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Francisco J. Martínez-López
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Advances in Digital Marketing and eCommerce

Third International Conference, 2022

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Preface

The Digital Marketing & eCommerce Conference aims to bring together leading researchers and research scholars to exchange and share their experiences and research results on any aspects of ecommerce and digital marketing. It also offers a platform for academicians and practitioners to present and discuss the most recent breakthroughs, trends and concerns as well as practical challenges encountered and solutions adopted in the fields of ecommerce and digital marketing.

Each paper submitted to the 2022 DMeC Conference has gone through a stringent peer-review process by members of the programme committee, which comprises over 60 researchers from around 30 countries.

This edition has been devoted to trends for retailing and ecommerce. The recent pandemic has brought significant shifts to ecommerce and digital marketing. Retailers seek to remain as competitive as ever in a rapidly changing landscape by truly embracing digital channels. The most resilient and adaptive brands and retailers will set the tone and thrive for years to come in the context of omnichannel business models. New trends on retailing and ecommerce will definitely arise in the aftermath of COVID-19, as adopting them is likely to increase brand reputation and even survival rates. Brands are expected to lean heavily into video shopping (e.g., Instagram story-style shopping, one-on-one virtual consultations). Also, customers are more likely to purchase from (and identify with) purpose-driven companies, and this trend shows no signs of slowing down. Accordingly, social impact plays a significant role on this trend equation, and particularly independent retail brands try to adjust their cultural positioning. Brand authenticity is also a key variable here, as the perception of authentic content could be seen as a gateway to a far more personalized shopping journey. Additionally, the use of nudging techniques in the digital world is on the rise, as influencing consumer behaviour in a subtle manner is vital in an omnichannel context. Moreover, the role of sales associates will adapt to this increasingly digital reality, while continuing to guide customers along their shopping journey through text, chat and video, thus greatly expanding their sphere of influence beyond the walls of the brick-and-mortar stores.

A total of 32 papers have been accepted, and they address diverse areas of application and topics, not necessarily connected with the primary topic of this edition, such as recommendation agents, chatbots, digitalization, value co-creation, omnichannel experience, the use of shopping carts, influencer marketing, eye tracking and e-WOM, among others.

With this third edition, the conference continues its commitment to encourage, promote and publish high-quality contributions on digital marketing and ecommerce that can aid academics and practitioners in dealing with a wide range of issues.

Finally, we wish to acknowledge the support of our sponsors and publisher. Last but not least, we would like to thank all the contributing authors, members of the programme committee and the rest of the organizing committee for their highly valuable work in enabling the success of the 2022 DMeC Conference.

Francisco J. Martínez-López
Luis F. Martinez

Contents

Recommendation Agents? I don't Know Any and I don't Trust Them!

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Abstract. Tools that use artificial intelligence in order to improve consumer experiences and automate processes, such as recommendation agents (RAs) have been widely adopted by companies. However, the use of this type of technology can increase a user's perception of a risk to data privacy. This article aims to go in more depth into what is known about the variables that impact this perception of risk related to RAs. By way of an exploratory stage with in-depth interviews followed by a survey, it was possible to identify how aspects such as a concern with data and the perceived risk in online shopping increase the sense of a risk to privacy. Consumers are generally unaware of how recommendation agents work, and it makes them unsure as to their usability and purpose. Consumer trust, however, mediates this relationship by mitigating the negative effects of risk perception.

Keyword: Recommendation agents · Online consumer behaviour · Data privacy · Risk · Trust

1 Introduction

Artificial intelligence (AI) has helped companies deliver a better experience to consumers by introducing enhanced convenience into routine activities and supporting consumer decision making (Puntoni et al. 2021). This type of technology has been disrupting the market, especially in retailing contexts. Using tools such as recommendation agents (RAs) and predictable algorithms, companies can offer products that match consumers' interests, thus facilitating the decision-making process (Dabholkar and Sheng 2012).

Even though AI offers benefits like experience personalization, it can also spark consumer fear and distrust, either because companies are not fully transparent with their customers about using their data, or because customers are unaware of how the technology works (Hasan et al. 2021). This lack of knowledge influences user trust and can even impact the perception of risk that a website or transaction represents to customer privacy (Xiao and Benbasat 2007). Other aspects that may also influence the privacy risk are the perception of how risky it is to make a purchase in an online environment (Miyazaki and Krishnamurthy 2005), and the concern that some people have regarding the use of their data (Lwin et al. 2007). People react in different ways to risk perceptions, including avoiding a situation that is seen as threatening. For this reason, it is essential to

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understand those aspects that influence the perception of a risk to privacy in the context of online shopping.

Perceptions of risk related to data privacy and the use of technology have been the focus of recent theoretical discussions (Martin and Murphy 2017; Hasan et al. 2021). Even though there are studies about RAs that focus on understanding the impact of trust on usage and the willingness to accept a recommendation agent's suggestions (Shi et al. 2021), or are dedicated to understanding the impact of RAs on a consumer's purchase intentions, there is still lack of research into privacy risk perceptions, trust and especially knowledge about RAs. This research, therefore, focuses on understanding how perceived risk in online shopping, concerns related to data usage and knowledge about how RA works, influence risk to privacy perceptions considering the impact on trust in the RA.

This study contributes not only to a theoretical advance in this subject (Martin and Murph 2017; Shi et al. 2021), but also to a better understanding of consumer perceptions of Ras considering a developing country. The research also provides insights for companies that use artificial intelligence as a tool to improve business and consumer experiences (Puntoni et al. 2021).

2 Recommendation Agents and Risk Perceptions

Artificial intelligence has the potential to influence consumer behaviour and perceptions (Hasan et al. 2021). Among the tools used in marketing to advise and assist the consumer are recommendation agents (RAs), a type of AI. RAs can serve as an instrument for consumers by helping them make better buying decisions, by advising them according to their interests. In addition to simplifying decision-making by reducing the complexity of the search, comparison, and choice, RAs also reduce the sense of information overload (Dabholkar and Sheng 2012).

Despite all these positive aspects, the use of consumer data to customize and optimize offers and the experience raises concerns about the disadvantages of this technology. Aspects such as breaches of privacy, bias, and discrimination generated by AI have been widely discussed. Although users accept some level of risk when they disclose personal information to companies, some consumers do not clearly understand how companies use their personal data (Hasan et al. 2021) This concern can generate a greater perception of a threat to an individual's privacy, which ends up becoming a negative attitude regarding a company and the probability of sharing data with it (Jarvenpaa et al. 2000). Thus we suggest:

H1: A Greater Concern with the Use of Personal Data Has a Positive Influence on the Risk to Privacy Perception

This concern may be associated with the extent to which a person perceives a particular situation to be risky. Individuals have different attitudes towards risk, and this impacts their propensity to engage in this type of situation (Hasan et al. 2021). In the specific case of e-commerce, it is already known that individuals who perceive higher levels of risk in an online purchase situation usually avoid sharing their information online and may even stop buying online (Miyazaki and Krishnamurthy 2005). Based on the theoretical framework, it is proposed that:

H2: The Perception of Risk in an Online Purchase Has a Positive Influence on the Risk to Privacy Perception

3 Trusting Recommendation Agents

Another aspect that may influence customers' online behaviour is trust, which is the positive expectation regarding services in a situation perceived as risky (Wang 2019). Specifically considering RAs, consumers have little knowledge of this technology either with regard to how it operates, or how it influences decision-making. Familiarity often minimizes people's uncertainty about something that is new, or that they have never used before (Norberg et al. 2007). Regarding RAs, understanding how they function can influence not only an individual's decision-making process, but also have a bearing on their trust in this technology and their intention to use it (Xiao and Benbasat 2007).

Trust makes users believe that the online service provider, which is using the agent on its website, will collect, store, and use their personal information appropriately, thus reducing the risks associated with a lack of privacy (Wang 2019). Xiao and Benbasat (2007) have already shown that explanations of an RA's reasoning logic strengthened users' trusting beliefs in the RA's competence, however, they have not tested the effect of trust in the relationship between knowledge about the technology (e.g., RA) and risk perceptions. If understanding technology influences how an individual trusts it, and also has an impact on the perceived risk, it is expected that this effect will also occur with recommendation agents. Therefore, the following hypothesis is suggested:

H3: Trust is a Relationship Mediator Between Knowledge of Recommendation Agents and the Risk to Privacy Perception.

4 Method

The target population of this study comprised Brazilian consumers who shop online. The focus on Brazilian consumers is because of the size of this market. In 2020 e-commerce reached the historical milestone of more than BRL 87 billion (approximately Euro 14 billion) in sales, which represents 41% increase if compared to the previous year. Just in 2020 the number of new consumers online reached 13.2 million, resulting in a total of 79.7 million individuals purchasing online in the country (EBIT 2021). The number of consumers shopping online, and the amount spent on e-commerce has been increasing consistently in recent years.

Initially we performed in-depth interviews in order to better understand the relationship consumers had with AI and RAs. Seventeen consumers of a convenience sample who had made frequent online purchases in the previous year (on average once a month), were interviewed. The age of respondents ranged from 22 to 56 (Mean = 36 years old) and nine were male. The interviews were performed through videoconference and took on average 23 min. All of them were recorded, transcribed and analysed using a qualitative content analysis approach with the following categories: the online purchase process, confidence in online shopping, the RA and its influence on online shopping, and data security concerns when shopping online. The objective of this stage was to understand

in a more exploratory way the online buying process, and the perception of individuals about the functionality of recommendation agents, their impact on decision making, and the privacy and data protection issues that permeate this context.

After this first phase, we ran an online survey using a snowball technique with a sample of 308 valid questionnaires. The goal was to understand more fully the risk dimensions and privacy perceptions that appeared in the interviews, in addition to consulting a larger number of individuals with regard to their perception of RAs. The survey included a scale of concern with online data with 4 items (e.g., "How concerned are you about your online personal privacy when using Recommendation Agents in websites") adapted from Lwin et al. (2007), a risk perception in online purchase scale with 3 items (e.g., "I feel that purchasing products over the internet is risky") from Miyazaki and Krishnamurthy (2005), and a privacy risk scale with 9 items (e.g., "Overall, the perceived privacy risk involved when using the website is very risky") from Wang (2019). We measured trust with an item developed by the authors "how confident do you feel about exposing your data to a referral agent?" and RA's influence perception was measured with one item "how do you perceive the RA's influence in the decision making?". All responses used 5-point Likert scales (e.g., totally disagree/totally agree). The survey also included demographic questions and exploratory items about the purchase process.

5 Results

5.1 Qualitative Data

The interview response analysis was divided into four categories: the online buying process; trust in online purchases; recommendation agents and their influence on online purchasing; and data security in online shopping. When asked about their online shopping process, only two of the seventeen respondents mentioned that their transaction frequency was low in terms of purchasing specific items. In general, respondents indicated that they order at least once a month from e-commerce, and some do so on a weekly basis. Factors such as price, website usability, convenience and the opinions of other users were motivators in their decision to shop virtually.

About the extent that individuals trust online shopping, it was evident that brand and recognising large companies are factors those respondents take into consideration when assessing a site's credibility. When the page is from a well-known organization, they feel more comfortable buying a product from it. For some respondents, verifying the website's security key is also necessary as another way of confirming the reliability of a page.

When respondents were asked what an RA was, many did not know. Interviewee 15 mentioned "*I am not sure about it*", while interviewee 1 said "*I don't know if it is a person or an algorithm that is recommending a product or a website*". This lack of knowledge of how the recommendation system works suggests that even though consumers have already heard of AI sometimes they are unaware of its applications and purposes. Therefore, it is necessary to clarify how the mechanism works to reduce possible resistance to consumption in these channels.

Respondents generally believe that agents influence their choice process. Interviewee 1 said: "*I realize they do, because [I'm] being bombarded by several products, or the*

same product all the time […] I think it certainly influences the purchase decision". Some respondents, however, feel that the agent has no influence on their choice. One possible explanation for this may be related to the need to control these systems. By confirming that they are influenced by AI, the consumer is admitting that their control in terms of e-commerce is reduced, and this can make them feel uncomfortable.

Some respondents believe that RAs can be programmed with second intentions, as suggested by Interviewee 11 "*If the recommendation system recommends a certain item and doesn't recommend another, it has a reason, but it could also do it in bad faith*". This sentence explains the fear that RAs do not necessarily consider the interests of the consumer. This is an interesting aspect that can also be improved by organizations, through consumer education or transparency on the website itself.

When using AI, all respondents are concerned with the security of their data. Several respondents said that they would not give their data to a recommendation agent. This is evident in Interviewee 12's statement "*It would depend on what data the RA wants. If it wants to map out my digital behaviour, I'll feel invaded, because I don't want to feel manipulated and I wouldn't trust that this recommendation is for me*". Interviewee 2 corroborates this argument "*Not to a recommendation agent, no. I think I'd just give the data when it's time to place the order*". By stating that they would not feel safe supplying their data, respondents seem to have no real understanding that when accessing the e-commerce site, the user is already automatically disclosing their personal data to the company.

One aspect that seems to mitigate this insecurity is the understanding that the company is able to provide a better experience and assist in decision-making using the customer's own data, as suggested by Interviewee 10 "*If I need something and this agent can be useful to me, so yes, I provide my data to help me do what I want*".

5.2 Quantitative Data

After analysing the data from the qualitative phase, a questionnaire was applied, and data was analysed considering a quantitative approach in SPSS software. The sample of 308 valid respondents was mostly (64%) female and had an average age of 35 years (s.d. 11.32). Of the total, 57% had completed their higher education or had a post-graduation qualification. Regarding shopping frequency, it was noticed that almost half the individuals, 42.2%, usually engage in online shopping 1 to 3 times in a 6-month period, 20.8% buy 4 to 6 times, and 19.8% buy more than 10 times. The results show that people who participated in this research do buy online.

Among the aspects that consumers observe on a website when placing an order, they mentioned the credibility of the site, price, information quality and platform usability, in this order. Regarding the perception about an RA's influence on the decision-making process, 54% considered recommendation agents to be influential or very influential in the online purchase decision process. In addition, 34% signalled that they would buy a product at the suggestion of the algorithm.

For the scales used, the reliability tests with Cronbach's Alpha coefficient were as expected. The results were 0.707 for the online shopping risk assessment scale, 0.853 for the privacy risk scale, and 0.874 for the data concern scale. Demographic variables

were used as control and no difference was identified in the perception of risk between the different levels of income, age, gender, and education.

We ran an ANOVA to check if there is a difference in the privacy concerns between those who perceive the influence of RAs as high or low. The results confirmed that there is a difference in privacy concerns ($F(1, 307) = 2.45$, $p = 0.04$), with those who perceive little influence from RAs on their purchases reporting higher levels of concern about their privacy ($M = 4.33$, $S.D = 1{,}175$) than people who perceive the influence to be high ($M = 3.6$, $S.D = 0.90$). This result is intriguing, as it was expected that those who perceive a greater influence would have more concerns about their privacy. On the other hand, it may be that the individual understands that the influence of RAs reduces concerns with data security; they are adapting to technology being used.

We ran a linear regression to verify the effect of 'concern with use of personal data' and 'risk perception in online purchases' on the perceptions of risk to one's privacy. In the model the construct of privacy risk was used as a dependent variable (DV) and perceived risk in online shopping and concern with data as independent variables (IVs). Both variables had a significant and positive impact on the perception of risk to privacy, while concern with data had a greater effect ($b = .36$, $t = 6.94$, $p = .001$) than the perception of risk of buying online ($b = .23$, $t = 4.30$, $p = .001$). The model explained 23% of the variation in risk to privacy perception. These results corroborate both hypothesis H1 and H2.

To test Hypothesis 3, Macro from Process was used in a mediation test (Model 4). There was no direct effect of understanding the functioning and influence of RAs on risk perception ($b = -.01$, IC from $-.11$ to $.09$), but there was a positive impact of knowledge on trust ($F(1, 306) = 29.46$, $p = .001$, $t = 5.43$, $p = .001$). This, on other hand, had a negative effect on risk perception ($F(2, 305) = 33.27$, $p = .001$, $t = -7.73$, $p = .001$). The indirect effect was negative ($b = -.12$, CI from $-.18$ to $-.06$), which means that knowledge of RAs does not directly impact privacy risk, but when we add trust to the model, there is a full mediation. Therefore, H3 was confirmed.

6 Discussion

Artificial intelligence has been transforming not only marketing strategies, but also how consumers behave (Puntoni et al. 2021). Its use by organizations has given rise to a new environment in e-commerce. Therefore, this study aimed to analyse the role of recommendation agents, one of the AI techniques, in the decision-making process and how RAs can be related to the perception of risk to data privacy.

Overall, consumers who are frequent users of online shopping clearly realize the influence of RAs, and those who understand how RAs work also report lower levels of concern regarding data security, which may indicate an adaptation process. The findings of this research suggest that aspects such as online buying perceptions, risky transactions and concerns about data increase the perception that RAs represent a risk to privacy. These results contribute to the research field in data privacy (Martin and Murphy 2017), risk perception and consumer behaviour (Puntoni et al. 2021), an area that has been widely debated.

Consumers sometimes do not understand how the recommendation agent works and how it influences their choices, they seem to distrust this type of technology. If they have

no knowledge of the topic, it is difficult for them to trust the algorithm and reveal their personal data to servers and companies. This occurs because the individual's confidence in the tool and its usability is impaired and tends to increase the perception of a risk to their privacy (Lwin et al. 2007; Hasan et al. 2021).

This research increases our understanding of the topic of online shopping and artificial intelligence (Hasan et al. 2021; Puntoni et al. 2021) by connecting privacy risk perceptions, trust, and overall knowledge about how AI systems work. Previous research has already tested the impact of trust in an RA on the user's willingness to accept its recommendations (Shi et al. 2021) and the impact of RA usage on purchase intentions and website satisfaction (Dabholkar and Sheng 2012). As far as we know, however, this is the first research that focuses on the risk to privacy perception, trust and overall knowledge about RA in an e-commerce context of a developing country. This research investigates perceptions of Brazilian consumers, which is a market that has been reaching increasing amounts of online transactions but has received little attention from the literature. Besides of increasing levels of online purchases, there is still a relevant part of the population with limited access to internet and hence to AI mechanisms related to this environment, such as recommendation agents.

With 79.7 million individuals shopping online in 2020 in Brazil, and therefore, probably being exposed to RAs in these transactions, this research has also managerial relevance. Even though RAs provide several benefits to the customer experience, they can also spark uncertainty, so it is critical that not only academics, but also marketers pay attention to these results. Considering adopting AI can be seen in a negative way by customers (Lwin et al. 2007), so it is important that the information is clear and easily accessible to those who visit e-commerce sites.

Furthermore, it is essential that companies: a) declare their privacy policies in a clear and transparent way so that consumers can understand that the company is concerned with this topic; b) offer benefits to users who agree to share their personal information; and c) grant consumers control over data collection and management. Another possible insight might be the fact that individuals who have a better understanding of how the RA works seem to perceive less risk to their data privacy in online transactions and interactions with the technology. Improving consumers' understanding of the technology might be an interesting goal to be pursued by companies who use recommendation agents as a marketing strategy.

Among the limitations of this study, we would mention the sample with its focus on Brazilian consumers. Personal and cultural aspects may play a relevant role in trust and privacy concerns, so we suggest that further studies include collecting data from other customer contexts and profiles. This was a cross-sectional study; hence, future studies could also use experimental methods to test for explanatory mechanisms and boundary conditions related to these effects. Furthermore, we suggest addressing the relationship of AI with online consumer behaviour and data privacy in a more detailed way (Martin and Murphy 2017), to understand and explore possible new behaviours, or the reasons why consumers may feel safer in the virtual environment and how it affects their buying decisions or the intentions to disclose personal information to companies and websites.

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The Impact of a Company Website and Its Perceived Quality on the Buying Intention in B2B-Settings

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Abstract. The importance of the company website as a customer touchpoint and the influence of its perceived quality on buying intention in a B2B-setting was investigated in real life online setting. The quantitative study shows the greatest benefit of the company website at the initial phases of the customer journey. The perceived quality of the website influences visitors' buying intention with a medium to strong effect size. The overall impression of the website is the most important, interactivity the least important factor for the perception of website quality.

Keywords: Website quality · Online-buying Intention · Customer journey

1 Introduction

Research repeatedly highlights the importance of company websites for marketing and sales purposes (Gavin et al. 2020). For example, a study conducted by the market research institute GFK found that 92% of the participants place a high value on a company's website in order to obtain information about a provider before making a purchase. In addition, 34% visit the websites of competitor companies if the desired information cannot be found on the provider's website (Handelsblatt Media Group 2015). Remarkably, users form a first impression of a website within a few seconds (Lindgaard et al. 2006). The result determines whether the website succeeds in generating attention and in promoting the establishment of a relationship between consumers and the company (Berthon et al. 1996; Geissler et al. 2006).

In order to fully understand the value of a company website for forming and cultivating customer relationships, research highlights two aspects. First, various contributions emphasize the influence of individual elements of a website on its perceived quality and thus, its power to persuade customers (i.e. Aladwani and Palvia 2002; Kaur and Gupta 2021). Second, the website must be viewed as one touchpoint, among others, that is embedded in a customer journey (Edelman and Singer 2015). In marketing research, many studies focus on the recording and evaluation of the contribution of one or more

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touchpoints to a purchase event along the customer journey with the help of so-called attribution models (i.e. de Haan et al. 2016; Becker et al. 2017). Notably, both types of studies typically emphasize the importance of a highly qualitative website to build strong relationships with customers, but focus on B2C settings where a website also functions as a point of sale.

Following, the question remains to what extent the perceived quality of a corporate website influences the visitors' buying intention (Kincl and Strach 2012) and thus the importance of the corporate website as a customer touchpoint, in particular with respect to B2B settings. These settings are characterized by a demand resulting from subsequent customers, more intensive buyer-seller relationships and, with regard to the buying center, more informed, complex, and formalized decision processes (Cortez and Johnston 2017). These contextual factors result in different requirements for B2B websites than for B2C websites, calling for a more nuanced understanding of the impact of website quality and relevance along the customer journey.

In cooperation with a German supply chain management (SCM) group that offers complex B2B services, the study uses an online real life setting to survey in which phases of the customer journey the website has the greatest impact on buying intention and what importance its quality has in this context. The real life setting is designed to investigate the role of a website with regard to organizational (B2B) purchasing processes, focusing on websites that do not offer the possibility of e-shopping as it is often the case in B2C settings, but not common in B2B settings.

The guiding research questions for the study are as follows:

Research Question 1: In which phases of the customer journey does the company website have the greatest impact on the buying intention of the visitors?

Research Question 2: To what extent is the impact of a corporate website on the visitor's buying intention conditioned by the perceived quality of the website?

2 Theoretical Background

2.1 Company Website as a Digital Touchpoint of the Customer Journey

The customer journey describes the various phases and touchpoints that a customer goes through before making a potential purchase decision and that influence his customer experience (Lemon and Verhoef 2016). Divergent phase classifications of the customer journey can be found in the literature, although they are close in terms of content (Hamilton et al. 2021). In addition, recent contributions describe Customer Journey as a non-linear process (Edelman and Singer 2015; Lemon and Verhoef 2016). This description is useful for illustrating consumers' ongoing relationships with brands and retailers that lead to repeat purchases (Lemon and Verhoef 2016). However, with regard to the formalized decision process and intense buyer-seller relationships in B2B settings once an initial purchase has been made, it seems appropriate to use a linear model with five phases ending with the completion of the buying. In the awareness phase, consciousness of an offer is created in order to strengthen a concrete interest in it in the favorability

phase. In the consideration phase, the buying of the offer is considered and a selection of possible solution providers is made. In the intent-to-purchase phase, the buying intention is concretized and concluded in a final conversion phase (Beilharz et al. 2017).

There are numerous touchpoints along the journey that enable companies to interact with their customers and based on which customers can build their experience with a brand (Voorhees et al. 2017; Kuehnl et al. 2019). The touchpoints affect each other and have a direct or indirect impact on purchasing and other customer behavior (Lemon and Verhoef 2016). Therefore, coherent and targeted management of touchpoints can influence brand perception and help to build and secure profitable business relationships (Melero et al. 2016).

One of the most common touchpoints is the company website (Lo and Wang 2012). It is used by companies to convey information, establish a dialog with customers, and increase brand awareness (Berthon et al. 1996; Schach 2015). The company website consists of various elements. The home page represents the main entry point. It has to awake the visitor's interest and provide access to the other elements (Meffert et al. 2018). These elements usually include information pages on an organization's profile, portfolio of offerings, and references (Geissler et al. 2006; Bruhn and Hadwich 2013). In addition, the website serves to communicate news, attitudes, and a company's expertise, which are often presented in the context of a web blog (Huh et al. 2017; Orzan et al. 2013). Visitors expect dynamic contact options, such as form or chat functionalities, which enable efficient communication with the company and quick answers to simple questions (Laudon et al. 2015). In contrast to informational websites, transactional websites also offer buying functionalities. Whether a company website fulfills the purpose for which it was developed and is visited by consumers can be measured by its perceived quality (Kincl and Strach 2012).

2.2 Quality Factors of a Website

The perception of quality of a website is always subjective, as the fulfillment of purpose is assessed differently depending on the user (Herrera-Viedma et al. 2006). However, various studies have identified consistent factors of a website influencing quality perception. Based on a meta-analysis of these studies, website quality is operationalized using five individual factors. These can be grouped into the main factors of content, design and overall impression. Content is the most original and widely used quality criterion for websites and should provide answers to visitors' questions to generate the most value (Aladwani and Palvia 2002; Kincl and Strach 2012). The second main factor, design, is made up of three individual factors. As the first single factor, the layout influences the presentation of the website by stimulating the visitor's emotions with visual impressions (Lindgaard et al. 2006). Navigation represents the second single factor of the design and influences the intuitive use of the website as well as the findability of information (Sutcliffe 2002). The interactivity of the website, as the third criterion, enables flexible action on the platform and efficient contact with the company (Lee and Kozar 2006). As the last influencing factor, the overall impression of a website stands for the coherence of the individual elements in the overall picture (Kincl and Strach 2012). These findings form a basis for deriving the research hypotheses.

3 Hypotheses Development

3.1 Research Question 1

The first research question is about identifying the phases of the customer journey in which the company website fulfills the greatest benefit as a touchpoint. In each phase of the customer journey, there are different requirements for the interaction between the customer and the company. Due to their specific characteristics, customer touchpoints fulfill different benefits for each individual phase (van der Veen and van Ossenbruggen 2015; Lemon and Verhoef 2016). The complex services of the investigated company lead to a high level of cognitive and emotional involvement of the customer as well as extensive processing of information before a buying (Kroeber-Riel and Gröppel-Klein 2013). The sale of complex solutions, combined with extensive buying decision-making processes, requires the personal contact and expertise of specialized sales person (Sommer 2014). Company websites are particularly suitable for increasing brand awareness, providing company information and beginning an initial dialog, which is why they are attributed the greatest benefit at the beginning of the customer journey. The first hypothesis is therefore as follows:

H1: The impact of the company website on the buying intention of its visitors decreases in the course of the customer journey.

3.2 Research Question 2

The second research question aims to find out to what extent the perceived quality of the company website influences its impact on the buying intention of visitors. The stimulus-organism-response model represents a simplified explanation of human behavior, which is illustrated below on the basis of a buying decision-making process. The human organism processes marketing stimuli, such as product advertising, on the basis of activating variables (e.g., emotions) as well as cognitive variables (e.g., perception). The variables trigger an evaluation of the characteristics as well as the expected product benefits. This intrapersonal processing leads to a visible reaction, which is expressed in the form of a buying intention, such as buying the advertised product (Hofbauer et al. 2009).

By presenting information about a company, the website serves as an external stimulus and provides marketing incentives. The processing of the stimuli in the human organism is based on emotional criteria and on the cognitive perception of the website, which is primarily measured by the viewer on the basis of its quality characteristics. Because organismic processing influences response behavior, it is hypothesized that the impact of a website on visitors' buying intention will increase with high perceived quality of a company's website.

H2: The higher the perception of website quality, the higher the websites impact on the buying intention.

4 Research Design and Statistical Analysis

4.1 Research Design

To test the hypotheses, a survey in a real life online setting (Elling et al. 2012) was conducted, performed on the website of the investigated company. As part of content marketing, the website includes content on solutions to SCM challenges in addition to information on the company's services and characteristics. The website should demonstrate the competence of the investigated company and animate visitors to find out more about the range of its services. Due to the complexity of services offered, the website contains no e-shopping option, but encourages visitors to consult sales managers for inquiring individual service contracts.

The data set comprises the assessments of 40 participants that were selected by purposive sampling with criteria of respondent's experience with SCM services and unfamiliarity with the investigated company (no previous contact). In addition, participants had to have previous experience with organizational purchasing processes and be eligible as potential buyers of the services. For this, the participant's employer had to meet relevant criteria, such as a certain size of logistics department. These criteria were collected at the end of the survey. Survey from participants who did not meet these requirements were not included in further data analysis.

At the beginning of the survey, participants received a description of the procedure and were integrated into the underlying vignette. Participants were asked to imagine they were looking for a service provider to solve a SCM challenge in their company. In this context, the website should be used as a source of information for evaluating the company as a potential provider. At the end of the description, a hyperlink was provided that directed the participants to the company's website. To create a realistic buying scenario, no further restrictions or interventions were made when visiting the website. After the visit, the impact of the website on buying intention was collected as the dependent variable and perceived website quality as the independent variable. To evaluate the impact of the website on the buying intention within the customer journey, a representative purchase behavior characteristic was presented for each phase. Based on these characteristics, the participants were asked to evaluate the extent to which the website visit influences their behavior in each of the five customer journey phases. For example, the statement to be evaluated for the favorability phase was: "The website has increased my interest in the services of company". This was followed by the assessment of website quality. Here, participants rated their perception of each website quality factor derived in Sect. 2. As an example, the statement to be evaluated with regard to the contents of the website was: "The contents of the website were useful for my solution search". For reasons of comparability, both variables were measured on a five-point Likert-type scale from "not at all likely" to "very likely". By assuming equally sized scale segments, this ordinal-scaled data will be interpreted as interval-scaled for further analysis. To gain comparability and to interpreted the data more accurately, the quality factors were weighted in a fourth step using a pairwise comparison.

4.2 Statistical Analysis

Hypothesis 1

The focus of the first investigation was on the impact of the company website on the buying intention in the different phases of the customer journey. To create an initial data overview, the arithmetic mean of the company website's impact on the buying intention was calculated for every customer journey phase. This resulted to a value of 4.10 for the awareness and the favorability phase, 3.85 for the consideration phase, 3.60 points for the intent-to-purchase phase and 3.45 points for the purchase phase. Descriptive statistics shows a steady decline in the influence of the company website on buying intention as the customer journey progresses.

An analysis of variances (ANOVA) was applied to investigate, whether the impact differences of the company website are significant. A prerequisite of the ANOVA is the homogeneity of variances. The Levene test illustrated a lack of homogeneity of variances, which is required as a prerequisite for performing ANOVA ($p > .01$). Therefore, a Welch-ANOVA was performed. The Welch-ANOVA shows a significant difference of the influence of the corporate website on the buying intention in the different customer journey phases ($F(4,96.63) = 4.95, p < .01$). To specify in which of the phases differences in impact exist, a post hoc test was conducted. Since no equality of variance can be assumed within the groups, the Dunnett-T3-corrected post-hoc test was applied. The test indicates significant differences of the buying intention only between the awareness and purchase phase ($p = .02$; 0.65, 95%-CI[0.08, 1.22]), as well as the favorability and purchase phase ($p = .02$; 0.65, 95%-CI[0.01, 1.00]). The cohen's d was computed to measure the effect size of these variances. With a value of $d = 0{,}69$, the effect size is medium between the awareness and conversion phase. For the favorability and conversion phases, the effect size is $d = 76$, which corresponds to a medium effect as well.

Since the influence of the company website on buying intention differs significantly in the individual phases of the customer journey, hypothesis 1 can be supported. However, only the first two phases of the customer journey (awareness and favorability phase) differ significantly from the last phase (purchase phase).

Hypothesis 2

The quality factors were measured on a five-point scale. A pairwise comparison was used to determine the weighting of the quality factors by comparing the individual factors in pairs to derive a ranking using a dominance score. The results were multiplied by the associated quality factor scores to form the overall quality score per participant. The resulting arithmetic averages of the quality factors are 4.18 for content, 4.53 for layout, 4.23 for navigation and 4,53 for interactivity and the overall impression of the website. The result for the overall quality of the website is thus 4.40 points. The dominance analysis illustrates that the quality perception is determined by the general impression with a weighting of 31,25%, navigation with 21,00%, content with 19,00%, layout with 16.50% and interactivity with 12.25%.

To further specify the relationship between the influence of the perceived website quality on the buying intention, a simple regression analysis was conducted. First, buying intention was considered aggregated across all phases. The simple linear regression with website quality as the independent and the impact of the website on the buying intention

as the dependent variable indicates a significant correlation ($F(1,38) = 18.51$, $p < .01$). 32.8% of the variance from the websites impact on the buying intention can be explained by the website quality. Thus, website quality is a significant predictor of the websites impact on the buying intention. The estimated increase in the websites impact on the buying intention is 0.61, per level of website quality ($ß = 0.61$; $t(38) = 4.30$; $p < .01$). Overall, website quality has a moderate effect ($f = 0.35$) on the websites impact on the buying intention. Next, the correlation between the website quality and the impact of the website on the buying intention was analyzed for each customer journey phase. The consideration phase ($F(1,38) = 183.40$, $p < .01$) has the highest effect size with a value of $f = 0.60$, followed by the intent-to-purchase phase ($F(1,38) = 8.90$, $p = .01$) with a value of $f = 0.48$. This is followed by the purchase phase ($F(1,38) = 7.32$, $p =. 01$) with a value of $f = 0.44$ and the awareness phase ($F(1,38) = 6.53$, $p = .02$) with an effect size of $f = 0.42$. Only buying intention in the favorability phase ($F(1,38) = 5.89$, $p = .02$), with an effect size of $f = 0.39$, minimally fails to be classified as a strong effect. Considering the correlation of the perceived website quality and the influence of the website on the buying intention, slight differences can be identified along the journey. However, since the differences are small and the correlations almost always indicate a strong effect, the differences are not further interpreted.

An influence of the website quality on the buying intention is concluded. This can be assumed both when looking at the average buying intention across all buying phases and when looking at the individual phases. Thus, the second is supported.

5 Results and Implications

The study results lead to four central findings. First, the importance of company websites for the buying intention can be confirmed. The websites influence demonstrates its special importance as a touchpoint in the first phases of the customer journey, but not at later stages in the buying process. Accordingly, websites are particularly suitable for attracting attention and interest in a company's offering and positioning it as a potential solution provider even for complex buying decisions.

Second, the regression analyses indicate that website quality has a medium to high influence on the effect of the website in influencing the visitors' buying intention. The dominance analysis showed the layout, the interactivity and the overall impression as the most important quality factors for the qualitative perception of the website. In this vein, our study highlights the importance of aesthetic aspects in designing web pages to support the creation of a desired image and the buying intention. While B2B settings are typically associated with more rational decision processes, the role of aesthetics often is downplayed in light of the importance of informativeness and usability of a website (Chakraborty et al. 2005).

Third, with regard to the important role of interactivity, we interpret the result as organizational buyers' preference for self-service options where they can gather information or compare options without contacting sales representatives, even in complex scenarios. Although the importance of the web page decreases in the course of the customer journey, B2B decision makers prefer websites enabling them not only to select potential suppliers, but to already form a preference.

Since people involved in B2B decision processes have different needs than customers in B2C settings, the results show that web pages for both settings have much in common. From these findings on the importance of qualitative website design, new research approaches in the field of customer touchpoint management emerge. Existing studies on the optimal integration of touchpoints in the customer journey can be supplemented by the influence of their qualitative design on buying intention.

6 Limitations of the Study and Future Research Direction

Tracking real customer journeys is complicated by increasing data protection regulations. Nevertheless, newer technologies in marketing automation and web analytics can pinpoint each touchpoint in the customer journey and provide important information about the buying behavior of potential customers. By creating an artificial environment, surveys do not necessarily correspond to a truthful answer or they are distorted by a false self-perception of the participants. In a further study, it would be useful to validate the research results with real customers on different websites and in different industries by tracking unmodified purchase transaction data.

Touchpoints can influence each other, and the impact of a single touchpoint can depend on its position in the customer journey. Such influences should be reduced by further investigations that also consider which phase of the journey a customer is in and which touchpoints they have already interacted with. In the course, the investigation of quality relevance can be extended to other customer touchpoints.

Instead of conducting the study as a survey in an online real life setting with a single test group, it would be fruitful to conduct an experiment with two groups, qualitatively distinct websites, and by performing A/B testing. The resulting divergence of scores could highlight the findings of this study. Finally, the study only examines buying intention up to the purchase phase. It would be useful to also gain insights into the relevance of the website and its qualitative design in the post-purchase phase to consider the entire customer journey.

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Impact of Purchasing Experience on Brand Loyalty Comparing Third Party and Brand Electronic Commerce Site

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Abstract. As demonstrated by Nike and LVMH, some companies are withdrawing from third-party electronic commerce (EC) sites, amid concerns that these sites may cause the long-term decline of the quality of brand experience. However, very few academic studies have researched these adverse effects of third-party EC sites. Therefore, this study examines the question, "*Does purchasing from the brand EC site increase loyalty compared to purchasing from a third-party EC site?*" from an observational perspective. The propensity score was applied to an online survey of personal computer owners in Japan, and it was found that buyers at the brand site are more willing to repurchase than those at the third-party site. This result suggests that depending on a third-party site may benefit the manufacturer brand by a short-term increase in sales volume, but it may also lead to a decrease in long-term brand loyalty.

Keywords: Brand experience · Third party EC site · Brand EC site · Personal computers

1 Introduction

With the proliferation of the internet and remarkable development of IT, online purchasing became a viable and popular option for many consumers. In addition, the COVID-19 pandemic and the lockdowns that ensued globally, made online shopping almost a necessity and most companies decided to actively promote online sales. Uniqlo, for example, plans to expand online sales while simultaneously making physical stores essential (Dvorak 2020). Durable and expensive consumer goods are no exception to this trend. Apple eliminated the Apple Store and converted them into places or zones for experience because of the declining need for customers to visit stores simply for purchasing. In addition to delivering product experience, it is also a place to experience, participate, and host community events to strengthen consumer relationships and enhance long-term loyalty (Du et al. 2019; Kestenbaum 2016). Tesla has also indicated a change in strategy toward reducing the number of stores and shifting to online-centric sales and channels (Kolodny 2019). Volvo has been selling cars online since 2016, but it is one step ahead of its competitors in electric vehicles sales, having declared that henceforth it will sell exclusively online (Rolander 2021).

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For manufacturer brands, the expansion of online sales entails difficult decisions about the relationship and terms to be maintained with third-party electronic commerce (EC) sites. Even if a short-term increase in sales volume is achieved using this channel, there is concern that a low-quality brand experience will lead to a decrease in loyalty. Loyalty is not determined by short-term purchases, but is gradually built over a long period of time (Liu 2007). Based on this concern, Nike and LVMH have recently announced that they will withdraw from Amazon's EC and strengthen direct sales to consumers (Wendlandt 2016; Zimmerman 2020). However, such concerns are curiously lacking in academic discussion.

To fill this gap, this research posed the following question: Does purchasing from the brand's EC site increase loyalty compared to purchasing from the third-party EC site? Two studies were conducted on the purchase of personal computers (PCs) in Japan. Propensity score was applied, and differences in repurchase intentions according to purchasing channel were verified through an online survey of consumers with PCs. The result suggests the importance of building a customer experience that consistently embodies the brand concept in a channel that can be managed by the manufacturer's brand.

2 Literature Review and Hypotheses

With online purchases, it is not possible to physically touch and feel the product, which is a deterrent to purchase (Kato 2019; Overmars and Poels 2015). However, in addition to the high convenience value of online purchasing, (Chocarro et al. 2013), vivid photographs and videos (Flavián et al. 2017), and abundant social media use and electronic word of mouth promotion (Roy et al. 2019) are powerful drivers for overcoming this difficulty. Due to these factors, online purchases even of durable consumer goods are now increasingly widespread. Among them, consumers who prefer online purchasing are characterized by greater involvement with the products (Frasquet et al. 2015), because familiarity with the product and channel lowers psychological barriers. Thus, such consumers make more online purchases than offline (Dawes and Nenycz-Thiel 2014). Therefore, the following hypothesis is proposed:

H1: Consumers who purchased online are more willing to repurchase products of the manufacturer's brand than consumers who purchased offline.

Within the same online channel, the brand and third-party EC sites exhibit completely different characteristics. For manufacturer brands whose priority is sales volume, there are three main risks in using a third-party EC site. The first is that imitations may also be distributed on the same site. Second, as previous literature on showrooming and webrooming indicate, consumers use reliable manufacturer-branded channels to first collect information and then finally make the purchase at the lowest price, usually from the third-party channel (Flavián et al. 2020). At third-party EC sites, many products are sold at discounts and with points-collection benefits, but these are not necessarily linked to loyalty to the manufacturer brands. The third factor is the risk of deterioration of the quality of brand experience. This holds especially for high-end manufacturer brands, wherein it is difficult to provide a high level of experience on the channels that are not managed by the companies/manufacturers themselves.

However, very few studies have compared the differential effects of brand and third-party EC sites on loyalty. Among them, a verification of hotel brands by Magnini and Karande (2011) revealed that customers that made their purchases from the hotel's own

website showed higher loyalty than purchasers on third-party websites. However, this study lacks relevance from the following three perspectives. First, the findings have not been verified in the context of expensive durable consumer goods. Second, to make a fair comparison, both the manufacturer brand and the third party must be equally strong brands. Third, since the relationship between past purchases and loyalty was evaluated, the results merely showed the characteristics of the consumers of each site. Ideally, a randomized controlled trial should be conducted to extract the causal effects of the EC sites in question. Based on the above, the following hypotheses are proposed to verify the characteristics of consumers through observational studies, and the causal effects of EC sites through experimental studies:

H2: Compared to consumers who purchased at a third-party EC site, consumers who purchased at a brand EC site are more likely to repurchase the manufacturer's brand.

3 Methodology

An online survey was conducted in Japan from June 11–17, 2021 of people in their 20s and 30s. The main condition for recruiting a respondent was that they had recently purchased a new PC. The survey work was contracted to Cross Marketing Inc., a major Japanese research company. Consumers who did not meet the conditions were excluded, and the survey was conducted until 500 eligible participants were enlisted. The number of respondents to the survey invitation was 648.

Table 1. Respondent attributes

Item	Content	No. of respondents	Composition ratio
Gender	Male	257	51.4%
	Female	243	48.6%
Age	Early 20s	139	27.8%
	Late 20s	135	27.0%
	Early 30s	120	24.0%
	Late 30s	106	21.2%
Owned brand	Apple	88	17.6%
	Dell	61	12.2%
	Fujitsu	89	17.8%
	Hp	45	9.0%
	Lenovo	78	15.6%
	Nec	113	22.6%
	Others	26	5.2%
Purchased channel	Brand store	13	2.6%
	Retail store	261	52.2%
	Brand online store	89	17.8%
	EC	75	15.0%
	Others	62	12.4%

The survey contains the following nine question items: (1) gender, (2) age, (3) PC ownership status, (4) form of the purchased product (new/used), (5) brand owned, (6) frequency of use, (7) purchase elapsed time, (8) channel used for purchase, and (9) repurchase intention. If respondents owned multiple PCs, they were asked to identify the product they used the most. Table 1 shows the respondent attributes.

Respondents who did not meet the conditions, completed the survey until (5). As shown in Table 2, from the distribution of purchase channels used, (denominated by (8)), it is found that offline third-party retail stores account for the largest number, at 52.2% of the total. Offline brand stores are emerging exclusively for Apple, and the other brands rely on third parties for sales. On the other hand, brand and third-party EC sites have the same frequency of preference. Finally, in (9), repurchase intention of the owned brand was ranked on a five-point Likert scale (e.g., 1: do not want to purchase at all, 5: want to purchase very much).

Table 2. Distribution of purchase channels used

Brand	Offline		Online		–	Total
	Brand store	Third party retail store	Brand EC site	Third party EC site	Others	
Apple	13	39	24	4	8	88
Dell	0	25	15	12	9	61
Fujitsu	0	61	10	7	11	89
Hp	0	11	17	10	7	45
Lenovo	0	36	13	21	8	78
Nec	0	76	7	19	11	113
Others	0	13	3	2	8	26
Total	13	261	89	75	62	500
Mean of repurchase	4.000	3.364	3.629	3.187	3.210	3.382

As a hypothesis verification method, present study is considered an observational study; thus, propensity score matching was applied, which is a typical method for estimating effects when randomization is impossible. Multiple covariates are aggregated into one variable called the propensity score, which is used to correct the covariates in the treatment and control groups. In verifying H1, consumers who purchased online were placed in the treatment group, and consumers who purchased offline were in the control group. In the verification of H2, consumers who purchased at the brand EC site are the treatment group, and the consumers who purchased at the third-party EC site are the control group. As the true value of the propensity score of each subject is unknown, using a logistic regression model for estimation is common. The objective variable was the dummy for online purchase (No. 2 in Table 3) (Model 1 for H1)/purchased at the brand EC site dummy (No. 3) (Model 2 for H2), and the explanatory variables were respondent attributes (Nos. 5–18). A stepwise method was used to select them. The

Table 3. Variable list

No	Variable	Description	Data type	Mean	SE
1	Repurchase	Repurchase intention	5-point Likert scale	3.382	0.043
2	Online			0.328	0.021
3	BrandOnline			0.178	0.017
4	Female	Female dummy	0/1	0.486	0.022
5	Age	Age	1: early 20s, 2: late 20s, 3: early 30s, 4: late 30s	2.386	0.049
6	Apple	Owned brand dummy	0/1	0.176	0.017
7	Dell		0/1	0.122	0.015
8	Fujitsu		0/1	0.178	0.017
9	Hp		0/1	0.090	0.013
10	Lenovo		0/1	0.156	0.016
11	Nec		0/1	0.226	0.019
12	Frequency	Frequency of use	1: less than once a month, …, 7: every day	4.996	0.103
13	PurchasedTime	Purchase elapsed time	0: don't know, 1: within a year, …, 5: 5 years or more	2.226	0.065
14	Brand	Emphasis point dummy	0/1	0.060	0.011
15	Design		0/1	0.104	0.014
16	Functionality		0/1	0.240	0.019
17	Price		0/1	0.264	0.020
18	Usability		0/1	0.258	0.020

effects were estimated by inverse probability weighting (IPW), which is the reciprocal weight of the propensity score. When ATE was positive and the 95% confidence interval did not include 0, it was judged to be significant at the 5% level. The statistical analysis software R was used to perform the analyses.

