scientific consensus (Venkatesh et al., 2012) our research reaffirms the positive and significant effect of Performance Expectancy on Behavioral Intention to Use. The high importance of Performance Expectancy shows that users must be convinced of the efficiency and effectiveness of ANN applications in order to use them. Furthermore, our results confirm the positive impact of Technology Trust on the Behavioral Intention to Use financial advisory applications based on ANNs. Additionally, we identify the negative indirect effects of Privacy Concerns on Behavioral Intention to Use, mediated by Technology Trust. Contrary to the scientific consensus, our results indicate that Effort Expectancy has no significant influence on the behavioral intention to use. A possible explanation could be that the participants are already tech-savvy for example due to the average age of the participants (Pew Research Center, 2019). It could also indicate that ease of use is less relevant in this specific context if the technology is perceived as powerful and trustworthy. An alternative explanation could be the abstraction and analysis of an hypothetical tool, which none of the participants have been able to try out (Manis & Choi, 2019). Our study partly confirms and extends the UTAUT model by Venkatesh et al. (2012). Additionally, as the adoption process of ANN-based applications as financial advisors has not yet been thoroughly investigated, our research makes a significant contribution to the literature on the adoption of ANN-based financial technologies. We present an adjusted

acceptance model that highlights the importance of not only perceptual and performance-oriented decision-making in the context of openness to using new AI based technology in finance but also emphasizes the relevance of rather cognitive variables such as Technology Trust and Privacy Concerns. This is particularly pertinent in questions regarding investment and financial decisions, where these cognitive factors appear to play a crucial role in user acceptance, next to utilitarian motivation (Guiso et al., 2008; Hernandez-Ortega, 2011; Pavlou, 2003). Privacy concerns have gained increased attention in research as digitalization has made them a more pressing issue (Fontes et al., 2022). According to a survey, 93 percent of US and European citizens are concerned about privacy issues related to identity theft and fraud (Clement, 2019). According to our results, in the sensitive domain of finance, these fears remain persistent, confirming our Hypothesis H3, that privacy concerns have a significant negative impact on trust in technology. This underlines the importance of privacy in the adoption of new technologies, especially in the financial sector (Kim et al., 2017). Users are concerned about the security of their personal data, which reduces trust in the technology and thus negatively influences the intention to use it. On the other hand, reduced privacy concerns related to ANN-based financial advisory applications, significantly enhance technology trust, which in turn positively influences users' behavioral intention to use these applications. A high level of trust in the technology correlates with a strong intention to adopt it. Trust is a critical factor in the acceptance of new technologies (McKnight et al., 2002). Trust in the functionality, reliability, and security of ANN applications plays a central role in the decision-making process for or against usage (McKnight et al., 2002). In summary, our findings confirm that Performance Expectancy significantly influences users' intentions to adopt ANN-based financial applications. Trust in technology emerges as a critical factor, especially in alleviating the negative impact of privacy concerns. Contrary to our expectations, Effort Expectancy does not play a significant role in adoption. This study contributes to the existing literature by extending the UTAUT model, emphasizing the importance of Technology Trust and Privacy Concerns in the adoption of ANN-based financial applications. Our results challenge the conventional view of the relevance of Effort Expectancy in technology adoption, suggesting that ease of use may become less important when a technology is perceived as both powerful and trustworthy.

Practical Implications:

Developers: Implement advanced encryption and data anonymization to address privacy concerns (Solove, 2006).

Marketers: Highlight performance improvements and financial outcomes in campaigns. PE is driven by a rational, utilitarian motivation, encompassing factors such as goal-oriented product quality, economic value, convenience, and forecasting performance (Meyer-Waarden & Cloarec, 2022; Johari et al., 2024). Marketers should therefore focus on effectively communicating these utilitarian benefits, particularly emphasizing forecasting efficiency along with the associated economic and efficiency gains.

To strengthen user trust, data protection measures should be both implemented and communicated transparently. Building and maintaining high levels of trust in the technology is essential, particularly in addressing privacy concerns, which pose a substantial barrier to adoption. To overcome this obstacle, products could, for instance, undergo rigorous third-party security audits, include end-to-end encryption, anonymize user data, and show transparent privacy policies that reassure users about the security of their personal and financial information.

Policy Makers: Introduce regulatory measures ensuring ethical AI practices. The financial sector's reliance on sensitive user data necessitates robust data protection mechanisms. Concerns about unauthorized data usage, breaches, and lack of transparency discourage adoption (Solove, 2006). Addressing these challenges through regulatory compliance and end-user communication is paramount (Martin et al., 2017). Trust encompasses functionality, reliability, and ethical considerations. As ANN systems become integral to financial decision-making, transparency in algorithm design and decision processes becomes essential to foster trust (McKnight et al., 2002).

Future Research Directions

Suggested Directions:

1. Cross-cultural studies comparing trust dynamics in global markets.
2. Studies that delve into more nuanced dimensions of psychological influences and explore various moderators such as age, gender, and education (e.g., Venkatesh et al., 2003).
3. Longitudinal analyses to track evolving attitudes toward AI systems.
4. Exploration of the relative importance of different psychological factors in technology acceptance models, as these may vary depending on the specific technology and application context (e.g. This study, contrary to the scientific consensus, concludes no significant impact of EE on BIU, which could indicate that the ease of use is less relevant if the technology is perceived as powerful and trustworthy).

References

- Amirtha, R., Sivakumar, V. J., & Hwang, Y. (2021). Influence of Perceived Risk Dimensions on e-Shopping Behavioural Intention among Women—A Family Life Cycle Stage Perspective. Journal of Theoretical and Applied Electronic Com- merce Research, 16(3), 320-355.
- Atsalakis G. & Valavanis K. (2009). Surveying stock market forecasting techniques – Part II: Soft computing methods, *Expert Systems with Applications,* Volume 36, Issue 3, Part 2, Pages 5932-5941, ISSN 0957-4174, https://doi.org/10.1016/j.eswa.2008.07.006.
- Anderson, J.C., Gerbing, D.W., (1988). Structural equation modeling in practice: a review and recommended two-step approach. Psychol. Bull 103 (3), 411-423.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.
- Ajzen, I., & Fishbein, M. (1988). Theory of reasoned action-Theory of planned behavior. *University of South Florida,* 2007, 67-98.
- Baba, N. & Suto, H. (2000). Utilization of artificial neural networks and the TD-learning method for constructing intelligent decision support systems. European Journal of Operational Research 122: 501–8.
- Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. *Prentice-Hall.*
- Bay, S. (2018). Factors affecting user trust and intention in adopting chatbots: the moderating role of technology anxiety in insurtech. *Journal of Financial Services Marketing*.https://doi.org/10.1057/s41264-018-0056-2
- Blut, M., Chong, A. Y. L., Tsiga, Z., & Venkatesh, V. (2022). Meta-Analysis of the Unified Theory of Acceptance and Use of Technology. *Journal of the Association for Information Systems, 23*(1), 13–95.
- Bitkina, O. V., Jeong, H., Lee, B. C., Park, J., Park, J., & Kim, H. K. (2020). Perceived trust in artificial intelligence technologies: A preliminary study. Human Factors and Ergonomics in Manufacturing & Service Industries, 30(4), 282-290.
- Cao, L. (2022). Ai in finance: challenges, techniques, and opportunities. ACM Computing Surveys (CSUR), 55(3), 1-38.
- Cao, L., & Tay, F. E. (2001). Financial forecasting using support vector machines. Neural Computing & Applications, 10, 184-192.
- Cesar, G. (1996). Aktienanalyse heute: Gewinnmaximierung an der Börse. Gabler.

- Chaudhuri, A., Holbrook, M., (2001). The chain of effects from brand trust and brand affect to brand performance: the role of brand loyalty. J. Market. 65, 81–93.
- Chen, A. S., Leung, M. T., & Daouk, H. (2003). Application of neural networks to financial forecasting. *Expert Systems with Applications, 24*(4), 351–357.
- Chen, Yuehui, Xiaohui Dong, and Yaou Z. (2005). Stock Index Modeling Using EDA Based Local Linear Wavelet Neural Network. Paper presented at the 2005 International Conference on Neural Networks Brain, ICNNB'05, Beijing, China, October 13–15; vol. 3, pp. 1646–50.
- Clement, J.,(2019). Most concerning issues about data privacy according to mobile users in the United States as of April 2019 Harvard Business Revue. https://www.statista.com/statistics/248488/frequency-with-which-us-internet-users-worry-about-onlineprivacy/#statisticContainer.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340. doi:10.2307/249008
- Denwitthayanan, K. (2017). *Robot Advisor Investment Management Assistant.* Retrieved January 20, 2018, from https://www.pwc.com/th/en/pwc-thailand-blogs/blog-20170131.html
- Ebrahimpour, R., Nikoo, H., Masoudnia, S., Yousefi, M. R., & Ghaemi, M. S. (2011). Mixture of MLP-experts for trend forecasting of time series: A case study of the Tehran stock exchange. International Journal of Forecasting, 27(3), 804-816.
- Esfahanipour, Akbar, and Werya Aghamiri. (2010). Adapted neuro-fuzzy inference system on indirect approach TSK fuzzy rule base for stock market analysis. Expert Systems with Applications 37: 4742–48.
- Enke, D., & Thawornwong, S. (2005). The use of data mining and neural networks for forecasting stock market returns. Expert Systems with applications, 29(4), 927-940. https://doi.org/10.1016/j.eswa.2005.06.024
- Fontes, C., Hohma, E., Corrigan, C. C., & Lütge, C. (2022). The Ethical and Privacy Implications of Datafication and Digitalization in Developing Country Contexts. Development. https://doi.org/10.1007/s11447-022-09758-1
- Fornell, C., Larcker, D.F., (1981). Evaluating structural equation models with unobservable variables and measurement error. J. Market. Res. 18 (1), 39-50.
- Gao, L., Bai, X., (2014). A unified perspective on the factors influencing consumer acceptance of internet of things technology. Asia Pac. J. Market. Logist. 26 (2), 211–231. https://doi.org/10.1108/APJML-06-2013-0061.

- Gao, T., & Chai, Y. (2018). Improving stock closing price prediction using recurrent neural networks. *Neural Computing and Applications, 30*(10), 2833–2854.
- Giovine, C., Lerner, L., Moon, J., & Schorsch, S. (2023, September 25). Been there, doing that: How corporate and investment banks are tackling gen AI. *McKinsey & Company.*
- Guiso, L., Sapienza, P., & Zingales, L. (2008). Trusting the stock market. Journal of Finance, 63(6), 2557-2600. https://doi.org/10.1111/j.1540-6261.2008.01408.x
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate data analysis* (7th ed.). Pearson.
- Hamid, S. A., & Iqbal, Z. (2004). Using neural networks for forecasting volatility of S&P 500 Index futures prices. Journal of Business Research, 57(10), 1116–1125. https://doiorg.gorgone.univ-toulouse.fr/10.1016/S0148-2963(03)00043-2
- Hasan, R., Shams, R., & Rahman, M. (2021). Consumer trust and perceived risk for voicecontrolled artificial intelligence: The case of Siri. Journal of Business Research, 131, 591-597.
- Haykin, S. (1994). Intelligent signal processing. In Advances in Signal Processing for Nondestructive Evaluation of Materials (pp. 1-12). *Dordrecht: Springer Netherlands.*
- Hernandez-Ortega, B., (2011). The role of post-use trust in the acceptance of a technology: drivers and consequences. *Technovation* 31 (10/11), 523–538.
- Hong, W., Thong, J.Y.L., (2013). Internet privacy concerns: an integrated conceptualization and four empirical studies. MIS Q. 37 (1), 275–298. https://doi. org/10.25300/MISQ/2013/37.1.12.
- Huang, W., Nakamori, Y., & Wang, S. Y. (2005). Forecasting stock market movement direction with support vector machine. Computers & operations research, 32(10), 2513-2522.
- Johari, M., Shafiai, S., & Wan Ahmad, W. M. (2024). Fear or Greed? Assessment on Investors' Investment Decisions in Equity Funds. Global Business and Management Research: An International Journal, 16(2s), 437-450.
- Kamalnath, V., Lerner, L., Moon, J., Sari, G., Sohoni, V., & Zhang, S. (2023). Capturing the Full Value of Generative AI in Banking. McKinsey & Company.
- Kamruzzaman, J., & Sarker, R. (2003). Forecasting of currency exchange rates using ANN: A case study. Journal of Financial and Quantitative Analysis, 38(3), 375-389.
- Kara Y., Boyacioglu M., Baykan .., 2011. Predicting direction of stock price index movement using artificial neural networks and support vector machines: The sample of

the Istanbul Stock Exchange, Expert Systems with Applications, Volume 38, Issue 5,Pages 5311-5319, ISSN 0957-4174, https://doi.org/10.1016/j.eswa.2010.10.027.