4 Results

As shown in Table 4, when significant variables were extracted at the 5% level in Model 1, the following characteristics of the online consumers were revealed: male; Dell/Hp/Lenovo owners; frequent PC users; and short elapsed time from purchase. Similarly, from Model 2, the characteristics of the consumers who made their purchases on the brand EC site are: young; Apple owners; and non-owners of Lenovo/Nec. To validate the model, the c-statistic (area under the curve; AUC) should be 0.7 or greater. In the present study, all the models exceeded 0.7, confirming a certain degree of validity. As shown in Table 5, when offline is the control group and online is the treatment group,

95% CI of ATE contains 0. On the other hand, when third-party EC site is the control group and brand EC site is the treatment group, 95% CI did not contain 0 and showed a positive value. Hence, H1 was not supported, but H2 was.

Table 4. Results of logistic regression model to estimate propensity score

Variable	Model 1				Model 2			
	Estimate	SE	p-value		Estimate	SE	p-value	
Intercept	−0.260	0.300	0.387		1.310	0.476	0.006	**
Female	−0.624	0.220	0.004	**				
Age					−0.366	0.159	0.021	*
Apple					1.254	0.598	0.036	*
Dell	0.760	0.333	0.023	*				
Fujitsu	−0.604	0.329	0.066					
Hp	1.730	0.401	0.000	***				
Lenovo	0.714	0.297	0.016	*	−0.808	0.431	0.061	
Nec					−1.482	0.514	0.004	**
Frequency	0.636	0.217	0.003	**				
PurchasedTime	−0.255	0.082	0.002	**				
c-statistics	0.723				0.743			

Table 5. Estimated results of ATE by IPW

Treatment	Control	E(Y1)	E(Y0)	ATE	95% CI		
Online	Offline	3.387	3.393	−0.006	−0.187	–	0.175
Brand EC site	Third-party EC site	3.680	3.253	0.426*	0.168	–	0.685

5 Conclusion and Implications

In existing studies, the benefits of online transactions include travel distance and time savings (Chocarro et al. 2013), ease of information acquisition (Aw et al. 2021), and availability of low prices (Zettelmeyer et al. 2006). Off-line appeal has been shown to be associated with the opportunity of product touch and feel (Overmars and Poels 2015), immediate ownership (Aw et al. 2021), and conversations with staff (Grewal et al. 2004). Consumers understand the attractiveness of both channels and use them regularly (Bell et al. 2014; Flavián et al. 2020; Grewal et al. 2004). Therefore, the H1 result shows that there is no clear tendency for loyalty to the manufacturer's brand, regardless of the channel (offline/online) used. Further, the H2 result indicated that when purchasing

online, consumers with high loyalty tended to choose the brand EC site. Therefore, the brand EC site is considered to provide a better brand experience.

The results of this study provide useful implications for brand management research, where consistent embodiment of the concept is a key success factor (Aaker and Joachimsthaler 2000; Kato 2021; Keller and Swaminathan 2019; Lanseng and Olsen 2012; Park et al. 1991). The target of embodiment includes the online purchasing experience, and the brand EC sites, which are media that the companies can self-manage for communicating their intended brand image (Müller and Chandon 2003). Therefore, reliance on third-party EC sites to enjoy short-term sales growth risks the decline of loyalty from a long-term perspective. A practical implication may be that the maintenance of a strong brand requires ruthless decisions about the relationship with third-party EC sites, as demonstrated by Nike and LVMH's withdrawal from Amazon (Wendlandt 2016; Zimmerman 2020). In the future, both the advantages and disadvantages of third-party EC sites should be examined at the same time. This study has two limitations. First, the extent of comprehension of the purchasing channel depends on the respondent's recognition. To carry out a more detailed verification, it would be ideal to link behavioral data. Second, because this study is respectively limited to PCs in the Japanese market, there is a limit to the generalizability.

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Humanizing Chatbots: The Effect of Fear from the COVID-19 Pandemic

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Abstract. Does fear of COVID-19 shape consumers' tendency to anthropomorphize chatbots? To answer this question, this paper analyzed data from a survey of 377 US participants. Grounded in the three-factor theory of anthropomorphism, our results showed that fear of COVID-19 increases consumers' tendency to imbue chatbots with human-like characteristics, which in turn leads to increased intention to use chatbot-powered mobile apps. In addition, our results also showed that consumers' sensation-seeking (versus pragmatism-seeking) tendency toward using mobile apps moderated the indirect effect of fear on intention to use via perceived anthropomorphism. Our findings provide both theoretical and practical implications, especially with the recent call for utilizing chatbots in customer service due to the COVID-19 pandemic.

Keywords: Chatbot · Fear · Perceived anthropomorphism · COVID-19 pandemic · Sensation-seeking tendency · Pragmatism-seeking tendency

1 Introduction

There are various reasons why chatbots have recently become the go-to solution for firms to provide online customer service. First, chatbots allow firms to provide 24/7 online customer service without human intervention (Ling et al. 2021; Tsai et al. 2021). Second, chatbots can replace human representatives in dealing with various tasks (Leung and Wen 2020; Tsai et al. 2021), thus reducing operating costs (Sands et al. 2020). Third, chatbots help firms to automatically collect and aggregate customer data on a large scale for decision-making purposes (Murtarelli et al. 2021; Thomaz et al. 2020). Since chatbots play a central role in marketing and customer relationship management, it is vital to understand what drives consumers to adopt chatbots, as well as the factors influencing the human-chatbot relationship (Ling et al. 2021).

Anthropomorphism plays an important role in determining consumers' intention to adopt chatbots (Crolic et al. 2022). While prior research has mainly focused on how individuals perceive chatbots with anthropomorphic external features (e.g., conversational style) (Ling et al. 2021), there is scant research addressing how anthropomorphic internal features (e.g., chatbots' warmth) affect individuals' intention to adopt. Also, as the COVID-19 pandemic continues to spread, individuals worldwide have been living in constant fear of being infected (Knowles and Olatunji 2021) and of being alone (due

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to social distancing) (Galea et al. 2020). As a result, people are inclined to use chatbots (e.g., Replika) to alleviate their loneliness during the pandemic (Metz 2020). Nonetheless, the impact of consumers' psychological factors (e.g., fear of COVID-19) on their tendency to anthropomorphize chatbots, as well as the conditions that moderate such a relationship, remain under-researched. Thus, this paper aims to address the following research questions: Does fear of COVID-19 increase individual's tendency to anthropomorphize chatbots? And under what circumstances do such relationship dynamics change?

2 Hypotheses Development

Humans are capable of anthropomorphizing non-human entities from an early age (Lane et al. 2010). The three-factor theory of anthropomorphism (Epley et al. 2007) proposes three motivational factors that determine anthropomorphism: elicited agent knowledge (i.e., the fact that people utilize self-knowledge or human-relevant knowledge in general for judging unfamiliar non-human entities), effectance motivation (i.e., the need to understand and master one's environment), and sociality motivation (i.e., the need to establish social connection) (Sheehan et al. 2020).

The COVID-19 pandemic and its negative impacts stimulate fear, notably fear of loneliness due to the lack of social interactions (Al-Maroof et al. 2020). Since humans are social-centric creatures, according to the theory of anthropomorphism (Epley et al. 2007), sociality motivation increases our tendency to humanize non-human entities in two ways. First, sociality motivation makes it easier for individuals to find social cues (e.g., humanlike traits and characteristic) in non-human agents (Epley et al. 2007). Second, sociality motivation urges individuals, especially those suffering from social distress and disconnection, to actively seek sources of social connection in their environment (Epley et al. 2007). Prior studies have found that individuals tend to humanize religious deities or non-human animals for social supports. Likewise, we argue that as fear of the COVID-19 pandemic increases, people are more likely to anthropomorphize chatbots and perceive them as a surrogate for human contact and warmth (Gefen and Straub 2003). Thus, we hypothesized that:

H1: As consumers experience a higher level of COVID-19 fear, they are more likely to anthropomorphize chatbots.

There is a reason to expect that consumers' perceived anthropomorphism can influence their intention to use mobile apps powered by chatbot services. For example, Moriuchi (2021) found that anthropomorphism positively influenced consumers' intention to re-use voice assistants via the mediating role of engagement. In a recent meta-analysis by Blut et al. (2021), the authors synthesized relevant findings and concluded that anthropomorphism has a strong and positive impact on individuals' intentions to use a chatbot. Thus, we hypothesized that:

H2: Perceived anthropomorphism of chatbots increases individuals' intention to use chatbot-powered mobile apps.

During the COVID-19 pandemic, people have been more likely to adopt and use technology as a way to cope with their fear of loneliness (Kayis et al. 2021). Our study suggests that perceived anthropomorphism can serve as a potential mechanism behind this relationship. Notably, the fear of COVID-19 motivates people to humanize chatbots to gain a sense of social presence and connectedness (Epley et al. 2007). Since anthropomorphizing chatbots provides the social support needed to alleviate their loneliness (Epley et al. 2008), people are more likely to adopt and use chatbot-enabled mobile apps. Thus, we suggest that perceived anthropomorphism of chatbots plays a mediating role in the relationship between the fear of COVID-19 and the intention to adopt chatbot-powered mobile apps. Therefore:

H3: Fear of COVID-19 increases consumers' intention to use chatbot-powered mobile apps via the mediating role of the chatbot's perceived anthropomorphism.

In the context of a mobile app, consumers with a higher pragmatism-seeking tendency (PST) may use mobile apps for functional purposes (Strahilevitz and Myers 1998). In contrast, consumers with a higher sensation-seeking tendency (SST) are more likely to use mobile apps for pleasure and emotional comfort (Choi et al. 2014). Building on this literature, our paper examines whether the type of tendency plays a distinctive role in consumers' adoption of a chatbot-integrated mobile app.

Specifically, we argue that individuals' SST (vs. PST) toward using a mobile app can enhance the effect of fear on chatbots' perceived anthropomorphism. This is because, according to the dual-process models of information processing (Chaiken 1980), automatic processing is often adopted when assessment relies on emotions and sensational qualities, while a deliberate mode is often activated when the decisions require logical reasoning and pragmatic qualities. Since the feeling of fear (e.g., from COVID-19) alerts individuals to enter a survival mode and generate consequent defensive strategies, such a response is regarded as an automatic, affect-laden, heuristic, and intuitive process. Similarly, SST is also governed by automatic processing while PST is governed by deliberate processing. As a result, the higher processing fit between fear and SST (vs. PST) indicates that the process of avoiding or eliminating the experience of fear through humanizing chatbots can be heightened as individuals' SST increases.

Our earlier H3 suggested that perceived anthropomorphism mediates the effect of fear on adoption intent. As SST (vs. PST) increases, the combination of COVID-19 fear and SST can potentially lead to a higher degree of perceived anthropomorphism compared to when there is only fear. This heightened level of perceived anthropomorphism will in turn lead to an increased level of intention to adopt chatbot-powered mobile apps. Therefore, we proposed the following hypothesis:

H4: The effect of COVID-19 fear on intention to adopt chatbot-powered mobile apps via perceived anthropomorphism of chatbots becomes stronger for individuals with SST (vs. PST) toward engaging in a mobile app.

Figure 1 depicts the relationships and hypotheses in our study:

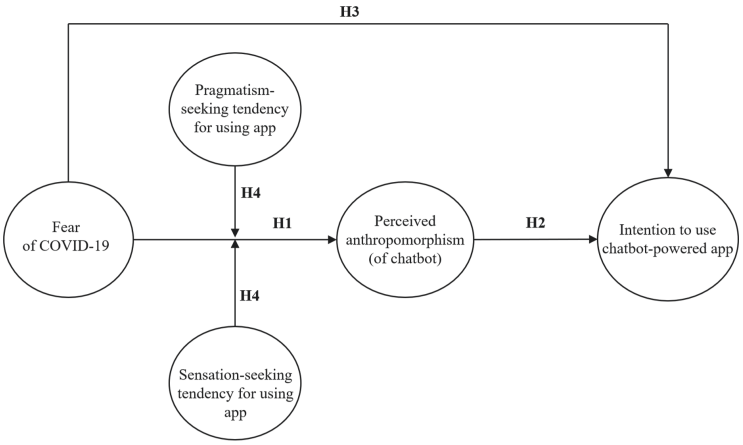

Fig. 1. Conceptual model

3 Method

We collected the data in the US using an online survey on Amazon Mechanical Turk. In the survey, participants first viewed a picture of a chatbot window on a mobile app and then answered the relevant questions. Our questionnaire was part of a larger survey that was intended for a different purpose, thus reducing a potential demand artifact. As recommended by Podsakoff et al. (2003), we ensured the participants that: (1) their anonymity would be protected; (2) there were no right or wrong answers; and (3) their responses would be used for academic purposes only. Additionally, the wording of each item was checked to avoid item ambiguity and complex syntax structures (Podsakoff et al., 2003). These procedures were implemented to lessen the potential for common method biases. A total of 377 valid responses were obtained, of whom 64.5% were male, 78.8% had a bachelor's degree or more, and the average age was 42 years.

We adopted items from the established literature (Babin et al. 1994; Gefen and Straub 2003; Moon and Kim 2001; Witte 1994). The items related to fear were measured on a seven-point scale (1: not at all; 7: to an extreme degree) while all other items were measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). We conducted our analyses with SPSS Statistics 25.0, Excel, and PROCESS macro.

4 Results

4.1 Descriptive Statistics and Reliability Check

According to Table 1, Cronbach's alphas (α) and composite reliabilities (CR) of all constructs exceeded the threshold of 0.7 (Hair et al. 2019), therefore establishing the internal consistency reliability of all constructs. Next, since all factor loadings exceeded 0.65 (Nunnally 1978) and all values of average variance extracted (AVE) were above 0.5 (Hair et al. 2019), our data satisfied the minimum requirements for convergent validity.

Table 1. Reliability and convergent validity

Construct	Item	Component					α	CR	AVE
		1	2	3	4	5			
Sensation-seeking tendency (SST)	ST_1	0.69	0.33	0.14	0.12	0.25	0.89	0.84	0.52
	ST_2	0.70	0.28	0.18	0.26	0.22			
	ST_3	0.76	0.10	0.22	0.27	0.17			
	ST_4	0.75	0.09	0.18	0.22	0.22			
	ST_5	0.69	0.11	0.19	0.35	0.25			
Pragmatism-seeking tendency (PST)	PT_1	0.09	0.84	0.09	0.11	0.17	0.83	0.86	0.68
	PT_2	0.17	0.85	-0.02	0.08	0.10			
	PT_3	0.24	0.78	0.06	0.11	0.17			
Fear of COVID-19 (FC)	FC_1	0.18	0.11	0.84	0.19	0.04	0.94	0.95	0.74
	FC_2	0.14	0.03	0.91	0.11	0.05			
	FC_3	0.12	0.06	0.91	0.09	0.03			
	FC_4	0.13	0.05	0.90	0.09	0.04			
	FC_5	0.05	0.07	0.87	0.04	0.04			
	FC_6	0.28	-0.15	0.73	0.26	0.17			
Perceived anthropomorphism (PA)	PA_1	0.17	0.15	0.15	0.86	0.16	0.92	0.89	0.67
	PA_2	0.32	0.04	0.12	0.78	0.20			
	PA_3	0.17	0.15	0.16	0.84	0.15			
	PA_4	0.34	0.05	0.19	0.79	0.19			
Intention to use (IU)	IU_1	0.27	0.15	0.03	0.23	0.83	0.86	0.83	0.62
	IU_2	0.26	0.26	0.06	0.21	0.79			
	IU_3	0.34	0.16	0.14	0.21	0.73			

Next, we examined discriminant validity using the Fornell–Larcker criterion (Fornell and Larcker 1981). As shown in Table 2, the square roots of AVEs were larger than the inter-construct correlations, thus satisfying the minimum requirements for discriminant validity.

4.2 Mediation Analysis

We adopted model 4 of the PROCESS macro using a 5,000-bootstrapping method with a 95% confidence interval (Hayes 2018) to test H1–H3. Fear positively increased perceived anthropomorphism ($\beta = 0.37$, $p < 0.001$, CI [0.18, 0.30]), providing support for H1. Perceived anthropomorphism had a positive impact on intention to use mobile apps ($\beta = 0.50$, $p < 0.001$, CI [0.35, 0.50]), thus confirming H2. Fear exerted a positive yet

Table 2. Correlation matrices and discriminant validity

Variable	Mean	SD	AVE	SST	PST	FC	PA	IU
SST	3.37	1.00	0.52	***0.72***				
PST	3.89	0.76	0.68	0.46	***0.82***			
FC	4.26	1.69	0.74	0.43	0.14	***0.86***		
PA	3.28	1.09	0.67	0.63	0.31	0.37	***0.82***	
IU	3.64	0.92	0.62	0.65	0.45	0.25	0.53	***0.79***

Note: the square roots of AVEs are presented in diagonal terms, and numbers below the diagonal are the inter-construct correlations.

insignificant impact on intention to use ($\beta = 0.06, p > 0.05$, CI [–0.02, 0.08]). However, the total indirect effect of fear on intention to use via perceived anthropomorphism was significantly positive ($\beta = 0.25, p < 0.001$, CI [0.08, 0.19]). Therefore, the effect of fear on intention to use was fully mediated by perceived anthropomorphism, thus confirming H3.

4.3 Moderated Mediation Analysis

We first adopted model 2 of the PROCESS macro (Hayes 2018) to test the moderating effect of SST and PST on the relationship between fear and perceived anthropomorphism. According to the results shown in Table 3, the moderating effect of PST was insignificant ($\beta = –0.04, p > 0.05$, CI = [–0.11, 0.04]). In contrast, the moderating effect of SST was significant ($\beta = 0.07, p < 0.05$, CI = [0.01, 0.12]).

Based on the above results, we then examined only the moderated meditation effect of SST on the indirect effect of fear on use intention via perceived anthropomorphism. We tested this moderation mediation effect using model 7 of the PROCESS macro (Hayes 2018; Jebarajakirthy and Das 2021). Results of the moderated mediation test are shown in Table 3.

According to the results in Table 3, at one SD below the mean of SST, the indirect effect of fear on intention was insignificant ($\beta = 0.01$, CI [–0.02; 0.04]). However, such indirect effect was significant both at the mean of SST ($\beta = 0.03$, CI = [0.01; 0.06]) and at one SD above the mean of SST ($\beta = 0.06$, CI = [0.02; 0.10]). Moreover, the results of pairwise contrasts indicated that as the moderator increases, the corresponding conditional indirect effect becomes significantly larger. Lastly, the overall moderated mediation index for the conditional indirect effects was significant ($\beta = 0.02$, CI = [0.001; 0.045]), thus supporting H4.

Table 3. Results for moderation and moderated mediation analysis

Moderators	Effect	SE	t	*p*	LLCI	ULCI
Moderating effect on the relationship between fear and perceived anthropomorphism						
PST	– 0.03	0.04	−0.91	0.36	−0.04	0.04
SST	0.07*	0.03	2.32	0.02*	0.01	0.12
Conditional indirect effect analysis at different values of SST			Effect	BootSE	LLCI	ULCI
M – 1 SD (= 2.37)			0.01	0.02	−0.02	0.04
M (= 3.37)			0.03	0.01	0.01	0.06
M + 1 SD (= 4.38)			0.06	0.02	0.02	0.10
Pairwise contrasts between conditional indirect effects	Effect1	Effect2	Contrast	SE	LLCI	ULCI
M versus M – 1 SD	0.03	0.01	0.02	0.01	0.02	0.04
M + 1 SD versus M – 1 SD	0.06	0.01	0.05	0.02	0.03	0.09
M + 1 SD versus M	0.06	0.03	0.02	0.01	0.02	0.04
Index of moderated mediation			Effect	BootSE	LLCI	ULCI
SST			0.02	0.01	0.001	0.045

Note: Contrast = Effect1 – Effect2; SE = standard error; BootSE = Bootstrap standard error; LL = lower limit; UL = upper limit; CI = confidence interval; M = the mean. *$p < 0.05$. Contrast = Effect1 – Effect2

5 Conclusion

5.1 Theoretical Contributions

Our study offers several important theoretical contributions. First, it enriches the literature on the effect of chatbots' perceived anthropomorphism, which has previously yielded conflicted findings (Ling et al. 2021). Grounded in the three-factor theory of anthropomorphism (Epley et al. 2007), our study showed that chatbots with anthropomorphic social traits can enhance consumers' intention to adopt. Second, prior research has mainly focused on how anthropomorphic design cues were used to make chatbots more human-like. Thus, our study adds to the literature by showing that fear of COVID-19 (i.e., a psychological factor caused by the external environment) is also a relevant antecedent to chatbots' perceived anthropomorphism. Third, our paper contributes to the literature on the adoption of radical technologies by discovering the underlying mechanism behind the impact of COVID-19 fear on intention to use chatbot-powered apps. Lastly, our findings enrich the literature by uncovering the conditions in which the indirect effect of fear on usage intention via chatbots' perceived anthropomorphism becomes stronger: when consumers have higher SST (vs. PST) toward using mobile apps.

5.2 Managerial implications

Our study also provides managerial insights for marketers. First, the COVID-19 pandemic has caused severe damage to the service industry, thus prompting firms to find ways to connect with their customers without the risk of physical interactions. Our study suggests that chatbots is one of the technologies that can help service firms achieve such goals. Second, marketers should be mindful of the psychological impacts of the COVID-19 pandemic on their customers' perception and behaviors. Specifically, our results indicate that marketers should try to make their chatbots more human-like in terms of social traits (e.g., warmth and sociability) to increase customers' intention to adopt. In addition, firms should find ways to identify whether their customers use mobile apps for sensational or pragmatic purposes. This will help managers to segment their target audience and modify their applications of chatbots to match customers' usage motivation more effectively.

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Reassessing the Marketing Mix Through the Lens of Digitalization

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Abstract. The digital transformation of the economy compels businesses to put digitalization at the top of the agenda. The focus is particularly on solutions that entail consumption experiences along the integrated customer journey. This new agenda also emphasizes the necessity for a shift in the marketing mix to match revolutionary changes in the consumer journey and expectations. Although the traditional marketing mix consisting of 4Ps has long been criticized for its weaknesses and alternatives were proposed to remedy its shortcomings, it remains unclear how the fundamental functions and instruments of marketing should be adopted to a disrupted experience under digitalization. This particularly entails the lack of co-creational context in makeovers of the concept, through which the disruption along all processes is taking place. In this vein, our ongoing study presents a new marketing mix model via the perspective of digital transformation and its influence on market participants, exploring the question using a lens of 4Ss, namely, solutions, smartness, speed, and semiotics.

Keywords: Digital transformation · Marketing mix · Co-creation

1 Introduction

The idea of the marketing mix has long been a source of contention in marketing theory and practice. The concept was coined by Neil Borden in 1953 and served as the conceptual foundation for developing offerings that meet the customer needs (Borden 1964). The marketing mix elements are blended to form a marketing program that elicits the desired response in a target market (Kotler et al. 2012). Obtaining the desired feedback is inextricably linked to meeting customers' expectations, accompanying the fact that "expectation is an important determinant of satisfaction" (Paul and Bihani 2014, 51). Therefore, it is vital for businesses to adapt their offerings to the changing needs and expectations of their consumers in order to assure satisfaction. Since the digitalization agenda of recent years underlines the need for a similar transformation in the marketing mix to meet revolutionary changes in consumer decision journey and expectations, this study-in-progress proposes a novel marketing mix model by examining the impact of digital transformation on market participants.

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The paper is structured as follows: first, we give a brief literature review on the evolution of marketing mix across time, followed by a statement of the problem. We conclude this study-in-progress by addressing the importance of adapting marketing mix to digital transformation and presenting a fresh model to demonstrate the proposed 4Ss.

2 Literature Review

Historically, the first marketing mix model proposed by Borden consisted of 12 elements, namely: "product planning, pricing, branding, channels of distribution, personal selling, advertising, promotions, packaging, display, servicing, physical handling, and fact-finding and analysis (Borden 1964, 9)." McCarthy (1964) narrowed these elements into four (4Ps) and redefined them as the product, price, promotion, and place. In the following years, several researchers proposed new elements into the 4Ps. For instance, Judd (1987) suggested "people" as the fifth P, Booms and Bitner (1980) introduced three extra Ps for participants, physical evidence and process to extend the concept into services industry, and Kotler (1986) proposed the political power and public opinion formation. Similarly, Purohit et al. (2021) re-conceptualized the traditional marketing mix for Bottom of the Pyramid (BoP) markets and offered a redesigned framework by restructuring the elements based on the customer perspective while preserving existing services marketing concepts. The five Ps in their new approach is personalization, product, place, the process of service delivery, and price.

The majority of conceptual frameworks for marketing mix have been criticized for being production-oriented and failing to take the customer perspective into account (Popovic 2006). Lauterborn (1990) asserts that in order to elicit the desired reaction from the market, consumers should be central to the marketing plan, following the contemporaneous vein of relationship approach to marketing (e.g., Grönroos 1990). The replacement of the 4Ps with the 4Cs (i.e., customer value, convenience, cost, and communication) marked a shift of orientation from products towards consumers, which was widely acknowledged by marketing academia (Miller et al. 2002).

The third Millennium's digitalization trend was also mirrored in efforts to re-describe and re-design the old marketing mix, as organizations attempted to adapt to wholly new marketing aspects spawned by the online world and new technology. Strauss and Frost (2001), for example, established a paradigm that incorporates internet business components into the 4Ps of marketing mix by adding relationship marketing as a fifth component. Similarly, Mohammed et al. (2002) defined the internet marketing mix as combining the traditional 4Ps with community and branding.

Furthermore, Kalyanam and McIntyre (2002) coined the term "e-marketing mix" as an extension of traditional 4Ps and included the following elements: site, personalization, security, privacy, community, and customer support. However, most of these attempts remained isolated to particular domains and lacked a holistic vision that reflected significant shifts in the consumption landscape, such as co-creation, prosumerism, customer journey evolution, and the "smart" revolution.

The relevance of the '4Ps of marketing' in today's digital world continues to spark much debate: Consumers of the 21st century were and are still being exposed to revolutions in the social, technological and economical areas, through which they became

better-educated and had more access to information (Jackson and Ahuja 2016). In other words, they are no longer passive recipients of products and information, and they cannot be described in general terms, without taking the global dimensions of change into account. Moreover, the ecosystems of the new millennium are intertwined more than ever, eliminating any possibility to attempt for studying the actors of business in isolation. Digitalization in this sense, calls for improving our understanding of this interrelation between the actors in the society, while the interaction itself serves to be the locomotive of knowledge and value creation (Pappas et al. 2018), which necessitates consideration of new models incorporating this interplay in marketing.

The original contribution of this study is to suggest a re-work of the conventional marketing mix, emphasizing the paradigm shift caused by digital transformation, and proposing a revised model.

3 Discussion: 4Ss of Marketing Mix

Among a myriad of definitions, digital transformation can be concisely expressed as "the integration of digital technology into all areas of a business resulting in fundamental changes to how the business operates and *how it delivers value to customers, partners and employees*" (Ure 2018, *italics added*), bringing marketing into the heart of this revolution. Digital transformation pertains to each sub-domain of marketing and therefore should be prevalent in every strategic decision made by marketing practitioners. In this sense, the digital transformation of marketing cannot be limited to so-called "digital marketing," which we believe to be a historical misconceptualization of the term, unfortunately restricting digitalization merely to communication-related activities. To this end, the model proposed in this paper aims to integrate digital transformation to all marketing domains, with a locus of "prosumer" and a framework of "co-creation." Co-creation is central to digital transformation and refers to the "the customer's creation of value-in-use" and interactions that facilitate the co-creation of value between the firm and the customer (Grönroos and Voima 2013). In this context, the traditional consumer now also engages in value creation, i.e., production, transforming into a "prosumer," while an outside-in approach replaces inside-out approach of marketing management, which was prominent in the previous decades.

The model, as shown in Fig. 1, that highlights how traditional 4Ps or 4Cs should be addressed from a co-creation perspective, labelled with 4Ss, namely, Solutions, Smartness, Speed and Semiotics. The model was developed by taking the criticisms voiced by several literary predecessors, particularly those addressing the missing links between the actors of marketingscapes in a digitalized world, which posits co-creation as core component of these ecosystems (Pappas et al. 2018).

This novel conceptualization does not merely rename the traditional decision-making domains or make additions that match changing business terminology, but rather integrates the prosumption activity into the core of marketing.

Briefly, a co-creational ***solutions*** framework can be understood as a "collaborative new product development activity" in which customers participate and actively contribute to the new and existing product offerings (O'Hern and Rindfleisch 2009). Co-creation is facilitated by the advancement of digitization, which enables businesses to

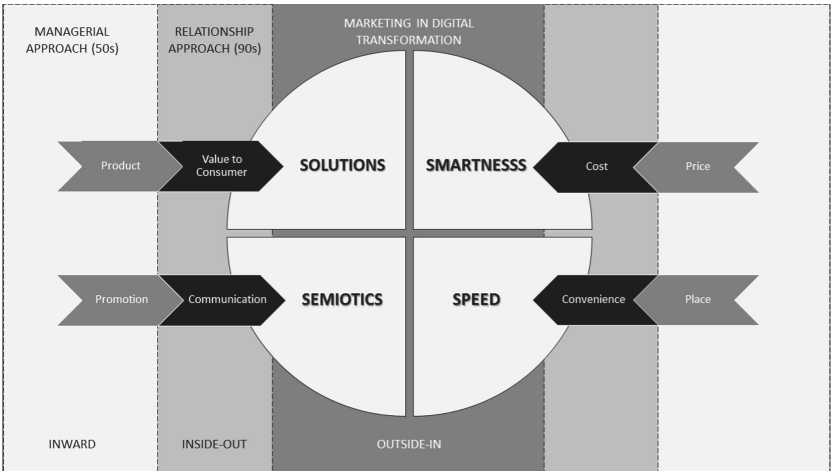

Fig. 1. Marketing Mix in Digital Transformation: The 4Ss

maintain control over the product development process while including all stakeholders. Information, design and ideas are exchanged in real time to further improve the project and the product's life performance. By involving consumers more actively in the new product development process, new insights (ideas, suggestions, and questions) can be generated and further developed, while the customer is made to feel valued.

Smartness refers to different technological systems that are autonomous or collaborative and have combine functionalities including the ability to sense, actuate, and control a given situation to describe and analyse it. For instance, the Internet of Things is a critical component of smartness, which refers to the concept of billions of objects being connected to the Internet in parallel with artificial intelligence, machine learning, and analytics, which develop cognitive awareness in other agents and enable them to interact with their external environment. Smartness, in a co-creational framework, enables companies transform existing products or invent completely new connected ones that dramatically improve operational efficiencies and lower costs, which ultimately are reflected on the prices or other sacrifices that the consumers expected to make. Inventory management, security, wage and labour savings, and energy management are just a few examples.

Speed refers to products, business decisions, data analysis and adaptation to changes in the environment, and co-creation is an imperative factor that speeds up businesses in all these processes. Speed and agility lie at the heart of digitalization, and it does not only refer to "time-to-market", i.e. the time from product development to market launch. Within the context of digitalization, businesses should aim at "economies of time", marking a paradigm shift from economies of scale or scope. Economies of time is about saving the working time as well as the reduced costs for raw materials, consumables and supplies, machines, equipment, and other means of production. The attainment of these goals necessitates information technologies coupled with artificial intelligence, machine learning and advanced analytics. From the consumer's lens, the success of a brand is directly connected to its speed in creating and delivering value. Businesses that operate

in a variety of industries, from consumer goods to telemedicine, agriculture, and banking services, today benefit from driving speed into their business processes and creating a seamless customer experience.

Finally, ***semiotics*** refers to the contribution of consumers and producers to the continuous process of brand storytelling, which often embraces shared symbols and signs. By enforcing an outside-in approach, digital transformation thereby offers a variety of tools to create brand value by leveraging the power of cultural meanings through consumer interconnectedness. In a co-creative setting, consumers and producers collectively contribute to this continuous process of brand storytelling. The digital marketing environment, and particularly social media, plays a critical role in developing and refining brand narratives, for two obvious reasons: First, social media users are storytellers who co-create brands, and second, marketers may leverage powerful tools to drive storytelling. Co-creating a semiotic network around a brand's value through the use of digital technologies (most notably social media platforms) is one of the most prevalent and visible strategies in digital marketing today, even to a point that is misunderstood as the main function of digital marketing.

As Westman et al. (2014) "…[digital] technologies such as social media, mobility, and data analytics are not goals to attain…[but] are tools to get closer to customers, empower employees, and transform internal business processes" (p. 13). Leveraging the impulse of digitalization by acknowledging how these processes are intertwined and could be employed to allow for extraordinary customer experiences is an important task for marketing scholars. This work-in-progress, therefore, is being developed to better understand the role of marketing and brand management within the dynamics of digital transformation and to reflect these changes in a broader fashion to cover all aspects of marketing, as compared to the limited focus of "digital marketing."

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Why Does the User's Attitude for Co-creation Online Vary Across Cultural Contexts? The Role of Prior Experience, Perceived Risk of Use, Brand Reputation, and Brand Trust

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Abstract. This paper explains the differences found in the previous research in the effect of motivators and deterrents on the attitude towards co-creation online for users' groups from different cultural contexts introducing the moderating effects of perceived risk of use, brand reputation, and mediation effect of brand trust to the model. Furthermore, the advanced model is tested by implementing previous experience in co-creation as the moderation effect to the entire model and by comparing different groups using multigroup analysis.

Keywords: Co-creation · Cultural context · Prior experience · Risk of use · Brand reputation · Brand trust

1 Introduction

The need to create value and to involve customers in this process is a topic that is receiving increasing attention in the marketing literature, and its application to the online environment seems to be the most efficient way for a company to build a competitive advantage (Zhang et. al. 2018) and with even more possibilities in the future, as can be seen in the strategies of companies and organizations in all productive sectors (Rasool et al. 2017). This trend has been tremendously boosted by the crisis that the COVID-19 pandemic has caused on a planetary scale: it has transformed the world by initiating new social ways of living (Alon et al. 2020), introducing social distancing as a new norm. Moreover, to deal with these changes, persons are using more digital communication activities in their daily routines than ever before (Ratten 2020).

COVID-19 has converted value co-creation into a more essential part of consumers' and businesses' everyday lives than it has been before basically because the circumstances of the pandemic have restricted the means to co-create value in the offline settings. The companies that can successfully manage to engage customers in online co-creation practices during and after COVID-19 pandemic are the ones that can benefit from new business ideas, innovative sources of income, enhanced understanding of customer needs and the originality of the ideas related to conventional market investigation

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tools (Poetz and Schreier 2012). Since the trend of significance of co-creation practices online will remain growing, it is highly important to focus the research on investigating the barriers and motivators to co-creation online in the international settings.

Chepurna and Rialp (2021) determined the impact of cultural context on the deterrents and motivators for user's online co-creation, specifically: deterrents to online co-creation only have a significant negative effect for the hierarchical cultures with low individualism and masculinity scores (Hofstede 2010); the effect of motivators and attitude on user participation is higher for users from high individualistic cultures scoring high in masculinity and low in uncertainty avoidance. However, there is still a lack of the research that can explain why those discrepancies exist. The current study is dedicated to answering this research question by complementing the earlier model with the widely-used concepts in the online marketing studies - perceived risk of use, brand reputation, brand trust, and prior experience in co-creation online.

2 Theoretical Background and Hypotheses Development

Co-creation in the Online Environment

Co-creation is defined as "a customer's perceived value arising from interactive, joint, collaborative or personalized brand-related activities for or with stakeholders in service systems" (Hollebeek et al. 2019, p. 168). Consumers are building a certain level of perceived value when interacting with brands and companies online, that outcomes in their forthcoming behaviors and developing attitudes towards these firms (Rather 2021). In this research we suggest that the formation of these attitudes and behaviors in the co-creation online frameworks can be affected by the trust that a consumer develops towards a brand, the brand reputation, the notion of the perceived risk of use of the technology, and the experience in the co-creation activities online in the past. We also believe that previously described effects can be different for customers from distinct cultural backgrounds.

Brand Trust

The brand trust is defined as "the confidence a consumer develops in the brand's reliability and integrity" (Chatterjee and Chaudhuri 2005, p. 2). This definition draws one's attention not only to the developing nature of trust, but also that the concept of trust is a function of a consumer's experience. Chatterjee and Chaudhuri (2005) suggest that brand-consumer communications provide the grounds for the improvement of brand trust by extensively developing brand awareness for brands that experience greater levels of trust. In the online environment, trust has been referred to as a significant part in achieving consumers' favorable behaviors (Reichheld and Schefter 2000). According to Huang et al. (2010), the negative or positive attributes that affect attitude on consumers' behavior is mediated by their judgment about these products. Therefore, consumer trust in a product brand may be seen as a consumer's judgment, and can have a mediation effect on the attitude. In line with the previous argument, we suggest the following:

H1: the brand trust has a mediating effect on the relationship between deterrents (a) and motivators (b) to co-creation online and positive attitude towards co-creation online.

Perceived Risk of Use

Perceived risk of Internet use indicates the degree to which a user considers it is insecure to use the web or that undesirable consequences are possible (Grazioli and Jarvenpaa 2000). Perceiving high probability of online risk will unfavorably affect consumer disposition to give personal information, track seller instructions, and, eventually, perform a desired behavior. Also, the risk has frequently been acknowledged to be a main reason in deterring users from acceptance of new know-hows such as a co-creation online practice (Littler and Melanthiou 2006). Leclercq et al. (2016) stated that the absence of the perceived risk and developed level of trust is a key success component of value co-creation practice. Therefore, the following hypothesis has been generated:

H2: the perceived risk of use has a negative effect on the relationship between positive attitude towards co-creation online and participation.

Brand Reputation

The concept of reputation has been described at the general company's position and it has been often associated with the business image and the corporate reliability (Jarvenpaa et al. 1999). Applying this concept to the Internet environment, brand reputation is the outcome of the assessment between what users are promised to obtain and what they finally achieve from the online communication with the company. In reference to this finding, Casalo et al. (2007) have proposed that the improvement of brand reputation may assist in diminishing the ambiguity felt by the users in the online setting. In a co-creation project online, brand reputation would reveal a consistent behavior of the users, showing positive attitude towards co-creation online. Keeping in mind the previous deliberations, we propose our third hypothesis:

H3: the brand reputation has a positive effect on the relationship between attitude and participation in co-creation online.

Moderating Effect of the Cultural Context

Culture is defined as "shared perceptions of the social environment" (Triandis 1972), and it includes verbal and artistic components, as well as traditions, conducts, experiences, morals, and attitudes developed by an individual in the process of socialization. It influences the process of information evaluation and affects the self-analysis and group identification of each person. Cultural context plays important role in the users' online decision-making process. Various studies investigated how online identification is related with users' national context (Lehdonvirta and Räsänen 2011; Grott et al. 2019). Chepurna and Rialp (2021) explored how cultural context moderates the effects of deterrents, motivators, and attitude and how it affects the participation in online co-creation practices. Furthermore, previous research identified dissimilarities in brand trust among cultures (Pentina et al. 2013). Ko et al. (2004) identified differences among cultures in terms of perceived risk of use in online shopping among US and Korean users. Other research results specify that the online behavior is affected negatively for the cultures

characterized by high uncertainty avoidance and high perceived risk with internet (Al Kailani and Kumar 2011).

H4: the cultural context has a moderation effect on the brand trust on the relationship between deterrents (a) and motivators (b) and attitude; on the perceived risk of use (c), and brand reputation (d).

Moderating Effect of the Previous Experience in Co-creation Online

Upcoming behavior of user is also predefined by his/her previous experiences (Thamizhvanan and Xavier 2013). It is argued that the previous experience in using the Internet would considerably reduce the amount of time and mental efforts needed for both learning and performing online activity and therefore should lead to a higher probability of online behavior. Additionally, the theory of diffusion of innovations (Rogers 2003) suggests that innovation that is compatible with previously generated ideas would simplify the implementation of the new ideas. Past experience with co-creation online can reduce the negative effect of the deterrents and at the same time favor the stronger effect of the motivators and positive attitude towards initiating new online co-creation process. Following the Chepurna and Rialp's (2021) findings that were based on the Hofstede's cultural theory we believe that adding previous experience in co-creation online can explain the earlier research results based only on the cultural context. Therefore, the following hypotheses are proposed:

H5: the previous experience in co-creation online has a moderation effect on the the deterrents (a) and motivators (b) have on the positive attitude towards co-creation online (c) and its effect on participation in co-creation online; (d) on the effect of perceived risk of use, (e) brand reputation; and brand trust on the relationship between deterrents (f) and motivators (g) and attitude.

3 Methodology

The survey[1] was sent to the users from Spain and the UK, 307 (M-151, F-156; prev. exp.: yes-23, no-284) and 306 responses (M-147, F-159; prev. exp.: yes-69, no-237) were obtained respectively. Two softwares were used to conduct the data analysis: Stata13 was applied to perform the exploratory and confirmatory factor analyzes, and SmartPLS 3.0 was used for PLS-SEM approach.

Multi-item scales for all constructs were generated based on the previous literature. The scales for deterrents and motivators (second order formative constructs), attitude and customer participation (first order reflective constructs) were adopted from Chepurna and Rialp (2021) study. Perceived risk of use, brand reputation, and brand trust are first order reflective constructs. The method of confirmatory factor analysis was applied to prove the validity of the items provided by Corbitt et al. (2003), Cretu and Brodie (2007), and Chatterjee and Chaudhuri (2005) respectively. The previous experience in co-creation variable was collected through dummy variables adapted from Thompson et al. (1994). All measures used a five-point Likert scale response format, with "1" corresponding to "strongly disagree" and "5" corresponding to "strongly agree."

[1] Due to length restrictions, questionnaire and tables containing the results of the MGA analyzes are only available upon request.

4 Results

4.1 PLS Structural Equation Modeling Analysis

Outer Model Analysis. The entire dataset of 613 respondents was measured using PLS-SEM. Convergent and discriminant validity for the constructs were assessed, with factor loadings (FL > 0.5) (Gefen et al. 2000) and composite reliability (CR > 0.7; Nunnally 1978) significant at the 1% level. The Cronbach's alpha, the measurement of the internal reliability of the scales, had values greater than 0.7 for all constructs. Furthermore, the average variance extracted (AVE) values for all constructs exceeded 0.5 (Fornell and Larcker 1981) and the maximum value of heterotrait-monotrait ratio of correlation (HTMT) was 0.784 (Henseler et al. 2014).

Inner Model Analysis and Path Estimates. The explained variance (R2 > 0.1) was used to measure the predictive ability of the research model (Fig. 1). All constructs passed the Stone-Geisser's Q2 test with the highest value being 0.432. Applying the bootstrapping method, the path coefficients proved the correctness of the model developed by Chepurna and Rialp (2021). In the case of the mediating effect of brand trust, the results show that there is a partial mediation effect between motivators and attitude, but no effect between deterrents and attitude (p-value = 0.357), therefore the first hypothesis is partially rejected. The perceived risk of use has a significant negative effect on the relationship between positive attitude and participation in co-creation online, supporting the second hypothesis. The brand reputation has insignificant moderating effect on the relationship between attitude and participation in co-creation online (p-value = 0.204), therefore the third hypothesis is not supported.

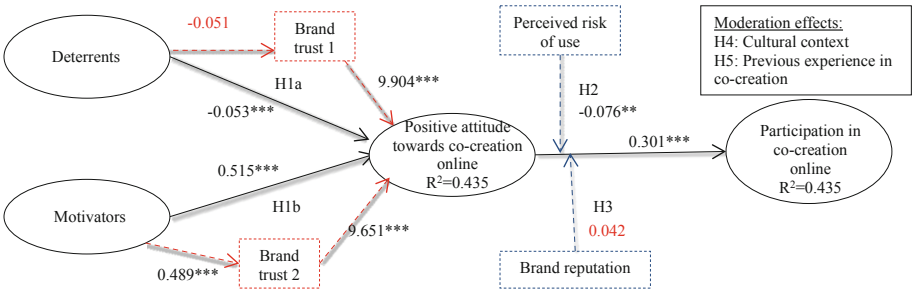

Fig. 1. Research model. *Notes: Deterrents: technology anxiety, lack of trust, skepticism, daily life, task layout, no shared values, no offline meeting, inertia. Motivators: learning, social cognitive, personalintegrative, hedonic integrative, financial integrative. ***p < 0.01, **p < 0.05, *p < 0.1*

4.2 Multigroup Analyses

Cultural Context, Brand Trust, Perceived Risk of use and Brand Reputation

The model studied for the entire dataset was assessed through multigroup analysis in order to determine if the context may cause significant differences between two subgroups – the UK and Spanish samples. The outer model analysis was performed for both samples separately (FL > 0.5, CR > 0.6, AVE > 0.5, and Cronbach's alpha is higher than 0.7 for all constructs for both samples). The partial invariability was detected: there are 8 items with p-value < 0.05. According to the argument by Byrne et al. (1989), the full equivalence is not strictly necessary to make a comparison across groups, meaning that if at least two items per latent variable are invariable, multigroup assessment can be performed validly. Using bootstrapping the path coefficients for Spanish (N = 307) and UK sample (N = 306) were calculated (see Table 1). The last column presents the results of t-test, which shows if there is a significant difference between the path coefficients between the groups. The non-parametric approach to PLS-MGA was applied for moderator effects (Table 2).

Table 1. Path coefficients for multigroup analysis across Spain and UK

Constructs	N=613	Spain	UK	MGA p-value
Deterrents→Attitude	-0.053*	-0.062*	-0.012	0.774
Motivators→Attitude	0.489***	0.430***	0.536***	**0.083**
Attitude→Participation	0.301***	0.179***	0.379***	**0.028**
Deterrents →Brand trust 1	-0.051	-0.074	-0.021	0.716
Brand trust 1→Attitude	9.904*	12.075	10.814*	0.473
Motivators→Brand trust 2	0.515***	0.473***	0.571***	**0.091**
Brand trust 2→Attitude	-9.651*	-11.821	-10.588*	0.527
Perceived risk of use	-0.076**	-0.091*	-0.061	0.639
Brand reputation	0.042	0.082	0.022	0.181

Table 2. MGA for cultural context and previous experience in co-creation.

Variables	ESexp	ESnoexp	UKexp	UKnoexp
	(N=120)	(N=187)	(N=174)	(N=132)
Deterrents→Attitude	-0.018	-0.084*	-0.047	-0.055**
Motivators→Attitude	0.419***	0.389	0.666***	0.374***
Attitude→Participation	0.159*	0.118***	0.472***	0.280*
Deterrents →Brand trust 1	-0.177**	-0.055**	-0.028	-0.142
Brand trust 1→Attitude	10.729	24.162*	6.911*	17.063
Motivators→Brand trust 2	0.503***	0.388***	0.586***	0.531***
Brand trust 2→Attitude	-10.52	-23.9*	-6.74*	-16.7
Perceived risk of use	-0.147*	-0.072	-0.056	-0.032
Brand reputation	0.045	0.106	0.066**	0.008

MGA p-value	Det.→ Att.	Mot.→Att.	Att.→Part.	Med.B.T.1	Med.B.T.2	Mod.PRU	Mod. BR
ESexp-UKexp	0.355	**0.026**	**0.003**	**0.062**	0.640	0.769	0.299
ESnoexp-UKnoexp	0.747	0.474	0.797	0.138	0.535	0.742	**0.079**
ESexp-ESnoexp	0.226	0.407	0.364	0.851	0.222	0.734	0.731
UKexp-UKnoexp	0.657	**0.041**	0.162	**0.062**	0.204	0.697	0.297

The explanation to the results obtained are presented in Table 3.

4.2.1 Cultural Context and Previous Experience in Co-Creation Online

This research involved analysis across four groups combining two variables of cultural context and previous participation in co-creation online. Satisfactory results were obtained when measuring convergent and discriminant validity of the outer model separately for each sample, where the factor loadings are higher than 0.5, CR > 0.6, AVE > 0.5, and Cronbach's alpha > 0.7. Furthermore, the consistency of construct measurements and meanings across subsamples was validated ($p > 0.05$) and the invariability of the model was proved (FL > 0.05). Bootstrapping was conducted for the path coefficients of the Spanish and the UK subsamples with or without previous experience and the significance comparison of those. Explanations are provided in the Table 3.

Table 3. Conclusions, theoretical and managerial implications, future research lines

Conclusions		Theoretical and managerial implications, future research
Brand trust	There is no mediation effect between deterrents and attitude for either of the samples. There is a partial mediation effect of brand trust on the relationship between motivators and attitude, but not for the Spanish sample	The hypothesis of the existence of the mediation effect between deterrents and motivators was derived from the search of possible explanations of the results obtained in Chepurna and Rialp (2021), where the deterrents had significant effect for the Spanish sample, but not for the UK sample. This study revealed that brand trust does not have any mediation effect between the relationship of deterrents and attitude, however there was partial mediation effect found for the motivators and attitude for the UK sample. Managers should understand that the positive effect of the motivators is partially due to the strong brand trust of the user that increases the positive attitude towards co-creation. The future research should continue searching the possible mediation effect between the deterrents and attitude for the users from similar to the UK cultures
Perceived risk of use	The perceived risk of use has a strong negative moderation effect for the entire sample, Spanish users' sample, for Spanish users with previous experience	Managers can interpret this result in the following manner: the riskier the user perceives his experience in the online co-creation project the less participation can be expected. Furthermore, the results obtained for the Spanish users and more precisely for those with previous experience, mean that they have tried before the co-creation online and their experience wasn't pleasant/secure and therefore, now they perceive it to be "risky", which affects negatively their participation level. Future research should look for the ways to study this type of users from a broad perspective (with experience and originating from similar culture to Spanish) in order to obtain trustable results

(*continued*)

Table 3. (*continued*)

Conclusions		Theoretical and managerial implications, future research
Brand reputation	Brand reputation has no moderation effect on the relationship between attitude and participation in co-creation online, however, it was found to be significant for users from the UK with previous experience in co-creation online	Apparently, brand reputation in the case of online co-creation doesn't create the expected moderating effect like in case of online shopping for the general public. This finding should give a clear hint for the marketers that brand reputation is indeed not significant for the users as might logically seem when deciding to participate in co-creation online. However, marketers from the cultures like the British should give special attention to their public appearance as it might affect positively the levels of participation in co-creation projects online. Researchers should look closely to this phenomenon. One of the possible research questions might be: does brand reputation have more influence on the users from cultures like the British than on the users from cultures similar to Spanish?
Previous experience in co-creation online	The effect of motivators and attitude towards participation is stronger for UK with experience than for Spanish with experience. The effect of motivators is stronger for Uk with experience than for the UK without experience. The MGA p-value shows that there is significant difference for mediation effect of brand trust, however the path coefficients are not significant	The marketers can derive certain conclusions from the paper and apply them in their professional practice: (1)The *highest participation level* in a co-creation project online is expected if targeting the users that come from the cultures similar to British and with previous experience in co-creation, due to the higher effect that motivators have on attitude, the deterrents do not have a significant effect on attitude, there is neither moderation effect of perceived risk of use nor of brand reputation that may affect participation behavior. The variable to pay attention to is a brand trust which has a partial mediation effect between motivators and attitude. (2) The lowest participation level in a co-creation project online is expected if targeting users from cultures similar to Spanish and with no previous experience in co-creation online; these users are expected to be exposed not only to the negative effect of the deterrents have on the attitude, but also to the full mediating effect of brand trust between motivators and attitude. To increase the applicability of these results, researchers should gather data from various cultures similar to the British (e.g. USA, Australia, Canada and Denmark) and to the Spanish (e.g. Greece, Portugal, Brazil, Argentina, Chile and Russia)

5 Conclusions and implications

A number of managerial and theoretical implications can be derived from this research. First of all, this paper is of a special value for academia as it expands the marketing model studied by Chepurna and Rialp (2021) by adding the moderating and mediating effects. This not only proves the nature of reflective and formative constructs developed in the previous works but also offers the new lines for the future research. Although the theoretical implications are essential in this study, the main focus of the current research is given to the managerial implications.

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Key Opinion Leader and Business Growth: Econometrics and Machine Learning Approaches

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Abstract. Key opinion leaders (KOLs) are individuals with a strong social status whose recommendations and opinions are influential on their followers' decision-making (Bamakan et al. 2019; Chowdhry and Newcomb 1952). Prior to the social media era, KOLs were typically political figures, journalists and celebrities who received enough media exposure to cast their influence. The increasing importance of user-generated content (UGC) provides regular people with such opportunities and creates new groups of KOLs.

The brace for KOLs roots from the importance of acquiring trustworthy information during consumers' decision making. The role of KOLs is twofold: first, the opinions offered by KOLs reduce information asymmetry; second and more importantly, KOL social status legitimates their opinions (Kirmani and Rao 2000) and because of that, those opinions may be deemed more trustworthy than information from other sources. For small businesses, online consumer review (OCR) communities, such as Yelp, is designed to facilitate information sharing and simplify the customer decision making process. Online communities analyze the textual information and aggregate them into a review score to signal quality and to attract customers. A recent article on Martech Advisor (BasuMallick 2020) shows that Yelp brings in 38 million unique mobile app users every month, and 91.3 million users via its website. Customers around the world are using Yelp to look up businesses around their regions. As such, business owners seek 5-star reviews to convert potential customers into sales (de Langhe et al. 2016). As one of the most typical forms of electronic word-of-mouth (e-WOM), OCRs have received continuous attention from both business and academia. Although research has found relevant cultural differences and nuances (Kim et al. 2018), OCRs are suggested to be an important component of a successful product, because they act as social proof to other customers (Salesbacker 2019).

Many e-commerce retailers and review communities have invested in reviewer ranking or certification programs that grant qualified consumers the KOL status to further validate their credibility. Yelp Elite Squad, a reviewer certification program launched by Yelp in 2005 possesses the original goal of identifying KOLs within the community (Rocks and Michael 2015). Once users are certified as "Elite" reviewers, they obtain a colorful Elite badge displayed on their Yelp profile (see Fig. 1). In addition to knowing

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whether a reviewer has Elite status, readers can also filter reviews to only view reviews by Elite reviewers. Given the dynamism and social engagement of Elite reviewers, their reviews typically appear on top of the entire review thread, which highlights the influence and potential economic impact of this status.

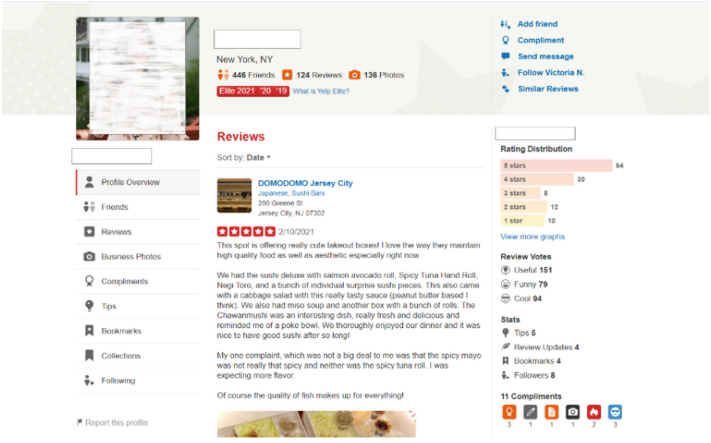

Fig. 1. Yelp Elite Squad profile example

Some research discusses the impact of reviewer certification on sales, primarily focusing on an indirect effect through the aggregate numerical rating of the products. Luca (2012) examines the impact of Elite reviews implicitly through an average of the ratings left by Elite reviewers and finds that the impact of average Elite ratings on sales doubled that of other reviews. However, the numerical ratings might not sufficiently convey important subtleties of online interactions and do not tell the entire story. Yelp does not officially disclose the relative weight they assign to Elite reviews when aggregating all the reviews into a rating score. The direct economic effect of a KOL's review on business sales needs to be further explored in the literature. Additionally, Yelp does not disclose how they evaluate reviewer's Elite status, although existing literature suggests that 'Elite-worthiness' could potentially be based on several review and reviewer features, including well-written reviews, high quality tips, a detailed personal profile, an active voting and complimenting record, and a history of cooperative engagement (Patterson 2020). This uncertainty highlights the importance of investigating the drivers of KOL status and our work will contribute through machine learning approaches.

Being certified as an Elite reviewer on Yelp can be a good indicator of a reviewer's competence and can enhance a reviewer's reputation in the community. Reviews that the community finds helpful have a stronger influence on consumers' purchase decisions than other reviews do (Chen et al. 2011). Reviews posted by KOLs act similarly to feedback ratings, mitigating customers' uncertainty of the product and business, but in a more nuanced way. When consumer product awareness is not high, which can be reflected through a low review volume (Lu et al. 2013; Yang et al. 2012), a review posted by a KOL or highly-reputed review can help make up the lack of product awareness and exert a direct impact on sales.

In addition, KOL's reviews tend to have high ratings compared with regular reviews, which might trigger a positive effect on business sales. These findings suggest unequivocally that KOL reviews might increase business sales. Chen and Lurie 2013, also using Yelp review data, found evidence that the information value of a review is negatively related to the review valence, and that a negative KOL's review can impact sales in a negative direction. Additional findings in this same work indicate that the impact of the first positive KOL's review on sales are disproportionate and outperforming other negative KOL's reviews, thus generating an overall positive economic impact on sales of the business. In light of the existing literature, we suggest the following research proposition that will be empirically tested to assess the effectiveness of review certification programs:

- P1: Inviting KOL's reviewer to write a first KOL review for the service increases business sales.

Previous literature seems to suggest that the positive impact of KOL's reviews do not depend on the rating of the review itself. Finally, (Luca 2012) found evidence that a one-star increase in Yelp business rating leads to a 5–9% increase in revenue, which suggests that the pre-existing rating of the business may play a role in the effect of the first KOL review. We propose the following propositions that the boosting effect of first Elite review could be weakened for those businesses who already signal a high reputation through its high average business rating. In other words, the effect of the first KOL review can be negatively associated with the previous ratings of a business.

- P2a: The effect of the first KOL's review is negatively associated with average rating of the business.
- P2b: The effect of the first KOL's review is irrespective of the rating of that review.

We start by examining the direct economic impact of reviewer certification programs based on a two-level study. We add to the perspective of previous research a more granular investigation of how KOLs' opinions and comments encourage business patronage. A recommended approach to understand causal relationships is through running randomized trials (Aral and Walker 2011). However, random assignment of KOL's reviews is infeasible in this study given that its goal is to study the economic impact of the first Elite review resulting from businesses' unprovoked decision to invite Elite reviewers. In the absence of random assignment, a common approach is to employ the difference-in-difference (DID) technique with propensity score matching (PSM) to estimate the treatment effect (Bapna et al. 2018; Goh et al. 2013; Xu et al. 2017). To account for both observable and unobservable covariates, we utilize a DID analysis with look-ahead PSM (LA-PSM) to estimate the difference between the matched treatment and control groups' change in business sales before and after the first KOL's review from Elite reviewers. The results indicate that the first KOL's review significantly boosts business sales and this effect is moderated by the average business rating and is irrespective of the rating of that KOL's review. This implies that finding KOLs and inviting them to review a business can help local restaurants, especially for those newly launched ones, to lift their sales through product awareness enhancement and customer uncertainty mitigation.

Our results also indicate that the sales boosting effect will be moderate among businesses that already possess high rating and regardless of the rating of the first KOL's review. Business rating also acts as a customer uncertainty mitigator, thus making KOL's reviews less crucial in affecting customer decision making. Most of the first KOL's ratings are found to be moderately positive and exhibit little variation. The positive KOL's reviews generate a dominating impact on sales compared to the negative ones, which conceivably explains the insignificant impact of KOL's rating on the sales lifting happens after obtaining the first KOL's review. Businesses should be encouraged to invite KOL's reviewers even though a high review rating might not be guaranteed. Businesses' decision to invite the first certified reviewers happens prior to the rating's being revealed. Given the overall positiveness of the first certified reviews, businesses should still be encouraged to get their first certified review early. Despite the rating's effect, business sales can still be lifted through the certified reviewer's social power and activeness in the online community.

Based on the econometric analysis in the first level, two follow-up inquiries are: (1) how sales can be predicted given the consideration of KOL's reviews; and (2) what the primary determinants of reviewer certification would be among various reviewer characteristics are. In the second phase, we build two machine learning models using Random Forest (RF) to predict business sales and reviewer's Elite status by including other review and reviewer characteristics as well. We also create Partial Dependence Plots (PDP) based on the model output to capture the dependency pattern and further interpretation of sales and reviewer certification regarding their determinants.

The number of KOL's reviews and two textual characteristics of reviews, average review polarity and average review length, appear to be important features in sales prediction. Consistent with extant theory, our findings also suggest features related to reviewers' social activities are more important determinants of reviews' Elite status than those review history related characteristics. To get or retain Elite status, reviewers need to maintain their social activity and influence by engaging with other users and sending more feedback votes to reviews posted by other users as well. The importance of social ties in OCR suggests an interesting blend between the traditional role of social media platforms focused on developing social networks online (Holsapple et al. 2018; Obar and Wildman 2015) – by connecting a user profile with other individuals and/or groups, such as Facebook or LinkedIn – and the role of product review sites, traditionally defined as free "sales assistants" (Xi and Chen 2008).

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Omnichannel Experience in Loyalty Loop for Customer Engagement Management

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Abstract. This study explicates customers' experience in the context of omnichannel integration strategy by synthesizing a disparate body of research in the topic areas of omnichannel marketing, customer engagement, and loyalty loop. The research model was built on a strategic set of managerial factors and their influences on customer engagement behaviors in the initial stage of omnichannel integration. Analysis results found that web usability and customer characteristics, such as share of store visits, social media use, and email receptivity, were associated with customer engagement behaviors. Customers' email receptivity moderated the impact of channel characteristics, including web usability and store proximity.

Keywords: Omnichannel marketing · Customer engagement · Loyalty loop · Customer experience management · Customer journey

1 Introduction

This study constructs a research model to strategically manage customers' experience in the context of omnichannel integration, focusing on the management of customer engagement behaviors (CEBs). Both marketers and scholars recognize the usefulness of the concept of engagement that enables them to depict the customer's role in the experience. In our research model, we investigate the direct and moderating effects of firm-based factors (i.e., channel characteristics) and customer-based factors (i.e., customer characteristics) on CEBs. This study accounts for a strategic model of omnichannel integration to enhance customer engagement management, claiming that omnichannel integration can provide a groundwork to engage customers into and put them on hold in loyalty loop which intends to enroll customers into an ongoing cycle of loyalty. We aim to highlight the strategic importance of CEBs through the framework of loyalty loop, constructing a nomological net of the nonpurchase-focused behaviors in managing omnichannel customer experience and relating managerial constructs as their antecedents and consequences in a loyalty loop. To our knowledge, no extant studies investigated customer engagement behaviors in the context of managing business-to-business customers' omnichannel experience in a loyalty loop. This study focuses on

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managing omnichannel customer experience and aims to generate new insights into the management of CEBs in a loyalty loop. By providing seamless and thus more wholesome experiences to the customer, omnichannel integration makes the stage increasingly relevant to the customer whom the marketer wants to put on hold in the loyalty loop. This study aims to develop an impactful study in a rigorous procedure, which has the potential to improve decision-making in practice (Suh et al. 2017; Suh and Chow 2021).

2 The Research Model and Hypothesis Development

The research model of this study includes five relevant types of CEBs (interactions, word-of-mouth, recommendations, cocreation, and helping other customers) and their managerial antecedents: channel characteristics (web usability and store proximity) and customer characteristics (store visits, social media use, and email receptivity). The five antecedents were selected as more important managerial factors through a series of discussions with our research collaborators-in-practice who are marketing managers in the context of the initial stage of their omnichannel integration. This study places CEBs at the center of this discussion in terms of the managerial consideration of omnichannel integration. The nomological net of CEBs (e.g., Suh et al. 2020) has a bi-directional relationship with outcome variables such as brand loyalty, which does not follow a sequence and has an iterative quality. The continuous nature of consumer engagement (behaviors) in an exchange relationship to enhance brand loyalty, explains the dynamic and multidimensional ability of consumer engagement to act as an antecedent and consequence in the feedback loop (Brodie et al. 2011).

2.1 Channel Characteristics

2.1.1 Web Usability

Web usability is one of the important factors for the quality of a website and other consequences. The usability literature suggests a direct or indirect interrelationship between engagement and usability. Arguing for "thinking of engagement in terms of use, rather than by technical features" (p. 17), Porter (2008) asserted engagement is epistemologically a close associate of usability. There is ample evidence regarding the indirect relationship. The association between usability and CEBs could be understood in terms of the marketing funnel or loyalty loop framework. For example, according to Montoya-Weiss et al. (2003), the website's perceived usability is positively associated with perceived virtual channel service quality. A website usability study found usability directly affected satisfaction and customer loyalty, and positive word-of-mouth. Therefore, the following hypothesis is developed.

H1: Web usability enhances CEBs in the omnichannel context.

2.1.2 Store Proximity

Generally, the distance to a store influences a store's attractiveness, decreasing with distance (Dennis et al. 2002). The distance to a store that increases the number of alternatives entails more costs, such as time, efforts, psychic burden, to reach a store. Meanwhile,

distance decreases the demand by negatively impacting utility and the formation of the store's overall evaluation, and inconvenience incurred by the travel distance also has negative impacts on the store's evaluation and whether to use the store (Darley and Lim 1999). Positive evaluations of a store's attributes, including travel distance, make customers passionate about the store and interested in knowing about and consciously paying attention to the store, and then develop motives to shop at the store (Vivek 2009). Therefore, positive evaluation of stores' stimuli, including distance, forms customers' experience and triggers the co-creation of values and customer engagement (Mohd-Ramly and Omar 2017). Also, the spatial distance from an object determines the amount of available information. As individuals approach an object, they tend to have more and detailed information. Given that individuals with more knowledge and information tend to engage in word-of-mouth (Bansal and Voyer 2000), customers physically closer to a store are likely to execute CEBs. From the discussion above, we expect perceived store proximity enhances CEBs while, corollary, perceived store remoteness dwindles CEBs. Thus,

H2: Perceived store proximity is positively associated with CEBs.

2.2 Customer Characteristics

2.2.1 Share of Store Visits

We claim customers' loyalty indicated by frequent store visits should be an important motive for managing customer engagement in our research context, focusing on a set of existing customers. A non-linear, loop model is replacing the traditional, linear model of the marketing funnel. The emerging notion of the customer loyalty loop can realistically illustrate how marketers engage with customers after the first purchase and how consumers decide their purchase and continue to make purchases again in the future (Court et al. 2009). According to this framework, customer engagement management may be initiated with a group of loyal customers. If marketers understand how customers make their way through the loyalty loop, it would be much easier for them to make their customers experience different moments of brand resonance that can repeatedly reinforce loyalty. When it comes to customer experience management, loyal customers, often indicated by the share of store visits in the context of retailers (Kumar and Shah 2004), must be the first or automatic audience for any engagement programs. Loyalty and engagement are pigeonholed into the framework of brand resonance (Keller 2013). Therefore, the following hypothesis can be entertained.

H3: In the omnichannel context, the share of store visits representing customer loyalty is associated with customer engagement behaviors.

2.2.2 Social Media Use

The omnipresence of social media has significantly altered the ways customers engage with focal objects and brands. Social media's interactive properties enable customers to shift to active participants from passive observers and serve as an ideal forum for brand-related advocacy. Other studies also tested social media's role on customers' co-creative content generation (Vivek et al. 2012) and co-creative product innovations (Hoyer et al. 2010). Also, omnichannel marketers consider social media as one of the

main venues regarding cross-channel integration because a consistent experience across channels is critical for effective customer engagement. Customers become more engaged when they value the content and process consistency across channels (Hollebeek 2011) which enables marketers to provide a valued exchange to customers (Lee et al. 2019). Therefore, for omnichannel marketers, customers' social media use should be associated with CEBs.

H4: Customers' social media use is positively associated with customer engagement behaviors in the omnichannel context.

2.2.3 Email Receptivity

Email is a useful promotion channel that allows marketers to acquire potential customers, retain current customers, and provide information about offerings (Tran and Strutton 2020). Permission-based email is trusted and highly relevant to recipients (i.e., customers). In the first place, when customers decide to opt-in, they have already evaluated the email sender as trustworthy. Also, reflecting customers' specific interests indicated when they opt-in, marketing messages in the opt-in email tend to have high relevance to the customers. In addition, opt-in emails contain promotion offers that can be perceived as economic gains (Carmen and Nicolae 2010). The permission-based email with such features can boost customers' engagement through the customers' motivation process. As expected benefits enhance the ability to strengthen confidence, improve the status, establish a reputation, and enhance self-efficacy (Verhagen et al. 2015), perception of expected benefits, such as economic benefits from promotional offers in an email, can raise enthusiasm for and thus customers' involvement in the product/service or brand (Nardi et al. 2020). Based on the discussion, recipients of permission-based emails are likely to execute engagement with a product/service or brand. Therefore, given that most customers receive promotional emails after voluntarily agreeing to receive promotional emails (Godin 1999), permission-based email recipients are more receptive to promotional emails and are likely to demonstrate CEBs. Thus,

H5: Customers' receptivity to promotional emails is positively associated with customer engagement behaviors in the omnichannel context.

It also follows that the effect of web usability on CEBs will be intensified under the condition that customers are more receptive to promotion-related information via email. Hence,

H6: Customers' receptivity to promotional email strengthens the association between web usability and customer engagement behaviors in the omnichannel context.

In addition, we expect that customer's receptivity to email promotion can moderate the relationship between store proximity (or store remoteness) and CEBs. As we discussed earlier, store proximity can enhance CEBs, or store remoteness can diminish CEBs. Considering the strong involvement of customers with a strong preference for email promotion, we expect the receptivity to email promotion can mitigate the negative relationship between store remoteness and CEBs. That is, as the distance between customer and physical store increases, the customer with high receptivity (vs. low receptivity) to email promotion is likely to perform the higher CEBs. Therefore,

H7: Customers' receptivity to promotional email diminishes the association between store remoteness (i.e., low proximity) and customer engagement behaviors in the omnichannel context.

3 Methods

The research site was a traditional building supply company with siloed structures in which the virtual and physical operations were done almost independently without being integrated. The company has focused its marketing strategy on business-to-business customers. By the period of data collection, the company was planning for omnichannel integration under the leadership of the CMO. We randomly selected 1,000 names of existing customers from the company's customer database and sent them an email survey. The database contained repeat customers who had made multiple purchases. We collected 340 participants to whom we gave a gift card ($50). The response rate was 34%. We finally obtained a valid dataset from 322 participants after removing incomplete data from 18 participants. We used various scales for the current research. The survey instruments were carefully discussed and selected through three in-person meetings with the company's marketing team. Whenever available, we used existing scales from the literature after adapting them for the context. Since some of the scales include multiple items, we used confirmatory factor analysis (CFA) to assess the factor structure of survey measures. Then, we adopted structural equation modeling (SEM) to test the hypotheses. CFA results demonstrated that the model has acceptable model fits ($\chi 2 = 178.81$, df = 72, $p < .01$; SRMR = .06, RMSEA = .07; CFI = .93). Prior to conducting SEM, we conducted multiple methods to ensure the dataset is free from common method variance (CVM) since the data were collected from single sources. We controlled CVM factoring CLF into the model to ensure the validity of the analysis. We report results from both models with CLF and without CLF.

4 Analysis Results

In the structural model ($\chi 2 = 154.00$, df = 86, $p < .01$; SRMR = .04, RMSEA = .05; CFI = .96), we controlled for the effects of CMV, homeownership, homeownership, years of having known the company, age, and gender. Also, as in the CFA model, negative error variance at one item of web usability was fixed at .001. First, we tested the direct effect of each independent variable on CEBs. Except for H2, all other hypotheses were supported. In addition to the direct effect tests, the moderation effects of email receptivity were tested. First, we tested the moderating effect of email receptivity on the relationship between usability and CEB ($\chi 2 = 521.66$, df = 145, $p < .01$; SRMR = .06, RMSEA = .09; CFI = .83). The result discovered that email receptivity intensified the relationship between usability and CEBs both when CMV was controlled ($\beta = .13$, $p < .05$) and uncontrolled ($\beta = .14$, $p < .05$). H6 and H7 were supported in both models (Table 1).

Table 1. Results of hypothesis test

Direct effect on CEBs		**Model with CLF**			**Model without CLF**		
Hypothesis	Path	β	S.E.	C.R.	β	S.E.	C.R.
H1	Web usability → CEBs	-.03	.05	-.35	.26**	.04	3.76
H2	Store proximity → CEBs	.01	.05	.11	.00	.08	-.07
H3	Share of store visits → CEBs	.31**	.29	3.78	.33**	.39	4.66
H4	Social media use → CEBs	.19**	.01	2.63	.18**	.01	2.74
H5	Email receptivity → CEBs	.16*	.02	2.38	.15*	.02	2.47

*: p <.05, **: p <.01

Moderating effect on CEBs		**Model with CLF**			**Model without CLF**		
Hypothesis	Path	B	S.E.	C.R.	B	S.E.	C.R.
H6	Web usability x Email receptivity → CEBs	.13*	.02	2.10	.14*	.02	2.29
H7	Store proximity x Email receptivity → CEBs	-.13*	.02	-2.00	-.12*	.03	-2.06

*: p <.05, **: p <.01

5 Discussion

For channel characteristics, including web usability and store proximity, we discovered the contradicting findings about the association between web usability and CEBs according to CMV either controlled or uncontrolled: the path was only significant ($\beta = .26$, $p <. 01$) when CMV uncontrolled. For the insignificant relationship ($\beta = -.03$, n.s.) when CMV controlled (i.e., in the model with CLF), we speculate that it is because the negative error term of one item of web usability was fixed to .001 to address Heywood case (i.e., negative error variance) (Nguyen and Biderman 2008). While the observed correlations might be inflated in a model with CMV uncontrolled due to common biases, we believe a model with CMV controlled may have a lower standardized beta coefficient but not an extremely low standardized beta coefficient close to 0 if it were not for Heywood case. Also, we do not expect the association between web usability and CEBs to disappear just because we controlled for CMV considering the theoretically implied relationship between them (e.g., Casaló et al. 2008). This relationship should be tested in future research.

For customer characteristics, including the share of store visits, social media use, and email receptivity, the current study found that the share of store visits, representing loyalty, is positively associated with CEBs. Also, social media use, which turns customers into active participants, was positively associated with CEBs. Finally, since those who are receptive to email promotion already decide to opt-in to email service and are highly involved in the product/service and brand (Nardi et al. 2020), email receptivity was found to be positively associated with CEBs. Considering the mediating effect of involvement was not tested explicitly in the current paper, we suggest future research to explore the mediation effect.

The current study also found that email receptivity, one of the personal characteristics, moderates the effects of channel characteristics, including web usability and store proximity (or remoteness), on CEBs. That is, the effect of web usability on CEBs was found to be intensified under the condition customers prefer to receive promotion-related information via email. Furthermore, it was also found that as the distance between customer

and physical store increases, the customer with high receptivity (vs. low receptivity) to email promotion is likely to perform the higher engagement CEBs.

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Consumers' Online Brand Related Activities in the Context of Their Motives and Outcomes: Case Study of the Social Network YouTube

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Abstract. This study analyzes consumers' online brand related activities (COBRAs) on the social network YouTube. These activities include consuming, contributing and creating brand-related content. The goal was to assess the effects of COBRAs on motives and the outcome for the brand in the form of word-of-mouth. The paper analyzed the primary data of a standard-designed questionnaire filled in by 346 respondents. In order to meet the goal, the paper employed business factor analysis and subsequently also PLS PM modelling equations. The significance of the selected trajectories analyzed was observed in the case of all four motives and also in terms of the impact on the brand in the form of word-of-mouth. The results were also interpreted in the context of the existing research. The analysis showed that the most effective motives with a significant trajectory for all three types of COBRAs are social interaction and remuneration. The results of our findings are among the first to confirm this concept on the social network YouTube.

Keywords: Consumer · Online · Activities · Brand · YouTube and confirmatory analysis

1 Introduction

Today, social media grow extremely fast. Therefore, there is a clear need for scientific research in this area, as social media are very important for e-commerce business indicators. Technological and behavioural knowledge of this issue can provide the brand with a competitive advantage and also help in research. The presented paper aims at confirming the relatively new concept of consumers' online brand related activities, known as COBRAs, in the context of consumers' motives for these activities and their outcomes for the brand in the form of word-of-mouth. Such a research setting was outlined in the study by Piehler et al. (2019) where the exploratory factor analysis was employed. The study hereunder tackles the need to confirm and replicate Piehler's study in conditions of new markets and platforms. The pandemic made it clear such a study is needed, as because of it many communication links between the brand and its consumers were broken. As it turns out, one of the few unaffected channels are social media. The paper focuses on the social network YouTube. YouTube has the second largest number of active

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users per month (2.3 billion) (Kemp 2021). Apart from being an influential social media platform, it is also the second most visited site on the Internet (Newberry 2021). The aim of the paper is to assess the effects of COBRAs on the consumer's motives and on the brand's word-of-mouth on the social network YouTube.

2 Theoretical Background and Current State of Research

Consumers' online brand related activities are understood as behavioural constructs (Schivinski et al. 2016). Their role is to unify the understanding of the categories of activities that consumers perform online (Muntinga et al. 2011). Content consumption is an activity with the lowest level of engagement under the COBRA concept. The work by Dholakia et al. (2004) is among the first studies to address the issue. According to Muntinga et al. (2011), this is the most common form of COBRA. The medium level of engagement is represented by the content contribution, as the content contribution is not yet the creation itself, but reflects a certain form of contribution to the content. The first studies to analyze this type of COBRAs include those by Patria Dellarocas et al. (2007), Chevalier and Mayzlin (2006) and Hung and Li (2007). Content creation activity represents the highest level of engagement ever and is based on the principle of co-creation (Füller et al. 2006; Gavurova et al. 2021). However, it is also about strengthening the consumer's position in their relationship with the brand (Pires et al. 2006; Tiu Wright et al. 2006). Over the last decade, there has been more than twenty studies which address consumers' online brand related activities in relation to their motives or outcome for the brand. However, with the exception of the study by Piehler et al. (2019), most did not fully classify content-related activities at three levels (most often lacking content creation activity, which was included in content-contributing levels), some did not work with four categories of motivation and some did not use the relevant statistical analyses. It is the above-mentioned study by Piehler et al. (2019) which analyzes the COBRAs concept using a complete set of three activities. Moreover, the study analyzes the relationships based on the four categories of motivation. In terms of complexity (studies dealing with three types of COBRAs), studies by Pöyry et al. (2013), de Vries and Carlson (2014), Kang et al. (2014) and Jahn and Kunz (2012) should be highlighted. However, as it has been already mentioned, these studies consider contributing to content and creating content as one set.

3 Methodology

The research made use of the exploratory factor analysis (EFA) by Piehler et al. (2019). The aim of the paper is to assess the effects of COBRAs on the consumer's motives and on the brand's word-of-mouth on the social network YouTube. Based on the above, the following hypothesis were established:

H1: There is a significant relationship between consumer information motivation and selected brand-related COBRAs on the social network YouTube.

H2: There is a significant relationship between consumer entertainment motivation and selected brand-related COBRAs on the social network YouTube.

H3: There is a significant relationship between consumer motivation for social interaction and selected brand-related COBRAs on the social network YouTube.

H4: There is a significant relationship between consumer remuneration motivation and selected brand-related COBRAs on the social network YouTube.

H5: There is a significant relationship between selected brand-related COBRAs on the social network YouTube and brand-related word-of-mouth.

The research dataset consisted of primary data collected for the purpose of the research. Data was obtained between January and June 2021 through an online questionnaire. In addition to demographic questions, this questionnaire contained 28 standardized questions as presented in the study by Piehler et al. (2019), which formed the basis for the analyzed variables. By reducing these manifest variables, we also obtained latent variables. Individual constructs were based on the five-point Likert scale. The Muntinga et al. (2011) and Azar et al. (2016) studies provided a knowledge base for the formulation of COBRAs, the Henning-Thurau et al. (2004) study provided the basis for the formulation of social interaction motivation factors and remuneration, the Ko et al. (2005) study provided the basis for formulation of information motives and the study by Taylor et al. (2011) provided the basis for formulation of entertainment motives. The analyzed dataset consisted of 346 respondents aged 18 to 34, which is the most prominent age group on this platform (Globalmediainsights.com 2021) (Fig. 1).

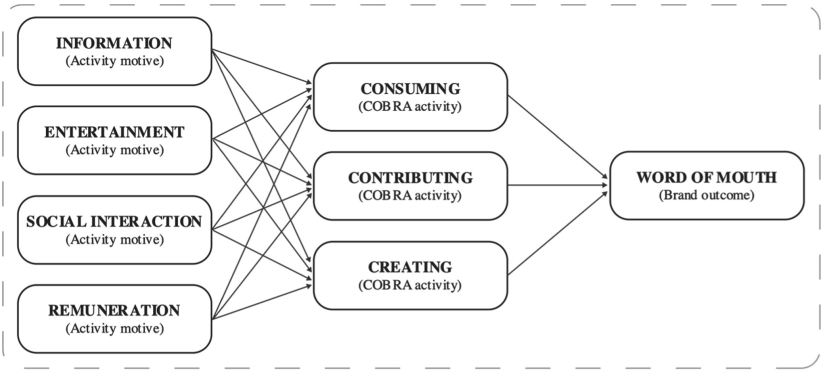

Fig. 1. The outline of the researched relationships between motives and impact of COBRAs in terms of the social network YouTube

The analytical processing itself was carried out in several steps. Most important, however, were confirmatory factor analysis (CFA) and partial least square path modelling (PLS PM). CFA was performed using maximum likelihood estimation due to the potential need to exclude items that disrupt the internal structure of the factors. AVE and CR metrics have also been applied (Fornell and Larcker 1981). Following CFA, the PLS PM was required to describe the trajectories studied (Latan and Noonan 2018). It was divided into two parts, where the first monitored the fulfillment of the conditions for its application through reliability, factor loads and eigenvalues (Sanchez 2013) and

the second tackled the modelling of relationships. For the statistical processing of this analysis, IBM SPSS software (the programming language "R") was used.

4 Analysis Results

This section presents the main results of the analysis of the COBRAs model in the conditions of the social network YouTube. In the first step, a business factor analysis (CFA) was performed. This was necessary for the subsequent application of PLS PM equations describing the analyzed trajectories of the relationships. CFA was performed on a sample of 346 observations and its output is considered significant *(p value* $\chi 2 > 0.001$*)* (Fig. 2).

Manifest Variables	Latent Variables	LF	CR	AVE
YT _Info_1	*Motive*: Information	0.907	0.942	0.844
YT _Info_2		0.921		
YT _Info_3		0.927		
YT _Enter_1	*Motive*: Entertainment	0.914	0.948	0.820
YT _Enter_2		0.910		
YT _Enter_3		0.895		
YT _Enter_4		0.903		
YT _SocInt_1	*Motive*: Social interaction	0.816	0.891	0.731
YT _SocInt_2		0.863		
YT _SocInt_3		0.886		
YT _Remu_1	*Motive*: Remuneration	0.929	0.945	0.851
YT _Remu_2		0.943		
YT _Remu_3		0.894		
YT _Cons_1	*Activity*: Consuming	0.873	0.859	0.671
YT _Cons_2		0.868		
YT _Cons_3		0.706		
YT _Contr_1	*Activity*: Contributing	0.721	0.939	0.721
YT _Contr_2		0.832		
YT _Contr_3		0.883		
YT _Contr_4		0.899		
YT _Contr_5		0.860		
YT _Contr_6		0.886		
YT _Crea_1	*Activity*: Creating	0.941	0.962	0.895
YT _Crea _2		0.951		
YT _Crea _3		0.946		
YT _WOM_1	*Brand outcome:* Word of mouth	0.861	0.944	0.739
YT _WOM_2		0.888		
YT _WOM_3		0.881		
YT _WOM_4		0.887		
YT _WOM_5		0.858		
YT _WOM_6		0.780		

Fig. 2. Confirmatory analysis of the COBRAs model on YouTube

Based on the results, no manifest variable was removed, as they all reached the required level of *LF* and *CR*. A single value (*Content Consumption*) was observed for the *AVE* indicator, which was slightly lower than expected. Slightly higher values were also shown by *RMSEA* and SRMR, but due to the conditions of *CFA* and a comprehensive view of the analysis, these slight deviations are considered acceptable given the subsequent work on regression modelling using *PLS PM*. This modelling was done using the bootstrap method (500 resamples) and worked with 8 latent variables and 31 man-fest variables. The values of *Crombach* α and *Doges* ρ reached the required values, as well as the values of eigenvalues and *GOF*. The following table lists the effect tests (Fig. 3).

DV:	Estimate	Std. Error	t value	Pr(>|t|)
Content Consuming Activities				
Intercept	0.0000	0.0439	0.0000	1.0000
Information	0.1510	0.0600	2.5200	0.0120
Entertainment	0.2140	0.0594	3.6100	0.0003
Soc. interaction	0.1700	0.0533	3.1900	0.0016
Remuneration	0.2910	0.0499	5.8400	0.0000
Content Contributing Activities				
Intercept	0.0000	0.0409	0.0000	1.0000
Information	-0.0141	0.0559	-0.2520	0.8020
Entertainment	0.0358	0.0553	0.6460	0.5180
Soc. interaction	0.2530	0.0496	5.1000	0.0000
Remuneration	0.4960	0.0465	10.7000	0.0000
Content Creating Activities				
Intercept	0.0000	0.0393	0.0000	1.0000
Information	-0.0867	0.0538	-1.6100	0.1080
Entertainment	-0.1020	0.0532	-1.9200	0.0556
Soc. interaction	0.1980	0.0477	4.1400	0.0000
Remuneration	0.5950	0.0447	13.3000	0.0000
Word of Mouth Brand Outcome				
Intercept	0.0000	0.0393	0.0000	1.0000
Information	-0.0867	0.0538	-1.6100	0.1080
Entertainment	-0.1020	0.0532	-1.9200	0.0556
Soc. interaction	0.1980	0.0477	4.1400	0.0000
Remuneration	0.5950	0.0447	13.3000	0.0000

Fig. 3. Test of selected effects on YouTube (PLS MP model)

The testing of selected effects and their impacts on brand-related content consumption on the social network YouTube showed a significant effect at $\alpha < 0.05$ in all observations. In all cases, too, there was a positive effect. Thus, it is possible to expect higher values of consumption of brand-related content at higher values for all motives. In the

case of content contribution, the effect was confirmed to be significant at the level of $\alpha < 0.05$ in two cases. In both cases, it was a positive effect. Based on these results, it is reasonable to expect that higher values for the social interaction and remuneration should contribute to higher values for contributing to the brand's content on the social network YouTube. The third effect concerned content generation. It showed two significant effects at the $\alpha < 0.05$ level. Therefore, with higher values for social interaction and remuneration motives, we also expect higher values for creating branded content on the social network YouTube. The effect of activities on the word-of-mouth was analyzed as the last. Only one case showed a significant effect observed at the level of $\alpha < 0.05$. It is possible to expect a higher rate of brand-related word-of-mouth at higher values of content consumption.

5 Discussion and Conclusions

We've seen only one significant effect of informational motive on YouTube in relation to the activity of consuming branded content. However, this effect is weaker and would therefore require further investigation. To a large extent, therefore, there is a parallel with the studies of de Vries et al. (2012) and Piehler et al. (2019), where the information motive did not prove to be significant. However, the insignificance of the information motive found for two of the three activities is not in line with the findings of Jahn and Kunz (2012) and Pöyry et al. (2013). This may be due to the different conceptions of motivation in these studies and the specificity of the social network studied. The fact that the only significant, though still not strong enough, impact was found for content consumption may be due to the fact that YouTube has a huge amount of information-rich content in the form of videos and is also the second most used search engine ever. Users use this network for advice and manuals to help them to solve problems they have. However, information itself is not enough to motivate users to create or contribute to the content. In the case of entertainment, the study arrived at the similar conclusion to that of Piehler et al. (2019) – there is a significant relationship between the entertainment motive and the activities of consuming brand-related content. The results regarding the significance of this relationship are supported by several studies (De Vries and Carlson 2014; Jahn and Kunz 2012; Pöyry, Parvinen, and Malmivaara 2013) and the insignificance of the entertaining motive in relation to contributing activities is supported by De Vries et al. (2012). Here, too, the very definition of the motive of entertainment plays an important role – the motive itself does not require any particularly interactive behaviour to meet the needs arising from the motive of entertainment. To a large extent, brand-related consumption is sufficient for this. There is a high probability that elements of the motive of social interaction are also hidden in the given motive with the aim of further interaction or gaining attention from others. Somewhat contradictory results were observed in the study by Pletikosa et al. (2013), which, however, worked with a different definition of the motive of entertainment in their analysis. Their analysis showed several elements of the motive of social interaction. It is very important to distinguish between these two motives as their definitions may be similar, but their impact on COBRAs is very different. The importance of the motive for social interaction in stimulating COBRAs was confirmed in all cases. This is largely an expected outcome due to the

nature of these platforms. The study identified all three relationships as significant, i.e. activities of consuming, contributing and creating brand-related content. The results are also supported by the findings of other studies (Piehler et al. 2019; Davis et al. 2014; De Vries and Carlson 2014; Dolan 2015; Jahn and Kunz 2012; Kang, Tang, and Fiore 2014; Luarn et al. 2015). This social network is different in nature from other social networks (e.g. Facebook or Instagram) and therefore it is logical that the strongest effect was observed when contributing to the content, because there is a high chance of interaction with other users. Content creation has not achieved such significance (Miklosík et al. 2020), because creating content for this social network is one of the most demanding. The remuneration motive also proved to be significant in all three relationships related to COBRA's. With the remuneration motive, the brand reciprocally requires a higher degree of engagement or interaction, which is logical. Even the remuneration motive in relation to the consumption of content proved to have a significant effect. In most cases, there are not many significant reasons to reward consumer behaviour (Svetozarovová et al. 2021) that does not return the brand's investment. However, it's different on YouTube, because consumer metrics such as video views are an important variable in this social network's algorithm and can help other content perform better. So here, too, the results are supported by the findings of Pletikosa et al. (2013), who identified the effect on comments, Luarn et al. (2015) who identified a "like" effect and Piehler et al. (2019), who identified effects on contributing and creating content. The results of the paper focus on the specifics of the network, and bring new knowledge on the motive of remuneration and its effect on COBRAs. In the analysis of the COBRAs in terms of the off-line outcome for the brand (the word-of-mouth), one significant trajectory was identified, in particular consumer activities and their effect on WOM. These results have supported the findings of Piehler et al. (2019), who also identified the same significance (also in relation to WOM). Partial support was identified in the studies of Jahn and Kunz (2012) and de Vries and Carlson (2014), where this trajectory was confirmed in the context of brand loyalty. Although these studies have confirmed the significance of the content, but since it was a broader notion of brand loyalty, of which WOM is only one part, those aspects of loyalty that were not the subject of our research may play a role here. The results are in line with the study of Pöyra et al. (2013), where consumption activities were significant and the content contribution and creation in terms of active participation defined were insignificant. Given the social network under review, this is an expected result, because the very content contribution and creation is often considered by consumers as eWOM and so consumers are no longer motivated to share their opinions and experiences. This is most logical for the content creation on YouTube, as it requires more time and capital investment when compared to e.g. Facebook or Instagram. After performing these activities online, consumers probably no longer have a reason to discuss the hereunder issues in off-line environment.

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An Analytical View of Online Consumers' Behavior in the Visegrad Group Countries: Social Status Perspective

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Abstract. Online shopping has been growing in importance recently, also due to the pandemic caused by COVID-19. The paper's main goal was to evaluate and compare the development of online shopping in the Visegrad Group countries (Slovakia, the Czech Republic, Poland and Hungary) in the years 2015 to 2020 and to point out significant differences based on the social status of consumers. The paper outlines the theoretical basis of online shopping, describes the current situation in the Visegrad Group countries and current trends in online shopping due to the COVID-19 pandemic. Based on data from the Eurostat database, the paper outlines the development of online shopping in monitored years and compares the results for individual countries. The results were compared on the basis of the social status of consumers (employed, unemployed, student, pensioner). In all countries in the period under review, there has been recorded an increase in online shopping, with the exception of Slovakia, which recorded a year-on-year decline in 2020. The largest increase compared to 2015 was found in the Czech Republic. A growing share of employed and unemployed online consumers, students and pensioners, was recorded with the highest share in all categories found in the Czech Republic. It could be assumed that online shopping will continue to grow in the future, not only due to the pandemic but also due to its undeniable advantages.

Keywords: E-commerce · Visegrad group · Business-to-consumer and social status

1 Introduction

The Internet has become a necessity and is one of the most important ways of communicating and connecting with others. The Internet has also stimulated changes in global consumer behavior and habits. The rapid development of digital and web technologies in the 1950s contributed greatly to the rise of online shopping as one of the forms of electronic shopping. Since its discovery in the 1980s, e-commerce has become a global growing trend and is now one of the most popular online activities. In recent years, online shopping has become an important part of the new digital economy (Hostler et al. 2012; Trong et al. 2014; Boboc 2020). Almost all Internet users are currently online shoppers

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(Laudon and Traver 2021). As a result, online retail is currently the fastest-growing retail channel, with the fastest-growing customer base and ever-expanding product offering.