- Kiani, K., & Kastens, T. (2008). Testing forecast accuracy of foreign exchange rates: Predictions from feed forward and various recurrent neural network architectures. Journal of Forecasting, 27(5), 417-437.
- Kim, Y., Park, Y., Choi, J., (2017). A Study on the Adoption of IoT Smart Home Service: Using Value-Based Adoption Model, vol. 28. *Total Quality Management & Business Excellence*, pp. 1–17.
- King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. Information & Management, 43(6), 740-755. https://doi.org/10.1016/j.im.2006.05.003
- Knill, A., Minnick, K. & Nejadmalayer, A. (2012). Experience, information asymmetry, and rational forecast bias. Review of Quantitative Finance and Accounting 39: 241–72.
- Koopman, P., Wagner, M., (2017). Autonomous vehicle safety: an interdisciplinary challenge. IEEE Intelligent Transportation Systems Magazine 9, 90–96. https://doi.org/10.1109/MITS.2016.2583491.
- Kruse, R., Borgelt, C., Braune, C., Klawonn, F., Moewes, C. & Steinbrecher, M. (2015). Computational Intelligence: Eine methodische Einführung in künstliche neuronale Netze, evolutionäre Algorithmen, Fuzzy-Systeme und Bayes-Netze (2. Aufl.). Computational Intelligence. Springer Vieweg. https://doi.org/10.1007/978- 3-658-10904-2
- Kulviwat, S., Bruner, G., Kumar, A., Altobello, S., Terry, C. (2007). Toward a unified theory of consumer acceptance technology. Psychol. Market. 24, 1059–1084.
- Kumbure, M. M., Lohrmann, C., Luukka, P. & Porras, J. (2022). Machine learning techniques and data for stock market forecasting: A literature review. *Expert Systems With Applications*, 197, 116659.https://doi.org/10.1016/j.eswa.2022.116659
- Lee, R. S. T. (2004). iJADE stock advisor: An intelligent agent based stock prediction system using hybrid RBF recurrent network. IEEE Transactions on Systems, Man, and Cybernetics Parts A: Systems and Humans, 34: 421–428.
- Long, W., Lu, Z., & Cui, L. (2019). Deep learning-based feature engineering for stock price movement prediction. Knowledge-Based Systems, 164, 163-173. DOI:10.1016/j.knosys.2018.10.034
- Manis, K. T., & Choi, D. (2019). The virtual reality hardware acceptance model (VR-HAM): Extending and individuating the technology acceptance model (TAM) for

virtual reality hardware. Journal of Business Research, 100, 503–513. https://doi.org/10.1016/j.jbusres.2019.02.030

- Martin, K. D., Borah, A., & Palmatier, R. W. (2017). Data privacy: Effects on customer and firm performance. *Journal of Marketing, 81*(1), 36–58.
- Masoud, E. Y. (2013). The effect of perceived risk on online shopping in Jordan. European Journal of Business and Manage- ment, 5(6), 76-87.
- McKnight, D. H., Cummings, L. L., & Chervany, N. L. (1998). Initial Trust Formation in New Organizational Relationships. *The Academy of Management Review*, 23(3), 473. https://doi.org/10.2307/259290
- McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce. *Information Systems Research, 13*(3), 334–359.
- McNally, R. (1997). The use of neural networks in forecasting stock prices. Journal of Finance, 52(2), 1083-1111.
- Meyer-Waarden, L., & Cloarec, J. (2022). "Baby, you can drive my car": Psychological antecedents that drive consumers' adoption of AI-powered autonomous vehicles. Technovation, 109, 102348.
- Nagy, S., & Hajd., N. (2021). Consumer Acceptance of the Use of Artificial Intelligence in Online Shopping: Evidence from Hungary. Amfiteatru Economic, 23(56).
- Pavlou, P., (2003). Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model. *Int. J. Electron. Commer*. 7 (3), 101–134. https://doi.org/10.1080/10864415.2003.11044275.
- O'Connor, N., & Madden, M. G. (2005, December). A neural network approach to predicting stock exchange movements using external factors. In International Conference on Innovative
- Ostrom, A.L., Fotheringham, D., Bitner, M.J. (2019). Customer acceptance of AI in service encounters: understanding antecedents and consequences. In: Handbook of Service Science, II, pp. 77–103. https://doi.org/10.1007/978-3-319-98512-1_5.
- Pan, Y., Xiao, Z., Wang, X., & Yang, D. (2017). A multiple support vector machine approach to stock index forecasting with mixed frequency sampling. Knowledge-Based Systems, 122, 90-102. Techniques and Applications of Artificial Intelligence (pp. 64-77). London: Springer London.
- Pavlou, P., (2003). Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model. Int. J. Electron. Commer. 7 (3), 101–134. https://doi.org/10.1080/10864415.2003.11044275.

- Pew Research Center. (2019, September 9). Millennials stand out for their technology use, but older generations also embrace digital life. Pew Research Center. Retrieved from https://www.pewresearch.org/fact-tank/2019/09/09/us-generations-technology-use/
- Rajihy, Y., Nermend, K., & Alsakaa, A. (2017). Back-propagation artificial neural networks in stock market forecasting. an application to the Warsaw stock exchange WIG20. Aestimatio: The IEB International Journal of Finance, (15), 88-99.
- Sharma, A., Bhuriya, D., & Singh, U. (2017). Survey of stock market prediction using machine learning approach. In 2017 International Conference of Electronics, Communication and Aerospace Technology (ICECA) (Vol. 2, pp. 506-509). IEEE.
- Siddiqui, N., Haque, M. A., & Shoaib, H. (2024). Different ML-based strategies for customer churn prediction in banking sector. *Journal of Data, Information, and Management*, 6(2), 29-45.DOI: 10.1007/s42488-024-0001-x.
- Solove, D. J. (2006). A taxonomy of privacy. *University of Pennsylvania Law Review, 154*(3), 477–559.
- Sonkavde, Gaurang,Deepak Sudhakar Dharrao, Anupkumar M. Bongale, Sarika T. Deokate, Deepak Doreswamy, and Subraya Krishna Bhat., (2023) Forecasting Stock Market Prices Using Machine Learning and Deep Learning Models: A Systematic Review, Performance Analysis and Discussion of Implications. International Journal of Financial Studies 11: 94. https://doi.org/10.3390/ijfs11030094
- Statista. (2022, 12. Dezember). Monthly active users of the leading eTrading apps worldwide2017-2021. *Statista*. https://www.statista.com/statistics/1259822/global-etrading-app-monthly-activeusers/
- Statista. (2023, November 30). Forecast of the global online trading market 2026. *Statista*.https://www.statista.com/statistics/1260026/forecast-global-online-trading-platform-market/
- Stevens, J. (2002). Applied multivariate statistics for the social sciences (Vol. 4). Mahwah, NJ: Lawrence Erlbaum Associates.
- Vanstone, B., & Finnie, G. (2009). An empirical methodology for developing stockmarket trading systems using artificial neural networks. European Journal of Operational Research, 192(2), 631-650.
- Vanstone, B., Gavin, F. & Tan, C. (2004). Applying Fundamental Analysis and Neural Networks in the Austrailian Stockmarket. http://epublica-tions.bond.edu.au/infotech_pubs/19

- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.
- Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178. https://doi.org/10.2307/41410412
- Venkatesh, V., Thong, J. Y., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. Journal of the association for Information Systems,17(5), 328-376.
- Walczak, S. (1999). Gaining Competitive Advantage for Trading in Emerging Capital Markets with Neural Networks. Journal of Management Information Systems, 16(2), 177–192. https://doiorg.gorgone.univ-toulouse.fr/10.1080/07421222.1999.11518251
- Wei, Z., & Nguyen, Q. T. K. (2020). Local responsiveness strategy of foreign subsidiaries of Chinese multinationals: The impacts of relational-assets, market-seeking FDI, and host country institutional environments. Asia Pacific Journal of Management, 37, 661–692.
- White, H. (1988). Economic prediction using neural networks: The case of IBM daily stock returns. Journal of Financial Economics, 15(3), 197-211.
- Zhang, G. P. (2003). Time series forecasting using a hybrid ARIMA and neural network model. Neurocomputing, 50, 159-175.

AI Morality: The Impact of AV Settings on Perceived Morality of AV's Actions

Thomas Teychenié*
TSM-Research, Universite Toulouse Capitole, CNRS, Toulouse,
France thomas.teychenie@tsm-education.fr

Julien Cloarec
Université Jean Moulin Lyon 3, Lyon, France
julien.cloarec@univ-lyon3.fr

Marc Kuhn
Duale Hochschule Baden-Württemberg Stuttgart, Stuttgart, Germany
Marc.Kuhn@dhbw-stuttgart.de

Lars Meyer-Waarden
TSM-Research, Universite Toulouse Capitole, CNRS, Toulouse,
France lars.meyer-waarden@tsm-education.fr

*corresponding author

AI Morality: The Impact of AV Settings on Perceived Morality of AV's Actions

Abstract:

This study examines consumer responsibility in autonomous vehicles (AVs), focusing on how AV morality settings influence perceptions of accountability in emergencies. Through four studies, we explored how AVs programmed with either a self-protective or utilitarian morality influence user perceptions of responsibility. Factors like the decision-maker behind the AV's morality settings (government vs. manufacturer) and vehicle ownership type (owned vs. shared) further shape morality perceptions. Findings reveal that consumers tend to prefer self-protective AVs and may internalize responsibility for AV actions, even when perceiving those actions as morally ambiguous. This "responsibilization" of consumers highlights ethical concerns, as consumers could bear consequences for AV decisions they did not make. The results underscore a need for policymakers and manufacturers to consider public perceptions of AV morality settings when developing and regulating AV technology.

Keyword:

Autonomous vehicles; Responsibilization; Morality; Dilemma

AI Morality: The Impact of AV Settings on Perceived Morality of AV's Actions

INTRODUCTION

Autonomous vehicles (AVs) promise to deliver a new experience for consumers allowing them to relax while using a safer car. Thus, the market for this technology, already at 41 billion dollars in 2024, should reach 115 billion by 2029 (Statista, 2024). If private highly autonomous cars are not yet available, some cab companies already use such vehicles in some cities, like San Francisco or Phoenix (BBC, 2023). The recent announcement by Elon Musk about the development of a Tesla cab service named "Cybercab" demonstrates that the industry pushes for the release and use of the technology (BBC, 2024). Yet, consumers are afraid of those vehicles (AAA, 2024). One of the main concerns regards the ethical dilemma (Shariff et al., 2017). Especially, determining which morality the car should follow in case of an ethical dilemma (Rhim et al., 2020; Zhu et al., 2022). Regardless of the car's morality, the responsibility for the accident could be attributed to the user (Hong et al., 2021). Therefore, there is a need to study the effect of morality type on consumer responsibilization in case of emergency in AVs.

We conducted 4 online studies, each composed of a representative sample of the US population, in October 2024. In the first, we designed and tested 2 scenarios regarding the type of morality (self-protective vs utilitarian) the AV will follow in case of an emergency. The second implemented the decider of the car morality settings (Government vs Manufacturer) as a moderator. The third one added the ownership of the AV (owned vs shared). Finally, study 4 combined the decider type and ownership. We contribute to the understanding of morality appraisal of AV (Awad et al., 2018; Bonnefon et al., 2016; Gill, 2020) and consumer responsibilization (Giesler & Veresiu, 2014).

BACKGROUND

Autonomous Vehicles and Morality

An autonomous vehicle (AV) is a car that uses artificial intelligence to navigate with little or no input from the user (Eggers & Eggers, 2022). The degree of autonomy varies depending on the level of automation, which determines how much human input is required. The Society of Automotive Engineers (SAE) International defines six levels of vehicle automation, ranging from fully manual to fully autonomous (SAE, 2021). While much of the existing research focuses on the technical aspects of AVs, a growing body of literature addresses the ethical dilemmas posed by the technology. AVs have the potential to improve road safety, but they may, in some situations, be forced to make life-and-death decisions, such as determining who to prioritize in an unavoidable accident (Bigman & Gray, 2020). Deciding on such parameters is complex because individual preferences vary across cultures, as illustrated by the Moral Machine Experiment (Awad et al., 2018). The moral framework guiding AVs typically revolves around two approaches: utilitarianism, which aims to minimize the number of casualties, and self-protection, which prioritizes the safety of the vehicle's passengers (Bonnefon et al., 2016; Bruno et al., 2024). In addition to those moral considerations, another critical issue is that of responsibility. When accidents occur, the consumer could feel responsible for the car's actions.

Responsibilization

Responsibilization is the shift in responsibility from Governments and institutions to consumers through a neoliberal discourse pushing consumers to take moral responsibility for societal problems (Giesler & Veresiu, 2014; Shamir, 2008). Through the process of responsibilization, a new type of consumer is created the "responsible consumer" (Giesler & Veresiu, 2014). The responsibilization of consumers can tackle different contexts from cultural appropriation (Cruz et al., 2024) to menopause (Corus et al., 2024). Barhnart et al.(2024) study responsibilization in the context of gun usage, highlighting that consumers can accept responsibility for taking a life. Therefore, the responsibility for the consequences of using a technology with potentially fatal consequences could fall on the consumer. Consumers might reject the responsibilization (Eckhardt & Dobscha, 2019). In the context of AVs, consumers tend to perceive the manufacturer as responsible in case of an accident (Gill, 2020). Yet, certain factors can positively affect the perceived responsibility of consumers on matters where they hold firms most responsible (Moran et al., 2023). Hence, it is important to look at factors that could impact consumer responsibility in the AV context.

METHODOLOGY

Study 1: We administered an online survey in October 2024 using Prolific to obtain a representative sample of the US population (N=300). We implemented a 2x1 between-subject experiment where we manipulated the morality settings (Self-protective or Utilitarian) of an AV through a text-form scenario. We adapted the scale of perceived morality from Bastian et al. (2013) and that of responsibility acceptance from Wenzel et al. (2012). For the manipulation check of morality type, we adapted the scale from Longoni & Cian (2022).

Study 2: We administered an online survey in October 2024 using Prolific to obtain a representative sample of the US population (N=300). We implemented a 2x2 between-subject experiment where we manipulated the morality settings of an AV through a text-form scenario. In addition, we also manipulated who decided of the car morality type (either the Government or the Manufacturer). We adapted the scale of perceived morality from Bastian et al. (2013) and that of responsibility acceptance from Wenzel et al. (2012). For the manipulation check of morality type, we adapted the scale from Longoni & Cian (2022). For the manipulation check for the decider type, we adapted the scales from Ötting & Maier (2018) and VanBergen et al. (2022).