There are not many studies examining online shopping in different countries in terms of social status. Therefore, the study aims to examine and evaluate the development of online shopping in the Visegrad Group countries. The knowledge gained can be beneficial for online retailers in planning and creating their sales strategies, market segmentation and tailoring offers to target customers.

2 Theoretical Background of the Issue

Online shopping is a form of e-commerce that allows a consumer to purchase goods or services from a retailer through the Internet. The behavior of online consumers is influenced by several factors: price, quality, convenience, website design, time-saving, and security (Prebreza and Shala 2021). The world is currently facing a COVID-19 pandemic. It is possible to assume that pandemic reasons are the cause of the growing number of online shoppers. In 2020, more than 2 billion consumers in the world bought goods or services online. Monthly visits to online stores in June 2020 reached a record 22 billion visits worldwide, with high demand, especially for daily goods and services (Coppola 2021). Over the next five years, B2C e-commerce is expected to grow by 20% annually.

A large number of consumers are currently experiencing time stress, which, combined with the reduction of social contact due to the COVID-19 pandemic, makes it impossible to shop in a brick-and-mortar store. Thanks to its advantages, online shopping is currently the easiest and most convenient way for consumers to shop (Aref and Okasha 2019). The main benefit for shoppers is comfort and speed. Another advantage is that the customer does not have to physically visit the brick-and-mortar stores, which saves a lot of time. The consumer can choose from a wide range of products or services, has the ability to compare products or prices. Online stores also offer customers various types of discounts that cannot be obtained at a brick-and-mortar store. Unlimited time and space availability allows the online consumer to make a purchase anytime, anywhere (Ganapathi 2015).

Students currently have a high level of digital skills, so it is no surprise that they shop online on a daily basis. They buy anything, anytime, anywhere through any mobile device (Shaari et al. 2019). Consumers who are employed use online shopping mainly for time reasons and for convenience. Because of their job responsibilities, they are looking for ways to save as much time as possible when shopping, and shopping online is a good alternative for them (Naseri et al. 2021). During the COVID-19 pandemic, unemployment also rose as a result of various measures. Unemployed consumers also shop online, but the decisive parameter for them is the price (Buchláková 2021). Given the pandemics, retirees became concerned about their health and began to learn about new technologies, including online shopping, due to limited social contact. As a result, online shopping is becoming an increasingly common way of shopping (D'innocenzio 2021).

The COVID-19 pandemic has changed consumers' shopping habits and set new trends. People are looking for products at the lowest possible price, and they prefer to

buy healthier and local products and prefer greener way of shopping. Consumers shop online almost daily, and the use of mobile devices, smartphones and tablets in online shopping is growing. A PwC survey (2021) showed that most consumers do not plan to return to the old shopping ways after the pandemic. Consumer loyalty to brands has also changed. Their loyalty to brands has dropped significantly. The reasons were various, such as the lack of goods of a given brand or the search for the cheapest or fastest delivered alternative (eMarketer 2021). Online shopping through various social media platforms has become a major trend, especially among young people (Fryer 2021). A survey conducted by McKinsey (2020) shows that people now tend to shop online for everyday consumer products that they previously bought in brick-and-mortar stores, such as food, medicine and vitamins, household items, disinfectants and cosmetics. Consumers have said that their intention is to shop online even after the end of the pandemic. These changes in consumer shopping behavior are gradually becoming permanent, which poses a challenge for retailers in attracting and retaining customers in the online sales world as well.

The importance of online shopping has also been growing in recent years in the Visegrad Group countries. The Slovak Republic competes with a number of European countries in terms of the growth of e-commerce. There are more than 12,600 e-shops registered in Slovakia (Heureka 2021). In 2020, there were 79% of Internet users in Slovakia, while 60% of them shopped online. The Czech Republic is the fastest growing market in European e-commerce (Morgan 2019). There are currently more than 41,100 e-shops in the Czech Republic (Czech e-commerce 2021). Of the 78.5% of Czech Internet users, 64% made online purchases in 2020. In Poland, 11,000 new e-shops were launched in 2020. 77% of Poles are Internet users and almost 80% of them shopped online in 2020 (Ecommerce News 2021). In Hungary, online shopping is progressing at the slowest rate among the Visegrad Group countries. In 2020, 65.7% of Hungarians shopped online, representing 4.86 million consumers (Statista 2021).

3 Methodology

The main goal of the paper is to evaluate and compare the development of online shopping in the Visegrad Four countries (Slovakia, Czech Republic, Poland, Hungary) in the years 2015 to 2020 and point out significant differences based on the social status of consumers (employed, unemployed, student, retiree). The research sample consists of Internet users aged 16 to 74 who have made at least one online purchase in 12 months. The unit of measurement is the percentage of Internet users. The research presents three research questions: How has the share of online shoppers changed in the monitored years within the Visegrad Group countries? What differences can be observed between the Visegrad Group countries when shopping online in the monitored years? What differences can be observed in online shopping between the Visegrad Group countries in the monitored years based on the social status of consumers? The identified research questions were answered using secondary data analysis. The data used in the analysis were obtained from the Statistical Office of the European Communities (Euro-stat) database. The obtained data were processed in the RStudio program.

4 Results

Based on the available data, it is possible to evaluate and compare the development of online shopping in the Visegrad Group countries in the monitored years and point out significant changes and differences in terms of the social status of consumers.

Figure 1 shows the share of Internet users in the Visegrad countries who made purchases via the Internet at least once every 12 months between 2015 and 2020, as well as the average share for the EU countries. It can be stated from the figure that in all countries an increasing trend of the use of online shopping was recorded in the observed period, with the exception of Slovakia, which recorded a year-on-year decrease of 3% in 2020. In 2015, Slovakia (61%) accounted for a largest share of online shopping while Hungary (47%) accounted for the smallest share, while in 2020 the Czech Republic (80%) accounted for a largest share of online shopping while Slovakia (68%) accounted for the smallest share. Possible causes of these differences between countries are for example, the fact that Czech Republic has the fastest-growing market of e-commerce in Europe (Morgan 2019) or the fact that Hungarian e-commerce has the slowest pace of e-commerce growth due to the distrust of consumers (Jurčo 2020). In the monitored years, Slovakia achieved values comparable to the EU average. Compared to other countries, Hungary recorded the highest year-on-year increase in online shopping in 2020, from 59% to 70%. The Czech Republic recorded a year-on-year increase of 7% and Poland of 6%.

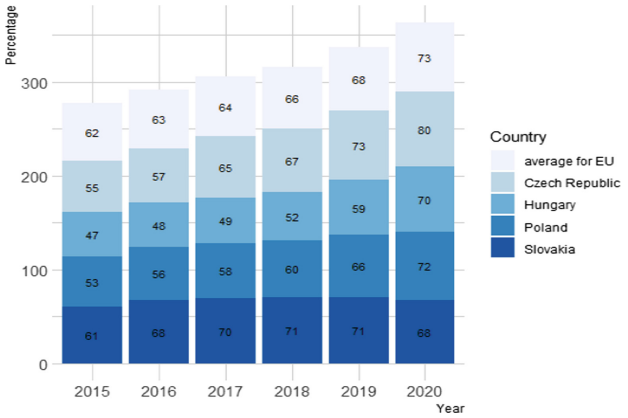

Fig. 1. Share of online consumers (% of internet users) (EUROSTAT 2021)

Figure 2 shows the proportion of online consumers who are employed and have shopped online in the reference years. While Slovakia (67%) accounted for the largest share of online shoppers and Hungary (53%) for the lowest. Recorded the largest share of employed online consumers in 2015, in 2020 it was the Czech Republic (85%) who accounted for the largest share and Slovakia (71%) the smallest. At the same time, the Czech Republic recorded the highest increase in 2020 compared to 2015 (+27%). The share of online shoppers in Poland who are employed has been on a comparable level to

the EU average in recent years. Slovakia recorded a year-on-year decrease in employed online shoppers by 1% in 2018 and by 2% in 2020. The significant factor that can cause differences between countries may be the salary of consumers. The highest average monthly salary in 2020 was in Czech Republic, followed by Poland and Hungary, and the lowest was in Slovakia (Fischer 2020).

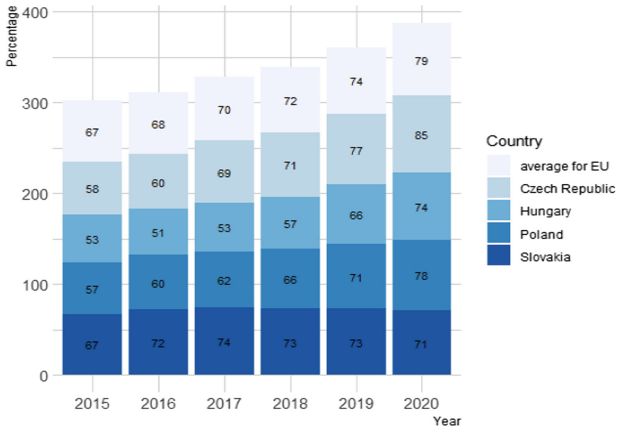

Fig. 2. Share of employed online consumers (% of internet users) (EUROSTAT 2021)

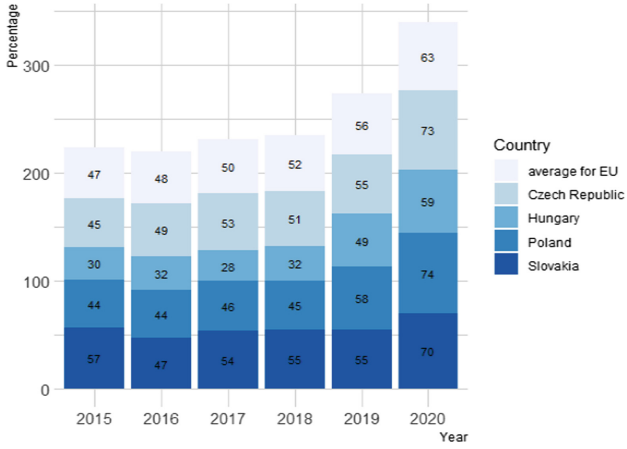

Fig. 3. Share of unemployed online consumers (% of internet users) (EUROSTAT 2021)

Although it can be assumed that the unemployed will not show high interest in online shopping, the opposite is true. In the years 2015–2018, changes in Hungary, Poland and the Czech Republic ranged from ±2 to 4% (Fig. 3). In the Czech Republic, this trend also persisted in 2019. Slovakia reached the level of 54–57% in these years, with the exception of 2016, when it recorded a decrease to 47%. Significant changes in the monitored countries can be observed in 2020, when the most significant increase in

unemployed online shoppers was achieved in the Czech Republic (+18%), followed by Poland (+16%), Slovakia (+15%) and Hungary (+10%). The reason for the significant increase in online shopping for the unemployed may be the search for cheaper and more affordable goods on the Internet during the COVID-19 pandemic.

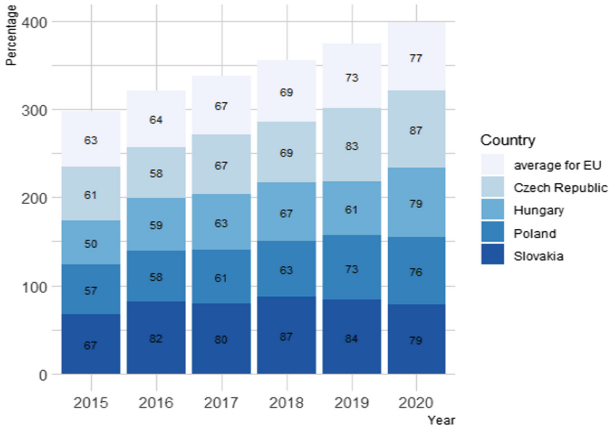

Fig. 4. Share of online student consumers (% of internet users) (EUROSTAT 2021)

Online shopping is also very popular among students (Fig. 4). This is evidenced by the growing trend of students who shop online in all Visegrad Group countries, with the exception of Slovakia, where online shopping has fluctuated in the years under review. The highest increase compared to 2015 was recorded in 2020 by Hungary (+29%), followed by the Czech Republic (+26%) and Poland (+19%). Slovakia recorded an increase of 13% in 2020 compared to 2015, but in the monitored years year-on-year fluctuating changes were recorded too, both positive and negative. Nevertheless, the share of students shopping online in Hungary, Poland and Slovakia in 2020 was at a level comparable to the EU average.

There is also a growing interest in using new digital technologies, which include online shopping among retirees (Fig. 5). Since 2015, there has been an increase in the online shopping of retirees in the range of 2 to 5% in the Czech Republic, Poland and Hungary. Slovakia recorded an increase of 14% in 2016 compared to 2015, and since 2017 the numbers regarding online shopping among retirees in the country has remained essentially unchanged - at a level comparable to the EU average. In 2020, the highest increase was recorded in Hungary (+12%), followed by the Czech Republic (+8%) and Poland (+6%). A possible reason for the higher increase in online shopping among retirees compared to other year-on-year changes is the reduction in social contact and health concerns, thus the increased use of digital technologies.

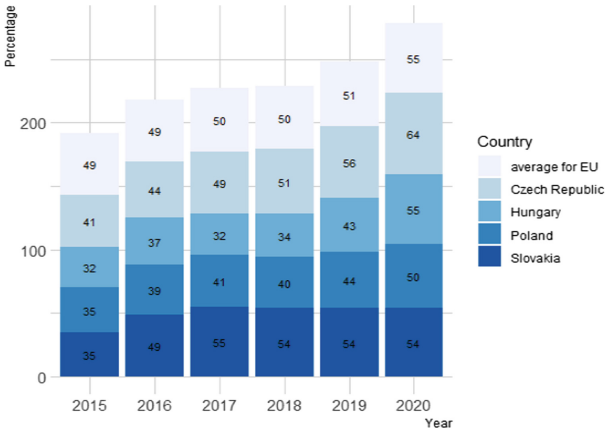

Fig. 5. Share of retired online consumers (% of internet users) (EUROSTAT 2021)

5 Conclusion

The importance of online shopping is also growing due to the ongoing COVID-19 pandemic. Online shopping is becoming an increasingly widespread way of shopping, not only because of its undeniable advantages, but also due to the pandemic and related issues - health concerns, limited personal contact as well as lack of products in brick-and-mortar stores (Reddy 2020; Sharma and Jhamb 2020; Shashidhar 2020).

Based on the available data and the above analyzes, it can be concluded that online shopping is on the rise. In all the countries of the Visegrad Group and with regard to the EU average, an increase in online shopping was recorded between 2015 and 2020. The exception was Slovakia, which recorded a year-on-year decline in 2020. The highest increase compared to 2015 was recorded for the Czech Republic, followed by Hungary and Poland. Slovakia has achieved a share comparable to the EU average. The research identified an increasing number of online shoppers among employed and unemployed, students and retirees, with the highest share in all categories being found in the Czech Republic. Slovakia recorded the highest share of employed online consumers in 2015, while the lowest in 2020. The share of unemployed online consumers has also risen, which may be due to the fact that this group of consumers looks for cheaper and more affordable goods online during a pandemic. An increasing trend among students of shopping online was found in all Visegrad Group, with the exception of Slovakia. The growth of online shopping was also recorded for retirees, with the highest year-on-year increase being recorded in Hungary, followed by the Czech Republic and Poland. The reason may be the restrictions imposed on personal contact due to the COVID-19 pandemic. In Slovakia, the share of retirees shopping online has been stable since 2017 and has not changed.

The consequences of the COVID-19 pandemic are reflected in the sphere of online shopping. More and more consumers of different ages and social groups prefer online shopping to shop in brick-and-mortar stores for pandemic reasons. It is likely that the impact of the COVID-19 on online shopping in the future will vary from country to

country, not only depending on the epidemiological but also the socio-economic situation in the country.

Future research may focus on comparing collected data with data collected from Western and Eastern European countries or gender and age comparisons. COVID-19 and its effect on online shopping and the problems associated with it may be examined, too. Results could help online retailers and marketers to improve the targeting and planning of their strategies.

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A Systematic Literature Review of Profit Models for Online Marketing Channels

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Abstract. During the last years, studies on analytical models in the field of online marketing channels have gained the attention of researchers along with the increase in the variety of alternatives that firms can access to market globally and improve their profits. A systematic review methodology was employed to screen the studies proposing profit models on online marketing channels and to identify research gaps in this area. The findings show that the comparative analysis of profitability of different online marketing channels was under-explored. Since most studies consider specific advertising forms in isolation, they offer little guidance for driving budget allocation decisions under budget constraints. Therefore, this study suggests the need of new analytical models to meet a gap in the literature and to adequately account for a variety of digital channels that firms usually rely upon to increase their profits.

Keywords: E-commerce · Online marketing channels · Profit models · Systematic review

1 Introduction

The pervasiveness of the internet and the proliferation of online users have created new challenges for the success of businesses. With people increasingly using the internet to access product information and make purchases, more and more firms employ online channels to reach new markets and new customers. Online marketing channels include "any e-marketing campaigns or programs, from search engine optimization (SEO), pay-per-click, and affiliate, and email, banner to latest web related channels for webinar, blog, micro-blogging, RSS, podcast, and Internet TV" (Malhotra 2014, p. 2). Hence, companies have a wide array of options to pursue their promotional strategies in a digital context, even though their relative effectiveness remains uncertain.

In today's economy, marketing is mostly carried out digitally by using websites, social media platforms, blogs, and other online channels, although synergies between traditional and online media should not be undervalued. Indeed, the variety of channel formats is highly suitable for attracting today's customers, who seek information in traditional, online, and mobile channels simultaneously, although the risks of cannibalization should not be overlooked (Zhang et al. 2021).

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The design of profitable and effective campaigns is one of the key research issues in digital marketing. Interestingly, with the dramatic increase in internet users and web advertising options, the academia has shown a growing interest in analytical models able to better understand how certain variables can impact sellers' profits.

A systematic review of studies on analytical models for online marketing channels has been carried out to understand their scope, challenges, and limitations. This analysis is relevant to understand to what extent studies on online marketing channels implemented models to support firms and marketers in their decision-making. Specifically, the objectives of this study are the following: first, to review and critically analyse the extant research on analytical model for comparing the profitability of competing online marketing channels; second, to identify possible research gaps that provide fruitful avenues for future research.

2 Methodology

A systematic review methodology was employed, because it is an appropriate method to identify, select, and critically analyse the extant literature in a rigorous, transparent, and replicable manner, leading to robust insights in the reviewed research area (Vrontis and Christofi 2019).

The research question inspiring the systematic review was formulated after having confronted the first proposal and ideas with the academic and industry experts who attended several conferences and workshops on marketing issues. In the light of this process, the research question was formulated as follow: how, or in what way, has research on online marketing channels evolved as an area of study to improve the firm's profit? This research, based on the specific questions, defined the criteria for including and excluding studies in the review, and the search strategy for identifying relevant studies. Studies were included in the review if: 1) they focused on online marketing channels; 2) they accounted their effect on firm profit. Moreover, the analysis selected the studies which examined the problem from the sellers' perspective, excluding those which focused their attention exclusively on the performance optimisation for search engine providers or platform owners. Furthermore, the analysis considered only academic articles, while it excluded other publications such as book chapters and conference papers, as well as academic articles not published in English. Figure 1 illustrates the applied review process.

The systematic search was conducted using the databases of Business Source Complete, ScienceDirect, and Emerald because of their comprehensive journal coverage of the business field (Vrontis and Christofi 2019). These databases were searched for articles containing variations of the following terms: "channel", "marketing", "online", "profit". More precisely, the search formula used was the following: marketing AND (online OR digital) AND (channel* OR platform* OR media OR medium OR marketplace*) AND profit*. The analysis did not limit the search by the publication date, instead leaving it open until December 2021.

The initial literature search returned a list of 2477 contributions with 1630 publications not eligible for the review, because not published in academic journals or as duplicates of academic articles. Therefore, the first phase of the search process allowed to

retrieve a sample of 847 articles that were further analysed on the basis of the boundaries of the review; the titles and abstracts were screened. This sample was further restricted to ensure a consistency with the review question. Accordingly, the analysis excluded the academic articles that did not develop an analytical model to measure the profit performance in the seller perspective. This phase has led to a set of 148 academic articles, which were reviewed by reading the full text. At this stage, the studies that implemented profit models for national or regional contexts as well as the studies not clearly related to the review topic were excluded. Following this process, 35 articles were selected. Additional studies (5) were sought through citation chasing, by obtaining a final set of 40 academic articles.

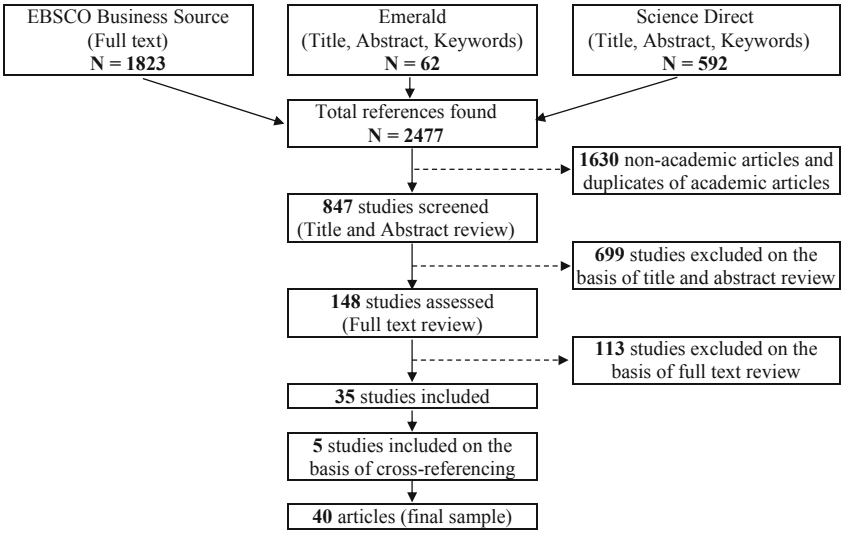

Fig. 1. Literature search strategy

3 Results

For each article included in the review analysis, Table 1 reports in chronological order the author(s), the key emerging themes, and the type of channels considered in the article: both online and offline channels, or only online channels. The results show that the academic interest in analytical models has increased exponentially over the past decade along with the proliferation of e-commerce and the internet shoppers. More interestingly, 60% of the studies are disseminated in publication outlets over the past 5 years (from 2016 to 2021), indicating the topicality of reviewed research area and its promising development. Probably, the increasing complexity and variety of digital advertising explain the increased research interest in developing profit models for supporting managers in making decisions. Most journals publishing the reviewed articles are strictly related to the marketing discipline (55%), with *Marketing Science* and *Journal of Marketing Research* covering 35% of articles included in this review, as shown by Fig. 2.

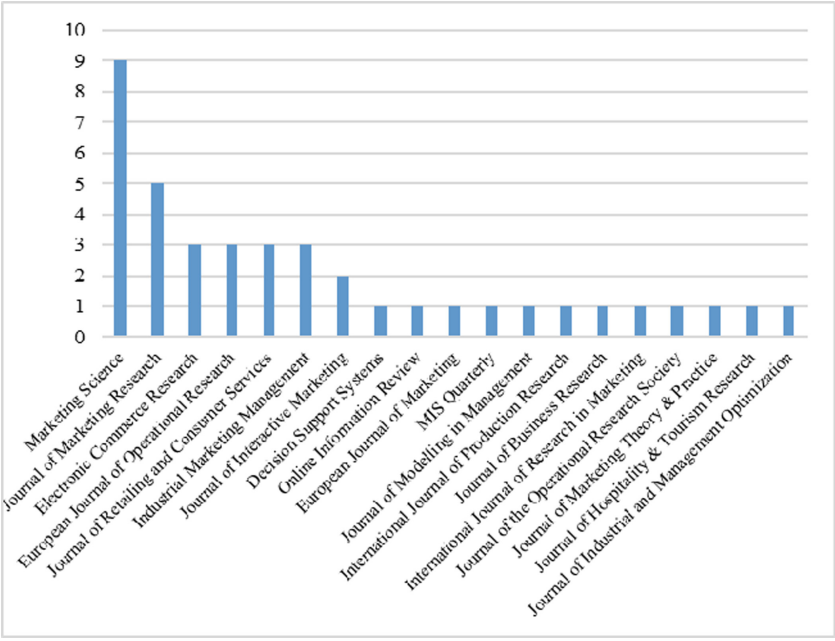

Fig. 2. Journals included in the sample

As regards the geographic analysis of authorship origin, the research results identified 98 authors, counting only once authors who wrote two contributions or more. Most authors are from the United Stated (44.9%) and from China (25.5%), followed by scholars from Germany (5.1%), the Netherlands (4.1%), Canada (3.1%), Korea (3.1%), Taiwan (3.1%), Australia (3.1%), Italy (2%), Iran (2%), Singapore (1%), Switzerland (1%), Turkey (1%), the United Kingdom (1%). Surprisingly, the percentage of European scholars involved is quite modest (13.3%). Most papers turn out to be published by an author team based in one country (57.5%) or in more countries (30%), while the percentage of papers published by a single author is low (12.5%). The systematic overview of extant studies on profit models allows to appreciate the remarkable progress in knowledge on what is important to manage in order to improve firm profits. More in detail, as regards the scope, the set of articles can be categorized into two groups, based on the level of analysis they focus on. The first category embraces the articles (65%) which studied profit impact by considering both online and offline channels, while the second category concerns the articles (35%) which strictly focused on online channels.

Many studies belonging to the first group highlight that the rapid development of e-commerce has led to the adoption of dual channels, consisting of the traditional retail channel and a direct online channel. Multi-channel strategies are often suggested as the best answer to multi-channel customers. Most studies emphasize the need for allocating one's marketing communication budget across multiple media and, particularly, between both online and offline channels. These studies also remark the risks of conflict and competition between manufacturers and retailers when manufacturers, who initially

Table 1. List of reviewed articles

Authors (year)	Key emerging themes	Channels
Gopal et al. (2006)	Price discrimination	Online
Yan (2008)	Profit sharing	Online and offline
Kim et al. (2009)	Pricing and market segmentation	Online and offline
Neslin and Shankar (2009)	Multichannel customer segmentation scheme	Online and offline
Zhang and Wedel (2009)	Customised promotions	Online and offline
Hua et al. (2010)	Delivery lead time	Online and offline
Yan (2010)	Brand differentiation	Online and offline
Yan et al. (2010)	Profit sharing	Online and offline
Agarwal et al. (2011)	Ad position, click-through rate and conversion rate	Online
Chan et al. (2011)	Customer lifetime value	Online and offline
Wiesel et al. (2011)	Marketing communication	Online and offline
Yan (2011)	Differentiated branding and profit sharing	Online and offline
Skiera and Abou Nabout (2013)	Determination of optimized bid	Online
Yang et al. (2014)	Competition effect on paid-search advertising	Online
Chan and Park (2015)	Impressions, clicks, and terminal clicks	Online
Rao (2015)	Consumer preferences	Online
Gu and Tayi (2017)	Pseudo-showrooming behaviours	Online and offline
Wang and Zhou (2017)	Price protection	Online
Zhang et al. (2017)	Price discrimination	Online and offline
Cao and Ke (2018)	Channel profit per click	Online
Danaher and van Heerde (2018)	Advertising effectiveness	Online and offline
Jiang et al. (2018)	Online promotion strategy	Online and offline
Karray and Sigué (2018)	Pricing strategies and market conditions	Online and offline
Kuksov and Liao (2018)	Showrooming behaviours	Online and offline
Yan et al. (2018)	Conditions for introducing a novel e-channel	Online and offline
Zhang and Wang (2018)	Impact of fairness concern	Online and offline
Banerjee and Bhardwaj (2019)	Incentive contracts	Online and offline

(*continued*)

Table 1. (*continued*)

Authors (year)	Key emerging themes	Channels
Choi and Sayedi (2019)	Bidding strategies under incomplete information	Online
Lawrence et al. (2019)	Online salesperson channel complementarity	Online and offline
Mark et al. (2019)	Impact of catalogues on online and offline channels	Online and offline
Zhang et al. (2019)	Impact of adding an online channel to offline platform	Online and offline
Liu et al. (2020)	Showrooming behaviours	Online and offline
Zhang and Chung (2020)	Price-setting process between merchants and platforms	Online
Angeloni and Rossi (2021a)	Budget allocation between different online channels	Online
Angeloni and Rossi (2021b)	Budget allocation between different online channels	Online
Huang et al. (2021)	Optimal bundling and pricing strategy	Online and offline
Jiang et al. (2021)	Digital coupon promotion	Online
Khorshidvand et al. (2021)	Pricing, greening, and advertising decisions	Online and offline
Mu et al. (2021)	Commission-driven and marketing-based rebate modes	Online
Tang (2021)	Daily deal campaigns	Online and offline

provided traditional retailers with products to sell in the market, decide to sell directly and digitally to the same market. Hence, a common research question is how channel members can pursue optimal coordination and performances in the supply chain. Various mechanisms for coordinating supply chain channels have been proposed by these studies focused on both offline and online channels, by analysing profit sharing, pricing and market segmentation, customized promotions, delivery lead time, brand differentiation, customer lifetime value, marketing communication, consumer pseudo-showrooming and showrooming behaviours, price discrimination, advertising effectiveness, online promotion strategy, pricing strategies, conditions for introducing a novel e-channel, impact of fairness concern, incentive contracts, mechanisms for online salesperson channel complementarity, impact of physical catalogues, impact of adding an online channel to offline service platform, daily deal campaigns.

Instead, studies that focused only on online channels considered predominantly the model of search engine advertising, such as Google AdWords. These studies, belonging to the second group, developed their profit analysis by considering specific aspects, such

as the price discrimination (Gopal et al. 2006), the impact of ad placement on both click-through and conversion rates (Agarwal et al. 2011), the best bidding strategies (Skiera and Abou Nabout 2013; Choi and Sayedi 2019), the effects of competition on click volume and on the cost per click of paid-search ads (Yang et al. 2014), the value per terminal click (Chan and Park 2015), the consumer preferences (Rao 2015), the influence of price protection (Wang and Zhou 2017), the manufacturer's and retailers' channel profit per click (Cao and Ke 2018), the price-setting process between merchants and platforms (Zhang and Chung 2020), the digital coupon promotion (Jiang et al. 2021), the commission-driven and marketing-based rebate modes (Mu et al. 2021). Within the last group, there were only two studies which posited the question of selection of different online channels (Angeloni and Rossi 2021a, b), while all the remaining contributions (i.e., 12) tackled the issue of profit enhancement by considering only one type of online marketing channels, mostly the option of search engine marketing. Substantially, most studies on online market channels consider single facets in detail but neglect the big picture.

4 Conclusions, Limitations, and Future Research

The systematic literature review allowed to highlight that there is scant literature addressing the issue of how firms can improve their profits by reallocating budgets between two or more online channels. Conversely, most of the analysed studies focused on the profit impact of online and traditional channels, recommending multi-channel strategies. Engaging in multiple online channels is highly recommended but, under budget constraints, the best strategy could be the allocation of financial resources to investments with relatively higher profitability. Accordingly, this research highlights the paramount importance of conducting a comparative analysis between complementary or alternative online marketing channels by developing new analytical models. For instance, firms can choose between two kinds of online channels to increase their sales and profits: search engine advertising and e-commerce marketplace. Shoppers often use search engines or e-commerce platforms in a very similar way, but for the potential sellers each channel presents different costs and attributes. Therefore, future studies should better investigate whether, when and how some online marketing channels are more beneficial than others to increase business profit. Compared with larger companies, small and medium enterprises (SMEs) have, in general, a more limited budget and fewer resources to invest competitively in digital content and media in order to promote their offers. Faced with such financial constraints, advertising professionals and managers need guidance in order to make their investment choices. However, besides a few exceptions, there is still a huge gap in exploring how firms should allocate their budget to different and alternative online channels in marketing.

On the grounds of this literature gap, some of the key questions that should be explored in future studies are identified as follows. How can researchers develop an integrated model or theory that would adequately define an effective and efficient allocation of limited resources to digital channels in marketing? What are the differences and similarities between alternative online channels used in marketing? How do businesses choose which channel to adopt? What are the characteristics of firms and of

industries that influence the adoption and the effectiveness of specific online channels? More specifically, could some variables (e.g., firm industry, size, marketing skills, budget amount) influence the adoption and the effectiveness of some online channels rather than others? Which variables should be accounted for to better allocate limited resources to complex digital campaigns? What influence do organizational capabilities have in deciding whether to implement search engine campaigns, affiliate programs, and social media campaigns in marketing practices?

Despite the valuable research findings, this study is not without limitations. First, the use of specific databases and keyword formula may have caused the loss of relevant studies. Second, the inclusion of only research articles published in the English language may have influenced the selection and size of the reviewed literature. Third, the research approach supposes a trade-off between different online channels, assuming that an advertiser does not or may not pursue a multi-channel strategy in the online ecosystem. However, such an assumption, without ignoring the positive effect of a variety of online marketing channels, may sound realistic if the company budget does not allow multiple online marketing channels, as it occurs with the majority of SMEs.

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The Use of the Shopping Cart: The Problem of Abandonment in e-Commerce

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Abstract. One of the biggest changes brought about by the Internet and technological advances has been the creation of e-commerce, which has expanded the strategic options for millions of entrepreneurs, erased borders and even led to the emergence of purely digital businesses. Convenience and savings in time and money have led more and more consumers to opt for this method of shopping. However, as in traditional commerce, entrepreneurs have to deal with specific problems, such as cart abandonment. Cart abandonment without completing the checkout process has emerged as the main reason for lost revenue and can account for up to 70% of initiated transactions.

For this reason, this research aims to know the state of the art on this subject, carrying out a systematic review of the literature to identify the main reasons for cart abandonment in e-commerce, as well as the possible gaps that may exist.

Keywords: E-commerce · Shopping cart · Online cart abandonment · Systematic literature review

1 Introduction

According to Nicholls (2011), in e-commerce environment more than two thirds of sales initiated do not end up happening, which means that companies lose around 70% of their potential revenue each year. Given the importance of e-commerce in the economy and the impact of online shopping cart abandonment (OSCA) on companies' revenues, it is essential to understand the reasons for such cases where users browse online shops, review products, search for information and add items to the shopping cart but ultimately do not complete the checkout process, i.e., do not make the payment and therefore do not process the purchase.

Therefore, this research aims to integrate all the studies and results and thus to update knowledge and identify the available scientific evidence on the subject, as a better understanding of this phenomenon would allow entrepreneurs to adapt their strategies so that more transactions are completed, and higher revenues are obtained. In addition, this research can serve as a basis for future research.

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2 The Use of the Shopping Cart

2.1 Offline vs. Online Commerce

Some preliminary considerations, before addressing the problem of cart abandonment directly, let's first learn more about the use of the shopping basket in general terms, as its function differs in many ways from that of traditional retailing, where it merely transports the products, that is to be bought from the shelf to the checkout. In this way, it is also possible to understand many of the behaviours and many of the reasons with which abandonment has been associated until now.

Shopping basket usage in e-commerce is defined as the behaviour of consumers in the online environment whereby they place products of interest to them in the virtual shopping basket. Seen from this perspective, its function is identical to that of the shopping basket in offline shops and, following the logic of traditional commerce, it could even be deduced that everything placed in it would eventually be purchased. As has already been said, this is far from the reality (Close and Kukar-Kinney 2010).

Firstly, online shopping, compared to traditional shopping, offers a greater sense of freedom and an increased sense of control. Hence, the use of the shopping cart is often not associated with a purchase intention as such, but rather as an entertainment and mood-enhancing option (Wolfinbarger and Gilly 2001). In fact, some people enjoy browsing the Internet as a separate and distinct activity from online shopping. This is known as "recreational shoppers" or "window shopping", if it is equated it with offline shopping (Kaufman-Scarborough and Lindquist 2002).

The use of the shopping trolley in physical shops is purely utilitarian in nature, whereas the virtual basket has a more hedonic function (Rubin et al. 2020).

Other features offered by the online shopping cart, which are not available in traditional commerce, are the ability to collect information about the total costs of the order, as these are not known unless you add goods to the basket (Xu and Huang 2015), or to use it as a wish-list to easily retrieve the products that might be of interest. In this way, there is no need to search the entire website again when there is a firm intention to buy (Erdil 2018).

All this means that, in the digital environment, putting products in the basket may not necessarily lead to a purchase, as perhaps it is simply being used as a tool to gather information and browse for entertainment (Close and Kukar-Kinney 2010).

In traditional retail this behaviour does not usually occur, as it is highly unlikely that a person would put products in the shopping trolley and load the basket full for entertainment and then, just at the moment of scanning the products, decide that he or she is not going to take anything (Pungartnik 2015). This is partly due to unwritten social norms and the fear of making a bad impression by acting in this way in public (Agrawal and Maheswaran 2005). In addition, cart abandonment in traditional retail is much more costly than in online retail, both for consumers and employees, due to wasted travel, wasted time and subsequent work to return all products to their place in the shop (Rubin et al. 2020).

In any case, sometimes some situations can be found similar to cart abandonment, but the reasons are much more specific, for example long queues at checkouts, not being able to pay by card, not finding the discount or promotion that was expected at the time

of payment or going over budget and having to leave some products behind (Kulkarni 2019).

Visits, both to online and offline shops, come mostly from companies' own efforts in the form of paid advertising, email marketing and social media campaigns, among others, after which businesses have to wait to reap the results. So it is crucial, especially when it comes to e-commerce, to know what happens at that final stage of the buying process in order to avoid a decline in conversion rate and revenue (Kulkarni 2019).

2.2 Theoretical Background and Frameworks

Ogilvie et al. (2016) examined reactive customer engagement strategies in online shopping cart abandonment and how does regulatory focus theory apply within this context. This theory proposes that individuals assign different importance to the same decision depending on their approach: promotion (concerned with maximising profits) or risk prevention (concerned with minimising losses).

Tang and Lin (2019) based on uncertainty reduction theory (IRT) from the communication literature, theorised critical communication capabilities and discussed their relative effectiveness and boundary conditions to reduce OSCA.

Recent studies (Mishra et al. 2021) identify factors that influence online shopping basket abandonment behaviour. They apply factors related to cognitive consistency theory, where people are motivated to seek consistency in their cognitive elements, such as attitudes, beliefs, values, behaviours and feelings (Abelson et al. 1968).

3 Cart Abandonment in Online Commerce

Cart abandonment in e-commerce can be studied from two perspectives, behavioural and technological (Kwon et al. 2020), and has been defined several times, as shown in Table 1.

There are two clear elements: 1) the products are chosen and 2) the payment process is not completed (Egeln and Joseph 2012). This research will adhere to the definition given by Rubin et al. (2020) as it is a more general definition, more current and open to any reason that may cause this phenomenon, and which leaves aside terms such as purchase intention or information gathering which, although they are causes that lead to cart abandonment, they are not the only ones.

It is estimated that 7 out of 10 consumers abandon their shopping cart in the middle of the checkout process (Weinstein 2014). Reducing this number has become paramount (Xu and Huang 2015). It is therefore important to discover the reasons why such a large number of purchases do not take place. Moreover, this problem is almost unique to online shopping as the reasons for cart abandonment in a supermarket, or any other physical shop, are very different and not comparable (Silva and Wijayanayake 2015).

In order to understand why this abandonment is so common, it is necessary to study, among other things, consumer behaviour, intentions and perceptions (Kukar-Kinney and Close 2010).

Although there is little work, some research has directly addressed the problem of cart abandonment in online shops and has looked at procrastination (Negra and Mzoughi

2012), irritation generated by poor web design (Hasan 2016), perceived risk (Egeln and Joseph 2012), confusion due to lack of usability (Garaus 2018), abstract or concrete mentality (Rubin et al. 2020), mere entertainment (Kukar-Kinney and Close 2010) or negative response to purchase incentives (Kulkarni et al. 2019) as the main reasons.

Some researchers (Chowdhury and Chouhan 2021) propose that customers sign up for shopping tickets simply to accumulate data or kill time and not to buy goods and businesses.

As seen previously, another reason that has been considered to cause cart abandonment and consumer behaviour is excessive research and information seeking prior to purchase. Better prices in other shops and waiting for future promotions have also been studied (Close and Kukar-Kinney 2010), as well as hedonistic behaviour (Krithika and Rajini 2017), product quality and website loading time (Harrison-Walker 2002).

Table 1. Definition of cart abandonment in e-commerce

Authors	Definition
Rewick (2000)	The action of placing products of interest in the shopping cart and leaving the website without completing the transaction
Cho (2006)	This is the situation where a consumer visits an online shop with the intention of making a purchase but does not complete the transaction, abandoning their purchase intention
Moore and Mathews (2006)	This is the situation when a consumer places products in their shopping cart to collect information about them and ultimately decides to abandon the cart without completing the last stages of the process
Coppola and Sousa (2008)	It is the action of leaving a website after having included products in the shopping cart and not having finished shopping
Ouellet (2010)	This is what happens when the consumer starts the checkout process but does not complete it
Kukar-Kinney and Close (2010)	It occurs when a consumer places an item(s) into their online shopping cart and then leaves the retail website without purchasing the item(s) during that online shopping session
Egeln and Joseph (2012)	This occurs when consumers do not complete their purchases but leave the products, they are interested in added to their shopping basket
Kulkarni (2019)	It occurs when a potential buyer searches for certain products within an online shop and adds them to the cart but abandons it at the last stage of the sales funnel
Rubin et al. (2020)	This is the placement of products in the shopping basket without completing the checkout process

A high abandonment rate for an online shop may indicate poor web usability and user experience or technical errors that break the sales funnel (Arul Kumar and Krithika 2019).

In fact, on mobiles the abandonment rate is even more alarming, as on smartphones it can browse the Internet and online shops very easily, however the checkout processes are not yet fully adapted and sometimes it is difficult to enter data and complete the transaction. This, coupled with the fact that more and more people are leaving computers behind to search and shop using mobiles, has caused the abandonment rate to rise and in 2018 it was above 73% (Arul Kumar and Krithika 2019).

The real challenge in this situation is not only to engage customers and get them to fill their shopping cart with products, but to actually buy those products and not leave the website without completing the checkout process (Sondhi 2017).

On the other hand, there are no differences in online shopping cart abandonment in relation to the implemented e-commerce platform (Jiang et al. 2021). For these authors, forgetfulness and the representation of the shopping cart on the homepage may be the reasons that lead to shopping cart abandonment behaviour.

4 Web Analytics and Other Mechanisms to Avoid Cart Abandonment

The widespread use of the Internet for commercial purposes has also brought the possibility of collecting objective data on user behaviour within websites that can be analysed by companies to gain valuable insight into the usage and traffic on their websites (Rausch et al. 2022).

These datasets provide, among other things, information on the number of pages visited, session duration, user demographics, bounce rate, which product pages they visit, which advertisements and offers they are most interested in and what they buy (Wilson 2010).

Website visit and click data models the navigation and the path the user takes, in this case, through the online shop (Montgomery et al. 2004) and is extracted from the logs of all requests and information transferred between the customer's computer and the company's server (Bucklin and Sismeiro 2003). In particular, they provide resources about how visitors obtain and use information, how they respond to marketing actions and how they order online (Wilson 2010).

This type of information can be used to create, for example, conversion models that predict the likelihood of a visitor making a purchase based on their history of previous visits and purchases or the frequency with which they visit the website (Rausch et al. 2022).

In the specific case of cart abandonment, the use of this type of information is essential in order to extract some clues as to why cart abandonment occurs. Primarily, it can identify problems in three areas that can significantly influence abandonment prior to purchase: the appropriateness of the content, the effectiveness of the design and the efficiency of the website (Phippen et al. 2004). For example, the fact that the vast majority of visitors leave the website through the same page may indicate that there is a problem of difficulty in not knowing how to complete the transaction, broken links or inability to

add required data, known as "sticking points" (Wilson 2010). Web heat maps showing the most and least active click-through areas are also very useful in these cases.

In summary, marketing executives can use these web analytics tools as a competitive weapon in their strategy to increase the efficiency and effectiveness of their online marketing actions, as usability is something that must always be taken into account and tested. Making design mistakes is very common (Nielsen 2000).

But web analytics is not the only tool that companies have been developing to avoid, as far as possible, the problem of cart abandonment. For example, mobile notifications or emails are also used to remind consumers that the products they have selected are waiting for them in their shopping cart and that they can resume the transaction at any time (Moriguchi et al. 2016; Tiffany et al. 2020), deleting products from the cart at the end of the session to prevent it from being used as a wish-list, limiting the number of products that can be placed in the cart so that the customer only selects the products they are truly interested in and intend to buy (Zhao et al. 2021), and differentiating the "Buy now" and "Add to cart" buttons (Kim and Chun 2018).

5 Discussion

5.1 Systematization and Methods

Each of the studies was reviewed and the variables used to explain cart abandonment, i.e. the explanatory variables, were identified. With the help of the Atlas.ti program, we were able to group the different studies that shared similar variables, or exactly the same but defined in different ways, in order to treat them as a single variable and facilitate the subsequent analysis. Once this process was completed, we obtained ten variables: perceived risk, price, technical problems and web usability, information gathering, hedonism versus utilitarianism, psychological motives, preference for shopping in the physical shop, marketing techniques employed, perceived waiting time and sociodemographic variables. There are other product categorisation variables, price, perceived importance, symbolic value, experience attribute and purchase attribute that have significant indirect effects on basket abandonment through purchase motivations (Song 2019).

Rochanapon et al. (2021) indicated eight different reasons (economic reasons, organisational tool, time pressure, intangibility, privacy issues, aesthetic design, social influences, and entertainment factors) that produce OSCA. Of these reasons, two of them, economic reasons and the use of the online shopping cart as an organisational tool, are the two main reasons why consumers abandon its.

In relation with research methods about abandonment online shopping cart, e-commerce studies applied other methodologies as consumers and users survey (Palos-Sanchez 2017; Chowdhury and Chouhan 2021), analyzes clickstream data (Rausch et al. 2022), a promotional code in order to minimize cart abandonment (Reniou et al. 2017), influence of payment method (See-To et al. 2014) or use machine learning algorithms (Padigela and Suguna 2021).

5.2 Definition of the Main Reasons for Cart Abandonment

For some authors (Rejikumar and Asokan-Ajitha 2021) the most influential factor in purchase completion is ease of decision making and promotions. However, hedonistic

aspects are more critical in the development of impulsivity. Impulsive buying can be reduced by the perception of risk.

Logically, some of these variables have been studied more than others, as new practices and trends emerge over time and guide the different lines of research. For example, perceived risk, hedonism and utilitarianism, information gathering, and psychological motives are the most abundant and have been analyzed at least since 2006. However, preference for the physical shop and perceived waiting time started to be defined a little later because sharing information in online shops about the stock in physical shops or offering the possibility to reserve products, as well as cutting time for deliveries and returns of orders, have been practices that have been implemented in recent years.

We began to consider them as the nine main reasons for cart abandonment in e-commerce. And, although they have been treated as completely independent reasons, during the development of the chapter we have been able to infer or glimpse certain relationships between them.

For example, perceived risk and privacy concerns may depend to a large extent on how trustworthy the design and operation of the website are. Similarly, the effectiveness of promotions and marketing techniques employed will depend to a large extent on where they are placed on the website and the words with which they are expressed. In turn, purchase intent will affect each customer's perception of the price of a product, just as the search for alternative goods and/or services will be more or less dependent on the amount of the desired product.

One strategy to get consumers to accept prices while still making a profit is the use of psychological pricing. Also, they can cross out the initial price on the price page of the pricing page and display a discounted price instead (Wang et al. 2022).

In addition, e-retailers can apply a combination of discounts, such as free shipping, bonuses, rebates, and discounts, such as free shipping, bonuses and cash back on returns, on the top page to capture consumers' attention (Kapoor and Vij 2021).

Hänninen and Ahlbom (2019) show that changes in the items left in the virtual shopping cart led to an increase in purchase intentions when the price has decreased, which is in line with the microeconomic understanding of price and demand elasticity. On the other hand, we also find that different types of price communication have an effect on consumers' purchase intentions when the price has increased.

On other hand, there are other strategies. Zhao et al. (2021) point out that there are companies such as eBay and Taobao, which often set limits on the maximum number of items placed in the shopping cart. These authors showed that reminding consumers to clean up items in their online shopping carts can polarise taste and purchase intention towards the most and least favourite items.

Recent studies claim that to prevent or avoid the threat of the COVID-19 pandemic, online sales have increased (Chan et al. 2021; Farooq et al. 2020). Several authors (Eger et al. 2021; Wang et al. 2022) demonstrated that the fear of being infected by the virus negatively influences consumers' purchasing decisions in a physical shop. They do this to avoid physical contact (Youn et al. 2021).

6 Conclusions

This study describes the main factors in online shopping cart abandonment. The study contributes to the literature by explaining from which different theories and perspectives abandonment has been studied. Secondly, it proposes variables and their relationship to abandonment.

The results contribute to our understanding of the importance of pricing, good information, online shopping cart tracking and its consequences for e-commerce, especially in an online retail environment.

It is noteworthy that this study identifies in the literature influencing factors of different nature related to the role of risk aversion and rational consumer decision making, or the consumer's rational decision tendency.

Thirdly, this chapter also identify gaps in the state of research on shopping cart abandonment, as insufficient research on basket abandonment in e-commerce, despite the fact that it is a growing issue and has a major impact on the revenues of many companies. Likewise, there is a lack of theoretical studies that bring together the existing knowledge on this issue. In fact, most articles always mention and refer to the same authors.

There is an important absence of longitudinal studies to conduct experiments and measure results over time. In another way, this research shows a lack of studies on cart abandonment on Europe. Although we are facing a globalized world with worldwide economic and business integration, people's preferences, and mindsets about using the Internet and making purchases in the digital environment may differ from those in other parts of the world.

Finally, does not exist in the literature of a classification of the main causes of cart abandonment. Not only in general terms, which is why we have carried it out in this study, but also within each of the causes. Theoretical content - psychological, perceived risk, price, etc. - is lacking.

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Conceptual Framework of Influencer's Marketing Power

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Abstract. Consumers need to be constantly reassured in these times of the global Covid-19 pandemic. For this reason, brand marketing strategies must be well thought out to keep consumers closer. Influencers have become essential players in creating and strengthening this link between the brand and consumers. This paper, therefore, focuses on the effect of influencer marketing on consumers in relation to brand notoriety and the perception of the influencer. Regarding the literary review, we focus on influencer and brand marketing (notoriety and attitude) and the relationships that link these to other intermediate concepts (influencer credibility, consistency between source and product) leading to purchase intentions. We formulate the conceptual framework of influencers' marketing power based on these findings.

Keywords: Influencer marketing · Product placement · YouTuber · Influencer collaboration

1 Introduction

Consumers need more reassurance in these uncertain times of the covid-19 pandemic than ever. In this age of social distancing, brands need to keep consumers as close as possible, which requires good communication. Nowadays, consumers appreciate being informed without necessarily having the impression of being overwhelmed by intrusive and repetitive communication (Amarnath and Jaidev 2020). Companies need to adapt to this new world by changing their marketing strategies to stay in touch with consumers (Taylor 2020). An ideal solution then is influencer marketing, an inexpensive and very effective method of reaching a large number of individuals in a personal manner with which they are comfortable (Yoo et al. 2015).

Brands have often used celebrities to share content about their brand and promote their products as the public generally admires them and aspires to be like them (Lou and Yuan 2019). However, new content creators have emerged alongside these celebrities, the social media influencers. They can be defined as independent individuals who seek a

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hearing through blogs, tweets, and other social media. They are genuine and passionate in their field and are thus perceived by their followers as trustworthy when it comes to recommendations.

Consumers are well aware that brands are present on social media for commercial purposes and communicate in a biased way. On the other hand, influencers are perceived as independent individuals with authentic content. Therefore, consumers are more receptive to commercial content disseminated by an influencer than a brand (Pei et al. 2018). In fact, according to a study of 3,600 people worldwide, 61% admit to interacting at least once a day with an influencer (Rakuten 2021). Another study shows that among 4000 people working in marketing, 91% admit that influencer marketing is a form of effective marketing (Geyser 2021).

The increasing importance of influencer marketing is undeniable. This paper analyzes how influencer marketing can impact the brand based on brand notoriety, whether strong or weak, positive or negative. The terms used in this study will be "notoriety" to determine if it is weak or strong and "attitude" to know if it is positive or negative. Based on these two concepts, influencer marketing, and branding, we will explore the current findings on influencer marketing and propose a theoretical framework of influencers' marketing power.

2 Role of the Source Credibility in Influencer Marketing

A vital characteristic that indicates the strength of an individual's influence is the level of credibility that the latter obtains with his community. After having reached this level of credibility towards an influencer, the community will feel the need to push this link even further. Individuals in this community trust and value the opinions of the influencer. One does not have to look specifically at the size of the audience, which will represent the size of the community, to judge whether an influencer will have a strong bond and strong credibility towards his community (Harrigan et al. 2021). It is clear that the larger an audience, the more people will be reached by the message transmitted by the influencer; on the other hand, not every one of this audience will not be part of this influencer community. The powerful bond of this community will often be more critical among micro-influencers than macro-influencers because the latter will not have the opportunity to read the slightest comment from their audience, let alone interact directly with them.

An important point concerning an audience's credibility with an influencer is the level of trust that the influencer has in an influencer. This level of trust will lead the consumer to follow the influencer more. However, the influencer will forge this credibility by being independent of the brands and companies he works for and speaks (Lee and Kim 2020). Leslie Rasmussen (2018) conducted a study on the perceived credibility of YouTube influencers by measuring the reaction of a sample of students to a set of beauty videos. The study found that the more popular an influencer, the more credible their opinions were perceived. She also found a strong correlation between an influencer's popularity and an individual's sense of friendship.

Lou and Yuan (2019) suggest three dimensions of credibility regarding influencer characteristics: expertise, reliability, and attractiveness. The source's expertise is its qualification in a field, whether through knowledge or know-how. Second, reliability is

the recipient's perception of the source's honesty and sincerity. Ultimately, attraction is about the source's physical attraction and sympathy. According to their study, only the source's reliability significantly influenced purchase intention and was therefore positive. For Gross and Wangeheim (2021), the expertise alone has a significant and positive effect, also confirmed by Goldsmith et al. (2000). For Lim et al. (2017), the attraction of the source has a significantly positive impact on the intention to purchase but only by mediating the consumer's attitude towards the influencer. This means that the more attractive the influencer, the more the consumer's attitude is positive towards him and the more the consumer intends to buy the product (s) highlighted by the influencer.

Nonetheless, for other authors, credibility, in general, has a significantly positive influence on purchase intention. Chin et al. (2019) studied the link between influencer credibility and brand attitude. They found that the more credible the influencer, the better the attitude towards the brand is. This hypothesis was also supported by Muda et al. (2014). The consistency between the source, namely the influencer, and the product comes from the match-up hypothesis. The match-up hypothesis argues that an influencer is more effective in increasing the intention to purchase when there is consistency between the influencer and the product they are promoting (Till and Busler 2000). This hypothesis was first explored by Kamins (1990). He suggested that a person's attitude towards a brand was significantly related to the consistency between the attributes of the influencer promoting the brand and the characteristics of that brand. However, Törn (2012) has shown that in the case of a well-known and familiar brand, the influencer is more effective when seen as inconsistent with the product. Research conducted in the United States examined the impact of celebrity influencer marketing on purchase intent at different levels of consistency. The authors showed that celebrity endorsement is more effective when there is a moderate inconsistency between the product and the influencer than when the consistency is total or the inconsistency is extreme (Lee and Thorson 2008).

3 Brand Notoriety and Brand Attitude

Brand notoriety is generally defined as the percentage of consumers who recall a brand. Rossiter (2014) defines it as the capacity of the buyer to identify the brand in enough detail to proceed with the purchase. It has been concluded that brand notoriety is one factor that affects the consumer's attitude towards purchasing a product. Notoriety ensures a connection and a relationship with the consumer, which is the goal of any marketer. There are three types of brand notoriety: Top of mind, spontaneous, and assisted. The first category is called Top of mind and includes the first brands that come to mind. These are the spontaneously mentioned brands. The use of mass media is the most effective in improving this type of notoriety (Berthelot-Guiet 2020). The second category is spontaneous notoriety. It represents the ability of a consumer to remember a brand when exposed to a product category or to needs satisfied by that category. This type of notoriety is solicited before contact with a point of sale (Rossiter 2014) and can be stimulated by creative advertising (Jin et al. 2019). A brand that creates an image and a personality that stays in the consumer's mind is more likely to trigger a recall and, therefore, spontaneous notoriety. In fact, for some product categories, this type

of notoriety is enough to generate sales. In fact, as a general rule, if the consumer's attitude towards the first brand recalled is favorable, the consumer will choose this brand (Rossiter 2014).

The last category is called assisted notoriety. The customer can recognize a brand in a given list. It represents the consumer's ability to confirm that they have already been exposed to the brand. This type of notoriety can be found when the consumer is at a point of sale, whether in a physical store or online. Most people who shop do not make a list, but when they do, it is made up of product categories only, not brands. People, therefore, scan product packaging in the store based on visual reminders of their needs (Rossiter 2014). Just seeing the different products, the "list" stimulates the need for that product, which is not the case with spontaneous notoriety since this "list" does not exist. In this case, brand recall occurs when the need is not met (Hakala et al. 2012). Brand attitude is defined as an individual's internal assessment of a brand (Mitchell and Olson 1981) or as an appreciation of the brand by the consumer. It differs from branding, which is characterized as the structure that a person has of a brand in their mind and, more specifically, its attributes (Stern et al. 2001). The attitude is not innate; it is acquired. Nevertheless, it remains stable over time.

To date, there are many models characterizing brand attitude. According to the ABC model (affect, behavior, cognition) (Martin et al. 2000), the attitude towards a brand can be broken down into three components: cognitive, affective. The cognitive component brings together the consumer's beliefs towards a brand. In other words, it is the accumulated knowledge of the consumer about a brand, what the consumer thinks he knows about the brand. The affective component describes the consumer's attachment to the brand. It is, therefore, a judgment, a feeling, which can be negative or positive. Thus, the consumer can have a favorable or unfavorable brand assessment. It is an emotional response, "like" or "dislike". Finally, the conative component refers to what the consumer intends to do with the brand (Duarte and Raposo 2009). Interestingly, the first two components are always present, while the conative factor may be missing.

4 Conceptual Framework Proposition

In this research, we seek to understand the role of brand notoriety and consumer attitude towards the brand in the context of influencer marketing. Thanks to the literature review, the "match-up hypothesis" (assumption of correspondence) suggest that an influencer is most effective when there is consistency between them and the product they promote (Till and Busler 2000). It has been proven by Kamins (1990) that attitude towards the brand has a significant and positive link with the consistency between the characteristics of the influencer and those of the brand. First, we thus propose a hypothetical relationship between the notoriety and attitude towards the brand in relation to the source consistency with the products and brand (**Hypothesis 1a** and **1b,** respectively).

As stated in the literature review, brand notoriety positively influences purchase intention. In other words, the more the brand is known, the more the consumer intends to buy its products (Tariq et al. 2017) (**Hypothesis 2a**). In addition, several authors have argued that the better the attitude towards a brand is, the more intensive the consumer's purchase intention (Gomathy and Rajan 2018) (**Hypothesis 2b**).

It is increasingly difficult for brands to gain attention on the Internet. In large part, this is because all businesses, large and small, have moved to the online world, creating large numbers of ads. This has made consumers extremely skeptical of brands that engage in self-promotion. With the emergence of influencer marketing today, every consumer can share and communicate with other individuals worldwide via the Internet. According to previous research, the information a consumer obtains from an interpersonal source, the influencer, will positively impact the purchasing decision, notoriety, and attitudes towards a brand (**Hypothesis 3**). Based on the previous hypothesis, we try to examine the effect of influencer marketing, i.e., collaboration with an influencer, on brands' notoriety and attitude **(Hypothesis 4)**.

Previous research on influencer marketing suggests that the attraction of the source positively influences the attitude towards the influencer, which itself positively influences the purchase intention (Lim et al. 2017). In addition, the reliability of the influencer positively and directly impacts the purchase intention (Lou and Yuan 2019). We may thus assume that these two characteristics (attraction and reliability) and the notoriety of the influencer impact the attitude towards them **(Hypothesis 5)**. Following the previous assumption, we wonder if the consumer's attitude toward the influencer may impact the relationship between brand notoriety and consumer purchase intention. This relationship has been proven positive by various authors (Trivedi and Sama 2019; Kim and Kim 2021) **(Hypothesis 6)**. All of the hypothetical relationships of influencer's marketing power are summarized below:

H1a Consistency between source and product is more important for a brand with high notoriety than a brand with low.
H1b Consistency between the source and the product is more important for a brand with positive consumers' attitude than for a brand whose attitude is less good.
H2a Purchase intention is more important for a brand with high notoriety than for a brand with lesser notoriety.
H2b Purchase intention is more important for a brand towards which consumers have the best attitude than for a brand towards which attitude is less good.
H3 In general, working with an influencer improves attitude towards the collaborating brand.
H4a Collaboration generates more significant improvement in attitude towards a brand with lower notoriety than a brand with higher notoriety.
H4b Collaboration generates more remarkable improvement in attitude towards a brand with the most unfavorable attitude.
H5 The characteristics of the influencer (attraction, reliability, and notoriety) positively influence the consumer's attitude towards them.
H6 Attitude towards the influencer positively influences the relationship between brand notoriety and consumer purchase intention.

5 Conclusion

Influencer marketing comprises individuals capable of influencing consumers, resulting in several advantages for brands or companies. These advantages have the potential to increase the purchase intention of consumers, decrease marketing costs, and give the possibility of reaching an unlimited audience. However, there are still many questions that need to be answered in influencer marketing. What are the necessary levels of awareness and attitude for the brand to be considered consistent with the influencer? What are the ideal brand awareness and consumer attitude for effective influencer marketing regarding purchase intent? In what measure does influencer marketing improve consumers' attitude toward a brand, according to its notoriety and the initial consumer attitude towards it? How does the consumer's attitude toward the influencer impact the relationship between the awareness of the brand and the consumer's intention to purchase? Moreover, what are the characteristics of the influencer that allow the consumer to shape his attitude towards him? The answers to these questions will identify managerial tracks for brands who are tempted to have recourse to the marketing influence.

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Cognitive Assimilation and Satisfaction with Live Streaming Commerce Broadcast in Hong Kong

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Abstract. Live streaming commerce is an increasingly popular marketing channel since it can present the product information in an interactive and personalized manner. This study examines the development of customer satisfaction and cognitive assimilation through live streaming by considering the drivers from perceived values, affective and cognitive perspectives. Consumer value, which consists of utilitarian, hedonic, and social components, is an appropriate framework to adopt in studying effects of live streaming commerce broadcast, because it includes all major benefits of watching live streaming simultaneously. Elaboration Likelihood Model (ELM) identifies central and peripheral routes for changing consumer attitudes. Quality of presentation and social presence arise as affective and cognitive concerns in this context. This research model also indicates a particular mediating role of consumer values from the two drivers for developing customer satisfaction and cognitive assimilation. Empirical analysis shows that both perspectives are important determinants to customer satisfaction and cognitive assimilation. The findings can help practitioners design more effective approaches for live streaming e-commerce.

Keywords: Live-streaming commerce · Perceived values · Cognitive assimilation · Argument quality · Social presence · Customer satisfaction

1 Introduction

Live streaming commerce is a business model in which retailers or influencers sell products via online video streaming, which is a hybrid involving video content, real-time communication and consumption. The live-stream e-commerce industry in China has experienced tremendous growth since 2015. In 2020, Taobao generated over US$60 billion through livestream commerce (Alibaba Group 2021). Reports from the Ministry of Commerce of China shows that there are more than 4 million live e-commerce live broadcasts in the first quarter of 2020. The live-stream commerce trend is spreading to other countries. Major retailers, such as Walmart, Amazon.com, also launched their live-stream commerce activities and platforms. Social media including Facebook and Instagram also incorporate more functions related to livestream e-commerce.

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Live streaming commerce provides consumer a shopping process with rich product information, real-time interactions, and creative entertainment (Wongkitrungrueng et al. 2020). Although live streaming becomes more prominent, research studies in this area still limited (Gao et al. 2021). Researchers attempt to use different theoretical perspectives, including consumer motivation theories (Cai et al. 2018), SOR framework (Wongkitrungrueng et al. 2020), and celebrity endorsement (Park and Lin 2020), to examine the influence of live streaming on consumers. Although these studies provide a lot of insights, a more systematic and congruent study is important to develop a better understanding on the effects of live streaming on consumers. This study aims to develop and empirically test the model related to viewers' cognitive assimilation after watching live-streaming and their satisfaction to live-streaming.

Live streamers influence consumers with not only the product information in using products (Hou et al. 2020) and positive image of the attractive streamer (Chen and Lin 2017), but also the social interactions with live streamers and co-viewers (Xu et al. 2020). ELM is used to examine the persuasiveness of live streaming as the viewers are influenced by both the argument and information presented by the live streamers (Hilvert-Bruce et al. 2018) and the cues associated with the peripheral route such as trustworthiness and attractiveness of live streamers and other viewers (Gao et al. 2021). The contribution of this paper is twofold: Building on the model of consumer value theory and ELM, we expect the customer perceived value of live streaming shopping, quality of presentation and social presence will enhance their cognitive assimilation with live-streamers and satisfaction of live-stream shopping experience. This study also provides some practical suggestions for marketers to better leverage live streaming for effectively selling their products.

2 Theoretical Background and Hypotheses Development

The consumer value theory and ELM are the major theories that are widely discussed and used by various researchers to predict the consumer's decision and behavior. Consumer values have been established as key determinants of online experiences such as mobile purchase (Gao et al. 2015), use of streaming apps (Oyedele and Simpson 2018) and use of sharing platforms (Liang et al. 2021). Consumer's perceived value is defined as to the overall evaluation of perceived costs and benefits from the consumption (Zeithaml 1988), which may refer to the consumers' overall evaluation of live-streaming video in this context. With various kinds of experience including visual contents and social interactions simultaneously, it is appropriate to apply the multi-dimensional consumer value framework, including utilitarian, hedonic, and social components, to study live streaming e-commerce (Kim et al. 2011). Value perceptions about live-streaming may depend on the evaluation of the benefits and the sacrifices perceived by the consumers, leading to their satisfaction and assimilation with live stream broadcaster. Therefore, the following hypothesis can be formulated:

H1a. Perceived value of live stream video has a positive relationship to consumers' cognitive assimilation to broadcaster.
H1b. Perceived value of live stream video has a positive relationship to consumers' satisfaction to live stream programme.

ELM is a dual process theory examining the effectiveness of persuasive communications (Petty et al. 1981). The ELM has been applied to various studies in online contexts including persuasiveness of web design (Cyr et al. 2018) and online advertising (SanJosé-Cabezudo et al. 2009). Persuasion may be induced through a central route based on "thoughtful consideration of the true merits of the information" or a peripheral route based on cues such as source attractiveness (Petty and Cacioppo 1986, p. 125). The ELM suggests that central route, that is, information processing, exert a stronger influence on attitudinal change in high elaboration likelihood states; while audiences tend to be persuaded by peripheral cues if they are in low elaboration likelihood states.

This study applies ELM to the context of live stream commerce. The quality of product information is important to users and has an impact on user attitudes. Customers will not watch the video without making a purchase if they dissatisfied with the information contents. Quality of presentation is a central route based on the strength of the arguments. This in turn can result in a change in belief toward the persuasion topic (cognitive assimilation) (Sussman and Siegal 2003) and satisfaction of users (Walia et al. 2015). It also enhances the perceived value of live streaming. Thus, we hypothesize that:

H2a: Quality of presentation is positively related to consumers' perceived value.
H2b: Quality of presentation is positively related to consumers' cognitive assimilation with the live streamer.
H2c: Quality of presentation is positively related to consumers' satisfaction with the live-streaming programme.

Peripheral cues take the form of social presence that appear on the live stream broadcast. Social presence refers to "the extent to which a medium allows users to experience others as being psychologically present" (Gefen and Straub 2003, p. 11). Perceived social presence has been found to affect people's behavior in an online environment including their of mobile messaging usage (Ogara et al. 2014), social media activities (Han et al. 2015), and participation of online communities (Shen et al. 2010). When individuals perceive a high level of social presence through their personal interaction with live streamers and other audience, they tend to be more engaged in watching the live stream videos. Social presence increased the perception of the usefulness of information (Han et al. 2015) and enjoyment (Choi 2016). In this regard, the following hypotheses are proposed.

H2a: Social presence is positively related to consumers' perceived value.
H2b: Social presence is positively related to consumers' cognitive assimilation with the live streamer.
H2c: Social presence is positively related to consumers' satisfaction with the live-streaming programme.

3 Research Method

3.1 Participant

The data are collected by the Enterprise and Social Development Research Centre and Proactive Think Tank Limited. Participants were recruited via a different e-commerce, social media pages, and live-streaming websites[1]. There are 1006 valid responses. Among the 1006 samples, 453 respondents watched live-streaming video within 3 months. The data of these 453 participants were used for analysis. Demographic characteristics of the sample included age (over 90% aged between 21 and 60), gender (72.6% female), and educational level (60.0% with a tertiary qualification). Considering the use of live-streaming e-commerce, participants can be described as highly interested as well. When asked about their use of live-streaming, 36.2% of them spent more than 3 h watching live-streaming every week and 65% of them had experience of making purchase after live-streaming programme.

3.2 Measures and Data Analysis

To measure the constructs specified in the proposed model, we selected appropriate multi-item scales from previous studies making some modifications to fit the context of live streaming e-commerce. All items, reliability scores and scale sources are available in Table 1. All scales were written in a five-point Likert format where 1 = strongly disagree and 5 = strongly agree. The analysis of model was undertaken via partial least squares structural equation modelling (PLS-SEM). Two phase process involved including the analysis of measurement reliability and validity and the evaluation of the structural model (Hair et al. 2020). Using Smartpls 3.0, path analyses were conducted to test the effects of the perceived value, social presence and visibility on the two outcomes cognitive assimilation and customer satisfaction.

4 Findings

4.1 Measurement Model

The measurement model is used to examine reliability and validity. Table 1 summarizes the Cronbach's alpha (CA), composite reliability (CR), average variance explained (AVE) and factor loadings of the constructs. All of the constructs obtained Cronbach's Alpha and composite reliability greater than 0.7, which demonstrate a reasonable internal consistency of the survey instrument. All items exhibit factor loading coefficients greater than 0.7 on their respective constructs and all AVE are greater than 0.5, which satisfied the criteria of assessing convergent validity as suggested in Fornell and Larcker (1981). Discriminant validity examines the degree to which the measurements of two constructs are empirically distinct. It was corroborated using the Fornell Larcker criterion, cross

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loadings and "Heterotrait-Monotrait (HTMT)" criterion. All square-roots of AVE are greater than the correlation coefficients, the factor loadings of each construct are higher than all of its cross loadings with other constructs and none of the HTMT between the different pairs of the constructs was higher than the cutoff level of 0.9, confirming the discriminant validity of measurement model (Table 2).

4.2 Structural Model

The quality of the structural model is assessed by various indicators including a collinearity assessment, the significance and relevance of structural model relationships, the r-square (R^2) for exogenous-endogenous relationships, and the effect size and predictive relevance of the model (Hair et al. 2014). The model was able to explain 39.8% of the variance in cognitive assimilation and 60.5% of the variance in customer satisfaction. In addition, a blindfolding procedure was conducted to obtain the Stone-Geisser's Q^2 value. The results showed that the Q^2 value for cognitive assimilation and customer satisfaction is 0.284 and 0.462, respectively. Since both values are above zero, the research model was considered to have predictive relevance. With VIF ranged from 1.000 to 1.838, which is below the threshold of 5, collinearity among the predictor constructs is not an issue in this model.

The path analysis with 5000 bootstrapping samples indicates that perceived value of live streaming ($\beta = 0.139$, $p < 0.001$), quality of presentation ($\beta = 0.234$, $p < 0.001$), and social presence ($\beta = 0.284$, $p < 0.001$) have significant effects on cognitive assimilation. Similarly, the perceived value of live streaming ($\beta = 0.277$, $p < 0.001$), quality of presentation ($\beta = 0.222$, $p < 0.001$), and social presence ($\beta = 0.430$, $p < 0.001$) also have significant effects on customer satisfaction to live streaming programme (Table 3).

5 Discussion and Conclusion

In particular, while existing studies on influencers claim that they are a valuable channel of brand-related communication (Djafarova and Rushworth 2017), there is a need for research using valid and reliable results related to audience's perception and behavior toward these activities. Among all the antecedents, quality of presentation exerts the strongest influence on cognitive assimilation in live streaming commerce. This finding is in line with the finding of Gao et al. (2021) that information completeness is the strongest determinant on perceived persuasiveness. The results of this study also imply the importance of social presence in live streaming commerce, which agree with those of the prior studies. The live streaming commerce viewers are more satisfied if the live streaming video can provide higher level of social presence.

The results yield several practical suggestions for live streaming commerce operators. Our results show that the quality of presentation and social presence of live streaming shopping can indeed positively influence customers' satisfaction and cognitive assimilation through consumer values. Live streaming commerce operators should maximize the advantages of its visual and interactive features. Sellers can show more details of their products and respond rapidly to customers' questions to enhance customers' perceived values. Streamers should possess thorough product knowledge before broadcasting. If they can demonstrate the use of their products and proactively help customers to solve problems, customers are more likely to feel satisfy and being convinced. Live stream operators could also increase the functionality for streamer-customer interactions. For example, they should have customer service team specialized in handling customer enquiries. Real-time interactions with live streamers allowed the viewers obtain not only a more customized and thorough understanding of the products, but also develop a para-social relationship with the live streamers (Gao et al. 2021).

This study shows that the perceived values of live-stream videos, quality of presentation, social presence, customer satisfaction, and cognitive assimilation are interrelated, thus supporting the proposed conceptual framework. This study establishes a model based on the respondents of Hong Kong. However, focusing on a group of viewers in Hong Kong may limit the generalizability of the study. Future studies can also examine various contextual factors and moderators in the process of persuasion. For example, the effect of the potential power of live streamers such as celebrities and key opinion leaders has received surprisingly limited scholarly attention. This is an important issue as the marketer may need to have more thorough understanding on how to use live streams to change consumers' attitudes toward their products.

Table 1. Results of measurement model

Constructs and items	Standardized loadings
Social Presence (CA = 0.776, CR = 0.871, AVE = 0.692) SP1 There is a sense of human contact in live streaming shopping SP2 There is a sense of personalness in live streaming shopping SP3 I can keep in touch with the streamer and others during the live streaming Source: Sun et al. (2014)	0.820 0.872 0.801
Quality of Presentation (CA = 0.837, CR = 0.902, AVE = 0.753) QP1 Live streaming shopping makes the product attributes visible to me QP2 Live streaming shopping makes information about how to use products visible to me QP3 Live streaming shopping helps me to visualize products like in the real world Source: Xu et al. (2020)	0.882 0.869 0.851

(*continued*)

Table 1. (*continued*)

Constructs and items	Standardized loadings
Perceived Utilitarian Value (CA = 0.845, CR = 0.906, AVE = 0.764) PUV1 Live streaming helps me to find the information I would like to collect PUV2 Live streaming can help me collect information in a more effective way PUV3 Live streaming can help me address misgivings Source: Chen et al. (2020)	0.870 0.890 0.861
Perceived Hedonic Value (CA = 0.866, CR = 0.918, AVE = 0.790) PHV1 I feel pleasure from using online streaming PHV2 I experience enjoyment from using online live streaming PHV3 I have fun using online live streaming Source: Chen et al. (2020)	0.850 0.893 0.922
Perceived Social Value (CA = 0.908, CR = 0.942, AVE = 0.845) PSV1 I use online live streaming to make the acquaintance of new friends PSV2 I would like to use online live streaming to expand my social circle PSV3 I try to use online live streaming to make contact with people I am interested in Source: Chen et al. (2020)	0.930 0.934 0.893
Cognitive Assimilation (CA = 0.881, CR = 0.918, AVE = 0.738) CA1 My existing understanding regarding products/services is likely to be influenced through streamer information CA2 My current knowledge regarding products/brands is likely to be influenced by streamers CA3 My perceived value of the product can be transformed by streamer environmental cues CA4 My preference of the product can be changed by streamer interaction Source: Xu et al. (2019)	0.890 0.864 0.877 0.803
Customer Satisfaction (CA = 0.853, CR = 0.910, AVE = 0.772) SAT1 Overall, I am satisfied with my experience of using live streaming for purchase SAT2 I am sure I made the correct decision in using live streaming for purchase SAT3 I have obtained several benefits derived from my participation in live streaming for purchase Source: Zhang et al. (2014)	0.867 0.899 0.870

Table 2. Discriminant validity

FL	COA	COV	SAT	SOP	VI	HTMT	COA	COV	SAT	SOP
COA	0.859									
COV	0.426	0.706				COV	0.478			
SAT	0.490	0.590	0.879			SAT	0.557	0.68		
SOP	0.557	0.492	0.707	0.832		SOP	0.666	0.601	0.869	
VI	0.563	0.452	0.619	0.635	0.868	VI	0.648	0.516	0.728	0.79

Table 3. Significance testing results of the structural model path coefficients

Hypotheses	Path	Path coefficient	t-value	Sign.	f^2	Supported
H1a	PV→COA	0.139	3.477	***	0.023	Yes
H1b	PV→SAT	0.277	7.018	***	0.141	Yes
H2a	QP→PV	0.234	4.599	***	0.046	Yes
H2b	QP→COA	0.322	4.047	***	0.099	Yes
H2c	QP→SAT	0.222	4.599	***	0.072	Yes
H3a	SP→PV	0.346	6.407	***	0.100	Yes
H3b	SP→COA	0.284	3.830	***	0.074	Yes
H3c	SP→SAT	0.430	8.339	***	0.256	Yes

*$p < .05$; **$p < .01$; ***$p < .001$

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The Influence of Linguistic Style on Consumer Engagement: A Study from Top Global Brands' Posts on Facebook

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Abstract. In this article, we present the results of an empirical study on the influence of the linguistic style of global brands on digital consumer engagement. Our conceptual model is based on the analysis of more than 7,700 Facebook posts from 90 global brands across different categories and tests the effects of several linguistic elements such as pronoun choices, clout, emotional tone, informality, temporal focus, etc. The results show that these elements positively or negatively influence consumer engagement differently, depending on the type of engagement (likes, comments, shares, or reactions). By discussing these results, we inform managers on how to better communicate with consumers on social media to obtain more positive consumer responses.

Keywords: Linguistic style · Post content · Engagement · Facebook

1 Introduction

Social media has become an essential part of digital marketing strategies (Arora et al. 2019). As such, brands strive to publish content that serves their marketing goals as well as engages customers' motivations and interests (Barcelos et al. 2018; Sabate et al. 2014). However, several questions remain concerning the best ways for brands to address their customers in this highly interactive, both personal and public, conversational environment. For instance, what's the best communication style to talk to the public on social media? How do different elements of linguistic style influence digital consumer engagement? The way brands communicate with consumers can thus be decisive in shaping consumer attitudes and determining whether the relationship will progress beyond the initial encounters.

Hence, in this study, we present and test a conceptual model based on empirical data (more than 7,700 Facebook posts from 90 global brands across different categories) to determine how elements of linguistic style (such as pronoun choices, clout, emotional tone, informality, temporal focus, etc.) impact consumer engagement. This study distinguishes itself from current literature on social media communication by analyzing

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the effect of several linguistic features simultaneously and including reactions among other variables of consumer engagement (likes, comments, and shares). Reactions, while still understudied, may provide more nuanced insights into consumer responses. Moreover, the study contributes to the feelings-as-information theory by bringing insights into the affective reactions that can mobilize people's thoughts (Pham 2004). Furthermore, this investigation has managerial relevance as it informs managers on how to better communicate with consumers on social media to obtain more positive consumer responses.

2 Consumer Engagement on Social Media

In marketing literature, engagement definitions usually revolve around four poles: engagement as (1) a psychological state of mind, (2) intrinsic motivation, (3) customer activities and as (4) customer-added firm value (de Oliveira Santini et al. 2020). For the purposes of our study, we adopt a practical approach that mixes the third and fourth perspectives and posits that digital customer engagement is made-up of consumers' interactions with a brand in a digital environment; it strengthens their investment in the brand at different levels and phases to produce traceable reactions such as clicks, likes, comments, and shares (Gavilanes et al. 2018). Hence, a highly engaged customer will comment on a brand's Facebook page, retweet its content on Twitter, and share it with friends on Instagram, to name a few examples. These interactions, in turn, lead to improved sales performance by generating more word-of-mouth and by boosting behavioural intentions (de Oliveira Santini et al. 2020).

Nevertheless, a complete understanding of the antecedents of consumer engagement depends on considering the several ways people can interact with brands (Aggrawal et al. 2018). For instance, commenting involves more emotions and investment than liking, and it is considered a stronger form of engagement (Sabate et al. 2014; Labrecque et al. 2020). Consumer digital engagement is also platform-dependent. For instance, while many platforms allow users to like, share or comment on posts, Facebook, the largest platform in the number of users (Emarketer 2021), also allows reactions such as love, laughter (haha), surprise (wow), sadness and angriness. While still understudied, these reactions may provide deeper insights into brand popularity and their audience's behaviour, as traditional metrics do not consider nuances and qualitative differences in consumer responses.

3 The Influence of Linguistic Style on Consumer Engagement

The linguistic style reflects how a message is conveyed and is critical for understanding a person's state of mind (Tausczik and Pennebaker 2010; Pezzuti et al. 2021). Aligning linguistic styles such as analytical thought, clout, emotional tone, and temporal focus may enhance authenticity in service interactions, thereby enhancing communication effectiveness (Burton et al. 2021). Moreover, recent studies have shown that the use of specific linguistics can stimulate the mechanics of brand relationships and lead consumers to engage with a brand's post through various actions (Barcelos et al. 2018; Labrecque et al. 2020).

Our reasoning for the influence of a brand's linguistic style on the user's actions is founded on feelings-as-information theory and marketing literature findings of the impact of affective states on consumer behaviour and attitudes (Kwortnik and Ross 2007; Pham 2004). Since affect can encourage thought mobilization by directing attention to information that confirms initial feelings, feelings aroused by brand messages can also be treated as sources of information (Pham 2004; Kwortnik and Ross 2007). In this sense, consumers use momentary affective feelings to make a wide range of inferences and quick judgments. They also allow for strong interpersonal agreement, as people use the valence of their feelings to infer the direction of their attitudes and preferences (Pham 2004). Hence, since elements of linguistic style elicit affective reactions, they can be crucial for strategic brand communication decisions.

Accordingly, marketing literature has already shown the impact of certain linguistic elements in different contexts. For instance, the use of *pronouns* can help identify the attentional focus and, in turn, reveal priorities, intentions, and processing (Tausczik and Pennebaker 2010). Pronoun choices can also drive different types of social media engagement with branded content (Barcelos et al. 2018; Labrecque et al. 2020). Other elements of linguistic style include *analytical thinking*, which reflects an argumentative text which presents logical or associative ideas and facts, in opposition to a narrative style (Pennebaker et al. 2015); *clout*, which means a communicator in a position of knowledge and authority, reflected in the use of confident language and more first-person plural (i.e., we) and second-person pronouns (i.e., you) (Tausczik and Pennebaker 2010); *emotions and emotional tone*, which represent the degree to which people express emotion and the valence of that emotion (Tausczik and Pennebaker 2010). There are potentially many more elements of linguistic style such as informality, temporal focus (i.e., a discourse in the past, the present or the future), and an emphasis on cognitive and perceptual process (i.e., using terms like thinking, seeing, and feeling). The influence of these factors in consumer engagement is less known in marketing communications literature, so we found it relevant to include them in our analysis.

4 Method

The database for all research consisted of all messages posted on Facebook by 90 top global brands (according to the Interbrand Global Brands ranking) during three months in 2016. Data was collected with the Netvizz API. For each of the 7,721 individual posts, we collected their textual contents, likes, comments, shares, reactions, and other characteristics.

Dependent Variables: The dependent variables consisted of the number of likes, comments, shares, and reactions to brand posts. The first three are standard measures of engagement used in many other studies (for instance, Aggrawal et al. 2018; Arora et al. 2019; Hughes et al. 2019). However, reactions (such as love, anger, sadness, laughter, etc.) are not often considered, even though they may be helpful to picture a more comprehensive portrait of the impact of different linguistic styles on consumer reactions. Hence, they represent an important addition to this study. To account for the variability

of each brand's fanbase – from less than 1M to over 170M users – we divided the number of likes, comments, shares, and reactions by the number of fans of each brand page.

Main Independent Variables (Linguistic Style): We processed the contents of all posts through the Linguistic Inquiry and Word Count software (LIWC, Pennebaker et al. 2015). LIWC compares each word in a text extract against an empirically validated base of nearly 6,400 words, word stems, selected emoticons, and predefined word dictionaries. It then calculates the number of words that match each dictionary and assigns a percentile score (0–100) to represent the ratio of words corresponding to each category (Pennebaker et al. 2015). For instance, a score of 50 in "positive motions" or "cognitive processing" meant that 50% of words in a given post express that specific linguistic style. Although LIWC provides over 60 different categories of textual content, we removed those with very low variance in the sample and those not related to communication styles. Thus, we kept around 20 elements of linguistic style, which already resulted in a fairly complex model.

Control Variables: Finally, we included several control variables whose effect on user engagement has already been shown in the literature: the vividness and interactivity of posts, i.e., the presence of images, videos, and links (Moran et al. 2019; Labrecque et al. 2020), the time of the day when the post was published, i.e., morning, afternoon, evening or night (Sabate et al. 2014; Devereux et al. 2020), and the day of the week, i.e., Monday to Sunday (Devereux et al. 2020; Hughes et al. 2019). We summarize the information and descriptive statistics for all variables in Table 1.

Analysis Model. As much of the data are underdispersed, we choose a Tweedie regression model (TRM) with maximum likelihood estimates (MLE). Models in the Poisson–Tweedie family can automatically adapt to highly skewed count data with excessive zeros without the need to introduce zero-inflated or hurdle components (Bonat et al. 2018). This distribution provides better goodness of fit of the model than the Poisson-gamma distribution for the Akaike and the Bayesian information criteria (AIC and BIC). As previously mentioned, the eight dependent variables are the number of likes, comments, shares, and the reactions "love," "wow," "haha," "sad," and "angry" (divided by the size of the fanbase) for each post *j*.

The model for each VD can be then expressed as:

$$\begin{aligned}(log_{\lambda ij})\gamma_{ij} = \beta_0 + \beta_1(p\_wc_j) + \ldots + \beta_{20}(p\_informal_j) + \beta_{21}(p\_photo_j) \\ +\beta_{22}(p\_video_j) + \beta_{23}(p\_link_j) + \beta_{24}(p\_timeday_j) + \beta_{25}(p\_dotw_j) + \in_{ij} .\end{aligned}$$

where $log_{\lambda ij}$ is the rate of the Tweedie distribution process and $\in_{ij}$ is the distributed error terms for dependent variables y_{1j} to y_{8j}.

Table 1. Variable information and descriptive statistics

Dependent variables	Notation	Min	Max	Mean	Std. dev.
Likes per fanbase	$\gamma 1j$	.0000	.4433	.000933	.008314
Comments per fanbase	$\gamma 2j$	.0000	.0083	.000025	.000152
Shares per fanbase	$\gamma 3j$	.0000	.0131	.000070	.000413
Reaction LOVE per fanbase	$\gamma 4j$	.0000	.0099	.000022	.000149
Reaction WOW per fanbase	$\gamma 5j$	.0000	.0030	.000008	.000067
Reaction HAHA per fanbase	$\gamma 6j$	.0000	.0023	.000002	.000033
Reaction SAD per fanbase	$\gamma 7j$	.0000	.0014	.000001	.000017
Reaction ANGRY per fanbase	$\gamma 8j$	.0000	.0004	.000001	.000005
Main independent variables	Notation	Min	Max	Mean	Std. dev.
Post's word count	*p_wc*	1.000	307	25.120	22.101
Post's analytical thinking	*p_analytic*	1.000	99.000	852.722	2.320.543
Post's clout	*p_clout*	1.000	99.000	712.973	2.288.907
Post's authenticity	*p_authentic*	1.000	99.000	318.490	3.384.186
Post's tone	*p_tone*	1.000	99.000	558.588	3.594.926
Post's I	*p_I*	.000	25.000	.261	141.582
Post's we	*p_we*	.000	33.333	13.005	289.953
Post's you	*p_you*	.000	33.333	17.026	377.622
Post's positive emotions	*p_posemo*	.000	100.000	41.405	704.128
Post's anger	*p_anger*	.000	50.000	.211	143.771
Post's sadness	*p_sadness*	.000	50.000	.129	107.846
Post's social	*p_social*	.000	100.000	74.931	800.751
Post's cognitive processes	*p_cogproc*	.000	100.000	62.317	735.726
Post's perceptual processes	*p_percept*	.000	100.000	34.756	570.006
Post's achievement focus	*p_achieve*	.000	100.00	18.942	390.874
Post's reward focus	*p_reward*	.000	50.000	16.397	343.159
Post's past focus	*p_fpast*	.000	33.333	14.925	375.318
Post's present focus	*p_fpresent*	.000	66.667	72.647	702.292
Post's future focus	*p_ffuture*	.000	50.000	.760	251.680
Post's informal language	*p_informal*	.000	100.000	19.155	466.669

(*continued*)

Table 1. (*continued*)

Control variables	Notation	Categories	N (Percent)
Post contains photo	*p_photo*	1 (Yes), 0 (No)	Yes = 3567 (46.2%)
Post contains video	*p_video*	1 (Yes), 0 (No)	Yes = 2234 (28.9%)
Post contains link	*p_link*	1 (Yes), 0 (No)	Yes = 1899 (24.6%)
Post's day of the week	*p_dotw*	Monday	1179 (15.3%)
		Tuesday	1172 (15.2%)
		Wednesday	1335 (17.3%)
		Thursday	1246 (16.1%)
		Friday	1261 (16.3%)
		Saturday	771 (10.0%)
		Sunday	757 (9.8%)
Post time of the day	*p_timeday*	Morning (6 h to 12 h)	752 (9.7%)
		Afternoon (12 h to 18 h)	3544 (45.9%)
		Evening (6 h to 0 h)	2590 (33.5%)
		Night (0 h to 6 h)	835 (10.8%)

5 Results and Discussion

Table 2 reports the model results for the dependent variables (N = 7,721). To determine the effect sizes, we used the incidence rate ratio (IRR) or the factor by which positive scores (>1) would be expected to increase the predictor variable by one standard deviation, ceteris paribus. For the sake of space, we present the results of our analysis holistically and focus on specific effects of the elements of linguistic style in more detail when necessary. Overall, we can notice that the effect size of most specific linguistic elements is small but taken altogether exert a considerate amount of influence on consumer engagement. That is particularly relevant considering that our textual analysis captures mostly the choice of words and communication styles and not the topic of posts per se. Moreover, these linguistic elements do not demand any investment of brands, only the strategical choices of communication when talking to the public.

Beginning with the analytical and the authentic styles, we found only minor effects on the number of comments and the reactions of sadness. However, we found negative effects of clout on most forms of engagement and a positive effect on angry reactions. That suggests that users do not usually respond well to brands who speak to them from a position of authority. This result is corroborated by the negative effect of using more often the "I" pronoun vs. "we" and "you" on most forms of user engagement. Hence, brands that speak most about their public or themselves and the public as a whole tend to elicit more positive engagement. Accordingly, speaking more on "we" terms also seems to reduce reactions of sadness and angriness. As a matter of fact, our results show that focusing on social words, in general, seems to have a similar positive effect on consumer engagement. As a notable exception, brands who use "I" more often increase reactions

of laughter (haha). That maybe due to feelings of weirdness and amused surprise from the public, as brands do not often anthropomorphize themselves or speak of themselves as singular human beings (Barcelos et al. 2018).

The use of emotions seems to have mixed effects on consumer engagement. Overall, a strongly positive tone appears to slightly reduce consumer responses, maybe due to perceptions that such tone is not authentic or realistic.