Study 3: We administered an online survey in October 2024 using Prolific to obtain a representative sample of the US population (N=300). We implemented a 2x2 between-subject experiment where we manipulated the morality settings of an AV through a text-form scenario. In addition, we also manipulated the ownership of the car (owned vs shared). We adapted the scale of perceived morality from Bastian et al. (2013) and that of responsibility acceptance from Wenzel et al. (2012). For the manipulation check of morality type, we adapted the scale from Longoni & Cian (2022). For the manipulation check for ownership, we adapted the scale from Peck & Shu (2009).

Study 4: We administered an online survey in October 2024 using Prolific to obtain a representative sample of the US population (N=600). We implemented a 2x2x2 between-subject experiment where we manipulated the morality settings of an AV, the decider of said settings, and the AV's ownership through a text-form scenario. We adapted the scale of perceived morality from Bastian et al. (2013) and that of responsibility acceptance from

Wenzel et al. (2012). For the manipulation check of morality type, we adapted the scale from Longoni & Cian (2022). For the manipulation check for the decider type, we adapted the scales from Ötting & Maier (2018) and VanBergen et al. (2022). For the manipulation check for ownership, we adapted the scale from Peck & Shu (2009).

RESULTS

Study 1: We used PROCESS (Model 4) with 5,000 bootstrapped samples (Hayes, 2021). The results indicate that the direct effect of the type of morality utilitarian (compared to self-protective) on consumer responsibility acceptance was insignificant (b = -.08, p = .652). Yet, the utilitarian morality type has a significant negative impact on the perceived morality of the car's actions in case of emergency (b = -.40, p = .006). The perceived morality of the car's actions has a significant negative impact on consumer responsibility acceptance (b = -.20, p = .004). The results indicated that the perceived morality of the car's actions in case of emergency fully mediated the relationship between utilitarian morality type and acceptance of responsibility (b = .08, 95% CI = [.0120, .1867]).

Study 2: We examined whether car morality settings affected perceived morality for the car's action depending on the decider type for the morality settings. A two-way ANCOVA (i.e., with covariates) revealed one significant main effects of car morality settings (F(1, 292) = 6.21, p = .013, η^2 = .02) and one insignificant effect of the decider type (F(1, 292) = .08, p = .83, η^2 = .00). This was qualified by a significant interaction effect (F(1, 292) = 7.25, p = .041, η^2 = .01). When the Government implement the car morality setting, the perceived morality of the car's action is higher when the car is self-protective (M = 4.96, SD = 2.99) than when it is utilitarian (M = 4.27, SD = 2.87; F(1, 292) = 3.18, p = .002; d = .68). When the Manufacturer implement the car morality setting, the perceived morality of the car's action is not significantly higher when the car is self-protective (M = 4.67, SD = 2.77) than when it is utilitarian (M = 4.62, SD = 2.90; F(1, 292) = 0.24, p = .81; d = .05).

Study 3: We examined whether car morality settings affected perceived morality for the car's action depending on the ownership of the AV. A two-way ANCOVA (i.e., with covariates) revealed two insignificant main effects of car morality settings (F(1, 292) = 3.57, p = .060, η^2 = .01) of the ownership (F(1, 292) = 1.23, p = .26, η^2 = .00). This was qualified by a significant interaction effect (F(1, 292) = 9.74, p = .002, η^2 = .03). When the AV is owned, the perceived morality of the car's action is higher when the car is self-protective (M = 5.10, SD = 3.45) than when it is utilitarian (M = 4.30, SD = 3.30; F(1, 292) = 3.50, p = .001; d = .80). When the AV is available through a car-sharing app, the perceived morality of the car's action is not significantly higher when the car is utilitarian (M = 4.96, SD = 3.26) than when it is self-protective (M = 4.75, SD = 3.07; F(1, 292) = 0.24, p = .81; d = -.05).

Study 4: We examined whether car morality settings affected perceived morality for the car's action depending on the decider type for said morality setting and ownership of the vehicle. A three-way ANCOVA (i.e., with covariates) revealed significant main effects of car morality (F(1, 588) = 21.17, p < 0.01, η^2 = .03), decider type (F(1, 588) = 5.37, p = .02, η^2 = .01), and an insignificant effect of ownership type (F(1, 588) = 0.17, p = .68, η^2 = .00). This was qualified by a significant interaction effect (F(1, 588) = 8.25, p < .01, η^2 = .01). When the car is owned and the Government decides the morality settings of the car, perceived morality for the car's actions is not significantly higher when the car is self-protective (M = 5.70, SD = 3.95) than when it is utilitarian (M = 4.70, SD = 3.94; F(1, 588) = 1.27, p = .254; d = .26). When the car is owned and the Manufacturer decides the morality settings of the car, perceived morality for

the car's actions is significantly higher when the car is self-protective (M = 4.73, SD = 3.78) than when it is utilitarian (M = 4.10, SD = 4.08; F(1, 588) = 3.05, p = .002; d = .64). When the car is shared and the Government decides the morality settings of the car, perceived morality for the car's actions is significantly higher when the car is self-protective (M = 5.12, SD = 3.91) than when it is utilitarian (M = 4.18, SD = 3.84; F(1, 588) = 4.52, p < .001; d = .93). When the car is shared and the Manufacturer decides the morality settings of the car, perceived morality for the car's actions is not significantly higher when the car is self-protective (M = 4.63, SD = 3.94) than when it is utilitarian (M = 4.53, SD = 3.88; F(1, 588) = 0.51, p = .612; d = .10).

CONCLUSION AND IMPLICATIONS FOR THEORY AND PRACTICE

While studies have highlighted the importance of morality in autonomous vehicles (AVs) (Awad et al., 2018), there remains a notable gap in research addressing the factors that shape the perceived morality of AVs. Our study, conducted in four sequential steps, aims to deepen the understanding of these factors by examining how users perceive the morality of AV actions. Consistent with prior research, we observe a tendency among users to favor self-protective AVs over utilitarian ones when imagining themselves inside the vehicle (Bonnefon et al., 2016; Bruno et al., 2024; Morita & Managi, 2020). Interestingly, our findings from Study 1 reveal that consumers are willing to accept responsibility for the car's actions, even when they perceive those actions as morally questionable. This acceptance underscores a potential risk of "responsibilized consumers" (Giesler & Veresiu, 2014) who may bear the consequences of AV decisions they view as immoral.

Our findings also offer valuable insights for policymakers and AV manufacturers. Given that policymakers are likely to shape the AV's moral framework, they should be aware that what is deemed the "most moral" choice from a regulatory perspective may not align with consumer perceptions of morality.

References

AAA (2024) *: Fear of Self-Driving Cars Persists as Industry Faces an Uncertain Future*. AAA Newsroom. https://newsroom.aaa.com/2024/03/aaa-fear-of-self-driving-cars-persists-as-industry-faces-an-uncertain-future/

Awad, E., Levine, S., Kleiman-Weiner, M., Dsouza, S., Tenenbaum, J. B., Shariff, A., Bonnefon, J.-F., & Rahwan, I. (2018). *Blaming humans in autonomous vehicle accidents: Shared responsibility across levels of automation*. https://doi.org/10.48550/ARXIV.1803.07170

Barnhart, M., Huff, A. D., & Scott, I. (2024). Morality Appraisals in Consumer Responsibilization. *Journal of Consumer Research*, *50*(5), 1008–1030. https://doi.org/10.1093/jcr/ucad032

Bastian, B., Jetten, J., Chen, H., Radke, H. R. M., Harding, J. F., & Fasoli, F. (2013). Losing Our Humanity: The Self-Dehumanizing Consequences of Social Ostracism. *Personality and Social Psychology Bulletin*, *39*(2), 156–169. https://doi.org/10.1177/0146167212471205

BBC (2023). *How robotaxis are dividing San Francisco*. https://www.bbc.com/news/technology-66611513

BBC (2024). *Tesla robotaxi: Cybercab unveiled by Elon Musk*. https://www.bbc.com/news/articles/cm29x5ke9jdo

Bigman, Y. E., & Gray, K. (2020). Life and death decisions of autonomous vehicles. *Nature*, *579*(7797), E1–E2. https://doi.org/10.1038/s41586-020-1987-4

Bonnefon, J.-F., Shariff, A., & Rahwan, I. (2016). The social dilemma of autonomous vehicles. *Science*, *352*(6293), 1573–1576. https://doi.org/10.1126/science.aaf2654

Bruno, G., Spoto, A., Sarlo, M., Lotto, L., Marson, A., Cellini, N., & Cutini, S. (2024). Moral reasoning behind the veil of ignorance: An investigation into perspective-taking accessibility in the context of autonomous vehicles. *British Journal of Psychology*, *115*(1), 90–114. https://doi.org/10.1111/bjop.12679

Corus, C., Saatcioglu, B., & Sandikci, O. (2024). Gendered Consumer Responsibilization: The Constitution of Menopausal Women as Responsible Feminine Consumer Subjects. *Journal of Consumer Research*, ucae057. https://doi.org/10.1093/jcr/ucae057

Cruz, A. G. B., Seo, Y., & Scaraboto, D. (2024). Between Cultural Appreciation and Cultural Appropriation: Self-Authorizing the Consumption of Cultural Difference. *Journal of Consumer Research*, *50*(5), 962–984. https://doi.org/10.1093/jcr/ucad022

Eckhardt, G. M., & Dobscha, S. (2019). The Consumer Experience of Responsibilization: The Case of Panera Cares. *Journal of Business Ethics*, *159*(3), 651–663. https://doi.org/10.1007/s10551-018-3795-4

Eggers, F., & Eggers, F. (2022). Drivers of autonomous vehicles—Analyzing consumer preferences for self-driving car brand extensions. *Marketing Letters*, *33*(1), 89–112. https://doi.org/10.1007/s11002-021-09571-x

Giesler, M., & Veresiu, E. (2014). Creating the Responsible Consumer: Moralistic Governance Regimes and Consumer Subjectivity. *Journal of Consumer Research*, *41*(3), 840–857. https://doi.org/10.1086/677842

Gill, T. (2020). Blame It on the Self-Driving Car: How Autonomous Vehicles Can Alter Consumer Morality. *Journal of Consumer Research*, *47*(2), 272–291. https://doi.org/10.1093/jcr/ucaa018

Hong, J.-W., Cruz, I., & Williams, D. (2021). AI, you can drive my car: How we evaluate human drivers vs. self-driving cars. *Computers in Human Behavior*, *125*, 106944. https://doi.org/10.1016/j.chb.2021.106944

Longoni, C., & Cian, L. (2022). Artificial Intelligence in Utilitarian vs. Hedonic Contexts: The "Word-of-Machine" Effect. *Journal of Marketing*, *86*(1), 91–108. https://doi.org/10.1177/0022242920957347

Moran, N., Shepherd, S., & Alvarado, J. (2023). Responsibilization during uncontrollable events: Understanding how consumers assign and accept responsibility for service employee welfare. *Journal of Services Marketing*, *37*(8), 1075–1086. https://doi.org/10.1108/JSM-05-2022-0159

Morita, T., & Managi, S. (2020). Autonomous vehicles: Willingness to pay and the social dilemma. *Transportation Research Part C: Emerging Technologies*, *119*, 102748. https://doi.org/10.1016/j.trc.2020.102748

Ötting, S. K., & Maier, G. W. (2018). The importance of procedural justice in Human–Machine Interactions: Intelligent systems as new decision agents in organizations. *Computers in Human Behavior*, *89*, 27–39. https://doi.org/10.1016/j.chb.2018.07.022

Peck, J., & Shu, S. B. (2009). The Effect of Mere Touch on Perceived Ownership. *Journal of Consumer Research*, *36*(3), 434–447. https://doi.org/10.1086/598614

Rhim, J., Lee, G., & Lee, J.-H. (2020). Human moral reasoning types in autonomous vehicle moral dilemma: A cross-cultural comparison of Korea and Canada. *Computers in Human Behavior*, *102*, 39–56. https://doi.org/10.1016/j.chb.2019.08.010

Shamir, R. (2008). The age of responsibilization: On market-embedded morality. *Economy and Society*, *37*(1), 1–19. https://doi.org/10.1080/03085140701760833

Statista. (2024). *Autonomous car market size worldwide 2024-2029*. https://www.statista.com/statistics/428692/projected-size-of-global-autonomous-vehicle-market-by-vehicle-type/

VanBergen, N., Lurie, N. H., & Chen, Z. (2022). More Rational or More Emotional Than Others? Lay Beliefs About Decision-Making Strategies. *Journal of Consumer Psychology*, *32*(2), 274–292. https://doi.org/10.1002/jcpy.1244

Wenzel, M., Woodyatt, L., & Hedrick, K. (2012). No genuine self-forgiveness without accepting responsibility: Value reaffirmation as a key to maintaining positive self-regard. *European Journal of Social Psychology*, *42*(5), 617–627. https://doi.org/10.1002/ejsp.1873

Zhu, A., Yang, S., Chen, Y., & Xing, C. (2022). A moral decision-making study of autonomous vehicles: Expertise predicts a preference for algorithms in dilemmas. *Personality and Individual Differences*, *186*, 111356. https://doi.org/10.1016/j.paid.2021.111356

universität innsbruck
Institut für Management und Marketing

Sustainability on Autopilot:
Consumer Responses to AI and Human Sustainability Management Decisions

Philipp Jaufenthaler, PhD
Postdoctoral Researcher
University of Innsbruck - Faculty of Business and Management
Department of Management and Marketing
Universitaetsstr. 15, 6020 Innsbruck, Austria
Philipp.Jaufenthaler@uibk.ac.at

Eileen van Dongen, MA
PhD Researcher
University of Innsbruck - Faculty of Business and Management
Department of Management and Marketing
Universitaetsstr. 15, 6020 Innsbruck, Austria
Eileen.van-Dongen@uibk.ac.at / +43 512/507 72507

Sustainability on Autopilot:
Consumer Responses to AI and Human Sustainability Management Decisions

Abstract:

This study investigates the impact of human versus AI CEOs on consumer responses to corporate social responsibility (CSR) and corporate social irresponsibility (CSI) through the lens of mind perception. This theory suggests that entities perceived as having less capacity for thought and emotion (e.g., AI) are evaluated differently from those perceived as more human-like. The results of two experiments reveal that while sustainable decisions (CSR) made by AI CEOs elicit less appreciation from consumers compared to human CEOs, unsustainable decisions (CSI) made by human CEOs do not result in more condemnation than those made by AI CEOs. While AI CEOs elicit more negative attitudes towards the company due to lower mind perception, no significant difference in consumer condemnation was observed for unsustainable decisions. These findings suggest that while AI leadership influences consumer perceptions of CSR, its impact on their perception of CSI is less pronounced.

Introduction

Recent studies reveal that artificial intelligence (AI) is increasingly outperforming human managers in various strategic decision-making tasks (Kleinberg et al., 2018; Mudassir et al., 2024). With rapid advancements, AI is positioned not only to support but potentially to co-manage or fully replace human executives in certain companies in the future.

While recent studies have explored the role of AI in influencing consumer behaviour (Alabed et al., 2022; Jain et al., 2024; T. Kim et al., 2023; Sohn et al., 2020), there is a lack of knowledge on how decisions are received when made by human versus AI managers. This study aims to bridge that gap by exploring whether and how the source of management decisions — human or AI — influences consumer reactions to corporate communications that reflect corporate social responsibility (CSR) and corporate social *ir*responsibility (CSI). Specifically, it will explore whether consumers show less appreciation for sustainable decisions made by AI and whether consumers penalise unsustainable decisions made by human managers more harshly.

Theoretical framework and hypothesis development

Rising awareness of issues like global warming has led to increased attention on CSR. A rising number of companies are addressing social and environmental concerns beyond legal and financial obligations (European Commission, 2011). CSR communication, which informs stakeholders about these efforts (Marschlich & Hurtado, 2025), significantly affects corporate reputation (S. Kim, 2019) and stakeholder behaviour (Rathore et al., 2023). However, consumer reactions can differ based on numerous factors such as company reputation (Stanaland et al., 2011; van Doorn et al., 2017), business alignment (Deng & Xu, 2017) and whether the CSR source is family-owned or public (Panwar et al., 2014).

Corporate social irresponsibility

CSR typically conveys a company's positive efforts towards social and environmental issues, but corporate decisions can also be perceived as "bad news" for stakeholders. Bies (2013, pp. 137–138) defines bad news as information that results in a perceived loss and triggers cognitive, emotional or behavioural deficits. Corporate social *ir*responsibility (CSI) fits this definition, as it involves actions that cause harm (Khan & Kamal, 2021). CSI arises when managerial decisions conflict with personal values or have negative consequences for all stakeholders (Armstrong & Green, 2013; Carroll, 1979).

CSI can elicit strong consumer reactions. Consumers aware of a company's irresponsible actions may boycott, protest or "punish" the company otherwise (Price & Sun, 2017) — or remain indifferent. In general, CSR fosters positive emotions like trust (Rathore et al., 2023), whereas CSI more often provokes negative emotions such as anger and frustration (Antonetti & Maklan, 2017; Romani et al., 2013). We believe that the agent further influences emotional response to CSR and CSI: Consumer reactions may vary depending on whether a human or an AI agent communicates the decision.

Consumer responses to AI

Several studies demonstrated that, compared to humans, consumers perceive AI differently in terms of perceived empathy (Mehmood et al., 2024; Park et al., 2024), perceived competence (Yoganathan et al., 2021), perceived selfishness (Garvey et al., 2023), acceptance (Castelo et al., 2019; Dietvorst et al., 2018), appreciation (Bellaiche et al., 2023) and perceived trust (Jain et al., 2024; Mulcahy et al., 2024). Although a recent study by Choung et al. (2023) showed that trust in AI exceeded trust in institutions such as government, corporations and major tech companies, consumers generally place greater trust in humans than in AI (Jain et al., 2024; Promberger & Baron, 2006; Yun et al., 2021).

Theory of mind

The theory of mind suggests the ability to attribute mental states, such as beliefs, intentions, and emotions, to oneself and others, allowing individuals to understand and predict the behaviour of others based on these mental states (Gray et al., 2007; Waytz et al., 2010). Minds are occasionally attributed to non-human entities, such as gadgets, God or AI, when observers believe these entities can either feel emotions ("experience"), perform actions ("agency"), or both (Srinivasan & Sarial-Abi, 2021; Waytz et al., 2010).

Two interesting aspects of this theory are that people tend to attribute more intentionality to harmful acts than to kind ones (Cushman, 2008; Knobe, 2006) and that responsibility for actions is attributed to those who can act intentionally (Gray et al., 2007; Srinivasan & Sarial-Abi, 2021). This may affect how consumers perceive CSR CSI) and respond to (un)sustainable decisions made by human versus AI managers, as "perceiving emotion and intention can lead people to […] praise and punish others" (Waytz et al., 2010, p. 386). Therefore, decisions made by humans may be perceived as more intentional and consequential and, subsequently, praised for acting responsibly. On the other hand, AI CEOs are seen as less capable of emotions and intentional actions, which diminishes their perceived intentionality and reduces praise for sustainable decisions. We, therefore, hypothesise that:

> **Hypothesis 1:** Sustainable decisions communicated by AI managers are anticipated to elicit less favourable effects on company reputation and consumer responses towards the company compared to those made by human managers.

When a human CEO makes an unsustainable decision, thereby engaging in CSI, consumers may attribute greater blame due to a higher level of perceived intent or accountability. In contrast, AI CEOs are seen as having lower intentionality and emotional involvement, which could result in consumers reacting less strongly, as they may not hold the AI CEO as accountable for negative outcomes (Promberger & Baron, 2006) and be more forgiving towards AI (Srinivasan & Sarial-Abi, 2021). Therefore, we hypothesise that:

> **Hypothesis 2:** Unsustainable decisions made by human managers are expected to result in a stronger negative impact on company reputation and consumer response compared to those made by AI managers.

Empirical overview

We test our theory over a series of two studies. In study 1, we look at consumer responses towards a sustainable decision; in study 2 we investigate consumer responses towards an unsustainable decision. The decision-maker was DelightfulGoods's CEO (human or AI), manager of a fictional U.S.-based company with 500 employees, specialising in household and personal care products. The primary objective of study 1 was to test hypothesis 1; in study 2, we tested hypothesis 2.

We collected measures of purchase intention ("How likely would it be that you buy products from this company?", one item), consumer attitude (e.g., "How would you describe your attitude toward this company?", α=.97), mind perception of the CEO (e.g., "This CEO is capable of doing things on purpose. I fully disagree – I fully agree", α=.86) and appreciation towards the sustainable CEO's decision (e.g., "I appreciate the CEO's decision", α=.95) or condemnation towards the unsustainable CEO's decision ("I condemn the CEO's decision", α=.97). Additionally, we recorded environmental responsibility, familiarity with and perception of AI and demographics.

Study 1: Sustainable Management Decision

***Participants and design*.** Participants were randomly assigned to one of two experimental conditions: Human CEO vs. AI CEO (between-subjects study design). A total of 196 participants from the USA participated in the study on the platform Prolific, which they were

monetarily compensated for. An attention check question was included, and participants who failed (n = 40) were excluded from the final sample. The final dataset consisted of 157 participants (M_{age} = 36.4 years; SD = 11.9; age range 18-76; 56% female). A chi-square test of independence showed that the proportion of subjects who reported being environmentally aware (χ^2 (6, *N*=157) = 9.1, *p* =.167) and familiarity with and perception of AI (χ^2 (24, *N*=157) = 23.2, *p* =.508) did not differ per (human vs. AI CEO) condition. Participants were first asked to read a scenario in which a CEO (human or AI) adjusted a company's strategy, leading to a **decrease** in plastic usage in packaging by 10%. The scenario explained that this decision was made, to enhance the company's environmental responsibility and is expected to strengthen consumer trust and expand market share. This study interprets the CEO's decisions on plastic use as representative of CSR behaviour.

Results. A MANOVA revealed a significant effect of CEO type in line with H1 (Wilks' Λ = .706, *F*(4,150) = 15.63, *p* < .001, η^2 =.294), indicating that sustainable decisions taken by humans were more highly appreciated in comparison to the same decisions taken by AI. Additionally, familiarity and affinity with AI (Wilks' Λ = .792, F(4,150) = 9.87, *p* < .001, η^2 = .208) was a significant covariate in the model, while environmental responsibility (Wilks' Λ = .945, F(4,150) = 2.19, *p* = .073, η^2 = .055) was not significant at the multivariate level. Greater familiarity and affinity with AI was associated with more favourable consumer responses across all dependent variables: mind perception of the decision maker (b = 0.063, *p* < .001), appreciation for the sustainable decision (b = 0.087, *p* < .001), attitudes towards the company (b = 0.097, *p* < .001), and purchase intention (b = 0.094, *p* < .001). Higher environmental responsibility was associated with more positive attitudes (b = 0.182, *p* = .009) and greater purchase intention (b = 0.159, *p* = .034), but it did not significantly influence mind perception (b = 0.025, *p* = .673) or appreciation (b = 0.061, *p* = .375).

A one-way ANOVA was conducted to examine the effect of CEO type on participants' attitudes towards the company and purchase intention. The analysis revealed a significant effect of CEO type on attitudes towards the company, suggesting that participants evaluated companies with human CEOs more favourably (M_{human} = 5.55, SD = 1.04; F(1,155) = 7.92, *p* = .006, η^2 = .049) than those with AI CEOs (M_{AI} = 4.99, SD = 1.42). Similarly, CEO type had a significant effect on purchase intention, with participants reporting a higher likelihood of purchasing from companies led by human CEOs (M_{human} = 5.27, SD = 1.06; F(1,155) = 7.20, *p* = .008, η^2 = .044) compared to AI-led companies (M_{AI} = 4.71, SD = 1.53).

We then conducted a sequential mediation analysis (Hayes Model 6) to examine the indirect effects of CEO type on attitudes through mind perception and appreciation (5,000 bootstrapped samples, 95% CI), while controlling for AI affinity and familiarity and environmental responsibility. The analysis showed that the direct effect of CEO type on attitudes was not significant (b = 0.15, SE = 0.17, t(151) = 0.88, *p* = .381). However, the total indirect effect was significant (b = -0.84, 95% CI [-1.20, -0.50]), suggesting that CEO type influences attitudes through mind perception and appreciation.

The indirect effect via mind perception alone was significant (b = -0.35, 95% CI [-0.64, -0.05]), as was the sequential mediation effect through both mind perception and appreciation (b = -0.52, 95% CI [-0.85, -0.26]). The indirect effect via appreciation alone was not significant (b = 0.03, 95% CI [-0.12, 0.20]).

Study 2: Unsustainable management decision

Participants and design. Again, participants were randomly allocated to one of two experimental conditions: Human CEO vs. AI CEO (between-subjects study design). A total of 193 participants from the USA participated in the study on the platform Prolific, which they were monetarily compensated for. An attention check question was included to ensure the

quality of the data, and participants who did not pass (n = 48) were removed, leaving a final sample of 145 participants (M_{age} = 36.1 years; SD = 13.1; age range 18-67; 57% female). We ran a chi-square test of independence which showed that familiarity with and perception of AI did not differ in the two groups (χ^2 (22, *N*=145) = 19.2, *p* =.631). However, the chi-square test for environmental responsibility was significant ($\chi^2(6, N = 145) = 14.64$, $p = .023$). Participants assigned to the AI CEO condition thus reported significantly higher environmental responsibility (M_{AI} = 5.17, SD = 1.23) compared to those in the Human CEO condition (M_{human} = 4.53, SD = 1.66). This suggests that individuals with higher environmental responsibility were more likely to be assigned to the AI CEO condition, which could potentially influence how they evaluate the company's decision-making. Participants were first asked to read a scenario in which a CEO (human or AI) adjusted a company's strategy, leading to an **increase** in plastic usage in packaging by 10%. The scenario explained that this decision was necessary in order to meet rising demand, save costs and maintain production efficiency. This study interprets the CEO's decisions on plastic use as representative of CSI behaviour.

Results. Again, we first conducted a MANOVA to test participants' mind perception of the CEO, condemnation of the CEO's decision, consumer attitudes towards the company and purchase intention, while controlling for AI affinity and familiarity and environmental responsibility. The analysis revealed a significant multivariate effect of CEO type (Wilks' Λ = .757, $F(4,138) = 11.07$, $p < .001$, $\eta^2 = .243$), indicating that unsustainable decisions taken by human CEOs were less harshly condemned compared to the same unsustainable decisions taken by AI CEOs. Familiarity and affinity with AI was also a significant covariate (Wilks' Λ = .745, $F(4,138) = 11.80$, $p < .001$, $\eta^2 = .255$), while environmental responsibility was not significant at the multivariate level (Wilks' Λ = .974, $F(4,138) = 0.91$, $p = .458$, $\eta^2 = .026$).