Table 2. Model results

Variable	Likes	Comments	Shares	LOVE	WOW	HAHA	SAD	ANGRY
Word count	.010*** (.001)	.005*** (.001)	.003*** (.001)	-.006*** (.001)	.006*** (.001)	-.014*** (.001)	-.005*** (.001)	.005*** (.001)
Analytic style	.000 (.001)	.002** (.001)	.001* (.001)	.002** (.007)	-.001 (.001)	.000 (.001)	.007*** (.001)	.002 (.001)
Clout style	-.001 (.001)	.002* (.001)	-.007*** (.001)	-.008*** (.001)	-.006*** (.001)	-.005*** (.001)	-.008*** (.002)	.008*** (.002)
Authentic style	.000 (.001)	-.001** (.001)	.000 (.001)	-0,06923 (.001)	.001 (.001)	.001 (.001)	-.006*** (.001)	.001 (.001)
Tone	-.001** (.001)	-.001** (.001)	-.004*** (.005)	-.004*** (.001)	-.004*** (.001)	.002** (.001)	-.010*** (.001)	.000 (.001)
I	-.040** (.011)	-.040*** (.011)	-.033** (.011)	-.057*** (.012)	-.143*** (.016)	.029** (.013)	-.240*** (.030)	-.166***(.026)
We	.061*** (.005)	.069*** (.005)	.052*** (.005)	.069*** (.005)	.017** (.006)	.026*** (.007)	.048*** (.011)	.084*** (.009)
You	.016*** (.005)	.004 (.005)	.004 (.005)	.009** (.004)	-.009 (.006)	.030*** (.006)	-.018* (.001)	-.020** (.008)
Positive emotions	-.006** (.003)	.000 (.003)	.002 (.003)	.012*** (.003)	-.001 (.003)	.001 (.004)	.022*** (.004)	.007 (.005)
Anger	-.062*** (.011)	-.016 (.011)	-.033** (.011)	-.026** (.011)	.023** (.011)	.022* (.013)	-.051** (.019)	-.047** (.019)
Sadness	-.029* (.015)	-.018 (.014)	-.051** (.015)	-.028* (.015)	-.073*** (.018)	.025 (.016)	.006 (.020)	.004 (.022)
Social	.013*** (.003)	.000 (.003)	.022*** (.003)	.016*** (.003)	.004 (.004)	.036*** (.004)	.010* (.006)	-.012** (.005)
Cognitive proc	.007** (.002)	.004** (.002)	-.008*** (.002)	-.004** (.002)	-.007** (.002)	.012*** (.003)	-.020*** (.004)	-.004 (.004)
Perceptual proc	-.016*** (.003)	-.015*** (.003)	-.014*** (.003)	-.008** (.002)	.017*** (.003)	-.017*** (.003)	-.058*** (.005)	-.037*** (.005)
Achievement	.000 (.004)	.016*** (.003)	.023*** (.003)	.004 (.004)	.003 (.005)	-.018*** (.005)	-.071*** (.007)	.018** (.005)
Reward	.024*** (.004)	.050*** (.003)	.036*** (.004)	.031*** (.004)	.042*** (.004)	.026*** (.005)	.043*** (.006)	.027*** (.006)
Past focus	.020*** (.004)	.003 (.004)	.005 (.004)	.009** (.003)	-.003 (.004)	-.010** (.005)	.081*** (.006)	.019** (.006)
Present focus	-.005** (.002)	.004* (.002)	.000 (.002)	-.004* (.002)	-.004 (.003)	-.004 (.003)	-.012** (.004)	.008** (.004)
Future focus	.036*** (.005)	.019*** (.005)	.052*** (.004)	.047*** (.004)	.027*** (.006)	.057*** (.007)	.022** (.010)	.037*** (.009)
Informal language	.002 (.003)	-.034*** (.003)	-.037*** (.003)	-.027*** (.003)	-.017*** (.003)	-.005 (.004)	-.055*** (.005)	-.043*** (.005)
Contains photo	4.123*** (.584)	1.501*** (.330)	2.074*** (.414)	3.838*** (.650)	2.152*** (.491)	2.415*** (.644)	.600 (.569)	1.256** (.580)
Contains video	3.140*** (.584)	1.545*** (.330)	2.456*** (.414)	3.667*** (.650)	2.073*** (.491)	2.673*** (.645)	.408 (.571)	1.476** (.581)
Contains link	3.686*** (.584)	1.324*** (.330)	1.786*** (.415)	2.999*** (.650)	2.020*** (.492)	1.608** (.646)	.582 (.571)	1.788** (.582)
Monday	.102*(.053)	.336*** (.056)	.318*** (.057)	.044 (.055)	.137** (.068)	.213** (.073)	.175 (.109)	.398*** (.097)
Tuesday	-.252*** (.055)	.291*** (.056)	.342*** (.057)	.001 (.056)	.446*** (.067)	-.657*** (.079)	-.231** (.114)	.091 (.099)
Wednesday	-.163** (.053)	.333*** (.055)	.265*** (.056)	-.011 (.055)	.149** (.067)	-.352*** (.075)	-.034 (.109)	.069 (.098)
Thursday	.139** (.052)	.563*** (.055)	.170** (.057)	-.055 (.055)	.532*** (.066)	-.364*** (.076)	.145 (.108)	.481*** (.096)
Friday	-.351*** (.055)	.411*** (.055)	.204*** (.057)	-.091* (.055)	.238*** (.067)	-.416*** (.075)	.141 (.108)	.328** (.096)
Saturday	.047 (.059)	.185** (.062)	.016 (.065)	.110* (.061)	.089 (.075)	-.464*** (.085)	.879*** (.112)	.295** (.106)
Morning	-.039 (.055)	.690*** (.057)	.691*** (.061)	.532*** (.061)	.176** (.070)	.381*** (.082)	-.882*** (.116)	.829*** (.094)
Afternoon	-.270*** (.042)	.382*** (.046)	.586*** (.050)	.353*** (.048)	.185** (.054)	.240*** (.064)	-.970*** (.082)	.008 (.078)
Evening	-1.063*** (.047)	-.380*** (.049)	-.210*** (.053)	-.351*** (.052)	-.498*** (.058)	-.689*** (.069)	-.675*** (.084)	-.601*** (.084)
(Intercept)	-10.794*** (.594)	-13128*** (.346)	-11.981*** (.428)	-14.016*** (.654)	-13.570*** (.505)	-15.092*** (.662)	-13.386*** (.601)	-17.016*** (.610)
(Scale)b	.039 (.003)	.006 (-.562)	.011 (.001)	.006 (-.596)	.005 (.536)	.004 (.405)	.004 (.495)	.003 (.366)
AIC	-85.862.678	-141.779.589	-119.542.506	-132.237.389	-113.850.753	-94.896.039	-57.972.821	-71.839.795
BIC	-85.626.320	-141.543.231	-119.306.149	-132.001.031	-113.614.396	-94.659.681	-57.736.464	-71.603.437

Notes: b Maximum likelihood estimate. For dummy's variables, the results were compared with the baseline variables, not reported in the table. Number of betas (β), standard errors are in parentheses. AIC=Akaike information criterion; BIC= Bayesian information criterion. * p<0.10; ** p<0.05; *** p<0.001.

At the same time, positive emotions also positively affect reactions of love and sadness, so it seems to help evoke consumers' empathy. More significantly, the use of angry words has a considerable negative effect on most forms of consumer engagement, except for reactions of shock and surprise (wow). Hence, corroborating the findings of Munaro et al. (2021), brands should probably benefit from using emotions moderately and according to the context.

Regarding the focus of brand conversations, an emphasis on words denoting cognitive and perceptual processes seems to reduce consumer engagement, except for reactions of surprise and laughter. Again, speaking in terms of "think," "see," and "feel" may seem somehow out of place for global brands that represent large organizations and institutions too much to be considered as singular agents. It may also be possible that users do not react well to brands who try to portray themselves as too "human," which can also explain the overall negative effect of an informal communication style on consumer responses. On the other hand, brand posts that focus on rewards elicit increased most forms of user engagement, as do focusing on achievements (except for reduced reactions of sadness

and laughter). Hence, users seem interested in brand posts that tell them of possible gains and benefits. Brand posts that focus on the future and in the past also elicit increased engagement, possibly for the same reason as the previous topics, but also because such focus is often associated with storytelling and narrative style.

Concerning the length of the post, our results support the benefits of writing longer posts to user engagement (Sabate et al. 2014), even though these benefits are small. Moreover, shorter posts seem more appropriate to elicit love, laughter, and sadness reactions. Finally, regarding our control variables, while the time of publication had mixed effects on different types of engagement, the use of images, videos and links had a positive and consistent strong effect on all of them, supporting previous studies (for instance, Moran et al. 2019; Labrecque et al. 2020).

6 Final Remarks

Our study contributes to the feelings-as-information theory by addressing the affective reactions from a brand's linguistic style on social media. Consumers may consider the elicited reactions as proxies for value, which in turn influence their attitudes and actions (Kwortnik and Ross 2007; Pham 2004). The results of our study also offer guidelines for brand communication on social media, particularly regarding linguistic choices on Facebook. However, this research is part of an ongoing project, and its current limitations should still be addressed by future research. For instance, we should investigate how different linguistic styles interact with the brand personality and how certain styles may be more beneficial to the brand according to its industry or positioning. Finally, as other platforms come to prominence (such as Instagram), future studies may focus on them while also considering the interplay between textual and visual elements, such as videos.

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Magic Mirror: "You are the Fairest of Them All!" Cross-buying at the Point of Sale

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Abstract. To compete with the availability of online information, stationery retailers may introduce new technologies, such as augmented reality, to provide additional information and product recommendations and thus improve consumers' shopping convenience and experience. The present study analyzes the impact of such an augmented reality application on the cross-buying intention in stationary retailing. Based on an experimental scenario and the corresponding results from 301 questionnaires, the study finds the impact of augmented reality to be significantly different for female and male consumers. Whereas the results hardly differ for men, women experience augmented reality significantly differently. Specifically, the relationship between the attractiveness of cross-selling offers and the cross-buying intention significantly intensifies in a situation that includes augmented reality. Similarly, the effect of price attractiveness and shopping convenience is also higher with augmented reality, whereas the perceived product fit is significantly lower in this case. Thus, this study contributes to research by addressing augmented reality and describes practical implications for its use.

Keywords: Augmented reality · Cross-buying · Magic mirror · Point of sale · Retailing

1 Introduction

Cross-buying behavior has numerous advantages from a company perspective (Ngobo 2004). Given the competitive pressure of online retailing, cross-buying behavior is increasingly important for stationary retailers. Existing research has, for example, studied consumer satisfaction (Aurier and N'Goala 2010), commitment of consumers towards a company (Verhoef et al. 2002), price and price-performance ratio of products, fit between products (Ngobo 2004), and shopping convenience (Little and Wijnholds 1986) as antecedences of cross-buying. Traditional approaches to increasing cross-buying are limited at the point of sale, such as sales staff and product placement (Kamakura 2008). The use of new technology may overcome this limitation but has, so far, received little attention in stationary retailing. One technological approach to promoting cross-buying is augmented reality. In short, augmented reality adds digital information to reality (Azuma 1997). One such in-store augmented reality application is the so-called magic mirror. Magic mirrors can provide consumers with cross-selling offers that match their originally chosen product and can be tried on virtually (Sjøbakk et al. 2017). Furthermore,

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magic mirrors may provide additional information to reduce the potential information deficit in comparison to online shopping.

This study adds to the existing literature by examining the impact of augmented reality on consumers' cross-buying intention at the point of sale. Based on 301 online surveys in an experimental scenario setting, this study examines differences in cross-buying intention between a shopping situation with augmented reality and a shopping situation without augmented reality. The scenario specifically looks at the attractiveness of a cross-selling offer for cross-buying intention. In this study, the attractiveness of the selling offer is formed by its perceived product benefits, price attractiveness, convenience, and fit (e.g. Maitzen 2016).

2 Theoretical Background

2.1 Cross-buying Behavior

Following Kumar et al. (2008, p. 16), this study defines "cross-buy as the total number of different product categories that a consumer has purchased from a firm from the time of the first purchase." Literature investigates several factors influencing cross-buying behavior and intention (e.g., Kumar et al. 2008; Ngobo 2004; Verhoef et al. 2002). Maitzen (2016), for example, summarizes four categories: relationship-related factors, provider-related factors, consumer-related factors, and performance-related factors. Relationship-related factors of cross-buying behavior are consumer satisfaction (Liang and Chen 2009), trust (Soureli et al. 2008), commitment (Verhoef et al. 2002), and the length of the business relationship (Reichheld and Sasser 1990). In the case of performance-related factors, previous research has studied, for example, price and price-performance ratio (Verhoef et al. 2002), as well as the fit between the products (complementary products) (Drèze et al. 1994) and the fit between additional products and the retailer (Maitzen 2016). Provider-related factors include research on marketing activities (Kumar et al. 2008), company image (Liu and Wu 2007), and the role of the sales staff. The consumer-related factors include convenience in the buying process (e.g., one-stop-shopping) (Ngobo 2004) and consumer sociodemographic, such as age (Kumar et al. 2008). Previous research has considered traditional instruments to promote cross-buying, such as sales staff (Kamakura 2008). However, research has not yet considered the effect of augmented reality on cross-buying.

2.2 Augmented Reality in Marketing

Augmented reality is part of the reality-virtuality continuum (Milgram et al. 1994). In an augmented reality-enriched environment, virtual objects are added to reality (Azuma 1997). Augmented Reality is primarily used in online shopping for product presentation and visualization (Pozharliev et al. 2021). In stationary retailing, only a few companies have been testing the potential of augmented reality – in particular, magic mirrors, where clothes are worn virtually by consumers (Sjøbakk et al. 2017).

In general, research on augmented reality in marketing is scarce, so far. Along the lines of factors that influence cross-buying behavior, we briefly consider the state

of research addressing augmented reality. These four-factor groups are relationship-related, provider-related, consumer-related, and performance-related (Maitzen 2016). Some relationship-related factors have been examined and confirmed, for example, that augmented reality may increase consumer satisfaction (Poushneh and Vasquez-Parraga 2017). Provider-related factors are rarely considered in the cross-buying literature. An exception is the use of augmented reality as exclusive advertising (Bonetti et al. 2018). Perceived convenience as a consumer-related factor has been studied. In general, augmented reality is found to have a positive impact on convenience (Poushneh and Vasquez-Parraga 2017). As such, augmented reality helps to reduce search and transaction costs. Performance-related factors are not analyzed regarding augmented reality so far. For example, the impact of augmented reality on the price perception of consumers has not been studied. However, previous research suggests that product tests are more effective than advertising as consumers can evaluate the product (Smith and Swinyard 1983). In consequence, we assume virtual product tests through augmented reality to have a positive impact on price perception.

2.3 Research Model and Hypotheses

The cross-buying intention is directly affected by the attractiveness of the cross-selling offer. The attractiveness of the cross-selling offer has been defined as the evaluation of an offer by existing or potential consumers based on their perception of the product's attractive and beneficial effects (Maitzen 2016). This study draws on Maitzen's categorization (2016) and utilizes four first-order constructs to formatively measure the attractiveness of the cross-selling offer. These constructs are product benefit, price attractiveness, convenience, and fit. Product benefit was introduced by Maitzen to generalize findings from the predominantly researched financial industry, while the other three constructs are based on previous literature. These four constructs form the second-order construct attractiveness of the cross-selling offer. This study introduces augmented reality as a moderator in these relationships. We also control for the perceived appeal of the original product choice. Figure 1 displays the resulting research model.

The combination of the appeal of the original chosen product and the attractiveness of the cross-selling offer determine consumers' cross-buying intentions. In this experimental scenario, no prior relationship between retailer and consumer is assumed. Therefore, no factors that presuppose an existing relationship, such as consumer satisfaction and relationship length, are taken into consideration. However, the scenario considers complementary cross-selling offers for the original product. The following five hypotheses introduce augmented reality into the existing model on cross-buying intention.

H1: The use of augmented reality increases cross-buying intention as the cross-selling offer becomes more attractive
H2: The use of augmented reality increases the attractiveness of the cross-selling offer as the perceived product benefit increases
H3: The use of augmented reality increases the attractiveness of the cross-selling offer as the perceived price attractiveness increases.
H4: The use of augmented reality increases the attractiveness of the cross-selling offer as the perceived convenience increases.

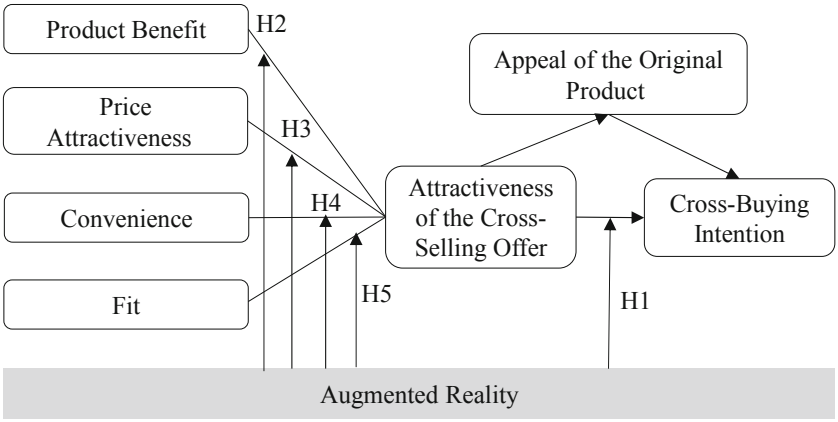

Fig. 1. Research model

H5: The use of augmented reality increases the attractiveness of the cross-selling offer as the perceived fit increases.

3 Methodology

3.1 Experimental Setup

The present study employed an experimental scenario technique. Data collection was done via an online survey. First, the survey asked for sociodemographics and technology use. After that, one of two scenarios was randomly shown. One scenario included a cross-selling offer without augmented reality. The alternative scenario included a magic mirror as an augmented reality technology to present a cross-selling offer. This is similar to the scenario in Sjøbakk et al. (2017). We also created those scenarios gender-specific to have four scenarios in total (2 with/without augmented reality × 2 female/male). Data measurement was based on previous research.

3.2 Data Measurement

Data measurement was based on previous research. The present study used multi-item measurement for product benefit, price attractiveness, convenience, fit, and cross-buying intention. All items were measured on a 7-point rating scale. For product benefit, items were drawn from Spangenberg et al. (1997). Price attractiveness was assessed with items from Grewal et al. (1998) respectively Sweeney and Soular (2001). Items by Seiders et al. (2007) were used for convenience. Items based on Maitzen (2016) were used for the fit. The cross-buying intention was addressed by items from Sweeney et al. (1999) and Dodds et al. (1991). We also controlled for the aesthetic quality of the original product with a single question.

3.3 Data Sample and Data Overview

A pretest suggested minor changes in the formulation of questions. The online survey ran for 2 weeks in April 2019. The questionnaire was opened 462 times and yielded a total of 315 completed and valid questionnaires. We remove minors from the sample, resulting in a final sample of 301. Participants are 52.5% (158) female, and almost equally distributed in the four scenarios. The majority of our participants are between the age of 20 to 40 (73.1%) and reside in Germany (93.7%). We also ask for education and occupation but found no particularities across these demographics. The scenarios with augmented reality and without augmented reality are randomly assigned and no significant demographic differences were detected.

4 Empirical Results

Variance-based structural equation modeling is used to include both formative and reflective measurement models. Calculations are done with SmartPLS 3. For significance tests, bootstrapping is run with 5,000 subsamples.

All first-level constructs are measured reflectively. To assess the multi-item measurement, we inspect the individual item reliability, composite reliability, and discriminant validity. The criteria were a factor loading of ≥ 0.7 at a 5% significance level, factor stability ≥ 0.7, average variance extracted ≥ 0.5, Cronbach's Alpha ≥ 0.7, Jöreskog's Rho ≥ 0.7, and the Fornell-Larcker criterion. All indicators exceed the relevant threshold levels. Next step, the formative second-order measurement model for the attractiveness of the cross-selling offer is assessed on the criteria: indicator weights ≥ 0.2, the significance of the factor loadings at a 5% level, all construct correlations ≤ 0.9, and variance inflation factors ≤ 5. Again, all criteria are met. The coefficient between product benefit and attractiveness of the cross-selling offer is 0.302 ($p < 0.001$). For price attractiveness, it is 0.319 ($p < 0.001$). The relationship of convenience and fit to the attractiveness of the cross-selling offer is 0.312 ($p < 0.001$) and 0.256 ($p < 0.001$) respectively.

The inner structural model is examined based on the path coefficients > 0.2, the significance of the path coefficients at a 5% level, coefficient of determination $R^2 \geq 0.1$, Stone-Geisser criterion $q^2 > 0$, effect sizes $f^2 \geq 0.02$. R^2 is 0.280 for cross-buying intention. Thus, this model accounts for 28.0% of the variance in cross-buying intention. Effect size f^2 for appeal of the original product is 0.197 and its path coefficient is 0.380 ($p < 0.001$). The variance accounted for (VAF) is 0.14 for a potential mediation of the appeal of the original product, so only a minor part of the cross-buying intention is accounted for by this relationship – below the threshold value of 0.2 for partial mediation. With an effect size f^2 of 0.160, the attractiveness of the cross-selling offer also has a medium influence on cross-buying intention. The path coefficient is 0.371 ($p < 0.001$) and confirms a positive influence of the attractiveness of the cross-selling offer on cross-buying intention. Thus, the assumption that the attractiveness of the cross-selling offer has a positive influence on cross-buying intention can be confirmed. Overall, the quality criteria attest to the appropriateness of the structural model.

Following the assessment of the measurement and structural model, the moderating effect of augmented reality is analyzed by multi-group analysis as described by Henseler et al. (2009). The path coefficient of the group with augmented reality (0.294, $p < 0.001$)

is lower than in the group without augmented reality (0.336, $p < 0.001$). However, the difference is not significant (|0.042|, $p = 0.323$). Data suggests that the attractiveness of the cross-selling offer on cross-buying intention decreases with the use of augmented reality. Thus, Hypothesis 1 is not confirmed. Even though not significant, data indicates that there might be a difference between female and male consumers (|0.095|, $p = 0.106$). While there was no significant positive difference between the group without and with augmented reality for women (0.063, $p = 0.278$), whether augmented reality is present was significant in the case of men (-0.174, $p = 0.912$). The cross-buying intention increases for women and decreases with augmented reality for men. The results indicate a considerable gender effect.

For the elements of the attractiveness of the cross-selling offer, there are considerable differences between female and male consumers (see Table 1). At the 5% level, *p*-values that are smaller than 0.05 or greater than 0.95 indicate a significant difference in path coefficients. In the case of product benefit and price attractiveness, women perceive a higher attractiveness of the cross-selling offer while attractiveness is higher for men when considering the fit between the products. No significant difference is found for shopping convenience.

Table 1. Differences between female and male consumers

Relationship	Path coefficient difference (women – men)	Significance
Product Benefit → Cross-Selling Offer	**0.033**	**0.044**
Price Attractiveness → Cross-Selling Offer	**0.061**	**0.002**
Convenience → Cross-Selling Offer	0.016	0.230
Fit → Cross-Selling Offer	**−0.043**	**0.991**

Consequently, the effect of augmented reality is analyzed across the four scenarios, differing between female and male consumers and with and without augmented reality. Table 2 presents the results across these four groups. As the sample size decreases for four groups, we also consider the *p*-value at the 0.1 level. Again, as differences are evaluated, *p*-values that are smaller than 0.1 or greater than 0.9 indicate a significant difference in path coefficients.

For product benefits, the data revealed no significant effect of augmented reality in either group, thus not confirming Hypothesis 2. Consequently, companies do not need to fear that employing augmented reality affects perceived product benefits. The relationship between price attractiveness and the cross-selling offer is moderated by augmented reality for women (0.075, $p = 0.934$), but not for men (0.016, $p = 0.678$). Hypothesis 3 is thus confirmed for women. The impact of convenience on the attractiveness of the cross-selling offer (0.101, $p = 0.995$) is positive for female consumers. Thus, the effect of shopping convenience on the attractiveness of cross-selling offers increases with augmented reality, confirming Hypothesis 4 for women. The relationship between product

Table 2. Results of the multi-group analysis across the four scenarios

Relationship	Gender	Path coefficient difference (with AR – without AR)	Significance
Product Benefit → Cross-Selling Offer	Female	−0.039	0.147
	Male	0.014	0.659
Price Attractiveness → Cross-Selling Offer	Female	**0.075**	**0.934**
	Male	0.016	0.678
Convenience → Cross-Selling Offer	Female	**0.101**	**0.995**
	Male	0.033	0.777
Fit → Cross-Selling Offer	Female	**−0.056**	**0.068**
	Male	−0.031	0.162

fit and attractiveness of the cross-selling offer is negatively affected by augmented reality for female and male consumers. In the case of women, this effect is significant at $p = 0.068$. In consequence, augmented reality may potentially reduce the perceived fit between the original product and the cross-selling offer. Hypothesis 5 is thus not confirmed.

For men, although not significant, the impact of augmented reality is positive regarding product benefit, price attractiveness, and shopping convenience. Comparing the effect of augmented reality between female and male consumers, data indicates that the effect is higher for women than for men. The positive effect of augmented reality can only be confirmed for women in the case of H3 and H4.

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Influencer Authenticity – Conceptualization, Nature and Nomological Role

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Abstract. Social media influencers are increasingly approached by marketers to advocate brands and products. This practice is commonly called 'influencer marketing'. Influencers can take advantage of their reach and importance for consumers' decision making by obtaining rewards from marketers. Consumers are increasingly aware of this practice and hence, both perceived influencer credibility and authenticity are key when it comes to influencers' ability to persuade others. Yet only an insignificant body of literature has investigated the concept of influencer authenticity. In this research, we shed light on the nature of this construct, its boundaries as well as its relationships with other variables responsible for consumers' buying decisions. Our literature research not only identifies influencer authenticity's components, but also the concept's importance for the impact of influencers' recommendations.

Keywords: Influencer · Authenticity · Credibility · Social media marketing

1 Introduction

In the digital era, marketers increasingly face the problem that consumers regard traditional forms of advertising (e.g., banner ads) as disturbing and untrustworthy (Wenzel 2016). This led to the use of influencer marketing. *Influencers* are opinion leaders who can affect consumers' decision-making via social media channels such as YouTube and Instagram (Lin et al. 2018). In the recent past, marketers tried to benefit from influencers' recommendations which were typically regarded as less biased and more informative compared to other types of online communication (Wenzel 2016). However, influencer marketing faces a severe credibility problem today: Consumers increasingly doubt the authenticity of influencers arbitrarily cooperating with diverse companies and brands, which seemingly do not correspond to an influencer's interests or personality (Audrezet et al. 2020).

From the consumers' perspective, perceived *credibility* and *authenticity* are the two major forces that determine influencers impact on buying decisions. For marketers this means that it will be increasingly important to select the right influencers based on these

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two characteristics (Tabor 2020). However, while marketing research has a profound understanding of the credibility concept, an appropriate discussion of the nature, boundaries and role of *authenticity* in the context of influencer marketing is still sparse. This is surprising as marketing literature has recognized the importance of authenticity across different market offerings, like historical sites (Goulding 2000; Grayson and Martinec 2004), (reality) television (Becker et al. 2019; Rose and Wood 2005), and brands (Fritz et al. 2017; Beverland et al. 2008; Lee et al. 2009). Only a few marketing studies address the perceived authenticity of others (e.g., Moulard et al. 2015).

To shed light on the role of authenticity in social media environments, we conducted a sound literature analysis on marketing scholars' knowledge about authenticity. In order to find relevant papers, the 64th edition of Harzing's Academic Journal Quality Guide and the VHB Jourqual 3 served as guides to identify journals with heightened academic rigor. We used two databases, the ABI/inform collection from Proquest and the Business Source Premier collection from EBSCO, to search for peer-reviewed articles. The keywords in these searches were: 'influencer marketing' OR 'influencer' OR 'opinion leader' OR 'human brands' OR 'celebrity' AND 'social media' OR 'Instagram' AND 'authenticity' OR 'authentic' AND 'purchase decision' OR 'purchase behaviour' OR 'purchase intention' OR 'buying*' OR 'consumer behaviour'. The search results were screened for relevancy with a stepwise procedure: first by assessing the title, second by examining the abstract, and third by reading the full paper in detail. Also, relevant papers referenced in screened articles, were included in the review. The process resulted in the identification of 16 academic articles in total.

Based on this review, we developed a conceptual understanding about the nature of perceived influencer authenticity. Furthermore, we identified its key antecedents as well as boundary conditions. Our conceptual model suggests that influencer authenticity can trigger a variety of desired digital marketing outcomes. Here, we particularly focus on influencer authenticity's positive spill-over effect on brand authenticity, brand attitude and consumers' buying intention.

2 The Authenticity Concept

While in marketing some agreement exists concerning the meaning of authenticity, no universally accepted definition is yet available. Various authors agree that the concept is the outcome of a verification process of the truth or a fact (Newman and Dahr 2014). Accordingly, Beverland and Farrelly (2010, p. 839) state "despite the multiplicity of terms and interpretations applied to authenticity, ultimately what is consistent across the literature is that authenticity encapsulates what is genuine, real, and/or true". While this phrase postulates that being 'authentic' means that someone or something is "genuine" and/or "true", these words can mean different things to different consumers in different contexts. Authenticity is therefore often described as a socially constructed interpretation of an observation (Beverland and Farrelly 2010; Grayson and Martinec 2004). As such, consumers should be considered as co-creators of authenticity because they interact with the authentic object or person (Rose and Wood 2005). They ultimately 'define' authenticity. While some consumers may perceive an object, person, experience, or brand as genuine and real, others may regard the same evaluation object as fake.

Consistently, various scholars theorize that the meaning of authenticity is goal dependent. This means that personal objectives determine which characteristics contribute to a perceived authenticity.

In line with this argumentation, Grayson and Martinec (2004) identify two types of authenticity: *indexical authenticity* and *iconic authenticity*. Concerning the former, authenticity can be used to describe something that is thought not to be a copy or an imitation. Here, an object is perceived to be authentic when it is believed to be "the original". Similarly, an individual's habits are authentic in case they are believed to reflect who the person really is. In contrast, a person would appear unauthentic if his/her actions are thought to solely meet social norms or make money. Alternatively, *iconic authenticity* means that sometimes the word "authentic" is used to evaluate whether an object's physical appearance resembles something stereotypical. For example, silver pieces in a museum gift shop are authentic if they are thought to look like coins made by Spanish colonies in the sixteenth century. In line with this perspective, we regard a person's authenticity as a form of what Grayson and Martinec (2004) describe as indexical authenticity as individuals primarily subjectively judge another person's genuineness based on the extent to which the actions mirror the other party's real self.

3 Influencer Authenticity

Self-determination theory (Deci and Ryan 2002) as well as attribution theory (Asch 1946) help to explain the perceived authenticity of individuals (e.g., Kowalczyk and Pounders 2016; Moulard et al. 2015). Here, various authors agree that in this context, authenticity can be described as the extent to which one remains true to oneself. People are regarded as authentic if they are genuine, original, and unique. They act in accordance with their inner believes, thoughts, feelings, and passion. The actions of an authentic person reflect his/her unbiased self (Ilicic and Webster 2016; Moulard et al. 2016; Moulard et al. 2015). These actions can be understood as intrinsic motivated behaviours, which are triggered without any commercial or opportunistic goals. According to self-determination theory, such behaviours are free of external influences, and they align with the personal concept of oneself. Intrinsic motivation originates from three native basic human needs: self-competence, self-determination, and social affiliation (Rohlfs 2011). Authentic individuals strive for these needs and are not motivated by potential rewards nor punishment (Ryan and Deci 2000).

As the true self and the inner motivation are not obvious to others, another person's authenticity can never be evaluated with absolute certainty. Nonetheless, individuals do make assessments of another's authenticity. The perception of another person's (e.g., influencer's) authenticity, despite whether the person is objectively authentic, is the construct of interest in this research. Individuals (e.g., consumers) typically try to infer another human's motivation from the observable behaviours. This corresponds with the basic tenet of attribution theory (Asch 1946), which describes individuals' inner urge to understand their environment and other persons' actions by making causal inferences. When making observations, people always try to discover connections and try to identify the most plausible reason for others' behaviours (Schwaiger and Meyer 2011). Here, the theory claims that individuals typically make inferences whether the behaviour is

intrinsically or extrinsically motivated. A person is judged as being authentic when an intrinsic motivation is perceived to steer the observable behaviour. A behaviour is regarded as being intrinsically motivated if (a) it is unique, and it is consistent across (b) different situations and (c) different stimuli (Kowalczyk and Pounders 2016). For instance, a person is evaluated as acting intrinsically motivated in case this person is much more friendly and sociable than other individuals (uniqueness), the person remains friendly despite being in a good or bad mood (consistency across different situations), and the person is friendly to everyone that he/she meets (consistency across different stimuli).

In the context of branding, scholars agree that the meaning of authenticity revolves around the extent to which consumers perceive brands – both human brands such as celebrities or artists and product or service brands – as intrinsically motivated. Here, a brand is perceived to be authentic if their marketers seem to be in business because it is enjoyable or provides hedonic value and not to increase profits or purely prestige. Having this said, Ilicic and Webster (2016) as well as Kowalczyk and Pounders (2016) define *celebrity authenticity* as the consumers' perception of the extent to which well-known human brands remain true to their true self. An authentic celebrity must act based on his/her personal values. Moulard et al. (2014) also conceptualized *artist authenticity* in a similar manner.

Based on the dominant understanding of authenticity in marketing, this research conceptualizes *influencer authenticity* as the extent to which consumers perceive a social media influencer as behaving in accordance with his/her true self. Authentic influencers are regarded as acting in correspondence with their personal characteristics, thoughts, feelings, and passions because of a strong intrinsic motivation (Ilicic and Webster 2016; Moulard et al. 2016; Moulard et al.2015). They produce content that is seen as being dominantly based on their dedication to a topic, product, or brand. Satisfying the audience (i.e., followers) or involved brands as well as any monetary incentives have minor importance to the authentic influencer. Their activities revolve around self-expression. For authentic influencers, producing social media content is not a means to an end (e.g., to please followers or marketers), but more importantly the mean in itself (Audrezet et al. 2020). Authentic influencers are perceived to derive gratification from self-improvement, enjoyment, pleasure, and positive emotions (Pütz 2017). Consumers interpret influencers' positive/negative statements about products or brands as recommendations based on their true and unbiased beliefs about market offerings. That is, only if they provide fair, intrinsically motivated reviews mirroring his/her own personal experiences. In a nutshell, influencer authenticity is a uni-dimensional construct that comprises a consumer's evaluation of the extent to which a social media producer genuinely communicates purchasing-relevant information which resembles his/her true stance towards the discussed product or brand.

4 Related Concepts

Influencer authenticity must be conceptually separated from *influencer credibility*. The latter is a well-established multi-dimensional construct, which was first conceptualized by Hovland and Weiss (1951). According to these scholars, individuals evaluate the

credibility of a source based on (1) its perceived expertise (i.e., the extent to which the source is regarded as knowledgeable) and (2) its perceived trustworthiness (i.e., the extent to which the source is assumed to be honest and caring for the welfare of his/her audience). While in the context of social media endorsers some scholars focus only on one dimension (e.g., Chung and Cho 2017), it is however widely agreed that at least these two dimensions should be regarded to fully capture an influencer's perceived credibility (e.g., Sokolova and Kefi 2020; Lindh and Lisichkova 2017; Hu et al. 2019). Other scholars regard *influencer attractiveness* as another component of source credibility or delimited construct (e.g., Torres et al. 2019). Here, the concept regularly not only encompasses the physical appearance, but also other factors such as sympathy and familiarity. These are components, which are typically not used to conceptualize authenticity. The argument that influencer authenticity and above-mentioned constructs are related, but conceptually disjunct constructs is supported by the fact that marketing literature widely agrees that these constructs have different antecedents (e.g., Moulard et al. 2015).

5 Conceptual Model

To specify the antecedents of influencer authenticity the construct's impact on behavioural outcomes, we conceptualized a Stimulus-Organism-Response-Model depicted in Fig. 1. Based on attribution theory (Asch 1946) and the conceptualizion of *celebrity authenticity* we define (1) *rarity* and (2) *stability* as factors determining influencer authenticity (Moulard et al. 2016; Moulard et al. 2015).

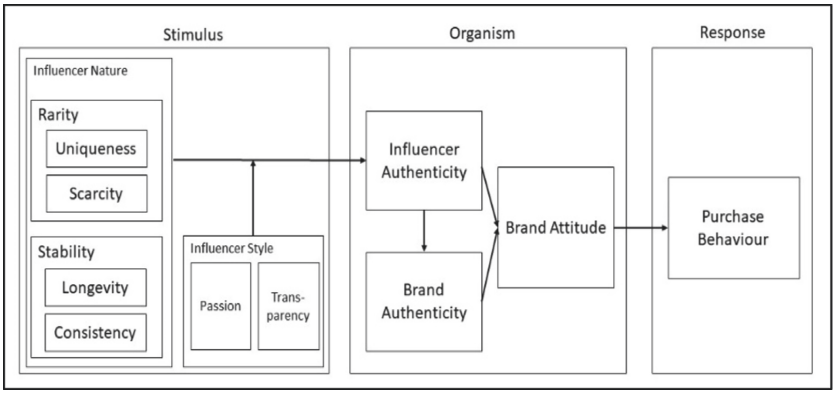

Fig. 1. Conceptual model

Rarity can be described as the degree to which the person is seen as uncommon. It leads to perceptions of influencer authenticity because influencers who do not conform to social norms are perceived as behaving according to their true self. Consumers value when somebody "goes against the grain" as society typically makes it more difficult to act against social conformity and withholds social approval. People who still do so are likely to be perceived as being intrinsically motivated. Rarity comprises of two sub-domains namely: (a) *uniqueness* and (b) *scarcity*. *Uniqueness* describes the originality

of an influencer. It is defined by the independence, creativity and individuality of an influencer. In this context, an influencer who is not considered to be 'typical' because of, for example, his/her age, occupation, social status and/or political beliefs is considered to be more authentic due to a stronger intrinsic motivation. *Scarcity* is specified by the popularity of the influencer. Influencers with a lower number of followers are considered to reach target groups more precisely than others. Their messages are considered to be of high relevance for their audience and are believed to have a higher credibility due to a stronger notion of authenticity (Moulard et al. 2016).

On the other hand, *stability* can be defined as the degree to which a person is perceived as unwavering. Influencers who exhibit stability and steadfast in their words, behaviours, principles, and their mental as well as physical characteristics are more likely to be perceived as authentic. People think that their true self is static and epitomizes their fundamental characteristics (Gergen 1991). Therefore, they make important inferences about the perceived authenticity based on the observed consistency of influencers' actions. Stability comprises of two sub-domains: (c) *longevity* and (d) *consistency*. *Longevity* represents the persistence of the activities of an influencer. Experienced influencers who already communicate constantly over a longer period of time are perceived as more authentic than inexperienced influencers with irregular posting activities. *Consistency* describes the perseverance of an influencer towards change. Influencers who do not change in personality and associated image appear to be more intrinsically motivated and are therefore considered to be more authentic. Based on these concepts, we propose:

Proposition 1: Perceived (a) uniqueness, (b) scarcity, (c) longevity, and (d) consistency of an influencer account has a positive influence on perceived influencer authenticity.

Besides the general nature of an influencer, mainly described by his/her social media account and associated information on personality (profile description) and popularity (e.g. follower numbers or likes), Audrezet et al. (2020) identify additional characteristics of the communication style of an influencer as relevant for authenticity building. Based on a rigorous qualitative study they define communicated (1) *passion* and (2) *transparency* as key features in this context. In terms of *passion*, intrinsic motivation in the form of communicated (a) satisfaction or gratification when producing and sharing posts, (b) emotions triggered by presented products or services, and (c) fit between influencer and promoted content, have a positive impact on perceived influencer authenticity. *Transparency*, on the other hand, represents the integrity of communication and is defined by the (d) disclosure of product placement contractual terms and (e) fact-based opinions about the product or service. Communication styles moderate the impact of an influencers' nature on perceived authenticity. Therefore, we propose:

Proposition 2: The influence of perceived (a) uniqueness, (b) scarcity, (c) longevity, and (d) consistency on influencer authenticity is moderated by the communication style (passion and transparency) of the influencer.

Furthermore, we propose that influencer authenticity is strongly related to *brand authenticity*. due to a naturally occurring image transfer as proposed by the Meaning-Transfer-Model (McCracken 1989). According to this model, specific characteristics

and meanings get transferred from a celebrity testimonial onto advertised products or services. In this context, results of Chung and Cho (2017) show that the trustworthiness of a celebrity has a positive influence on the credibility of the advertised brand. Similarly, the authenticity of an influencer is proposed to get transferred onto the authenticity of the communicated brand.

Proposition 3: Influencer authenticity positively influences brand authenticity.

Attitudes are relatively enduring and general evaluations of an object, person, group, issue, or concept and are a cornerstone of modern persuasion theories. Ewing et al. (2012) show the impact of brand authenticity on brand attitude based on the "Peirican" approach. According to this approach, perceived meaning of an object based on face value is subject to consumer judgement of its validity (Kleine and Kernan 1991). Therefore, authenticity is considered to have an impact on attitude. Furthermore, based on the classical theories of planned behaviour and reasoned action we propose a positive influence of brand attitude on behavioural outcomes like purchase behaviour.

Proposition 4: (a) Influencer and (b) brand authenticity have positive influence on brand attitude.

Proposition 5: Brand attitude has a positive influence on purchase behaviour.

6 Conclusion

The aim of this research is to draw both marketing scholars' and practitioners' attention to the critical concept of influencer authenticity, which can be characterized as the extent to which consumers perceive a social media influencer as behaving in accordance with his/her true self. Our conceptual discussion shows that this concept possesses unique characteristics that clearly distinguish it from other variables, such as perceived influencer credibility, which already received much more attention in research. For practitioners, this implies that they should consider both authenticity and credibility when selecting appropriate influencers on social media. Marketing scholars should assist this procedure by providing an adequate, standardized multi-item measure for the concept, which is able to capture its specific nature. The need for re-considering the importance of perceived influencer authenticity is also stressed by our theoretical discussion of the potential role of the focal construct as a key mediator between its determinants and purchase-relevant outcomes. We suggest that influencer authenticity is one of the main factors determining the persuasiveness of social media brand endorsers. Furthermore, it is likely that marketers can benefit from the positive relationship between influencer authenticity and brand authenticity. Certainly, the propositions must be tested empirically. Especially in industries such as tourism, fashion and cosmetics, where influencers already have a strong representation and impact on social media consumers, our propositions offer a valuable research framework. Here, particularly the relationship between perceived authenticity and credibility, their determinants, and influences can be instructive and can also differ between offered products and services. Also, differences in the nature and communication style of influencers and associated interrelations can be seen as a fruitful future research endeavour.

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Are Media Relevant in Promoting Brand Attitude? The Evidence of 'Super Media' During the Pandemic in Spain

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Abstract. Starting from the changing patterns of media consumption during the Covid-19 pandemic in Spain, the paper analysis, on the basis of a representative sample, the role of media in favoring a positive brand attitude. The results acknowledge the existence of three classes of media, that proved to differ in terms of effectiveness. We were able to outline as well other factors that proved to be relevant. Brand's features, marketing policies and *consumer perspective lenses* have the power - beyond media- to affect brand attitude, confirming the concurrent importance of complex relations. Though limited to a Country and a precise crisis period, the analysis offers some insights on the components of a successful brand strategy.

Keywords: Media consumption · Media selection · Covid-19 · Digital marketing

1 Introduction

COVID-19 pandemic has led to a significant increase in media related activities. At the same time media consumption patterns varied soon as a consequence worldwide: in many markets some 'old' media experimented a renewed interest, thus suggesting new questions on the reasons behind the audience choice. More clearly, television gained a renewed importance for all citizens locked down at home. Besides, social media -as reported also by the Global Web Index 2020- have proved to become a main source of news and marketing promotion.

Those changing patterns have been largely analyzed during the last two years focusing on news. Notably, a big stream of literature arose in relation to the global *epidemic* of misinformation with the intention to fight *infodemics.*

Little research has been devoted on the contrary, so far, to the analysis of the role of old and new media in affirming positive brand attitudes and in the trust generative process. This research analyzes the patterns of media consumption during the pandemic in Spain. The primarily objective is nevertheless to investigate the role of media in favoring positive brand attitudes. The chosen research methodology allowed us, as well, to reaffirm the concurrent role of different factors in generating brand attitude, thus acknowledging the complex relations between media, brands' strategies, communication policies, and consumers' characteristics.

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After the analysis of the relevant literature, this paper outlines the emerging trends in media consumption in Spain resulting from the survey conducted in 2020. As to gain insight in the research objectives, the chosen research questions, the methodology and the main results are then presented and discussed.

2 Relevant Literature

Decades have passed from McLuhan's worldly known statement: "the medium is the message"[1]. At that time, marketers and communication experts demonstrated a focused attention on communication media, on their role and their interplay with content in promoting brand image. More recent theory addresses the role of brands and the iterative relation between brand and customers during co-creation activities, whereas media seem to lose attention. Following Kotler et al. (2019), brands can meet their customers' needs even in the new wave era - i.e. the current environment, characterized by a strong embedment of technology and media in the everyday life of people who therefore bid on values in order to keep up with new advancements. There is also evidence that brand co-creation and trust play a pivotal role in boosting social brand engagement (SBE) (Prerera et al. 2020). In this sense, values and brand's attributes are significantly mediated by customers' perspective lenses, and the results of a company's strategy are affected by complex processes that should take into account also the mediating role of customers' active role.

Independently from the media, today trust is generally intended as an enhancing factor of brand equity, acting as a persuasive force in communicating brand's characteristics or products. Thus, the research on media-, customer- and brand influence in generating trust is important as to shed light on marketing and brand strategies and communication policies nowadays. More, due to the recent change in media consumption patterns during the pandemic, research on the importance and the role of media in favoring positive attitudes, buying intentions, engagement and conversion -that had been partially abandoned– could deliver further insight to all companies engaged in the pandemic and post pandemic recovery.

2.1 SMedia Proliferation and Media Choice

Digitalization opened a new side-market where offer and demand can meet almost effortlessly in terms of costs, and time, and it also allows the use of a new set of tools that can help both parties. Kaplan and Haenlein (2010) exhaustively defined what is commonly referred to as "social media": all internet-based tech-applications working with the principles of Web 2.0 and that provide the sharing and making of user generated-content, while helping interaction and collaboration between participants. Nowadays, given the wide variety of social networks (Facebook, Twitter, Instagram, Snapchat), streaming (Spotify, Deezer, Amazon Music, Netflix, Prime Video) and broadcasting

[1] *Beynon-Davies, Paul (2011). "Communication: The medium is not the message". Significance. London: Palgrave Macmillan UK. pp. 58–76.* Originally published in 1964 by Mentor, New York; reissued 1994, MIT Press, Cambridge, Massachusetts with an introduction by Levis Lapman.

channels (Youtube, Twitch, Vimeo), there is indubitably a great choice in media affecting the consumption by customers and the media selection by companies and agencies in marketing communications. At the same time media consumption can be considered a staple in people's lives and a major influencing force.