Follow-up univariate tests revealed that CEO type significantly affected mind perception ($F(1,143) = 31.73$, $p < .001$, $\eta^2 = .182$), with AI CEOs perceived as having lower mind perception (M_{AI} = 3.94, SD = 1.48) compared to human CEOs (M_{human} = 5.13, SD = 1.00). Additionally, CEO type significantly influenced purchase intention ($F(1,143) = 6.61$, $p = .011$, $\eta^2 = .044$), with participants reporting a higher likelihood of purchasing from human-led companies (M_{human} = 3.96, SD = 1.68) compared to AI-led companies (M_{AI} = 3.23, SD = 1.74). However, CEO type did not significantly affect consumer attitudes towards the company ($F(1,143) = 2.94$, $p = .089$) or condemnation of the CEO's decision ($F(1,143) = 3.24$, $p = .074$).

To further explore the mechanisms underlying the effects of CEO type on consumer attitudes towards the company, another sequential mediation analysis (Hayes Model 6, 5,000 bootstrapped samples, 95% CI) was conducted, testing whether mind perception and condemnation of the CEO's decision mediate this relationship, while controlling for AI familiarity and affinity and environmental responsibility. CEO type significantly influenced mind perception, with AI CEOs having lower mind perception (b = -1.25, SE = 0.20, $p < .001$) than human CEOs. However, CEO type did not directly influence condemnation of the decision (b = -0.14, SE = 0.28, $p = .631$). Mind perception, in turn, significantly predicted both condemnation (b = -0.52, $p < .001$) and consumer attitudes (b = 0.30, $p = .0001$), while condemnation negatively affected attitudes (b = -0.57, $p < .001$). The direct effect of CEO type on attitudes towards the company was not significant (b = 0.19, SE = 0.19, p = .310), but the total indirect effect was significant (b = -0.67, 95% CI [-1.07, -0.27]). Mind perception mediated the relationship between CEO type and attitudes (b = -0.38, 95% CI [-0.68, -0.15]). The indirect effect via both mind perception and condemnation was also significant (b = -0.37, 95% CI [-0.63, -0.17]).

Based on the regression output, AI affinity and familiarity significantly predict condemnation of the CEO, indicating that participants who are more familiar with AI are less likely to condemn both CEOs (b = −0.1369, $p < .001$, 95% CI [-0.1943, -0.0794]). Interestingly, this

suggests that familiarity with AI may reduce negative evaluations of the CEO, regardless of whether the CEO is human or AI.

General discussion and implications

We found partial support for our hypotheses. Study 1 provides strong support for Hypothesis 1, which predicted that sustainable decisions communicated by human managers would lead to more appreciation amongst consumers. In our study, participants consistently evaluated companies with human decision-makers more favourably than companies with AI decision-makers, when both engaged in CSR, making the same sustainable decision.

The results of study 2 showed that CEO type significantly and directly influenced mind perception and purchase intention, but not condemnation or consumer attitudes. It did, however, indirectly influence consumer attitudes towards the company through mind perception and condemnation. These findings suggest that participants reacted similarly to the unsustainable decision, regardless of whether it was made by a human or AI CEO. We could, therefore, not confirm hypothesis 2, which posited that CSI communicated by human managers would result in stronger condemnation. We did, however, discover other findings that we consider noteworthy.

One interesting finding was that environmental responsibility did not influence consumer evaluations of the CEO's decision, whether it was in the context of CSR or CSI. It suggests that consumers' evaluations of the CEO and the company are not influenced by how environmentally responsible they think they are. Instead, other factors, such as mind perception and AI affinity and familiarity, appear to play a more significant role in this context.

Another finding from our study was that affinity and familiarity with AI reduce condemnation of the CEO regardless of whether the CEO is human or AI, which raises interesting questions about the underlying mechanisms. One potential explanation could be that individuals who are more familiar with AI may exhibit greater openness to technology, which could make them more accepting of AI decision-makers and less likely to judge them harshly. Additionally, familiarity with AI might correlate with demographic factors such as higher education levels or younger age, as these groups are often more exposed to emerging technologies.

Limitations and future research

The stimuli used in both studies (a 10% increase or decrease in plastic use) may not have been strong enough to lead to emotional responses from participants. As a result, consumers may not have felt higher (and thus more measurable) levels of appreciation or condemnation, regardless of the decision-maker in the study. Future experiments could make the decision scenarios more extreme or ethically charged, which could then lead to higher emotional responses and, thus, stronger moral judgments.

Our findings show that affinity and familiarity with AI may play a critical role in shaping consumer attitudes towards AI decision-makers, but the underlying mechanisms were not addressed in this paper. Future studies could examine the psychological factors behind AI affinity and familiarity and how these factors potentially influence trust in AI decision-making, as well as explore what role demographics play in this context.

Finally, while our study provides interesting insights into consumer perceptions of AI decision-makers, it does not fully address the complex and psychological aspects of why consumers feel the way they do about AI decisions. Qualitative research, such as interviews or focus groups, could provide a more detailed understanding of how consumers perceive and evaluate decisions made by AI. By addressing these questions, future research can help uncover strategies to foster greater acceptance of AI in leadership and decision-making roles.

References

Alabed, A., Javornik, A., & Gregory-Smith, D. (2022). AI anthropomorphism and its effect on users' self-congruence and self–AI integration: A theoretical framework and research agenda. *Technological Forecasting and Social Change*, *182*, 121786. https://doi.org/10.1016/j.techfore.2022.121786

Antonetti, P., & Maklan, S. (2017). Concerned protesters: from compassion to retaliation. *European Journal of Marketing*, *51*(5/6), 983–1010. https://doi.org/10.1108/ejm-03-2016-0145

Armstrong, J. S., & Green, K. C. (2013). Effects of corporate social responsibility and irresponsibility policies. *Journal of Business Research*, *66*(10), 1922–1927. https://doi.org/10.1016/j.jbusres.2013.02.014

Bellaiche, L., Shahi, R., Turpin, M. H., Ragnhildstveit, A., Sprockett, S., Barr, N., Christensen, A., & Seli, P. (2023). Humans versus AI: Whether and why we prefer human-created compared to AI-created artwork. *Cognitive Research: Principles and Implications*, *8*(1), 42. https://doi.org/10.1186/s41235-023-00499-6

Bies, R. J. (2013). The Delivery of Bad News in Organizations: A Framework for Analysis. *Journal of Management*, *39*(1), 136–162. https://doi.org/10.1177/0149206312461053

Carroll, A. B. (1979). A Three-Dimensional Conceptual Model of Corporate Performance. *Academy of Management Review*, *4*(4), 497–505. https://doi.org/10.5465/amr.1979.4498296

Castelo, N., Bos, M. W., & Lehmann, D. R. (2019). Task-Dependent Algorithm Aversion. *Journal of Marketing Research*, *56*(5), 809–825. https://doi.org/10.1177/0022243719851788

Choung, H., David, P., & Ross, A. (2023). Trust and ethics in AI. *AI & SOCIETY*, *38*(2), 733–745. https://doi.org/10.1007/s00146-022-01473-4

Cushman, F. (2008). Crime and punishment: Distinguishing the roles of causal and intentional analyses in moral judgment. *Cognition*, *108*(2), 353–380. https://doi.org/10.1016/j.cognition.2008.03.006

Deng, X., & Xu, Y. (2017). Consumers' Responses to Corporate Social Responsibility Initiatives: The Mediating Role of Consumer–Company Identification. *Journal of Business Ethics*, *142*(3), 515–526. https://doi.org/10.1007/s10551-015-2742-x

Dietvorst, B. J., Simmons, J. P., & Massey, C. (2018). Overcoming Algorithm Aversion: People Will Use Imperfect Algorithms If They Can (Even Slightly) Modify Them. *Management Science*, *64*(3), 1155–1170. https://doi.org/10.1287/mnsc.2016.2643

European Commission. (2011). *Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of the regions: A renewed EU strategy 2011–2014 for Corporate Social Responsibility*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0681

Garvey, A. M., Kim, T., & Duhachek, A [Adam] (2023). Bad News? Send an AI. Good News? Send a Human. *Journal of Marketing*, *87*(1), 10–25. https://doi.org/10.1177/00222429211066972

Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science (New York, N.Y.)*, *315*(5812), 619. https://doi.org/10.1126/science.1134475

Jain, V., Wadhwani, K., & Eastman, J. K. (2024). Artificial intelligence consumer behavior: A hybrid review and research agenda. *Journal of Consumer Behaviour*, *23*(2), 676–697. https://doi.org/10.1002/cb.2233

Khan, S. N., & Kamal, A. (2021). Investigating corporate social irresponsibility (CSIR) and its impact on social judgments in the weak institution: moderating the role of corporate ability. *Journal of Business & Industrial Marketing*, *36*(5), 749–764. https://doi.org/10.1108/jbim-08-2019-0371

Kim, S. (2019). The Process Model of Corporate Social Responsibility (CSR) Communication: CSR Communication and its Relationship with Consumers' CSR Knowledge, Trust, and Corporate Reputation Perception. *Journal of Business Ethics*, *154*(4), 1143–1159. https://doi.org/10.1007/s10551-017-3433-6

Kim, T., Lee, H., Kim, M. Y., Kim, S., & Duhachek, A [A.] (2023). AI increases unethical consumer behavior due to reduced anticipatory guilt. *Journal of the Academy of Marketing Science*, *51*(4), 785–801. https://doi.org/10.1007/s11747-021-00832-9

Kleinberg, J., Lakkaraju, H., Leskovec, J., Ludwig, J., & Mullainathan, S. (2018). Human Decisions and Machine Predictions. *The Quarterly Journal of Economics*, *133*(1), 237–293. https://doi.org/10.1093/qje/qjx032

Knobe, J. (2006). The Concept of Intentional Action: A Case Study in the Uses of Folk Psychology. *Philosophical Studies*, *130*(2), 203–231. https://doi.org/10.1007/s11098-004-4510-0

Marschlich, S., & Hurtado, E. (2025). The effect of third-party certifications on corporate social responsibility communication authenticity and credibility. *Corporate Communications: An International Journal*, *30*(7), 1–20. https://doi.org/10.1108/CCIJ-01-2024-0015

Mehmood, K., Kautish, P., & Shah, T. R. (2024). Embracing digital companions: Unveiling customer engagement with anthropomorphic AI service robots in cross-cultural context. *Journal of Retailing and Consumer Services*, *79*, 103825. https://doi.org/10.1016/j.jretconser.2024.103825

Mudassir, H., Munir, K., Ansari, S., & Zahra, A. (2024, September 26). *AI Can (Mostly) Outperform Human CEOs: AI and Machine Learning.* Harvard Business Review. https://hbr.org/2024/09/ai-can-mostly-outperform-human-ceos?ab=HP-hero-latest-image-1&tpcc=paidsearch.google.dsacontent&gad_source=1&gbraid=0AAAAAD9b3uSTIe7N1L4DazonrQzZU3BLS

Mulcahy, R. F., Riedel, A., Keating, B., Beatson, A., & Letheren, K. (2024). Avoiding excessive AI service agent anthropomorphism: examining its role in delivering bad news. *Journal of Service Theory and Practice*, *34*(1), 98–126. https://doi.org/10.1108/JSTP-04-2023-0118

Panwar, R., Paul, K., Nybakk, E., Hansen, E., & Thompson, D. (2014). The Legitimacy of CSR Actions of Publicly Traded Companies Versus Family-Owned Companies. *Journal of Business Ethics*, *125*(3), 481–496. https://doi.org/10.1007/s10551-013-1933-6

Park, G., Chung, J., & Lee, S. (2024). Scope and limits of AI fundraisers: Moderated serial multiple mediation model between artificial emotions and willingness to donate via humanness and empathy. *Technological Forecasting and Social Change*, *201*, 123211. https://doi.org/10.1016/j.techfore.2024.123211

Price, J. M., & Sun, W. (2017). Doing good and doing bad: The impact of corporate social responsibility and irresponsibility on firm performance. *Journal of Business Research*, *80*, 82–97. https://doi.org/10.1016/j.jbusres.2017.07.007

Promberger, M., & Baron, J. (2006). Do patients trust computers? *Journal of Behavioral Decision Making*, *19*(5), 455–468. https://doi.org/10.1002/bdm.542

Rathore, P., Saha, E., Chakraborty, S., & Tiwari, A. K. (2023). Assessing impact of consumer perceived CSR on consumer attitude and purchase behaviour in retail segment: a stakeholder theory perspective. *Society and Business Review*, *18*(2), 264–295. https://doi.org/10.1108/sbr-10-2021-0207

Romani, S., Grappi, S., & Bagozzi, R. P. (2013). My Anger Is Your Gain, My Contempt Your Loss: Explaining Consumer Responses to Corporate Wrongdoing. *Psychology & Marketing*, *30*(12), 1029–1042. https://doi.org/10.1002/mar.20664

Sohn, K., Sung, C. E., Koo, G., & Kwon, O. (2020). Artificial intelligence in the fashion industry: consumer responses to generative adversarial network (GAN) technology. *International Journal of Retail & Distribution Management*, *49*(1), 61–80. https://doi.org/10.1108/IJRDM-03-2020-0091

Srinivasan, R., & Sarial-Abi, G. (2021). When Algorithms Fail: Consumers' Responses to Brand Harm Crises Caused by Algorithm Errors. *Journal of Marketing*, *85*(5), 74–91. https://doi.org/10.1177/0022242921997082

Stanaland, A. J. S., Lwin, M. O., & Murphy, P. E. (2011). Consumer Perceptions of the Antecedents and Consequences of Corporate Social Responsibility. *Journal of Business Ethics*, *102*(1), 47–55. https://doi.org/10.1007/s10551-011-0904-z

van Doorn, J., Onrust, M., Verhoef, P. C., & Bügel, M. S. (2017). The impact of corporate social responsibility on customer attitudes and retention—the moderating role of brand success indicators. *Marketing Letters*, *28*(4), 607–619. https://doi.org/10.1007/s11002-017-9433-6

Waytz, A., Gray, K., Epley, N., & Wegner, D. M. (2010). Causes and consequences of mind perception. *Trends in Cognitive Sciences*, *14*(8), 383–388. https://doi.org/10.1016/j.tics.2010.05.006

Yoganathan, V., Osburg, V.-S., H. Kunz, W., & Toporowski, W. (2021). Check-in at the Robo-desk: Effects of automated social presence on social cognition and service implications. *Tourism Management*, *85*, 104309. https://doi.org/10.1016/j.tourman.2021.104309

Yun, J. H., Lee, E.-J., & Kim, D. H. (2021). Behavioral and neural evidence on consumer responses to human doctors and medical artificial intelligence. *Psychology & Marketing*, *38*(4), 610–625. https://doi.org/10.1002/mar.21445

WEB MERCHANTS SITE DESIGN: THE INFLUENCE OF MENU BREADTH AND DEPTH ON USER REACTIONS

Jean-François LEMOINE

Université Paris 1 Panthéon-Sorbonne (PRISM Sorbonne)

ESSCA School of Management

jean-francois.lemoine@univ-paris1.fr

Thomas SENDER

Université Paris 1 Panthéon-Sorbonne (PRISM Sorbonne)

thomas.sender@univ-paris1.fr

WEB MERCHANTS SITE DESIGN: THE INFLUENCE OF MENU BREADTH AND DEPTH ON USER REACTIONS

Abstract:

This research contributes to the literature on factors shaping the atmospheric design of websites. It examines the influence of menu breadth characteristics (Long vs. Short) and menu depth (Presence of a submenu vs. Absence of a submenu) on user reactions. An inter-subject experiment was conducted to compare the effects of these two menu characteristics on perceived ease of use, the pleasure experienced during navigation, and the time spent on the site. Our convenience sample consists of 459 respondents, and the results indicate a direct effect of menu characteristics on perceived ease of use and the time spent on the site. The perceived ease of use influences the pleasure and the amount of time spent on the website.

Keywords:

design ; webatmosphere; menu; consumer behaviour

WEB MERCHANTS SITE DESIGN: THE INFLUENCE OF MENU BREADTH AND DEPTH ON USER REACTIONS

I. Introduction

Since the emergence of the web in the 1990s (Berners-Lee et al., 1992), the number of e-commerce websites has continuously increased. By the end of 2022, there were 207,000 active e-commerce websites in France, marking a 5% increase compared to the previous year (Fevad, 2023). Moreover, e-commerce in France is booming, with a turnover of €159.9 billion in 2023, representing a 10.5% increase in one year (Fevad, 2024). As highlighted by Bèzes (2019), it is important for businesses to optimize their website in order to create added value in the browsing experience for users. In this context, menus can be used by managers as a source of differentiation due to their significant role within websites and the consumer experience (Bailly and Oulasvirta, 2014). Numerous studies have assessed menus on desktop applications such as Word, Excel, Skype, etc. (Bailly et al., 2008; Malacria et al., 2013). However, few studies have looked at their effects on the web, and the literature indicates that the organization of a menu differs between an application and a website (Leuthold et al., 2011). The menu of e-commerce websites is defined as the navigation element that groups the various categories of the website, allowing users to access information about products or services and orient themselves on the site (Cortinas et al., 2019; Huizingh, 2000; Yu and Roh, 2002).

We propose to study them as an atmospheric element of websites, defined by Dailey (2004, p.796) as "*the development of virtual environments designed to create positive, cognitive, and emotional effects in users in order to generate favorable responses towards the site*." The atmosphere of websites can be broken down into three factors (Lemoine, 2008). Social factors refer to the interactions that individuals can have with each other or with the website (Cherif and Lemoine, 2019). Ambient factors concern colors (Ettis, 2017; Hsieh et al., 2018), images (Laroche et al., 2022), or sounds (Cuny et al., 2015). The design dimension, which includes menus, refers to users' ability to orient themselves when visiting a website (Hoffman and Novak, 1996). This is especially important for first-time visitors to websites, who are more engaged in controlling their navigation (Koufaris et al., 2001). Menus, like the site map (Lynch and Horton, 1999), breadcrumb trails (Lida and Hull, 2003), control commands (Lemoine and Charfi, 2022), or the website structure (Griffith, 2005), fall into this dimension and allow users to access information on the site (Lemoine, 2008).

Among the menu characteristics, its breadth and depth significantly influence user reactions (Leuthold et al., 2011). Several studies have focused on their effects on cognitive responses (Blustein et al., 2005; Madrid et al., 2009; Yu and Roh, 2002). However, to our knowledge, no study has explored their impact on how easily a user navigates a website. Therefore, we aim to address the following research question: "*To what extent do the breadth and depth of the menu on e-commerce websites influence user reactions?"*

II. Literature Review

Among the menu characteristics, breadth and depth are essential for users' movement across the web. Breadth refers to the number of categories present in the main menu, complemented by depth, which refers to the number of submenus. Thus, the breadth of the menu divides the website into different categories, and depth allows these categories to be further detailed. The architecture of these two characteristics is linked. Studies indicate that a menu that is too deep, with more than four submenus, loses the user (Cox and Dale, 2002; Roh and Yu, 2002). Regarding breadth, having too many categories in the menu increases the cognitive load on the user (Madrid et al., 2009; Schmutz et al., 2010). Therefore, the breadth and depth should follow an inverted U-shaped curve in terms of the number of categories and submenus, influencing

user movement on the site. Norman (2008) suggests that breadth should be prioritized over depth.

A benchmark study was conducted to identify the most common menu breadth and depth patterns on e-commerce websites. This preliminary study is typically used in menu studies to examine the most widely used characteristics in practice (Bailly, 2008; Majrashi, 2019). The benchmark included 97 e-commerce websites across ten different industry sectors according to Fevad's typology to represent a diversity of practices. These websites were also chosen non-exhaustively based on the number of products sold and their popularity.

Regarding the menu breadth, the benchmark indicates that these websites have an average of 8.75 categories in the menu. This figure is consistent with the literature, which suggests that a menu should include between 5 and 9 categories to align with Miller's (1956) "magic number" and facilitate short-term memory. We will define a long menu as having 10 categories and a short menu as having 3 categories. For the menu depth, the benchmark shows that 63.7% of websites have a single submenu, so we will retain the following categories: presence of a submenu and absence of a submenu.

When a website is considered large and offers more pages of navigation, users tend to spend more time exploring the site (Galetta et al., 2007). Additionally, when a website has too many or too few navigation links, users perceive the navigation as complex. We hypothesize that a long menu and a menu with a submenu will lead users to spend more time on the website. We formulate the following hypotheses:

H1a: A long menu (vs. short) increases the time spent on the website.

H1b: A menu with a submenu (vs. without a submenu) increases the time spent on the website.

H1c: The combined effect of a long menu with a submenu (vs. other combinations) more positively influences the time spent on the website.

Perceived ease of use assesses how easily the website allows users to find information and navigate (Bressolles, 2006). It is defined as "the extent to which a consumer believes that online shopping is effortless" (Vijayasarathy, 2003). When the menu has a sufficient number of categories, perceived ease of use should be higher because users can navigate through more categories on the website. Studies on menu breadth suggest that it should include a sufficient number of categories to prevent users from feeling disoriented and to avoid them becoming lost on the site (Norman, 2008). A long menu, with more details on the website's categories, should increase perceived ease of use. Furthermore, the total number of categories in both breadth and depth should influence perceived ease of use. The combination of both factors should further enhance the perceived ease of use of the website.

H2a: A long menu (vs. short) more positively influences perceived ease of use.

H2b: A menu with a submenu (vs. without a submenu) more positively influences perceived ease of use.

H2c: A long menu with a submenu (vs. other combinations) more positively influences perceived ease of use.

When perceived ease of use is higher, purchase intention (Cho and Sagynov, 2015; Ashraf et al., 2016) and attitude towards the website (Ashraf et al., 2016) increase, or the number of clicks to find information decreases (Hu and Hu, 2017). Therefore, time spent on the site should decrease when perceived ease of use increases because the user finds information more quickly.

H3: Perceived ease of use negatively influences the time spent on the website.

In research on website atmosphere elements, pleasure is considered a significant predictor of user behavior (Carlson et al., 2007; Gaur, Herjanto and Makkar, 2014, p. 922). According to Koo and Ju (2010), the menu does not directly influence user pleasure. Moreover, Lin and Lo (2016) show that the ease with which a person navigates a website directly influences the pleasure felt. We hypothesize that pleasure is positively influenced by perceived ease of use, but not directly by menu characteristics. Indeed, a person who navigates a website easily should feel more pleasure.

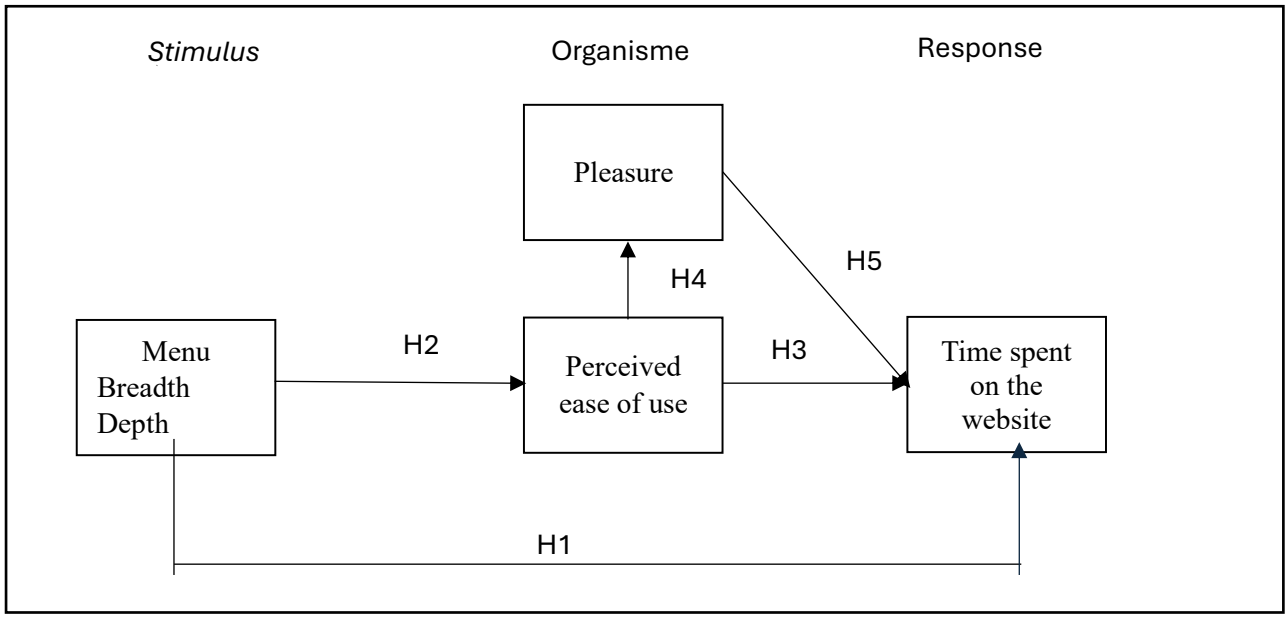
H4: Perceived ease of use positively influences the pleasure experienced.

Subsequently, pleasure should negatively influence time spent by users. A person who experiences more pleasure should spend less time exploring the website.

H5: Pleasure experienced negatively influences time spent on the website.

The research model is presented below (Figure 1).

Figure 1: Research model



III. Methodology

Experimentation: To test the research hypotheses, we chose to conduct an experiment with a 2x2 factorial design. This method is recommended for testing causal links (Mbengue and Vandangeon-Derumez, 2007). Our study focuses on desktop computers because this device is used by 77% of online shoppers, compared to 62% on smartphones (Fevad, 2024). To conduct our experiment, the website was created in collaboration with a professional. These websites only differ in menu breadth and depth; all other elements are identical. The website does not include a search bar, filter, or breadcrumb trail so that the menu serves as the only navigation element.

IV. Results

Manipulation Checks: We ensured that the stimuli of the study were perceived by respondents. We conducted a chi-square test for depth ($p < 0.001$; Absence = 80%, Presence = 85%; $\chi 2 = 198.173$) and a Student's t-test for breadth ($p < 0.001$; $\bar{x}Short = 3.12$, $\bar{x}Long = 4.21$; $F = 75.727$).

Sample: Respondents were recruited through the company Panelabs, which specializes in data collection for academic purposes. The sample consisted of 459 respondents, with sub-samples ranging from 107 to 124 respondents. The sub-samples were matched by age ($\chi 2 = 12.087$; p =

0.208), socio-professional category ($\chi 2 = 2.255$, $p = 0.895$), and gender ($\chi 2 = 7.119$; $p = 0.068$), although the latter slightly exceeded the 5% significance level. The composition of the sample and sub-samples is presented in the Appendix (Appendix 3).