Due to the high availability of different media, the issue of media selection by consumers arises. Taneja et al. (2012) identify user-defined *repertoires,* i.e. aggregates of media that are regularly consumed by users according to their routine habits and daily life. They acknowledge that many platforms are unused by customers, whereas others show dynamic users' habits. In that the social environment was proven to be a determinant feature of the composition of repertoires, and media consumption is affected by the routines of users' lives. Alves et al. (2016) manage to classify media in terms of brands strategic purpose. When the user is a company and the main objective is a marketing ad, text-based microblogs (such as Twitter or Facebook) proved to be the best alternative to start and spread conversation about products and to manage relations with customers. Finally, Toubia et al. (2018) successfully defined a content-based predictive model that suggests how media content consumption is affected by consumer behavior.

Furthermore, as per the Theory of Reasoned Action (TRA), trust is a major factor that affects a consumer intention to engage in a specific behavior (Fishbein and Ajzen 1975). To drive a positive consumer behavior, brands need to invest in social media interactions and content platforms that foster trust among the users. Along with promoting their products and services, brands therefore are in search of a way to increase trust in an online environment.

2.2 Media Consumption and Consumers' Ties Among Users and Media

Media selection by consumers occurs on the basis of precise criteria. Media are characterized as well by a bond with their users, and consumers use the same bond to relate to contents and brands presented by media and platforms. Pentina et al. (2013) built upon the brand-relationship theory studying the ties among users and media. They show how trusted social media affects patronage intentions towards brands, i.e. customers feel safer in relating to a business that puts itself on the same level in *a peer to peer* relationship. They enlighten, as well, how different cultures translate into different trust transfer processes. Rentfrow et al. (2011) suggest that those "matches" between preferred choices of entertainment and users are mediated by the psychological needs of individuals. Thus, emotional and inner themes that are treated differently in different media, affect audience preferences.

Consumer behaviorism provides later interesting additions and managerial implications to the relevant topic. Researchers suggested that both, internal and external elements have a role in influencing people's opinions and judgements. The Stimulus-Organism-Response (SOR) model proposes that an external impulse (stimulus) that is elaborated by an individual (organism) returns an answer (response) which is bigger than the sum of its parts, i.e. the processing by a person adds to the impulse the previous experience and knowledge collected by the subject, and most important it does reason with his/her needs to produce an urge and a change of its attitude towards the initial drive (Prashar et al. 2017). Deepening the SOR perspective from the customers' point of view, Ismail, Nguyen and Melewar (2018) investigate how social media activities are perceived and

how they affect brand loyalty and consumption. They demonstrate as well the messages' powerfulness in determining changes and in building strong links of advocacy between brands and customers if products are consistently advertised in the media. More precisely, social media usage resulted to be significantly influential also on materialistic values and consumptions, and online communities played a relevant role in determining loyalty to a brand and a trust bond to it.

To this purpose, the Sequential Mediation Mechanism (SMM) addresses specific social media activities to be the reason for the increase in profitability of some companies due to the intense engagement of clients who developed a strong emotional connection and attachment to the business, resulting, in the end, in brand loyalty and repeated purchase (Ibrahim et al. 2021). Also Ebrahim (2020) analyze the impact of social marketing activities on trust and point to characteristics like trendiness, customization and electronic word of mouth (eWOM) as directly and positively impacting ties with brands. Combinations of these factors resulted in higher levels of trustiness in a framework -the digital environment- where outsourcing and openness threatened safety of transactions and reliability of information. More recently Sanghvi (2020) demonstrates how dark social -a neologism that refers to unseen actions on the internet, like private chats and direct messages- have the power to reinforce trust bonds and to promote a more detailed knowledge of products, resulting in an effective tool of marketing. Irshad et al. (2020) also reveal three consumer motivation factors: remuneration, socialization and empowerment appear to represent the determinants of consumer trust in social media settings.

2.3 Media and the Brand-Attitude Behavior Link

Though the interest in digital and social digital media is recently undoubtedly high (Ebrahim 2020; Irshad et al. 2020; Ibrahim et al. 2021; Lee et al. 2020), so far only a few previous studies offer a comparative picture of the role of media in favoring brand performance. In 2012, for example, Bruhn, Schoenmueller and Schäfer compare the effects of traditional communication media and social media communication on brand awareness and image. Interestingly, their results showed that a significant impact of traditional media was on brand awareness while a significant impact on social media was on brand image.

Moving from the recent increased use of certain 'old' media by consumers, it appears to be important to deepen knowledge on the issue and to offer a comparative overview on the whole. In details, the changing patterns of media consumption arise new questions on the role of media in promoting brand attitude at least during crisis periods.

Being attitudes the consumers' overall evaluation of the brand (Wilkie 1986), they will contribute toward the perception of the brand. At the same time, as purchase intentions are affected directly or indirectly, deliberately or not, by brand attitude (Fishbein and Ajzen 1975; Bagozzi and Burnkrant 1979; Sicilia et al. 2006; Fazio and Petty 2007), they can be assumed as a demonstration of the existence of a positive attitude towards the brand. Finally, the attitude toward a brand, or brand attitude, is a vital component in the valuation of a brand's equity (Liu et al. 2012).

3 Research Questions and Methodology

During the Covid-19 pandemic media consumption showed a different pattern compared to previous years. Thus, the topic of media gained new interest. This research is aimed at giving insights about the ability of media in favoring positive brand attitudes, allowing also some suggestions on successful communication strategies.

The chosen methodology is based on statistical analysis principles and follows a three steps path. Firstly, we use descriptive statistics to synthetize the data gathered during the survey. Then, we propose a generalized linear model via regression that identifies significant threads of the sample and assigns them a score. In the end, we used factorial analysis to prove the existence of latent dimensions between the observed variables that provide a theoretical coherence and a rational interpretation of the media relevance.

A preliminary analysis allowed us to draw some conclusions on the changing patterns of media consumption in Spain during pandemic, and to the consumers' expectations towards brands. For the purpose of the research, a questionnaire was designed and conveyed to a panel of the Spanish population. It allowed us to collect data about the interviewees' characteristics and family dimension, the changing habits during the pandemic, the use of media, the perceived behavior of brands and concerns about the future. Data were collected from March 27th to March 29th, 2020; we received 972 complete questionnaires filled in by people aged above 18 years across a population of 972 people, proportionally parted to mirror the gender/age/local distribution in a representative sample of the country. The sample is representative of the analyzed country. The questionnaire was diffused through CAWI (Computer Aided Web Interviewing) methodology, avoiding risk of contagion and ensuring to reach the targeted audience. With a size of 972 interviews, it is considered that the sampling error is set at $\pm 3.25\%$ for global data, $p = q = 50$ with a confidence level of 95%.

After the analysis of media consumption patterns during pandemic in Spain, we defined two research questions:

1. Which is the Role of Media in Generating a Positive Brand Attitude?
2. Which actions can brands take to improve brand attitude?

We focused attention on media, we selected a series of key variables and crossed them through tables; the appendix describes the variables selected for the core analysis. Then, we analyzed the outcoming framework in more depth.

Logistic Regression (LR) is a model that helps in relating a dependent-binary-variable and a bunch of independent regressors that are somehow linked to it. The process provides coefficients and some scores to the variables according to their capacity of explaining the target dependent-variable. Q13 and Q15 appeared to be the questions that best described the *attitude effect* and the best practices that brands can implement inquired by R2.

Since logistic regression proved to be a fairly limited model given the amount and the nature of the given variables, we added a factor analysis. That type of analysis was carried over on two different subsets of variables, given their different nature.

4 Media Preferences by Spaniards During Pandemic

In the uncertainties of the pandemic, new trends in media consumption emerged in Spain. The pandemic led to widespread increase in media consumption to keep pace with the crisis and possibly predict its developments: the interviewees reported an increase in the use of online news (47.3%), instant messaging services (69.4%), videoconferencing applications (62.4%) and social networks (54.2%).

The lockdown played a clear effect on the sources of information used by customers: television is regarded as the most popular alternative between the media scenery (21.3%), online press follows when "good" information is concerned (10.2% share) and the third most popular information source become networks, overcoming the radio and newspapers.

Intersecting data about 'online general awareness of ads in the media' and the increasing attention paid to it caused by the lockdown (ranked from 1 to 7), the results highlight a widespread hoist in the attention to this feature (Fig. 1).

From a content point of view, the role grew consistently in platforms devoted to entertainment. Whereas TV confirmed to be generally the "go to" solution, other media expanded their popularity thanks to their distinctive characteristics. Pay per view TV increased its users by 26.65% and online video consumption on Youtube and Vimeo also became valid alternatives for the public as they grew also by 29.63%, streaming services like Prime Video and Netflix eventually grew by 37.76%. The growth of those platforms emphasizes the request for uninterrupted content on demand. It also stresses the increasing habit of selectivity of the customer who wants to choose what to consume and when to consume it, without being interrupted by commercials and advertising messages that are perceived as intrusive and unfairly persuasive. Clients want to be free to decide whether they like a brand or not, and relationship should be spontaneous and unforced.

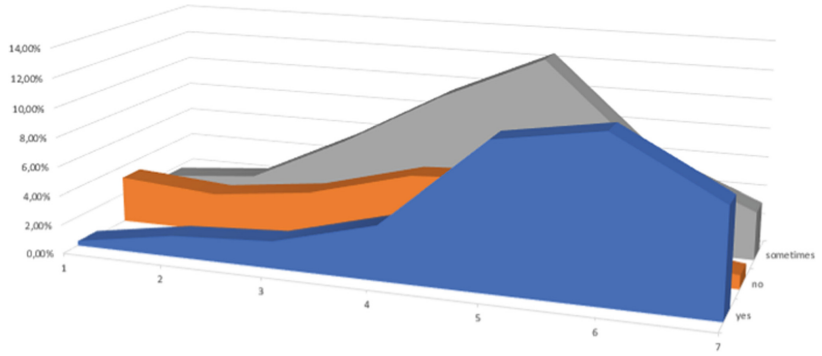

Fig. 1. Level of awareness related to online advertising during media consumption activities

Referring to social media, respondents declared to spend more time on Facebook (66.41%) than on Instagram (58.85%), Twitter (47.63%) or LinkedIn (16.32). This result can be interpreted in various ways: in terms of content, Facebook made up for relations with friends, Instagram provided entertainment and commerce, Twitter redressed the seeking of news in real time, while LinkedIn mirrored the stagnant job market and upcoming crisis. From a structural point of view, users called on social networks for their prompt nature of instantaneous vehicle of information, and informal tone of voice. Here people could ask questions to peers, to authorities and institutions as well as brands. Finding again the relationship bond with these parties that failed with the social distancing and limitations of Covid. The facilitated communication and perceived transparency made social networks the perfect substitute to the past habits of normal life, yielding a bond of trust and a relationship without actually coming across physically to a counterpart.

The interviewees also state that brands weren't always able to provide positive messages to their target audiences during pandemic, though 31.6% acknowledges them the capability to offer advice and coherent messages. The result possibly opens the debate on the role of brands during crisis periods, as 75% of respondents consider brand behavior during pandemic a reason for re-evaluating expectations towards them. 74.18% of the interviewees consider quality and transparency (68%) the most important features of marketing communication; moreover, 59.05% of the respondents classify corporate social responsibility practices as more important than brand image (49.28%).

As a matter of fact, companies shifted their communication strategy to match the feelings of the customers and to meet their need of care in a new, uncertain time. Three uses were appreciated, and three others were deprecated by customers. The top three activities welcomed by Spaniards include money donations and dilations policies for payments, hinting a sensitivity to prices and a fear of an economic disrupt as well as a theme of priorities in a situation of danger; moral suasion activities as to suggest a need for authority and responsibility; and, in the end, the complete or partial shift of production in order to help fighting the virus as to testify the value system of the brand and its active role in the society. On the other side, customers condemned lazy marketing messages like "stay positive" or "it's going to be good anyway" were perceived as useless or "fake" and marked as bad-communication with fall backs on the brand and its ties. Again, people denounced companies which did not change their commercial policies according to the situation and which kept minding their businesses as usual without recognizing the changing needs of their customers. Moreover, the total absence of communication marks the end of any bond or relationship with the brand and the company.

We also found evidence of the link between the modified perceptions of customers towards brands and their willingness to buy them. 71.19% of those who judged positively the brand's change due to marketing activities during Covid (q.13) also asserted to be likely to buy that brand whose marketing was proactive and aligned to the feelings of the audience (q.15). The end result is a preliminary validation of the role of marketing practices to reinforce and determine the acceptance/trust ties between a brand and its customers.

5 The Role of Media in Promoting Positive Brand Attitudes

To answer our research question 1, we used R-studio software. To be coherent with our two research questions, we opted to further split our set of data into two subsets:

1. BBB10: that grouped questions q1, q5, q6, q8, q9, q13, q14, q15 and q16;
2. BBB15: that only referred to question q4 and its alternative, plus q13, q14 and q15.

Starting from subset 1, we identified a clear link between the majority of the items of the subset and questions q13 and q15 that are regarded as the most accurate to describe the *attitude effect* inquired by research question number 1#:

q13: *Did those (positively judged) marketing activities carried over during the pandemic play any role in changing your brand perception?*

q15: *After this crisis, will you consider buying those brands who behaved actively during the pandemic rather than the passive ones?*

The logistic regression of the dependent variable q13 within the subset 1 yielded regression coefficients with respect to q1, q6, q8_1, q8_3, q9_4, q9_5, q9_8, q16_1 and q16_3. These predictors refer to people who are more likely to pay more attention to brand campaigns and advertisements (q8_1) and often prefer entertainment or amusement (q8_3 + q16_3). Also, these same people value brand image (q9_8) and good customer care (q9_4) as key aspects in choosing a brand. Further, the LR also showed a negative relationship between the changing of a person's perception of a brand due to social initiatives (q13) and valuing the quality of products or services as a key aspect in choosing a brand (q9_5); in simple words, people who value product quality most, rarely change their brand perception depending on brand's social initiatives in the times of crisis.

Similarly, the logistic regression of the dependent variable q15 within the subset 1 yielded regression coefficients with respect to q1, q6, q8_1, q9_2, q9_5, q9_8, q16_3, q16_4 and q16_5. Again, we discovered a relation between the willingness to buy a brand that is taking social initiatives (q15) and the attention paid to brand campaigning and advertising (q8_1). More, people who are willing to buy brands making positive initiatives (q15) consider transparency in brand communication (q9_2) and brand image (q9_8) as most relevant aspects in choosing a brand. Finally, the willingness to buy (q15) is correlated to another important set of variables describing the marketing strategy of a brand. The regression model suggested that people are more willing to buy brands in the future which are running entertaining campaigns helping people be more optimistic (q16_3), continuing their production or services to support the economy in the times of crisis (q6_4) and changed their production/services to focus solely on Covid-related problems (q16_5). Again, there is a negative relation to product or service quality (q9_5).

The analysis of the dependent variable q13 within the subset 2 output regression coefficients with respect to q4_1, q4_14, q4_16_q4_19, and q4_22. These variables refer to survey respondents' media consumption behavior, in terms of consumption of radio, online video platforms like YouTube, video conferencing apps, pay per view and Instagram respectively.

Similarly, the logistic regression analysis of the dependent variable q15 within the subset 2 (BBB15) output regression coefficients with respect to q4_2, q4_5, q4_6_q4_7, q4_12, q4_15, q4_18, and q4_19. These variables concern media consumption behaviors referred, to platforms as digital music providers, digital newspapers and video streaming services (Netflix, Prime Video, etc.).

We then carried out the factor analysis on the two subsets. Once again, we started from a subset that, like BBB10, groups those variables describing the customer behavior. We summarized all the variables of our first subset in three different factors. The same result emerges by comparing the communalities of different solutions. We opted for a full comparison of solutions with 2, 3, 4 and 6 factors, and after the due rotations we obtained the final grouping:

RC1: *Brand's (required) features*: transparency, adaptability, employees' care, customer care, product and services quality, differentiation, engagement in corporate social responsibility, image, innovativeness.

RC2: *Customer's perspective lenses* (Prerera et al. 2020): attention to ads, interest in commercials, perceived utility of information delivered through commercials, perceived effort of brands fighting the pandemic, willingness to buy links to commercials and (perceived) brand consistency in communication.

RC3: *Brand's communication policies*: charity donation, moral suasion, positive messages, focus on new products related to pandemic, advertising stop, advertisements of necessary goods.

The three factors appear to be important in favoring a positive brand attitude. Thus, they offer a first snapshot of what to look forward to when planning a marketing strategy focused on trust generation during period of crisis, and particularly during pandemic.

We then replicated the same process on the second subset. Also in this case we chose a three factors solution, that groups all the considered media in:

RC1: *Traditional media*: radio, digital radio, daytime-radio, themed-radio, newspapers, economic newspapers, sport newspapers, magazines, web-magazines, blogs and pay per view television;

RC2: *Free services*: general social networks, Instagram, LinkedIn, Twitter and Streaming services (Spotify);

RC3: *Super Media:* online news, live television, streaming services (Netflix, Prime Video), Facebook, instant messaging apps and video conference apps.

The resulting classes are helpful in detecting which media is more engaging and which one is less effective in favoring positive brand attitudes. As to reinforce their performance, brands should thus carefully choose media and platforms, taking in consideration not only their own features, but also the type of media and its ability to favor a positive brand attitude, In the mentioned analysis there is, for instance, evidence of the importance of Facebook, as it gained a solid reputation, now paired to live television and instant messaging in Spain.

6 Discussion

Our survey allowed us to distinguish two different classifications resulting from the factorial analysis; the first one offers three classes of media that exert a different role in promoting a positive brand attitude, and the second one outlines the components of a successful strategy brand strategy.

As far as the first taxonomy is concerned, we distinguished *traditional media*, *free services* and *super media*. The three genres pinpoint tools used for the same purpose, as previously theorized by Alves et al. (2016). Traditional media group themed radio channels and economic- or sport newspapers and pay per view TV channels. Those tools share a severe specialization on a branch of knowledge. Moreover, the grouping testifies the accuracy of the content based predictive model (Toubia et al. 2018) that is crucial for customers selecting platforms and for brands forecasting the audience attention. Furthermore, considering "free services" we get evidence of the need of autonomy and equality in the relation between companies and users, as well as the effects of patronage of platforms on marketing messages perceived by consumers (Pentina et al. 2013).

Finally, within *super media* we find online news, live television, streaming services like Netflix, along with Facebook, instant messaging and video conference apps. What strikes of these stages is the marriage of both the repertoire selection model (Taneja et al. 2012) and that of the characteristics of selectivity, authenticity, communities and equality in the relations between its actors. Those media platforms in fact are the same to be recognized from the logistic regression on q.13 and q.15 inside the BBB15 data-frame (media types), when online news, Netflix and Web Chat applications, granted a greater likelihood to purchase and to generate brand loyalty. This is also possibly explained by the type of content that affects brand perceptions of users, as testified by the LR on q.13 the more creative and spontaneous content seems to be, and the more effective they will be in shifting these recognitions. The *super media* genre assembles and summarizes the most effective media for a brand who aims at creating more solid ties with its target.

Despite the apparent heterogeneity of the ensemble, this resonates with the repertoire model theory, between others. Even unexpected apps of instant messaging and video chatting become useful allies for directing e-word-of-mouth of communities and to foster more direct relationships.

Though, up to 2017, there was only a small relation between attitude and media use in crisis scenarios (Williams et al. 2017) in the end media is confirmed to be an effective tool for marketers, as they provide the perfect environment to develop a relationship. These findings suggest a renewed interest in media selection by marketers as media appear to be crucial in helping brands' performance.

The second conclusion we get from the factor analysis is that of the BBB10 dataset. The end selection of the components enlightened three main factors that influence customers' attitude towards the brand. These three factors are related brand's qualities, to the *customers' perspective lenses* and to the features of brand communication policies. Each of these elements subtends different reasoning and various exploitations: *brand's attributes* are easily linked to psychological needs of customers and could help in matching users' personalities with brands' buyer personas and targets (Rentfrow et al. 2011). Regarding the *brands' required features*: transparency, CSR policies, the quality of product/service are all propositions of sudden access for a company who is willing to win its audience's favor, and again there is a link between the answer returned by both the LR and the FA on BBB10, with similar ratings: they result to be the most effective in determining the spark of a trust tie**.** On the other hand, the *type of marketing activity* enacted is also decisive in creating a bond. In our study, proactive actions resulted in being liked more by people who were constrained at home and with almost no alternatives than passively waiting for the situation to improve. Charity donations and moral suasion moves, as well as shifting in production lines, not only served at proving brands strength and vision during a hard time, but matched with the authenticity, the integrity, the authority and the ability, that combined together contribute in creating trust (Cho et al. 2015). The last pillar is maybe the most uncertain and difficult to be managed by a company: *customer's perspective lenses* are something aside from the direct marketing levers which managers are accustomed to. Its components wander from very subjective features like "attention to ads" or "interest in commercials" to more tangible ones like "consistency in communication" and "utility of its content". As a whole, the last factor raises and pushes further the Theory of Planned Behavior and that of Reasoned Action (Irshad et al. 2020).

7 Conclusions

Moving from the renewed interest in 'old media', like TV, this research aims at assessing and offering a compared overview of the media ability in favoring a positive brand attitude. The results acknowledge a different media ability in generating a positive brand attitude among Spaniards during the pandemic. In fact, it was possible to distinguish three media classes, suggesting that companies and brands ought to rely on *super media* to create more solid ties with its target audiences during crisis. More, all media grouped under the *super media* class share characteristics of proximity and relatability with mass audiences.

These results allow us to indirectly confirm previous studies focused on specific media, and on digital and social media particularly. Nevertheless, as pointed out previously, the study is characterized by a different objective and offers a first comparative overview of the importance of media in relation of their ability to affect brand attitude and consideration.

Our research confirms evidence also on other factors that influence brand attitude, beyond media. Thus, media selection and fruitful media choice should come along with a clear marketing communication of the required brand features, as to conquer the targeted audience during the pandemic, whereas brand's marketing and communication policies should experiment a real transformation, concentrating on urgent, pandemic-related needs and customer care, as to exploit the opportunity of maintaining a favorable brand perception and of favoring a positive brand attitude.

Obviously, this research paper remains limited by some of its structural elements. Starting with the data sample, as the research is based in Spain and was carried over during a period of lockdown and smart working. It must be taken into consideration that the final conclusions may have limited applications outside of Spain or in 'a new normal period'. Even if in the age of the Internet the formation of a global culture or "web culture" is underway, there will still be the influence of national habits and traditions, when it comes to the consumption of media (Pentina et al. 2013), and to every other aspect of consumer behavior.

All the measures used are related to brands in general: the relationships found could thus be different depending on the product category or specific brands. More, only replicating the study in a further period, we could confirm our results and eventually validate that media selection is affected by lives' routines (Taneja et al. 2012).

8 Managerial Implications

Though this is a first attempt to distinguish the role of media in promoting brand attitude, on the basis of the results it appears to become urgent for marketers to revise the traditional media selection criteria and to exploit the effectiveness of 'super media'. As hinted by Kotler et al. humanistic view of the brand (2018), companies should think of positioning also in terms of *media-positioning,* if they aim at maximizing marketing performance. Our research result underline more directly that some media and platforms -such a Facebook and streaming services like Netflix- gained a solid reputation during the pandemic in Spain, and if paired with other 'super media', like live television and instant messaging apps, they can be leveraged fruitfully by brands as to favor conversion.

The data presented can contribute as well to the debate on the role of brands during crisis periods, as changing expectations arose during the pandemic in Spain and the Spaniards seem to be intended to reward those brands that were able to show new behaviors and coherent communication messages.

Thus, marketing and communication practices – that maintain their huge relevance - appear not a sufficient condition *per se*, but rather a necessary one as to build a positive brand attitude. A more effective binding process requires the right content to be delivered in the right media at the right time, as well.

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Appendix. Description of Variables Used in Core Analysis

CODE	VARIABLE
q1	How many people shared your home with you during lockdown?
q5	Do you usually pay attention to ads in the media?
q6	What is the quality of media information about Covid-19 actually?
q8_1	How are you reacting to brands' marketing activities? I pay more attention to it
q8_2	How are you reacting to brands' marketing in the media? It annoys me
q8_3	How are you reacting to brands' marketing in the media? It entertains me
q8_4	How are you reacting to brands' marketing in the media? I think it's useful
q8_5	How are you reacting to brands' marketing? I think that some activity are not needed
q9_1	What do you rate most in a brand actually? Adaptability
q9_2	What do you rate most in a brand? Transparency
q9_3	What do you rate most in a brand? Employees' caring
q9_4	What do you rate most in a brand? Customer care
q9_5	What do you rate most in a brand? Quality
q9_6	What do you rate most in a brand? Differentiation
q9_7	What do you rate most in a brand? CSR activities
q9_8	What do you rate most in a brand? Image
q9_9	What do you rate most in a brand? Innovativeness
q13	Did these (positively judged) marketing activities carried over during the pandemic play any role in changing your brand perception?
q14	Were brand marketing efforts during pandemic positive?
q15	After this crisis, will you consider buying those brands who behaved actively during the pandemic?
q16_1	What kind of marketing activities have you noticed most? Money donations
q16_2	What kind of marketing activities have you noticed most? Moral suasion
q16_3	What kind of marketing activities have you noticed most? Entertaining once
q16_4	What kind of marketing activities have you noticed most? Product ads

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Can Eye Trackers and EEG Be Used by Small-Medium Marketing and Advertising Agencies? A Qualitative Study

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Abstract. The objective of this article is to evaluate whether neuromarketing tools, like eye trackers and electroegephalography (EEG), in the form of an integrated software system (NeuroMkt) can be used by small-medium marketing agencies to evaluate their clients' marketing material. Results that are based on physiological responses are more valid compared to results that are based on customers' self-reported data. However, with the specialized knowledge that is required to use neuromarketing tools, it is uncertain whether marketers can embrace this change in the marketing field. The findings of this study provide evidence that small-medium marketing agencies are really interested in gaining information about eye trackers and EEG and if the cost is permittable they are willing to use them in the near future. However, a crucial factor for using such tools is whether their clients openness towards the use of such methods in their campaigns. Small-medium marketing admit that lack of appropriate knowledge to clearly understand results and outputs of eye tracking and EEG is a caveat for using such methods. Therefore, they require simple and easy to understand information from future neuromarketing software. This study is part of a research project around the evaluation of a neuromarketing system to improve the promotion of groceries.

Keywords: Eye tracking · Neuromarketing · Advertising · Qualitative research

1 Introduction

As marketing researchers gradually admit the shortcomings of self-reported data obtained from surveys and qualitative methods, consumer behaviour researchers are searching for different approaches to overcome the biases that come along with self-reports. Neuroscience methods offer alternative tools, as well as a way to unearth the cognitive processes and inherent mechanisms that help describe consumer actions. Kenning and Plassmann (2008, p. 532) say that the goal of consumer neuroscience "is to use insights and methods from neuroscience to enhance the understanding of consumer behavior".

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Brain activity can provide marketers with information not accessible via traditional marketing research methods (e.g., observations, interviews, surveys, focus groups) (Ariely and Berns 2010). This is largely led by the fact that people cannot (or do not want to) fully describe their preferences when openly questioned; as human behaviour is driven by processes operating below the level of conscious awareness (Calvert and Brammer 2012).

Neuromarketing methods have increasingly been used by business practitioners, especially consumer brand managers. For example, Coca-Cola has been using neuroscience methods, including functional magnetic resonance imaging (fMRI), eye tracking, electroencephalogram (EEG), magnetoencephalography (MEG) and other biometrics (i.e. physiological measures used to characterize human behaviour) to better evaluate consumer responses to their ads (Looney 2016). Procter & Gamble (P&G) has launched research centers where researchers use eye trackers to study consumer behaviour in a supermarket environment. General Electric (GE) also launched the GE BBQ research center, to examine consumer responses to food and taste, to improve their BBQ recipe (Garun 2015).

Recently, Plassmann et al. (2015) recommended five ways neuroscience can be employed to enhance academic and practitioner knowledge of consumer behaviour:

1. identifying mechanisms;
2. measuring implicit processes;
3. dissociating between psychological processes;
4. understanding individual differences; and
5. improving predictions of behaviors.

2 Eye Tracking

Eye tracking is a human-computer interaction mechanism to analyze subjects' eye movement when looking at an advertisement (Duchowski 2007). Although this method is widely used in research laboratories, some universities also employ it to analyse human visual and attention processes regarding texts, images and general content (i.e. online games) (Duchowski 2007). A study by Horsley et al. (2014) agitates the basis of eye tracking research and research methodologies becoming progressively more widespread in many disciplines. The authors argue that eye tracking research recommends innovative ways of collecting data, structure research questions, and anticipate about how we view and understand the world. Eye tracking methodologies are favored in cross-disciplinary and multi-disciplinary studies because they assemble exceptionally detailed results (Wade and Tatler 2011).

Scientists generate new conclusions about the way the visual system collaborates with attention, cognition, and behaviour (Horsley et al. 2014). More and more eye tracking studies are persistently being circulated and new inventive ideas are shared among researchers (Horsley et al. 2014). Eye tracking helps advertisers and marketers understand the consumers' internal processes and then tailor the information to change some aspects of the advertisement in order to be effective (Duchowski 2007).

Eye tracking outputs consist of gaze plots, heat maps and fixation analyses. The latter enables scientists to examine the framework of attention and distraction in various

visual examples (Horsley et al. 2014). On the other hand, gaze investigation serves as a new approach to understand eye movements. Although eye movement is both fast and dubious, eye tracker is able to generate reliable data through algorithms and significance analysis (Wade and Tatler 2011). It is believed that heat maps and gaze plots are very important not only because they illustrate what areas of an advert people are looking at, but, more importantly, they provide data for what areas people are bypassing, thus helping advertisers to improve the aforementioned areas to catch peoples' attention.

In real life, eye trackers have been used widely by big brands in the last years to evaluate the packaging of their products (i.e. Procter & Gamble), the customer experience in their shops and showrooms (i.e. Toyota), the design of their websites (i.e. BMW) and many more. It is unknown whether those brands are managing the eye tracking experiments internally with specialized personnel, or whether they outsource the job to marketing agencies.

3 Electroencephalography (EEG)

The Neuromarketing Science and Business Association (NMSBA) in USA describes EEG as one of the most widely used methodologies employed by neuromarketers today. EEG measures brain activity by detecting and amplifying faint electrical signals, that are emitted continuously by the brain. These signals, or brainwaves, are the means by which human brain communicates activity across different anatomical regions. When researchers discover differences in brainwave activity, they spot changes in human cognitive processing.

As a direct measure of brain-related activity, EEG can thus be used to understand how brain cells (neurons) communicate with each other. EEG is thus distinct from fMRI, which is a measure of changes in blood flow to a brain region reflecting neural operations within that area. The use of EEG methods, which is almost real-time data, can assist researchers in discerning cause and effect relationships between the marketing stimuli and their associated cognitive response (Lin et al. 2018).

Compared to other methods, EEG is a relatively less invasive and less expensive method of measuring brain waves on the surface of the scalp, which is increasingly gaining attention in the field of marketing research (Lin et al. 2018). EEG is especially useful for capturing direct and objective data to further assist researchers in understanding the cognitive and emotional processes involved in information processing and decision-making (Lin et al. 2018).

4 Methodology

This study is part of a large research project that started in July 2021 and focused on the evaluation of supermarket marketing material with the use of an integrated system named "NeuroMkt" that includes eye tracking and EEG. "NeuroMkt" is a Multimodal Brain-Computer Interface that provides information about consumer response in various advertising stimuli that are presented on a computer screen. In fact, this study is the Work Package 1 (WP1) of the research project where the researchers investigate the possibility of commercialising "NeuroMkt" as it is assumed that small-medium marketing and

advertising agencies' services will gain added value if they incorporate such tools in their portfolio when suggesting solutions to their clients.

Qualitative methodology is employed, in the form of focus groups, and seven representatives from small-medium advertising agencies in Greece were invited in a Zoom meeting. The use of Zoom was necessary due to the restrictions imposed by the Covid-19 pandemic. The focus group took place in November 9th 2020. Participants were selected voluntarily. Especially, we sent emails to the 15 largest advertising agencies in Greece, where we call them to participate in this focus group. In this email we informed them about the scope of the study and other important information about how the focus group will take place. Seven out of the 15 agencies, replied that are willing to participate in the study. After that, we asked them to provide just one employee from each agency, and preferably the one that has the highest level of experience in the advertising sector, based on years. They all agreed and as a result the Director from each agency participated in the study. Four of them were male and three were female. Their age was 45 years old and above. We informed them that the Zoom call will be recorded for the research needs only, while information provided by them will be strictly confidential. Before we started the focus group a form of ethics and a form of participation was signed by them. Participants had the opportunity to leave the focus group any time they decided to. The team had prepared a set of six open ended questions that would be the main guide for the progress of the focus group. The goal was to derive information about six main sections that are described in detail in our Findings. The focus group lasted approximately ninety minutes and participants were encouraged to voice their views on the topic. Two academic researchers were present to facilitate the focus group and provide guidance throughout the study. The respondents were introduced to the capabilities of the integrated "NeuroMkt" system as well as distinct eye tracking and EEG techniques and various real-life examples were presented to better illustrate the importance of neuromarketing tools in Greece and abroad.

5 Findings

The focus group meeting started with a presentation of the "NeuroMkt" system as well as the two separate tools: eye tracking and EEG. Then, the participants were asked whether they are using/have ever used both or any of the two methods. They all replied negatively. However, all of them mentioned that they had heard about the use of eye tracking and EEG in marketing. Moreover, they were impressed by the idea of the "NeuroMkt" system that combines the use of eye tracking and EEG with a user-friendly interface software. All participants strongly supported that "NeuroMkt" can be considered as a future tool for small-medium marketing and advertising agencies.

During the prosecution of the focus group, six major questions/sections were set under investigation considering the use and applicability of "NeuroMkt". The first one was about the appropriate information that "NeuroMkt" should provide to advertisers. Participants were informed that "NeuroMkt" can provide information about 1) consumer attention to the advertising stimuli, 2) consumer emotional response to the stimuli, 3) consumer cognition to the stimuli. Participants declare that important information like consumer reaction to certain words, images or other stimuli and the capability of the

software to easily prioritize the provided information should be included. Moreover, all agreed that "The more information provided, the better"; however, this information needs to be significant and easily understandable. For instance, participants highlighted that it is very important for them to have clear information about the benefits and values perceived by the consumer for the product or the advertised message. Their main concerns were whether "NeuroMkt" is able to provide detailed information that leads to credible results coming from a highly efficient tool.

The second question was "how the additional information provided by "NeuroMkt" system could be used by them to improve their services". The most frequent answer was that they are interested to use all the above information to determine the levels of consumer loyalty to certain products and their intention to buy the product. Moreover, a participant stated that it is very important to him to understand whether consumers perceive the ad message as a credible one. In general, they are interested to use the "NeuroMkt" system to predict consumer behavior and perception. Finally, one participant declared that she would use this neuromarketing tool in combination with questionnaires to corroborate consumers answers with two different approaches.

Subsequently, participants were asked to provide information as to how they would communicate and recommend the use of the tool to their customers. Five out of seven participants stated that the first thing they would take into is price. If the price of such a tool is too high, they seem to be unwilling to invest in such a system, because they feel that their customers will opt out from using such an expensive tool. They highlighted the fact that small businesses may not be able to pay a high amount of money in marketing campaigns. However, medium sized businesses may be keener on using it. Moreover, four out of seven participants put focused on the importance of explaining the benefits and added value of using the tools to their customers. For instance, someone declared "this tool could optimize their products and advertising messages". Finally, all participants mentioned that "NeuroMkt" matches better for FMCG and in general consumer products and they would not recommend it to customers related to B2B marketing or political marketing. The participants felt that there is lack of evidence as to whether the tool provides valuable information for B2B or political marketing campaigns.

Considering the way "NeuroMkt" can be developed in the future, all participants clearly stated that a future edition has to be compatible with smart phones. In fact, from their point of view, in the future, an effective system like "NeuroMkt" should be able to run on devices other than PCs and laptops. The use of a smart phone camera in combination with a simple EEG hat is more practical for the advertisers as they stated that smartphones are the future for neuromarketing.

The fifth section was about the fact that the presence of a researcher trained in neuroscience, statistics and marketing is necessary. In some cases, external partners might be needed to consult them with major issues arising from the use of the system. So, they were asked whether they are willing to allocate a part of their budget to employ a trained researcher or collaborate with an external partner. Surprisingly, six out of seven participants said that they prefer to train themselves in using such a tool compared to hiring someone else for the job. Only one participant stated that he is willing to open such a job position, if a system like this could offer added value to her company.

In the final section participants were asked to suggest what would be the best way to get the results out of the proposed system for their immediate use. Two of them answered that 'all information is useful and crucial, as long as it is easily understandable. So, the output must make use of infographics and simple forms of numbers. In most cases, statistical analysis and numbers make our job more difficult". All participants mentioned that an explanation of each graph or number is necessary, while a small description of each metric should be included in the "NeuroMkt" system. Finally, five out of seven participants agreed that it could be very useful if "NeuroMkt" can provide a customized and dynamic dashboard based on the agency's particular needs each time.

6 Conclusions

This preliminary qualitative study provided some interesting information about the contingency use of eye tracking and EEG by small-medium marketing and advertising agencies. Even though no participant has ever used such tools in their working environment, all of them are interested in gaining information about them and, if the cost is permittable, they are willing to use them in the near future. However, a crucial factor for using such tools is their client's openness to using neuromarketing methods in their campaigns. Even though a system like "NeuroMkt" can provide detailed information about emotions, cognitive load, consumer attention and other concepts that are widely used in the marketing literature and research, advertising agencies are interested in gaining information about the levels of loyalty and intention to purchase a product. This result highlights that there is a crucial gap between small-medium marketing agencies and marketing researchers. While researchers can gain detailed information about consumer behavior, intention, emotions and other well studied constructs, practitioners are interested in more practical issues and particularly in metrics that can boost sales and loyalty. Yet, small-medium marketing and advertising agencies are willing to learn more about neuromarketing and understand that the use of neuro-tools is the future of marketing. Therefore, advertisers are willing to invest in such technologies. Within the contemporary digital environment in which consumers are bombarded by marketing messages, small-medium marketing and advertising agencies understand that every and each detailed information about consumers is crucial for them, to be able to apply effective marketing campaigns that grab consumer attention and preference. However, they comprehend that using eye tracking and EEG in the current form is complicated, as they do not have the appropriate knowledge to clearly understand results and outputs coming from the software. Hence, advertisers need neuromarketing systems that provide infographics, simple forms of numbers, explanation graphs, description of metrics and customized and dynamic dashboards that present detailed information based on the agency's particular needs each time.

7 Limitations and Future Research

This study is subject to certain limitations. Firstly, the qualitative nature of the study does not permit for the generalization of the results. Moreover, the sample of the present study is another limitation since representatives from small-medium marketing and advertising

agencies from Greece were only invited in the focus group. As a result, in other countries where the commercial use of neuromarketing tools might be a common practice, advertising agencies might respond differently to the queries. In this vein, larger marketing and advertising agencies might have different attitude towards the neuromarketing tools as they handle a bigger budget for their marketing campaigns. As a result, future qualitative studies in different countries and with larger marketing and advertising agencies is a direction for future research. Another limitation of the study is that the "NeuroMkt" system is a neuromarketing tool that is under development. As a result, participants were presented with a beta-version of the present system. However, in the contemporary marketing industry there are neuromarketing software that are in their final form and are sold to interested parties like researchers and practitioners. Nevertheless, this software is expensive, hence probably not affordable to small-medium marketing and advertising agencies. Probably, larger, and multinational agencies that make use of the existing neuromarketing software have slightly different opinion about the discussed topics.

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Privacy-Preserving User Modeling for Digital Marketing Campaigns: The Case of a Data Monetization Platform

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Abstract. This work proposes using a collection of Deep Learning approaches to design the privacy-preserving data monetization platform to improve the digital marketplace where users have control over their data and marketers can identify the right users for their marketing campaigns through several steps. First, representation learning on hyperbolic space is performed to learn latent embeddings of user interests across multiple data sources with hierarchical structures. Second, Generative Adversarial Networks is performed to generate synthetic user interests from the embeddings. Third, the system adopts a Federated Learning technique to ensure the user modeling is trained in a decentralized manner on the user's own devices while keeping data localized without sharing with marketers. Last, a recommender system is built upon the learned user interests to identify the right users for digital marketing campaigns. Overall, this work provides a holistic solution for privacy-preserving user modeling for digital marketing campaigns.

Keywords: Deep learning · Digital marketing · Data monetization · Data privacy · Hyperbolic embeddings · Federated Learning

1 Introduction

This study was conducted in collaboration with a European data monetization platform that aims to help European Union (EU) citizens better manage and monetize their data under the EU's digital laws. The platform was developed as a mobile app under the EU General Data Protection Regulation (GDPR) to give its users complete control over how their data is collected, used, and protected online. On the one hand, the platform has created a community of users who opt-in to share their information for fair compensation and receive marketing promotions. On the other hand, marketers may use the platform to target rights users by matching campaigns with user interests. This research aims at helping the platform to improve this marketplace for both users and marketers through several steps while ensuring compliance with the data privacy regulations. First, and since we do not have access to users' interests, it is investigated how to correctly represent them by incorporating hierarchical user interests into hyperbolic space. The learned latent embeddings represent user behavior patterns across multiple data sources. Then,

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synthesized user representations are further generated using the Generative Adversarial Networks (GAN) technique to approximate user interests. The training process is performed through Federated Learning (FL), a distributed learning method, to leverage data privacy and communication efficiency. This paper provides a holistic solution for privacy-preserving user modelling for digital marketing campaigns.

2 Related Work

2.1 Representation Learning for User Modelling

In extracting knowledge from hierarchical data from users' Facebook profiles that detail their interests in terms of likes to Facebook pages, hyperbolic embeddings present properties able to capture excellent quality hierarchy information in a few dimensions with arbitrarily low distortion. Even though the Euclidean geometry is widely used, it is shown that linear embeddings of graphs require higher dimensionality that typically is outperformed by lower dimensionality of hyperbolic embeddings, in terms of both the similarity between objects (distances) and their relative depths in the hierarchy (Maximilian and Kiela 2017). Through a deep search, the Poincaré Ball model was found to be the most adequate in learning hierarchical representations, as it offers to preserve the distances between the categories, making sure that similar categories are put nearer each other and the less similar ones farther away, as well as preserve the hierarchies of the data.

2.2 Machine Learning Approaches for Privacy-Preserving with GAN

Although plenty of techniques was introduced to protect privacy (such as de-identification techniques), these are vulnerable to attacks if the background information were leaked. GAN has made significant progress in providing a privacy protector layer for those domains that face data leakage threats. A variation called table-GAN was modified from DCGAN (Chintala et al. 2015). The table-GAN aims to synthesize relational tables (consists of different data types) and are statistically identical to the original table, based on convolutional neural networks. GAN also has a significant role in the medical industry, e.g., generating artificial patient electronic health records (EHRs). Firstly, medGAN (Choi et al. 2018) was introduced and had a good result in generating EHRs. Afterward, some improvements were realized, medWGAN and medBGAN (Baowaly et al. 2019) were proposed to generate realistic EHRs. Another variation - CTGAN (Xu et al. 2019) - aims to synthesize Tabular data, consisting of continuous and discrete columns using a conditional generator.

2.3 Machine Learning Approaches for Privacy-Preserving with Federated Learning

Nowadays, it has become increasingly evident the flaws Centralized Learning presents in a generation of accelerated data complexity and volume that deposits traffic overheads in the network responsible for exchanging this significant amount of data, imposing

additional burden to the server in its ability to process vast aggregates of information, and guarantee data protection (Drainakis et al. 2020). This circumstance has led to an alternate system of distributing the ML burden across numerous computers or mobile devices. FL leaves data training across several devices coordinated by one or more central servers. This technology introduction can resolve the conflict between data privacy and data sharing for detached devices, considering that the data are not disclosed to a central server. As a result, FL is suited for applications when data are privacy-sensitive. Distributed learning promises to diminish the potential risks of private data breaches as it tendentiously reduces the risk exposure to users' devices instead of aggregating the risk to central servers that contain the compiled information of users, as it happens in the centralized approach.

3 Platform Design

3.1 Illustrate the Platform Design

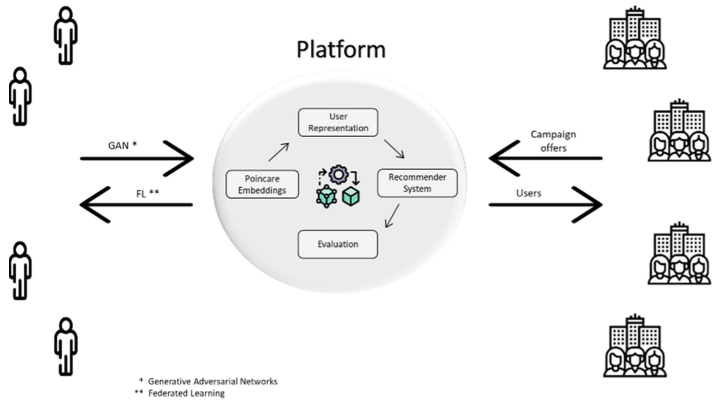

Fig. 1. Illustration of data monetization system design

Figure 1 illustrates the design of the platform with several key components. The core section demonstrates the modeling of users' representations using the Poincaré Embeddings, which are then used to match their interest to the campaign that marketers initiate. Finally, there is the evaluation stage of the learning process. On the left side, both GAN and FL techniques are used to generate synthetic user data to comply with data privacy. More specifically, GAN is implemented for generating synthetic data to protect users' data privacy. Also, FL is implemented to allow the training process to perform decentralized on the user's own devices, aiming to leverage communication efficacy and defense techniques to ensure data privacy. On the right side, it is illustrated how the user representations are used to identify the target audience that matches the right campaign. When a marketer wants to send an offer through the platform's mobile app, they must identify the target audience by specifying user characteristics such as interests, demographics, or online behavior. In particular, for each campaign to be conducted on the

platform, a list of users is created so that marketers target not only the users that meet the campaign requirement but also those who are more prone to accept the offer. However, neither the marketers nor the platform would know which users may receive a specific campaign offer, as only the learned latent user embedding is used. This is accomplished by modeling the user through a series of deep learning techniques, including Poincaré embeddings, and synthesizing the user data from these embeddings using GAN.

3.2 User Modelling from Poincaré Embeddings

The representation of the user on the hyperbolic space was possible by having the resulting embeddings of Facebook's interests from the Poincaré Model. Firstly, each user was represented into the space by calculating an average of their interests and characteristics, creating one unique vector. Additionally, to represent the embeddings of the users into the space, the creation of target groups would group users with similar characteristics together. That way, the characteristics of the targeted group create an avatar of the users that were targeted. Finally, this would guarantee the marketer that the right users are being targeted and the privacy of the user is being preserved.