ANOVA Test: To test Hypothesis H1, we conducted an ANCOVA with web expertise as a covariate. We found no direct effect of menu breadth ($p = 0.288$; $F = 1.130$) and menu depth ($p = 0.733$; $F = 0.117$) on time spent on the website. However, interaction effects analysis revealed a marginally significant second-order interaction effect ($p = 0.064$; $\bar{x}$Long+Presence = 187 seconds; $F = 3.460$). A long menu with a submenu reduced the time spent on the website more. Hypothesis H1 was partially validated.

To test Hypothesis H2, we performed an ANOVA test. Regarding perceived ease of use, we observed a direct effect of menu breadth on perceived ease of use ($p < 0.001$; $\bar{x}$Short = 5.34, $\bar{x}$Long = 5.66; $F = 21.675$) and menu depth on perceived ease of use ($p = 0.006$; $\bar{x}$Absence = 5.36, $\bar{x}$Presence = 5.66; $F = 7.570$). We observed no combined effect of these factors on perceived ease of use ($p = 0.477$; $F = 0.506$). Therefore, a long menu has a more positive effect on perceived ease of use than a short menu. Hypothesis H2 was partially validated. The results of direct effects are presented in the appendix.

Global Model Test Using Structural Equations: To test the global model, we used AMOS 25 software. The results indicate that perceived ease of use positively influences pleasure (β standardized: 0.459; $p < 0.001$) and negatively influences time spent on the website (β standardized: -0.123; p: 0.019). Pleasure does not influence time spent on the website (β standardized: 0.077; p: 0.139). Therefore, we validate Hypotheses H3 and H4 but reject Hypothesis H5.

V. Conclusion

This study provides several contributions. Our first contribution is to enrich the design dimension of e-commerce websites. This dimension has been less explored online than other dimensions (Krasonikolakis et al., 2022). These design elements are even more important for first-time visitors who are discovering the site for the first time (Koufaris et al., 2001).

We also enrich the literature on website menus. The study of the combined effect of breadth and depth on time spent is novel. We find that a short menu with a submenu positively influences the time spent on the website (vs. other combinations). Finally, this study underscores the importance of studying the influence between users' internal states (cognitions and emotions) as suggested by Lemoine (2022) to better understand consumer behavior. Indeed, pleasure is generated by perceived ease of use but is not directly influenced by menu characteristics.

Regarding managerial implications, our study suggests several options for practitioners. If they wish to increase the perceived ease of use of the website, a long menu or one with a submenu should be prioritized. Moreover, the combined effect of these two characteristics reduces the time spent on the website. On this last element, a short menu with a submenu or a long menu with a submenu will reduce the time spent on the website. We also suggest that practitioners focus mainly on increasing the perceived ease of use of the website, as this variable positively influences the pleasure experienced by users and reduces the time spent on the site.

Our first limitation concerns the choice of device used. Our study focuses on desktop computers, which are the preferred device for online shopping (Capterra, 2023). However, mobile devices are also widely used for this purpose. These devices have specific characteristics that differ from those of desktop computers in terms of menu creation (Khan et al., 2023; O'Neil, 2014). It would be interesting to extend this study by investigating mobile devices. A study comparing user reactions on both devices would be enriching. Our second limitation

concerns the product category used. Our experiment focused on tableware products, so the results cannot be generalized to other product categories. Replicating this study with different product categories would allow for broader generalization of the results. Finally, other design elements should be studied experimentally to better understand what influences users' navigation, such as search bars and filters, in order to refine the products users are searching for.

References Available Upon Request

DIGITAL ECO-DESIGN APPLIED TO WEBSITES: TOWARDS AN UNDERSTANDING OF USERS' PERCEPTIONS AND EXPECTATIONS.

ALIZÉE ROUX

PHD STUDENT

UNIVERSITÉ DE LORRAINE, CEREFIGE

ALIZEE.ROUX@UNIV-LORRAINE.FR

MATHIEU KACHA

UNIVERSITY PROFESSOR

UNIVERSITÉ DE LORRAINE, CEREFIGE

MATHIEU.KACHA@UNIV-LORRAINE.FR

SANDRINE HEITZ-SPAHN

UNIVERSITY LECTURER HDR

UNIVERSITÉ DE LORRAINE, CEREFIGE

SANDRINE.SPAHN@UNIV-LORRAINE.FR

DIGITAL ECO-DESIGN APPLIED TO WEBSITES: TOWARDS AN UNDERSTANDING OF USERS' PERCEPTIONS AND EXPECTATIONS.

Abstract

This proposal aims at examining users' perceptions and expectations regarding digital eco-design applied to websites, given growing environmental challenges, understanding how users perceive and evaluate eco-design approaches becomes essential. A qualitative methodology is based on 18 semi-structured interviews exploring their perceptions and expectations regarding these practices. Results indicate that consumers' knowledge of websites' environmental impacts remains spontaneously limited. Results also highlight that consumers expect the exemplarity of certain companies or organizations regarding the environmental impact of their website.

Key words: digital eco-design; sustainable website design; web-related environmental impacts.

Introduction

In 2020, in France, digital usage accounted for 2.5% of the national carbon footprint and 10% of electricity consumption (Victoria, 2022). According to projections by ADEME and ARCEP (2022), if our digital uses and practices remain unchanged, this carbon footprint could reach 6.7% of our total footprint by 2040. Despite these growing environmental challenges, in 2015, the environmental consequences of digital technologies remained largely unknown to users (Elgaaied-Gambier et al., 2020) due to their immaterial nature. To help organizations align their business strategies with their environmental impact (Collin-Lachaud & N'Goala, 2023), it is possible to optimize the use of marketing resources (Gaski, 2022) to move towards communication strategies that are more environmentally friendly and maintains equally efficient business activities. This approach involves rethinking the methodology of creating communication tools with an eco-design lens (Volle & Schouten, 2022), with websites being no exception (ADEME, 2022a). Website eco-design practices aims at designing or optimizing websites from an environmental perspective (Greenwood & He, 2021). Website eco-design has garnered interest from practitioners, as well as from the government, which offers a "*General Reference Framework for Digital Services Eco-design (RGESN)*" (Mission interministérielle numérique écoresponsable, 2022) in response to the world's first law (Fonbaustier, 2022) aimed at reducing the environmental footprint of digital technology - the REEN law (2021)[1]. Despite these actions for more eco-responsible design, their effect on users' responses remains overlooked in the academic literature (Liottier & Bilet, 2018). To evaluate the effects of eco-design websites on users' responses, a better understanding of users' perceptions and expectations proves necessary. To our knowledge, except for the work of Balogh et al. (2022) and Elgaaied-Gambier & al. (2020), literature on users' knowledge, perceptions in terms of websites' environmental impact, and expectations (Balogh et al., 2022 ; Elgaaied-Gambier et al., 2020) remains marginal despite the interest shown by the French government. Therefore, it is relevant to deepen our understanding of this subject. In this regard, after presenting digital eco-design practices applied to websites, we will describe the methodological approach chosen for our exploratory research, as well as the results, whichwill finally be discussed.

1. Digital eco-design applied to websites

Eco-design is a practice aiming to reduce environmental impacts ("*natural debt*", Shu-Yang et al., 2004, p. 103) without diminishing human satisfaction (Luttropp & Lagerstedt, 2006 ; Shu-Yang et al., 2004). According to ADEME[2], eco-design takes into account the environmental aspects and impacts of a product or service throughout its life cycle (ADEME, 2022 b ; Ceschin & Gaziulusoy, 2016). The use of the term digital eco-design was proposed in 2004 by the *Green IT*[3] collective. While this term is over twenty years old, digital practices impacts are still little known by internet users, due to their dematerialized and intangible nature (Elgaaied-Gambier et al., 2020). However, "*every byte has an impact in the real world*"[4] (Bordage, 2019, p. 15). Similar to products and services, digital eco-design considers the phases of the life cycle, from its conception to data storage until its end of life (ADEME, 2022 ; Ceschin & Gaziulusoy, 2016). Eco-design practices also apply to websites and aim to design more environmentally friendly websites (Greenwood & He, 2021). A digital or IT service designed with an eco-design approach should help reduce its energy consumption, unlike a traditional digital or IT service that does not take environmental aspects into account (Bose & Luo, 2011). Eco-designing a

[1] The REEN law (2021) is based on four fundamental objectives. First, it aims to raise awareness and increase consciousness about the impact of digital technology. Next, it strives to limit the renewal of digital devices by leveraging measures established by the AGEC law (2020). Additionally, it facilitates the creation and adoption of an environmentally friendly digital approach through the use of the general eco-design framework (RGESN). Finally, its ultimate goal is to reduce the energy overconsumption of data centers and networks.

[2] French Agency for Ecological Transition (French : Agence de l'Environnement et de la Maîtrise de l'Énergie).

[3] An association that brings together experts behind initiatives related to digital sobriety, eco-design of digital services, and responsible digital practices.

[4] « *chaque octet a un impact dans le monde réel* » (Bordage, 2019, p. 15)

website is not just about storing data on a "*green*" host[5], but also involves adapting and modifying certain elements of websites to make them less energy-consuming, such as optimizing the characteristics of the website (Bordage, 2019 ; Greenwood & He, 2021 ; Mission interministérielle numérique écoresponsable, 2022). From practitioners' perspective, these characteristics can be divided into two categories: *Front-Office* and *Back-Office*[6]. In the context of website eco-design, the visible part (Front-Office) encompasses functionalities (blog access), site structure, user interface (design), and media. Behind the scenes (Back-Office), technical aspects such as coding, maintenance, hosting, and end-of-life management constitute the characteristics on which adjustments can be made. While these elements offer designers numerous possibilities for developing eco-responsible websites, the question of how users perceive these practices deserves interest. To our knowledge, research on website eco-design has primarily focused on studying organizational practices and their implementation in different contexts. Thus, research has concentrated on studying the promotion of practices and environmental benefits of website eco-design for the environment (Andersen, 2022 ; Bonamy et al., 2022, 2022 ; Doyon, 2020), the integration of eco-design practices within education (Stolley, 2011), the inherent barriers to teaching these practices within training programs (Hansen et al., 2023) as well as their concrete implementation within organizations and website design projects (Liottier & Bilet, 2018). Elgaaied-Gambier et al. (2020) and Balogh et al. (2022) provides initial insights into users' knowledge and perceptions regarding the environmental impacts of digital technology. The results of Elgaaied-Gambier et al. (2020), based on data collection from 2015, show that consumers have little to no knowledge about the environmental impacts of digital technology and are reluctant to change their online behaviors (reducing their digital use, using more ecological devices) to act in favor of the environment. This study highlights consumers' expectations towards companies, particularly that they take responsibility for digital impacts by offering more efficient solutions (improving equipment, evolving data storage practices, etc.). Although this work sheds light on consumers' vision of digital effects on the environment, it does not explore the extent to which environmental concerns emerge spontaneously in users' discourse regarding websites, this spontaneity demonstrating a greater salience of this aspect in internet users' minds, and/or a deeper knowledge than responses formulated in an assisted manner (Lai & Aimé, 2016). Based on a qualitative methodology composed of semi-structured interviews, our research aims to examine the link between websites and the environment, and the awareness of internet users on the environmental impacts of websites.

2. Methodology and results

2.1 Methodology

To understand users' knowledge and expectations regarding the environmental impact of websites, and website eco-design, a qualitative methodology was conducted. This methodology allows for an in-depth analysis of respondents' reasoning (Dosquet, 2018). Semi-structured interviews give respondents freedom of expression (Delacroix & Monnot, 2021), to examine knowledge and potential expectations in terms of the eco-responsibility of websites to examine their. The interviews mainly focus on the spontaneous and assisted responses of internet users on the environmental impact of websites. It investigates internet users' perspectives on practices favoring environmentally friendly websites, and their expectations towards companies and organizations implementing such practices. The interview guide is part of a broader doctoral

[5] A host that aims to reduce the environmental footprint of its activities. Also one that aims to comply with ISO 14001 (ISO - ISO 14000 — Environmental Management, 2023) and ISO 50001 (ISO - ISO 50001 — Energy Management, 2021) standards.

[6] Front-Office refers to the visual interface of an application or website with which users have direct interaction. Its primary purpose is to provide a user experience that is both intuitive and pleasant. Back-Office, on the other hand, represents the behind-the-scenes system where all administrative operations take place. It is a space reserved for managers who handle confidential data and manage overall operations (Vertuoz, 2023).

research. This guide addresses three themes, only the first two are the subject of this paper[7]. The first theme focuses on websites considered by respondents as "*well-designed"*, the second theme focuses on more environmentally friendly websites and users' expectations. The sample includes 18 internet users (8 men, 10 women, average age 42 years). The interviews lasted an average of 45 minutes and were transcribed[8] and coded. A thematic content analysis (Delacroix & Monnot, 2021) was then performed using NVivo® software to facilitate the encoding process and its iterations (Richards, 2002).

2.2 Results

The results of the semi-structured interviews were organized into three main categories: users' perceived connection between websites and environmental impacts both spontaneously and with prompting, knowledge of environmentally-friendly websites, and internet users' expectations towards companies and organizations likely to have environmentally-friendly websites.

2.2.1 Perceived Connection Between Websites and their Environmental impacts by Internet Users: Spontaneous and Prompted Responses

As part of this research, the semi-structured interviews began by exploring internet users' expectations regarding websites they considered "*well-designed*"[9]. None of the respondents spontaneously mentioned the ecological aspect of websites as a characteristic of a "*well-designed"* website. Furthermore, when participants were asked about website impacts, the results reveal that spontaneously, only three out of 18 participants (two women and one man, all working in different fields unrelated to computer science) mentioned the environmental impacts of websites, associating them with data storage and server infrastructure. This awareness of websites' environmental impact stems particularly from professional training, as well as from personal reading or discussions with friends. When participants were prompted to make a connection between websites and environmental aspects, they were asked a specific question ("*What do you think if I say 'websites' and 'environment'?*"). In this prompted context, only two female participants established no connection between websites and potential environmental issues. Other participants identified various sources of environmental pollution, particularly servers, data storage, manufacturing materials and recycling of devices, as well as impacts related to the use of artificial intelligence used for developing websites and its infrastructure. It is worth noting that these sources of pollution primarily concern the material aspects ("*hardware*") related to websites. No participant mentioned elements related to software components or immaterial elements (applications, software, etc.). The gap between the number of participants spontaneously and prompted mentioning the environmental impacts of websites suggests a persistent lack of knowledge on these subjects, which can be explained, according to Elgaaied-Gambier et al., (2020) by insufficient awareness about issues related to the environmental impact of digital technology. This observation is corroborated by seven participants who spontaneously emphasized the importance of better informing the public about the environmental impacts of websites. This need for awareness appears even more important considering the two female participants who indicated they saw no connection whatsoever between websites and environmental impacts.

---

[7] The third theme examines both spontaneous and assisted communication, allowing to highlight the eco-responsible approach of a website to users.

[8] The data was transcribed using Whisper via Sharedocs, then carefully proofread and corrected.

[9] During the interviews, respondents were asked about their perception of a *"well-designed"* website through the following question: *"In your opinion, what constitutes a 'well-designed' website? Could you describe it to me?" Once* their spontaneous ideas were expressed, respondents were prompted further regarding the atmospheric characteristics of a website: ambient factors, social factors, and design factors (Lemoine, 2008).

2.2.2 Knowledge of More Environmentally-Friendly Websites

Following the exploration of connections between websites and environmental impacts, the characteristics of more environmentally-friendly websites were examined. Results indicate that no participant spontaneously mentioned the possibility of making websites more environmentally-friendly by modifying their design elements. When prompted, only two participants demonstrated prior knowledge of the existence of eco-design practices for websites. Analysis of the responses reveals that for some participants, website eco-design naturally aligns with current environmental concerns. Other respondents expressed surprise at the possibility of making websites more environmentally-friendly, questioning the technical means to achieve this performance. Unanimously, participants expressed favorable views toward website eco-design practices.

2.2.3 Internet Users' Expectations Towards Companies and Organizations Likely to Have Environmentally-Friendly Websites

After exploring perceptions of more environmentally-friendly websites, the analysis focused on participants' expectations towards companies and organizations likely to adopt this approach. The analysis reveals that no participant could identify companies with an eco-designed website. Their expectations differ according to the nature of the company or organization. For a first group of four participants, the websites of administrations should be pioneers in eco-design, thus playing an exemplary role to encourage other actors to adopt this approach. The analysis highlights that large companies, particularly French and American ones, are considered by thirteen participants as essential actors in this transition. Expectations are particularly pronounced towards American companies, given their high web traffic and substantial financial resources. Some participants view eco-design as compensation for companies' environmental product impact. Two-thirds of participants (twelve) advocate for alignment between the environmental values of environmentally-oriented brands and associations and their websites design, which should be environmentally-friendly. For environmentally-focused associations (e.g., Indra, 22 years old, who cites "*Greenpeace*"), the idea is to set an example, while for brands claiming environmental values (e.g., Margot, 22 years old, who cites "*Patagonia and Veja*"), it is to ensure consistency between their discourse and actions. Finally, one-third (six) of respondents emphasized that website eco-design should not be limited to organizations with stated environmental values. According to them, any organization, regardless of its values, can and should engage in an eco-design approach to minimize its environmental impact.

3. Discussion of the findings

The objective of this exploratory qualitative study, conducted with 18 internet users of varied profiles, aimed not only to examine users' perception of the potential connection between websites and the environment but also to identify participants' knowledge and expectations regarding website eco-design, distinguishing between spontaneously stated elements and those mentioned when prompted. Unlike prompted elements, spontaneity demonstrates a deeper level of knowledge than responses obtained through direct questioning (Lai & Aimé, 2016). A decade ago, the impacts of digital technology, and consequently of websites, were still little known by users (Elgaaied-Gambier et al., 2020, based on 2015 data). Our study reveals that, when prompted, respondents have somewhat more awareness of these impacts, but it is clear that knowledge remains limited even after nearly 10 years, as this information was only spontaneously mentioned by three participants. This limited knowledge can be explained by insufficient public awareness on this issue, which was spontaneously confirmed by seven participants in our study. Our results corroborate those of Elgaaied-Gambier et al. (2020) on

digital technology, while specifically complementing them regarding respondents' knowledge of website eco-design. Our results show that knowledge about more environmentally-friendly websites is limited and raises questions among respondents about the methods to reduce their impact. Our findings reveal particular expectations towards companies and organizations displaying environmental values to make their approaches and practices consistent with their values. Participants notably consider that government websites and large companies (French or American) have a duty to set an example. In this context, modifying or designing more environmentally-friendly websites could constitute an opportunity to reduce their environmental impact and be highlighted in communication tools. The exploratory semi-structured interviews allowed us to better understand internet users' perceptions and expectations regarding web eco-design. This study has certain methodological limitations that should be highlighted. First, the collected data may be affected by social desirability bias, which is particularly significant in the context of environmental issues (Hetet et al., 2013). Second, our initial website-centered approach may have influenced participants' responses. Indeed, our progressive approach focused on websites could have influenced how respondents addressed the relationship between websites and the environment, as was actually pointed out by one of the interviewees. To address this potential bias, we plan to conduct a new series of interviews with consumers by adopting an environment-centered approach this time, that is, by orienting the interview guide not around websites but rather around the environment, to see if the environmental approach spontaneously and/or with prompting elicits thoughts about websites. These two approaches (website/environment) appear complementary and are likely to enrich our knowledge about the potential connection between websites and the environment in internet users' minds. However, it seems appropriate to broaden our approach to include the various stakeholders surrounding the ecosystem of website eco-design. Interviews with different actors (internet users, website designers, public authorities, etc.), more specifically with website designers (whether they have adopted an eco-design approach or not), could clarify and compare the expectations and viewpoints of their service users. This would also allow us to consider the potential consequences that would result from the adoption of website eco-design practices from a marketing perspective. Data collection from internet users (environment approach[10]) and website designers, having begun in January 2025, we would be delighted to present the initial findings at the 9th French-Austrian-German Workshop on Consumer Behavior, which will take place from June 25-27, 2025, if this presentation proposal is accepted.

[10] This environmental approach aims to explore, initially, internet users' knowledge regarding environmental matters, through the environmental impacts of daily activities and the sectors with the greatest impact on the environment, leading to the impacts of digital technology on the environment. Once these topics have been addressed, the theme of more environmentally respectful websites will be discussed, as well as communication surrounding environmentally conscious characteristics.

References

ADEME. (2022a). *Le guide de la communication responsable* (Vol. 011190). ADEME. https://librairie.ademe.fr/consommer-autrement/5818-le-guide-de-la-communication-responsable-nouvelle-edition-enrichie-9791029715730.html

ADEME. (2022b, février). *Gagnez en performance avec l'écoconception*. Agir pour la transition écologique | ADEME. https://agirpourlatransition.ademe.fr/entreprises/ecoconception

ADEME, & ARCEP. (2022). *Evaluation de l'impact environnemental du numérique en France et analyse prospective* (Etude ISSN n°2258-3106; p. 18). https://www.arcep.fr/uploads/tx_gspublication/etude-numerique-environnement-ademe-arcep-note-synthese_janv2022.pdf

Andersen, M. (2022, juin 22). *Why Sustainable Web Design Matters*. Sustainablewww. https://sustainablewww.org/principles/why-sustainable-web-design-matters

Balogh, R. A., Bernataviciute, V., & Lindh, M. (2022, mai). *Sustainable web design in the e-commerce sector*. JÖNKÖPING University.

Bonamy, C., Boudinet, C., Bourgès, L., Dassas, K., Lefèvre, L., Ninassi, B., & Vivat, F. (2022). L'écoconception d'un service numérique : Des actions pour réduire l'impact environnemental du numérique. *1024 : Bulletin de la Société Informatique de France*, *19*, 59-68. https://doi.org/10.48556/SIF.1024.19.59

Bordage, F. (avec Bordage, S., & Chatard, J.). (2019). *Écoconception Web : Les 115 bonnes pratiques : doper son site et réduire son empreinte écologique* (3e édition). Éditions Eyrolles.

Bose, R., & Luo, X. (2011). Integrative framework for assessing firms' potential to undertake Green IT initiatives via virtualization – A theoretical perspective. *The Journal of Strategic Information Systems*, *20*(1), 38-54. https://doi.org/10.1016/j.jsis.2011.01.003

Ceschin, F., & Gaziulusoy, I. (2016). Evolution of design for sustainability : From product design to design for system innovations and transitions. *Design Studies*, *47*, 118-163. https://doi.org/10.1016/j.destud.2016.09.002

Collin-Lachaud, I., & N'Goala, G. (2023). Décisions Marketing, 30 ans de recherche pour la prise de décisions marketing : Bilan et perspectives. *Décisions Marketing*, *110*(2), 5-14. https://doi.org/10.3917/dm.110.0005

Delacroix, E., & Monnot, E. (2021). *Marketing research : Méthodes de recherche et d'études en marketing* (2e éd). Dunod.

Dosquet, F. (2018). *Études de marché*. Dunod.

Doyon, D. (2020). The Pedagogy of Sustainable Web Design. *Journal of Sustainability Education*, *23*, 1-9.

Elgaaied-Gambier, L., Bertrandias, L., & Bernard, Y. (2020). Cutting the Internet's Environmental Footprint : An Analysis of Consumers' Self-Attribution of Responsibility. *Journal of Interactive Marketing*, *50*, 120-135. https://doi.org/10.1016/j.intmar.2020.02.001

Fonbaustier, L. (2022, février 7). Environnement—Le législateur environnemental s'empare (enfin !) du numérique. - À propos des lois des 15 novembre et 23 décembre 2021. *La Semaine Juridique, Edition Générale*(5, doctrine 186), 286-293.

Gaski, J. F. (2022). Toward social responsibility, not the social responsibility semblance : Marketing does not need a conscience. *AMS Review*, *12*(1), 7-24. https://doi.org/10.1007/s13162-022-00227-1

Greenwood, T., & He, R. (2021). *Sustainable web design*. A Book Apart.

Hansen, S. G., Granum, H. L., Moen, M., Hulleberg, O., Vicient Monllaó, C., & Inal, Y. (2023). Current Challenges and Barriers in Sustainable Web Design : A Qualitative Study. *Mensch Und Computer 2023*, 375-379. https://doi.org/10.1145/3603555.3608529

Hetet, B., Moutot, J.-M., & Mathieu, J.-P. (2013). Le risque de l'implicite dans un cas d'innovation en faveur de l'écologie. *Innovations*, *40*(1), 65-81. https://doi.org/10.3917/inno.040.0065

Lai, C., & Aimé, I. (2016). Chapitre 3. Comment évaluer une marque ? *Les Topos*, *3*, 53-74.

Lemoine, J.-F. (2008). Atmosphère Des Sites Web Marchands Et Réactions Des Internautes : WEB ATMOSPHERICS AND SURFER RESPONSES. *Revue Française du Marketing*, *217*, 45-61.

Liottier, M., & Bilet, V. (2018). Éco – conception web et isomorphisme organisationnel. In *Tradition et innovation* (p. 145-158). L'Harmattan. https://doi.org/10.3917/har.anido.2018.01.0145

Loi visant à réduire l'empreinte environnementale du numérique en France (REEN), Pub. L. No. 2021-1485 (2021). https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000044327272

Luttropp, C., & Lagerstedt, J. (2006). EcoDesign and The Ten Golden Rules : Generic advice for merging environmental aspects into product development. *Journal of Cleaner Production*, *14*(15), 1396-1408. https://doi.org/10.1016/j.jclepro.2005.11.022

Mission interministérielle numérique écoresponsable. (2022, novembre 28). *Référentiel général d'écoconception de services numériques (RGESN)*. https://ecoresponsable.numerique.gouv.fr/publications/referentiel-general-ecoconception/#strategie

Richards, T. (2002). An intellectual history of NUD*IST and NVivo. *International Journal of Social Research Methodology*, *5*(3), 199-214. https://doi.org/10.1080/13645570210146267

Shu-Yang, F., Freedman, B., & Cote, R. (2004). Principles and practice of ecological design. *Environmental Reviews*, *12*(2), 97-112. https://doi.org/10.1139/a04-005

Stolley, K. (2011). Teaching Sustainable Methods of Web Design and Development. *2011 IEEE INTERNATIONAL PROFESSIONAL COMMUNICATION CONFERENCE (IPCC)*. IEEE International Professional Communication Conference (IPCC), New York. https://www.webofscience.com/wos/woscc/full-record/WOS:000298861500001

Vertuoz. (2023, août 4). Développements informatiques : Quelle différence entre Front-Office—Vertuoz. *Le Blog Vertuoz*. https://www.vertuoz.fr/blog/webmarketing/developpements-informatiques-quelle-difference-entre-front-office-et-back-office-on-vous-eclaire

Victoria, C. (2022). *Empreinte environnementale du numérique en France : L'ADEME et l'Arcep remettent leur premier rapport au gouvernement*. https://www.arcep.fr/actualites/actualites-et-communiques/detail/n/environnement-190122.html

Volle, P., & Schouten, J. W. (2022). *Marketing plus durable*. De Boeck supérieur.