3.3 User Representation Synthesized Using GAN

Before applying the embedding methods, GAN is used to generate the synthetic data, indistinguishable from the original ones, to protect user privacy. GAN consists of two neural networks simultaneously: 1 – a Generator (G), which generates synthetic data by capturing the distribution of the training data, providing negative training examples for the Discriminator; 2 – a Discriminator (D) distinguishes fake data from actual data, penalizing G for providing artificial samples. The training process starts by inputting a random noise created by the Generator and actual data from the original data set into the Discriminator. Next, discriminator loss penalization will be performed if D misclassifies. Lastly, the Generators' hyperparameters get updated through backpropagation. This process is repeated until the convergence of discriminator loss, minimizing the probability of making mistakes.

3.4 Distributed Training Using Federated Learning

In this context, sending updates of user embeddings on the server when training a global federated model is not desirable, as it inadvertently exposes potentially sensitive individual preferences. Consequently, Partially Local Federated Learning is introduced by partitioning the model into global and local parameters. As some parameters are not forced to be transferred to the server, it still requires clients to maintain their user embeddings across several rounds, which can also be undesirable. In large-scale cross-device settings, users are improbable to be sampled more than once during the training process, resulting in performance degradation. To solve this issue, a federated reconstruction framework is used to remove the necessity for users to keep their local parameters across rounds by reconstructing them as needed and using a reconstruction algorithm to restore them.

4 Results

4.1 Data Description

The dataset used in this paper is extracted from users' Facebook profiles that detail their interests in terms of likes on Facebook pages. Given that each Facebook page belongs to an intrinsic category, which is hierarchically organized with a 3-level depth, user modeling needs to consider the hierarchies of user interests. As Fig. 2 shown, an example is the category "Media" that contains child categories of "Music" and "Books & Magazines," which the Music category further contains child categories of "Song" and "Album." As such, user interests are represented as a set of hierarchical data that contains different levels of categories. Ideally, users with similar interests of the same parent category should be represented closely, which is challenging using the traditional one-hot encoding. Instead, a Poincaré embedding model is adopted to learn user representations to embed user interests into the hyperbolic space that calculates similarity using non-Euclidean distance.

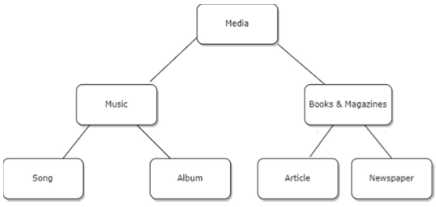

Fig. 2. Hierarchical data example

4.2 Result from Poincaré Embeddings

The outcome of the Poincaré model is a set of vectors or coordinates of each category on the hyperbolic space, known as Poincaré embeddings. To determine the best dimension of Poincaré embeddings, two tasks, link reconstruction, and link prediction, are constructed to examine whether the obtained embeddings contain meaningful representations of user interests in terms of mean rank and mean average precision (MAP).

Table 1. Poincaré ball evaluation

	Reconstruction				**Link Prediction**			
	25D	50D	100D	200D	25D	50D	100D	200D
Mean Rank	2.59	2.55	**2.50**	2.53	3.19	2.98	3.07	**2.76**
MAP	0.534	0.534	0.536	**0.54**	0.413	0.418	0.416	**0.538**

The evaluation results of the Poincaré Ball are shown in Table 1. Looking at the Reconstruction, we can check that the values vary slightly, especially the MAP values

that only increase from 0.53 to 0.54. However, looking at the Link Prediction values, the Mean Rank had 3.2 and decreased to 2.76, as well as the MAP value got from 0.41 to 0.538, showing a substantial increase for the Link Prediction. After fine-tuning our model, the best model has the following characteristics: 20 negative samples, 0 burn-in initialization, no regularization, 200 epochs in a 200-dimensional space. These results show that more than 50% of the dataset is represented correctly on the hyperbolic space in terms of distances between the interests and preserving the hierarchy of the 3 levels of categories.

Figure 3 exhibits the obtained embeddings of categories on the Poincaré Model as blue dots. The straight black lines represent the relations between the hierarchy levels of the categories. Additionally, the figure shows that more similar categories should locate closely, as in the case of "Music" and "Song." From the Poincaré Model, it is also possible to get representations of the users, as shown in Fig. 4. For the representation of the user into the space, six target groups are obtained. Such representations will help our analysis and understanding of the characteristics of each group, for which it may increase the accuracy of categories to a user because the likelihood of sharing similar preferences to other users in the same group is assumed to be higher.

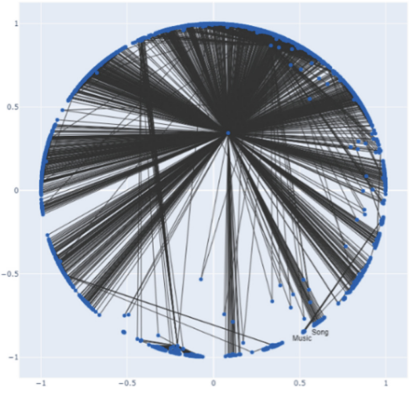

Fig. 3. Representation of the Poincaré Embeddings in 2D

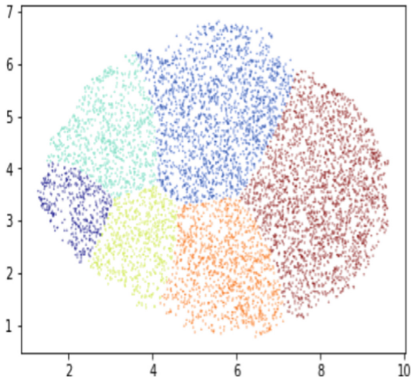

Fig. 4. Representation of the users into the Poincaré space

4.3 Results from GAN

In the following tables, it is possible to check the performance of GAN by comparing the original data set with the one generated by the model (synthesized data set). One can then conclude that the result obtained from GAN (Table 2) has a similar distribution as the original data set (Table 3), maintaining a good utility level and minimizing the risk of leakage simultaneously. In addition, even hackers who have some background information about the user's profile, cannot obtain any other information from the synthetic data set.

Afterward, the synthesized data could be applied in the next steps with minimal risk of the user privacy breach.

Table 2. Synthesized data set.

	user_id	insight	True	False	Birth_year	Gender	Civil_status	Degree	Professional_status	Annual_income	Practice_sports
0	2105	1536	1	0	1	0	0	1	5	4	1
1	7864	1494	1	0	6	0	0	1	1	1	1

Table 3. Original data set.

	user_id	insight_id	True	False	Birth_year	Gender	Civil_status	Degree	Professional_status	Annual_income	Practice_sports
0	235	1149	1	0	1	1	0	4	2	0	1
1	5056	1149	1	0	0	1	2	5	6	3	0

4.4 Result from Federated Learning

The loss and metrics are estimated for each sampled user on an unobserved portion of local data through the item matrix and the reconstructed user embedding. This is followed by an averaging of the losses and accuracies across users to calculate the total loss and accuracy.

Table 4. Federated Learning from the user-item matrix reconstruction

Metrics	Validation set	Test set
Loss	0.058	0.056
Accuracy	94%	94.2%

Table 4 shows the loss and accuracy of the user-item matrix reconstruction trained with federated learning on the validation and test sets. The model seems to perform well, indicating good prospects of being successfully implemented in a real context simulation. However, the good scores obtained from the model may also imply that the sparsity in the matrix may lead to an unbalanced dataset. Despite this issue, the model can perform training of the parameters (global and reconstructed local data) without having direct access to the user-specific information of users. This demonstrates how this approach can benefit users by strengthening their privacy.

4.5 Result from Recommender System

Finally, synthetized user embeddings are further incorporated into a recommender system model to match the marketing campaign as HyperML (Tran et al. 2020). Its main goal is to recommend new users for a specific campaign based on their interests and personal information. A list of users is identified for the specific campaign offer, and the model performance is evaluated with HR@10, which measures the percentage of identified top 10 users interested in the specific campaign. Table 5 presents the evaluation

results for matching campaigns with top 10 users at bottom categories and master (root) categories, respectively:

Table 5. Recommender system evaluation

	HR@10
Recommender system for bottom categories	0.904
Recommender system for master categories	0.965

Both results show that each campaign can be matched correctly, with over 90% of users likely to accept the offer. This would incentivize marketers to offer marketing campaigns with confidence to obtain matched users, even without knowing their identities.

5 Conclusion

To conclude, this study leverages deep learning techniques to model user interests for digital marketing by learning meaningful representations of users under privacy-preserving properties. Users' representations about their demographics and interests across multiple sources are obtained with Poincaré embeddings and then used to be matched with marketing campaigns. Thus, when a new campaign is to be conducted in the mobile app of the data monetization platform, the targeting process is performed by identifying the right target audience with representations indicative of their matched interests. Techniques such as GAN and FL are adopted during the learning process to ensure data synthesis and decentralized training. Finally, implementing all the techniques together intends to build a platform that allows targeting users with digital marketing offers they are likely interested in and allows marketers to target the right users with reasonable spending.

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Profiling the Users of Mobile Payments in Belgium: A Study Exploring Socio-demographics, Social Media Usage, and General Impulsive Buying Tendency

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Abstract. A great deal of research has been carried out on adoption of mobile payments, focusing on user intentions. However, little is known about the actual users and what circumstances trigger mobile payment. Mobile payment is of particular interest to retailers, as it can facilitate and thus encourage finalization of the sales transaction. In this Belgian study ($N = 1792$, average age = 44.3, $SD = 13.3$, 49% female), we take a closer look at the profile of mobile payers in terms of their socio-demographics, frequency of patronizing convenience retail channels, and social media usage, and their underlying general impulsive buying tendency before and during the COVID-19 crisis. We observed a clear uplift in users between 2019 and 2020. We further find a higher occurrence of mobile payers among younger ages and those with a higher socio-economic profile. The link between internet/online shoppers and mobile payment adoption seems to be firmly established. Our data also indicate a higher incidence of mobile payment among petrol station shoppers but not for vending or newsagent shoppers, indicating that certain convenience stores seem more suitable contexts for using mobile payments than others. Furthermore, a clear positive association was observed between general impulse buying tendency and mobile payment incidence. Finally, higher mobile payment incidences can be found amongst Facebook and Instagram users, but not amongst Twitter and YouTube users. Understanding these differences can help retailers set their digital and commercial agendas and researchers in the field of mobile payment adoption to select appropriate moderators for their models.

Keywords: Mobile payment · Social network sites · Impulse buying tendency · Convenience stores · Digital divide

1 Introduction

Only 20 years ago, the internet was, at best, an optional possible distribution-, transaction-, and communication channel (Peterson et al. 1997), today, many see a decline in physical retail due to the proliferation of online shopping and electronic commerce as inevitable (Helm et al. 2020). Whereas in the past, online and offline retail were still two

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very separate worlds, the distinction between the two is rapidly disappearing, in part, thanks to mobile e-commerce, which has been seen as a primary facilitator in the retail space of such convergence (Hagberg et al. 2016), and mobile payment, which has been seen as a factor of changing consumers' spending patterns and payment as payments can be made anytime, anywhere (Liu et al. 2019). Payment is an intricate part of the purchase phase in almost any shopper's journey, which either completes or deferments the purchase, making it of particular interest to retailers (Lemon and Verhoef 2016).

The COVID-19 crisis caused severe disruption for retailers, making physical shop activities difficult to impossible due to widespread restrictions (social distancing, lockdowns, quarantines, business closures). Whereas in normal circumstances, digital technology and its development already profoundly impacted consumer behavior in the last decades, the recent COVID-19 crisis made them indispensable for many aspects of daily functioning (Verma and Gustafsson 2020). Technological advancement has been credited with promoting and enabling businesses to continue running throughout the crisis (Renu 2021). Mobile (contactless) payment was already identified as a significant ongoing trend before the crisis (Hagberg et al. 2016) and one of the fundamental technologies within the Fintech landscape (Takeda and Ito 2021). However, it is hypothesized that the COVID-19 pandemic has fuelled the adoption of digital payments, both among customers and retailers, to limit in-person transactions (Abdullah and Khan 2021).

Mobile payment has attracted significant academic attention ever since technology made transactions via a mobile device possible, some 20 years ago, and several review articles have been published since. Reviewing the literature in 2008 and 2015, Dahlberg and colleagues concluded that in more recent literature, the same findings were put forward as in earlier contributions, and the research field shows little progression due to an overly one-sided approach to the topic (Dahlberg et al. 2015; Dahlberg et al. 2008). Indeed, analysis of mobile payment consumer research has focussed almost entirely on technological adoption models and which of those models' theoretical constructs are most likely to influence intention to adopt mobile payment services (Abdullah and Khan 2021; Dahlberg et al. 2015; Liu et al. 2019). Meta-analysis of 61 papers published between 2008–2017 on consumer-related adoption of mobile payment showed a high level of agreement among researchers that perceived usefulness, perceived risk, social influence, trust, and perceived ease of use, have a significant contribution in explaining consumers' intention to use mobile payment (Liu et al. 2019). However, while these factors are known, little to no research exists that investigates the antecedents of adoption factors, what they mean, in which situation they apply, by whom, and how they can be changed and managed (Dahlberg et al. 2015). Leaving aside some exceptions, the introduction of moderation effects on intention remains limited, and the impact of background variables like education and age should be taken further into account (Abdullah and Khan 2021). Also, the lack of understanding of the significance of adoption factors in different situations like the type of shop (e.g., supermarkets, kiosks, vending…) and various payment scenarios in terms of technology applied at the points of sales could be more thoroughly researched (Dahlberg et al. 2015). Finally, as Liu et al. (2019) demonstrate, the mobile payment field is almost entirely built on explaining the intention to use, making no difference between actual users and non-users. As a result, little is known about the current real users of mobile payments. For instance, research on social

media usage often focuses on identifying sociodemographic differences between users and non-users (Hellemans et al. 2020). However, such insights seem notably lacking when investigating the literature on mobile payment technologies.

2 Research Objectives

An increase in mobile payment has been noted in popular media and supported by trade data (Febelfin 2021). Our first research objective is to investigate to which degree mobile payments were used over 2020 during the COVID-19 crisis, compared to 2019. While experts agree that the COVID-19 crisis could accelerate the adoption of new retail technologies both for online and traditional shop retail (Willems et al. 2021), little empirical academic evidence has been found that compares their adoption and usage before and during the crisis. In a pandemic world where contactless interaction is advocated, it can be expected that contactless payment thrives even more than before to limit in-person transactions. The second objective of this paper is to contribute to the mobile payment field from a different angle by addressing some of the previously mentioned gaps, comparing users' profiles to that of non-users in terms of specific socio-demographics by adopting a digital divide perspective. We also explore differences in general shopper type and social media usage as a third objective. Dahlberg et al. (2015) pointed out that the adoption and use of mobile payment might be linked to the type of sales channel, especially convenience stores. Finally, profiling mobile payment users on sociodemographic, economic, and behavioral background variables can also help the mobile payment adoption research domain select potential essential moderators.

Digital inequality and the related concept of the "digital divide" refer to differences in digital access, information, tools, usage between regions and people and their underlying differences. Early digital divide studies focus on access to computers, the internet, and the significance of having access when and where one wants it (Hargittai 2021). In developed countries where access to the internet is seen as standard and in reach for most people regardless of urbanization, education, and age, the focus has shifted towards specific access to certain digital tools and usage like social media. In the related field of financial inclusion, the impact of fintech is studied to enable better access to financial services (Takeda and Ito 2021). Investigating such differences is paramount from a sociological or political point of view. Moreover, in light of the continuous advancement of digital innovations, their importance, and their infiltration in daily life, such research can also inform businesses, like retailers (Dewan and Riggins 2005). Understanding how consumers differ in their purchase behavior in a multichannel context becomes crucial (Konuş et al. 2008). It is more important than ever for retailers to understand their customer demographic profiles when adopting new technologies (Taylor 2016). Hence, the digital divide has critical managerial implications; customers show variation in the adoption and the ability to use technology. First, organizations also adopt them at varying rates, leading to differentiating competitive advantages. Second, insight into the profile and number of users capable of using specific technology can inform the reach and acceptance of their commercial digital agenda, how to promote it, and to whom., making a differential marketing strategy possible.

3 Methodology

3.1 Sampling

Cross-sectional data from 2019 and 2020 were obtained from a Belgian online panel, resulting in 1792 observations (2019: $N = 897$, *avg* age $= 44.5$, $SD = 13.04$, of which 49% were female; 2020: $N = 895$, *avg* age $= 44.1$, $SD = 13.50$, of which 49% were female). We further checked for underlying sociodemographic differences per profile between both years. Based on Pearson chi-square tests (year*[sociodemographic variable]), none showed any significant difference, indicating that the samples' profiles are similar.

3.2 Questionnaire

Besides age and gender, other included sociodemographic variables were the following categorical variables: (1) education level, (2) professional/occupational situation, (3) civil state, (4) household income, (5) children in household, (6) region (French-speaking part versus Flemish-speaking part), and (7) urban area. Education and professional situational occupation were also grouped in a Social Grade composite variable constructed from education and employment, differentiating seven groups from (1) lower to (7) higher in a similar vein like adopted by Esomar (2003).

Next to socio-demographics, we profiled respondents in terms of (social) media access. DAU's are defined as users that go on their (social) media at least once a day, which is a standard dichotomized metric used by Social Network platforms and industry press reports and used in other research investigating the adoption of Social Network Sites (Haight et al. 2014; Hellemans et al. 2020, 2021; Yu et al. 2016). The measurement was obtained for the following social media platforms; (1) Facebook, (2) Twitter, (3) Instagram, and (4) Youtube, as well as (5) internet browsing, (6) digital newspapers, (7) digital magazines, and contrasted with a similar measurement for the following traditional media channels; (8) TV, (9) radio, (10) newspapers, and (11) magazines.

In addition to sociodemographic and media usage variables, respondents indicated whether or not to be a regular shopper of (1) online shopping and (2) convenience stores like vending machines, night stores, gas stations, and newspapers kiosks.

Next, general impulsive buying tendency (GIBT) was measured using an adapted version of Weun et al. (1998), using a 6-point scale going from (1) never to (6) always. Following items were rated; (1) I am a person who makes unplanned purchases, (2) When I go shopping, I buy things that I had not intended to purchase, (3) I enjoy buying something spontaneously, (4) If I come across interesting promotions, I am inclined to buy them without much overthinking, (5) When shopping I look around for promotions I hadn't foreseen, and (6) I take notice of what might be in promotion, to score an unforeseen deal. Exploratory factor analysis revealed one factor explaining 67% of the variance. Cronbach's alpha was calculated for both the Dutch version ($Mean = 13.57$, $SD = 6.83$, $\alpha = 0.91$) and the French version ($Mean = 14.47$, $SD = 7.05$, $\alpha = 0.92$).

Finally, participants rated how frequently they have used Mobile (contactless) payment (apps) over the last 12 months on a 7-point frequency scale, going from "not at all" (i.e., score 1) to "Once a week or more" (i.e., score 7). Our definition of mobile payments

includes any payment made with a mobile device using SMS, QR, App, or wallet. Given the non-normal distribution of the user frequencies, the measure was dichotomized in the analytical stage. We differentiated between regular mobile payment (RMP), defined as at least once a month (1 = scores 5 to 7) and non-regulars (0 = scores 1 to 4) and adoption of mobile payment (AMP) specified has tried it at least once during the year (1 = scores 2 to7) versus non-users (0 = score 1). The results will be further analyzed with non-parametric statistical testing.

4 Results

4.1 Mobile Payment RMP and AMP-Scores

Table 1 shows the obtained RMP and AMP scores on the total sample and the univariate relationship between sociodemographically distinct groups and the obtained incidences for mobile payment. Almost half (46%) of the adult population, 18 to 64 years old, reported having at least tried mobile payment in 2020.

Table 1. Sample distribution and RMP and AMP incidence rates

		Column %	RMP%	AMP%	Chi-square RMP Chi-square AMP
Year	2019	50%	20%	26%	$\chi 2 = 66.41$, p = <.001*
	2020	50%	37%	46%	$\chi 2 = 78.24$, p = .000*
Region	FL	58%	29%	38%	$\chi 2 = 0.58$, p = 0.448
	FR	42%	28%	33%	$\chi 2 = 5.20$, p = .023*
Urban	No	46%	27%	35%	$\chi 2 = 2.02$, p = 0.156
	Yes	55%	30%	37%	$\chi 2 = 0.85$, p = 0.356
Sex	Male	51%	29%	38%	$\chi 2 = 0.91$, p = 0.34
	Female	49%	27%	34%	$\chi 2 = 2.69$, p = 0.101
Age	18–25	12%	48%	61%	$\chi 2 = 132.30$, p = .000*
	26–35	16%	43%	52%	$\chi 2 = 165.59$, p = .000*
	36–45	22%	32%	38%	
	46–55	25%	22%	28%	
	56–65	25%	13%	19%	
Being Single	No	61%	28%	35%	$\chi 2 = 0.11$, p = 0.745
	Yes	39%	29%	38%	$\chi 2 = 1.26$, p = 0.261
Kids	No	45%	22%	29%	$\chi 2 = 28.40$, p = <.001*
	Yes	55%	34%	42%	$\chi 2 = 29.86$, p = <.001*

(*continued*)

Table 1. (*continued*)

		Column %	RMP%	AMP%	Chi-square RMP Chi-square AMP
Education level	Lower	12%	22%	29%	$\chi 2 = 15.95$, p = .001*
	High school	44%	27%	35%	$\chi 2 = 19.34$, p = <.001*
	Graduate	21%	28%	33%	
	Master	24%	35%	44%	
Income level	−30k	31%	24%	29%	$\chi 2 = 16.07$, p = .001*
	30–50k	39%	28%	36%	$\chi 2 = 25.58$, p = <.001*
	50–70K	20%	32%	41%	
	70k+	10%	37%	48%	
Working	No	39%	22%	28%	$\chi 2 = 22.89$, p = <.001*
	Yes	61%	33%	41%	$\chi 2 = 33.77$, p = <.001*
Professional	Independent	*3%*	34%	39%	$\chi 2 = 76.03$, p = <.001*
	Managerial	9%	42%	54%	$\chi 2 = 108.34$, p = .000*
	White-collar	20%	35%	44%	
	Blue-collar	29%	27%	35%	
	Unemployed	*7%*	23%	26%	
	At home	25%	16%	21%	
	Student	*6%*	46%	59%	
Professional Grouped	White-collar	31%	37%	47%	$\chi 2 = 34.40$, p = <.001*
	Blue-collar	30%	28%	35%	$\chi 2 = 50.48$, p = <.001*
	Non-working	39%	22%	28%	

A significant increase from the 26% reported in 2019 ($\chi 2 = 78.24, p = .00$). A similar trend can be observed for regular mobile payment use. The RMP% increases from 20% in 2019 to 37% in 2020 ($\chi 2 = 66.41, p = < .001$). The significant chi-squares values for most group*period cross-tabulations (not reported) indicate that overall, the RMP and AMP prevalence of mobile payment increased during the corona crisis amongst almost all groups under investigation. An exception to this general rule is observed for the youngest age group (18–24 yo), which was already higher in 2019, and amongst the unemployed, which at a low level shows no significant increase.

4.2 Individual Differences in M-Payment

Chi-square analyses were run to examine significant differences per sociodemographic grouping, reported in Table 1. Except for the regional difference between the Dutch and French, the significant differences applying to RMP% are similar to those for AMP%. While the Flemish part (38%) reported a higher AMP rate than the French part (33%),

both regions report an equal portion of regular users. No differences could be detected for urbanization, gender, or single status.

A strong age effect shows that adoption and regular use are still mainly occurring amongst the younger population (RMP%: 48% for 18–24 yo versus 14% for 55–64 yo). The included economic profile background variables show a significant relationship with RMP and AMP incidences in the expected direction. We find a higher occurrence of mobile payment among those with a higher education level, a higher household income, and working versus those with lower education, income, and not working. Except for students, we find a lower mobile payment incidence among blue collars, unemployed, and home caregivers, with a higher incidence for white-collar workers.

The R Hetcor package available in SPSS was run to estimate the polychoric/ polyserial correlations between the (social) media DAU measures, the available convenience channel shopper's occurrences, and the general impulse buying tendency score with mobile payment. All social media measures show a significant correlation with RMP (Instagram: $r = .49$; Youtube: $r = .39$; Twitter: $r = .35$; Facebook: $r = .24$). Furthermore, a significant positive correlation could be observed for digital magazine readers ($r = .13$), while TV ($r = -.16$), and Radio ($r = -.08$), audiences showed a significant negative correlation. No significance could be detected for internet browsing, paper/digital newspapers, and paper/digital magazine audiences. All convenience channels exhibit a significant correlation with RMP (Internet/online shoppers: $r = .38$; Night shoppers: $r = .44$; vending shoppers: $r = .39$; Newsagent's shoppers: $r = .12$; Petrol station shoppers: $r = .39$) and also the general impulsive buying tendency score shows a significant correlation with RMP ($r = 0.34$). The correlations with AMP show similar significance and size. The only notable difference is that no significant relationship could be observed for radio audiences. Given the similarity between RMP and AMP, we report further on RMP in the context of this paper.

To contribute to understanding individual differences, logistic regression was run on the RMP score, the available sociodemographic, media usage, retail patronage variables, and the period indicator as determinants. Given some small sub-group sizes in the professional/occupational profile, the Social Grade Composite Score (SGCS) was used. Multicollinearity was checked for, which yielded no reasons for concern (Midi et al. 2010).

Analyzing the stepwise procedure's output in Table 2, the stepwise model shows an appropriate fit according to the Hosmer and Lemeshow test. Final Nagelkerke R Square as pseudo-indicator for explained variance reached 31%.

The periodic effect between 2019 and 2020 is clear, with an odds ratio running up to 2.54 (CI_{95}: [1.99–3.24]) in the last step. Also, the age effect can be observed with an odds ratio of 0.98 (CI_{95}:[0.97–0.99]) with increasing age. The lower chance for M-payment in the French-speaking part is apparent with an odds ratio of 0.75 (CI_{95}: [0.58–0.98] *). The SGCS as a social-economic factor shows a significant positive effect ($Exp(B) = 1.13$, CI_{95}: [1.06–1.21]). In the first stage, we introduced the socio-demographic variable from a digital divide point of view. As such, we also noted significantly lower odds for females ($Exp(B) = 0.68$, CI_{95}: [0.54–0.86]) and higher odds for those with kids ($Exp(B) = 1.35$, CI_{95}: [1.06–1.70]), but these effects did not withstand in a concurrent model when introducing underlying shopper profiles. With regards to the shopper profile, the odds

Table 2. Logistic regression: odds-ratios on regular mobile payment users (RMP)

Exp(B) [95% C.I]	Step 1	Step 2	Step 3
Year (2020)	2.57 [2.05-3.22] *	2.62 [2.06-3.33] *	2.54 [1.99-3.24] *
Region (FR)	0.80 [0.64-1.01]	0.72 [0.56-0.91] *	0.75 [0.58-0.98] *
Urban (Y)	1.11 [0.89-1.39]	1.00 [0.78-1.26]	0.97 [0.76-1.24]
Sex (F)	0.68 [0.54-0.86] *	0.90 [0.70-1.15]	0.86 [0.67-1.11]
Age	0.95 [0.94-0.96] *	0.97 [0.96-0.98] *	0.98 [0.97-0.99] *
Single (Y)	0.82 [0.64-1.04]	0.91 [0.70-1.18]	0.85 [0.65-1.12]
Kids (Y)	1.35 [1.06-1.70] *	1.14 [0.89-1.46]	1.14 [0.88-1.46]
SGCS	1.11 [1.04-1.18] *	1.12 [1.05-1.20] *	1.13 [1.06-1.21] *
Income level	1.05 [0.92-1.20]	0.99 [0.86-1.15]	0.98 [0.84-1.14]
GIBT		1.04 [1.02-1.05] *	1.03 [1.01-1.05] *
Internet/online shopper		2.27 [1.76-2.92] *	2.20 [1.70-2.85] *
Night outlet shopper		1.52 [1.09-2.12] *	1.38 [0.98-1.95]
Vending shopper		1.31 [0.96-1.81]	1.28 [0.92-1.77]
Newsagents shopper		0.94 [0.73-1.22]	0.92 [0.70-1.20]
Petrol station shopper		1.82 [1.36-2.43] *	1.82 [1.35-2.44] *
Facebook			1.38 [1.03-1.84] *
Twitter			0.83 [0.53-1.32]
Instagram			1.93 [1.34-2.78] *
YouTube			1.02 [0.71-1.47]
Internet browsing			0.88 [0.62-1.25]
TV			0.91 [0.65-1.26]
Radio			0.95 [0.72-1.26]
Newspaper			1.36 [0.93-1.98]
Magazine			0.69 [0.39-1.22]
Newspaper digital			0.95 [0.71-1.27]
Magazine digital			0.95 [0.57-1.58]
Step χ^2	**247***	**163***	**25***
Model χ^2	**247***	**410**	**435**
Df	**9**	**15**	**26**
Nagelkerke R^2	**0.19**	**0.29**	**0.31**
Hosmer & Lemeshow Test	**8.64**	**7.31**	**10.3**

**p<0.05, SGCS: Social grade composite score, GIBT: General Impulse buying tendency*

increase with general impulse buying tendency (GIBT) (*Exp(B)* = 1.03, CI_{95}:[1.01–1.05]) and amongst Internet/Online shoppers (*Exp(B)* = 2.20, CI_{95}:[1.70–2.85]), and fuel station shoppers (Exp(B) = 1.82, CI_{95}:[1.35–2.44]). Night outlet shoppers (*Exp(B)* = 1.52, CI_{95}:[1.09–2.12]) showed a higher odds ratio in step 2, but this effect disappeared by introducing social media access. Further observation shows that the odds for Facebook users (*Exp(B)* = 1.38, CI_{95}:1.03–1.84), and Instagram users (*Exp(B)* = 1.93, CI_{95}:1.34–2.78) are significantly higher. None of the other channel's audiences reaches significance.

5 Discussion

5.1 Theoretical and Managerial Implications

Our data support the first research objective, providing empirical academic evidence that the COVID-19 crisis accelerated the adoption of new retail technologies like mobile

payment (Willems et al. 2021) with an apparent positive periodic effect between 2019 and 2020. It remains to be seen whether such a shift is sustained in a post-pandemic world and becomes habitual and widespread. However, given the current societal trends, one could expect mobile payment to mature in the coming years. For the central part, differences observed during the crisis were already established before the crisis. The increase in mobile payment penetration can be observed in most layers of society, except for the youngest age group (18–24 yo), which was already higher in 2019, and amongst the unemployed, which at a low level shows no significant increase.

Further exploring sociodemographic differences in light of our second objective shows that an age and social class effect remains. We find a higher occurrence of mobile payment among younger ages and higher socio-economic profiles. The initial gender effect with lower odds for women and the kid's effect showing higher odds for those with kids seems to disappear once controlled for underlying shop-related profiles. From a digital divide perspective, we can conclude that with regards to mobile payment, there is still inequality in adoption and usage, which might be less related to access but more to education and age.

Our data seem to only partially support the hypothesis related to our third objective that the adoption and use of mobile payment might be linked to the type of sales channel, especially convenience stores with a higher incidence of mobile payment among petrol station shoppers but not for vending, newsagent shoppers or night outlet shoppers once controlled for social media access. The link with internet/online shopping and mobile payment seems to be firmly established.

Furthermore, a clear association was observed between general impulse buying tendency and mobile payment and between mobile payment and Facebook and Instagram users. Not surprisingly, Aragoncillo and Orús (2017) pointed out that General impulse buying is precisely related to these Social Network Sites. Younger ages, general impulse buying, and Instagram and Facebook users are related. Nonetheless, they all seem to have a significant unique contribution in a concurrent model.

The fact that mobile payments for impulse purchases may be more readily used indicates that retailers are commercially well advised to offer mobile payments as an incentive to facilitate such transactions not only online. Nonetheless, social media users of Facebook and Instagram, in particular, seem to be open to mobile payments. It is precisely these channels that facilitate social selling with specific shop-button features, allowing people to easily shop from the brand's photos and videos that they encounter.

5.2 Limitations and Suggestions for Future Research

Given the limitation of a repeated cross-sectional approach, further research could opt for a longitudinal approach to capture trends in adopting new retail technologies like mobile payment after the COVID-19 pandemic.

From a sociological digital divide perspective, researchers could further investigate whether the differences observed for age and education might be caused by underlying factors like knowledge and resistance towards new technology. Given the limitation of our sample to 18 to 65-year-olds, further research can also look at older seniors and younger people.

Besides background variables like socio-economic profile and age, the observed differences in our data warrant further investigation into specific shopper orientation-related differences like general impulse buying tendency as moderators in the field of mobile payment adoption. Future research can investigate which factors in such models, like the perceived utility and ease of use, might be moderated. The differences between social media users also warrant further investigation into the role of social media in adoption models. Mobile payment adoption was higher for internet/online shoppers and petrol station shoppers, while not for other convenience channels. The perceived utility and ease of use might be considered higher amongst the former channels, which could be further investigated.

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Analysis of the Impact of Brand Fit on Perceived Credibility of Social Media Influencers by European Millennials

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Abstract. Businesses are increasingly marketing their products through social-media influencers (SMI). Considering source credibility of SMI (conceptualized by information value, trustworthiness and expertise) and the theory of parasocial relationship, this study examines the effect of brand fit on SMI's perceived credibility and thus on the purchase intention using structural equation modeling. The findings reveal that SMI's perceived credibility has a positive effect on purchase intention and parasocial relationship. The familiarity with the influencer, conceptualized by parasocial relationship, was found to have a significant mediating role, and brand fit is found to have a positive effect on credibility. The study also examines the effect of brand fit on the model, brand fit was found to have a positive significant effect on SMI's credibility, but it weakens the effect of parasocial relationship on purchase intention. In addition, the study highlights the effect of different European Millennials' characteristics on perceived credibility and purchase intention. Self-expression and deal-driven were found to strengthen the effect of brand fit on SMI's credibility and also that on purchase intention, while selectivity and open-mindedness were found to strengthen the effect of brand fit on credibility but not on purchase intention. The study offers several theoretical and practical contributions.

Keywords: Brand fit · Expertise · European Millennials · Information value · Perceived credibility · Social media influencer · Trustworthiness

1 Introduction

With consumers increasingly trying to actively avoid advertising and more often install so called advertisement blockers companies have to find new ways to reach consumers (Breves et al. 2019). One such way is using social media influencers (SMI) to bridge the gap between the brand and the consumers. SMIs can be celebrities like sportspersons or musicians but nowadays, normal people had also gained influence on social media (SanMiguel et al. 2018; Breves et al. 2019). In order to make influencer marketing

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campaigns successful, companies have to select the right influencers. This selection of SMI is still a major pain point for many brands today (Backaler 2018; Breves et al. 2019).

Perceived influencer credibility is one of the most important aspects of influencer selection for a marketing campaign. SMI credibility was found to impact the followers' intention to purchase (Saima and Khan 2021). Researchers utilized the theory of parasocial relationship to understand its mediating role in explaining the effect of SMI credibility on the purchase intention (Lou and Kim 2019). The positive influence of social media influencers on followers' intention to purchase has already been studied by many researchers (Ibrahim et al. 2020; Raji et al. 2019; Loureiro and Sarmento 2019; Chakraborty and Bhat 2017). Due to the huge popularity of influencer marketing, academics and practitioners are interested in exploring brand fit effect on the purchase intention in social media influencers' campaigns. The brand fit, in general, relates to the perceived fit between the brand that an influencer promotes and the influencers themselves (Breves et al. 2019). A high brand fit has a positive effect of the purchase intention of the follower but also on the perceived credibility of the influencer (Kapitan and Silvera 2016; Breves et al. 2019). Yet, we agree with Saima and Altaf Khan (2021) that research on influencer marketing is still limited. Previous research studies have investigated how various characteristics of endorsers in traditional media affect consumers' purchase intentions (Spears et al. 2013; Kumar 2011). However, just a few studies have been conducted to investigate how the consumer purchase intention is affected by social media influencers (Saima and Altaf Khan 2021; Trivedi and Sama 2019; Lou and Yuan 2019). However, these studies have not considered the role of brand fit in explaining how influencer credibility affect purchase intention.

The aim of this study is, therefore, to investigate the effectiveness of SMI for marketing campaigns in the context of European millennials (EM). Particularly, the research main objectives are (1) to study the effect of SMIs perceived credibility on parasocial relationship and on the purchase intention of followers, (2) to determine the role of brand fit on SMIs perceived credibility, (3) study whether parasocial relationship will mitigate the effect of mediocre brand fit on perceived SMI perceived credibility (4) investigate whether the effect of the perceived brand fit will be stronger for EM who report high levels of certain characteristics (like: self-expression, selectivity, recommendation driven, deal-driven, control, and open mindedness) compared to those who report low levels of such attributes?

A survey by Mediakix (2019) reported the top five social media platforms for influencer marketing are Instagram, YouTube, Facebook, Blogs and Twitter. According to EuroStat (2021), "In the EU, 57% of people aged 16–74 participated in social networks in 2020 in the last 3 months prior to the survey, up by 3 percentage points compared with 2019." As per Statcounter (2021), the most popular social media platforms in Europe are Facebook, Twitter, Pinterest, Instagram, and YouTube. Thus, we consider these platforms for our study.

2 Theoretical Background

2.1 Influencer Credibility

Advertising is a process of information exchange and relationship building between the advertiser and the consumer (Ducoffe and Curlo 2000). It helps the consumer learn about a product and identify the benefits it will offer (Ducoffe and Curlo 2000). Researchers believe that the more credible a source is, the more persuasive the source is likely to be (Aaker and Myers 1987) and more likely to generate intentions to buy the brand (Ohanian 1991). Researchers conceptualized the source credibility model to depend on perceived level of expertise and trustworthiness in the endorser (Dholakia and Stemthai 1977; Hovland, et al. 1953; Hovland and Weiss 1951; Solomon 1996). Researchers concluded that the source influence consisting of the factors expertise and trustworthiness positively impacts the interest in the product and the purchase intention of followers (Lou and Yuan 2019; Yuan and Lou 2020; Siama and Khan 2021). Moreover, the quality of the information given by the influencer is also considered an important factor that influences the decision-making process of the follower (Price et al. 2008; Maltz 2000).

Expertise. Expertise refers to the competence or capability of an influencer such as his/her expertise or skill in a certain area (McCroskey 1966). It is also defined as "the extent to which a communicator is perceived to be a source of valid assertions. It refers to the knowledge, experience or skills possessed by an endorser" (Erdogan 1999). Expertise describes the extent to which the influencer is perceived as a valid source of information. Another way to define expertise is the extent to which a source is able to provide reliable information (Ismagilova et al. 2020). When influencers are perceived as experts in their respective area, the message is perceived as more credible and followers are more interested in the message (Martínez-López et al. 2020).

Trustworthiness. Trustworthiness refers to the sincerity, integrity and believability of an endorser. Advertisers select endorsers who are regarded as honest, believable and dependable (Shimp 1997). It refers to what extent a source is considered sincere and truthful (Giffin 1967). Trustworthiness in general refers to the honesty, believability and the integrity of an influencer or endorser (Ohanian 1990). Trustworthiness also relates to the goodwill that reflects his/her caring about his/her audience (Sokolova and Kefi 2019). A high degree of trustworthiness positively influences the credibility of a source (Rogers and Bhowmik 1970). Friedman et al. (1978) added likability to the set of factors of trustworthiness.

Information Value. Advertising informativeness relates to the value that the advertisement provides to facilitate an informed decision making (Ducoffe 1996). The value of the information given is determined through various factors; the first factor focuses on how credible or reliable the information is (Koohikamali and Sidorova 2017). The second factor is concerned with how relevant and appropriate the information provided by the influencer is for the follower (Koohikamali and Sidorova 2017). The third factor focuses on whether the information provided is clear and easily comprehensible (Koohikamali and Sidorova 2017). The last factor focuses on if the information provided is up-to-date and is being provided quickly (Song and Zinkhan 2008; Koohikamali and Sidorova

2017). The followers' perception of the information value provided by the influencer is critical. Perceived high information value has a bigger impact on the consumers' decision making process (De Veirman et al. 2017, Fransen et al. 2015).

H1: Influencer Credibility positively affects the purchase intention of the follower.

2.2 Parasocial Relationship

Another important factor for understanding the perceived credibility of social media influencers is the level of familiarity (Chung and Cho 2017). To study this factor, researchers have applied the theory of parasocial relationship (Breves et al. 2019). In the context of social media, parasocial relationship can be described as a one-sided relationship between the followers and the influencers. While the followers are deeply involved into the influencers' lives due to the content they post and media coverage around them, influencers most of the time know nothing or have no direct relationship to their followers (Lou and Kim 2019). Like social relationships, parasocial relationship develops through the followers' reaction to the Influencers and involvement with them (Stever 2017). In a parasocial friendship, the follower **likes and trust** the influencer as well as feels a certain sense of **solidarity** towards the influencer (Tukachinsky 2010). The credibility of an influencer affects the strength of the parasocial relationship between the influencer and the follower (Lou and Kim 2019; Yuan and Lou 2020). In particular, trustworthiness and expertise has been found to positively affect the parasocial relationship (Lou and Kim 2019).

H2: Influencer Credibility positively affects the parasocial relationship between the follower and the influencer.

The parasocial relationship that the follower forms with the influencer influences the effectiveness of the influencer marketing campaign (Lou and Kim 2019). The existing parasocial relationship between the influencer has been found to increase the followers' interest in a product promoted by the influencer (Lou and Kim 2019; Yuan and Lou 2020). A strong parasocial relationship makes the engagement of the follower more likely than when there is no relationship (Men and Tsai 2013; Pressrove and Pardun 2016), this is based on the positive relationship between the parasocial relationship and the purchase intention that was observed by several researchers (Lou and Kim 2019; Sokolova and Kefi 2019; Yuan and Lou 2020).

H3: Parasocial relationship between an influencer and the follower positively affects the purchase intention of the follower.

2.3 Brand Fit

Brand fit is the perceived fit between the influencer and the brand she promotes. When the influencer matches the brand she promotes it is often viewed as more honest as the followers think she promotes the brand because she actually likes it and not only for the

money. The followers of influencer want to have the feeling that the influencer represents the brand because she likes and uses the products instead of just for commercial reason (Breves et al. 2019). The fit between the influencer and the brand that he or she promotes impacts the credibility of the influencer (Breves et al. 2019). The brand fit is more important for influencers than it is for regular celebrities as influencers often represent one specific domain like the beauty domain for example (Balog et al. 2008). Schouten et al. (2020) found that a strong brand fit has a higher impact on the credibility of influencer than on the credibility of a regular celebrity. Influencer who promote brands that fit them are perceived as more credible (Breves et al. 2019).

H4: Brand fit between an influencer and the brand positively affects the influencer credibility.

2.4 European Millennials (EM) Attributes

We explore six distinct characteristics of European Millennials (EM) related to our study. The first characteristic is the strong need for self-expression and use of social media as tool to express oneself (Jacobsen and Barnes 2017; Fernandes and Inverneiro 2020). Second, is selectivity which relates to how they make decisions in life (Moreno et al. 2017; Bracinikova and Matsuinska 2020). Another characteristic is that they are deal-driven and price sensitive and therefore attracted by discounts (Gurau 2012; Parment 2012; Kraljevic and Filipovic 2017). EM are also characterized by their need to have control over a certain situation which is influenced by their understanding of the pros and cons of technology (Stafford and Griffis 2008; Parment 2012; Fernandes and Inverneiro 2020). In addition, EM are also characterized as being very open-minded (Corvi et al. 2017; Stafford and Griffis 2008) and relying on recommendations from family, friends and peers before making a purchase (Littman 2008; Moreno et al. 2017).

3 Methodology

3.1 Target Audience

One generational cohort which is of a particular interest for marketers is Millennials due to the significant market size and buying power they have (Schewe et al. 2013). Millennials are considered digital natives as the internet has been around ever since they were children, and they grew up with technology (Twenge and Campbell 2012). This exposure to technology and with it the exposure to a fast-paced environment shaped the values of Millennials (Twenge and Campbell 2012). Millennials are an important target group for influencer marketing due to the long time they spend on social media as they often view it as their main source of information (SanMiguel et al. 2018). This make them an appropriate target for this study. In order to target the right subjects, Millennials are defined as the generation that was born between the 1980s and 2000 (Kassaye and Hutto 2016). For this study, a European Millennial is considered if the subject was born or grew up in one of the EU27 countries or Great Britain.

3.2 Data Collection Instrument

The data was gathered through survey questionnaire that comprised three main sections. The first is for demographic details such as, age, gender, and other items qualifying the subject to be considered a European Millennials who use at least one of the most popular social media platforms in Europe for at least five hours weekly, and actively following at least one influencer. The second part contains items that measure the main latent variables of the study: purchase intention, parasocial relationship, brand fit, and perceived influencer credibility conceptualized by trustworthiness, expertise, and information value. Table 1 is a representation of observed items for each construct. The third part contains items to quantify the characteristics of EM. An anchored scale representing 1 = strongly disagree and 7 = strongly agree was used in this study.

Table 1. Observed items and their constructs

Constructs	Observed items brief description	Reference
Information value	Info1: reliable/relevant	Lou and Kim (2019)
	Info2: up-to-date	Song and Zinkhan (2008)
Trust-worthiness	Info3: quality	Price et al. (2008)
	Trust1: honest/sincere	Giffin (1967)
	Trust2: believable/integrity	Ohanian (1990)
	Trust3: care about audience	Sokolova and Kefi (2019)
Expertise	Exp1: valid	Erdogan (1999)
	Exp2: knowledgeable	Erdogan (1999)
	Exp3: Skill/experience	Erdogan (1999)
Brand fit	BF1: wouldn't represent a brand just for the money	Koernig and Boyd (2009)
	BF2: the content generated by the influencer matches the nature of the brands/products he/she features	Breves et al. (2019)
	BF3: personality and image of the influencer suits the brands he/she features	Mishra (2015)
Parasocial relationship	PR1: He/she makes me feel comfortable, as I am with a friend	Lou and Kim (2019)
	PR2: I look forward to seeing his/her posts	Lou and Kim (2019)
	PR3: If he/she starts another social channel, I will also follow	Lou and Kim (2019)
	PR4: I would love to meet him/her in person	Lou and Kim (2019)
	PR5: If something happens to him/her, I will feel sad	Lou and Kim (2019)
Purchase intention	PI1: Buy products because of influencer posts	Lou and Kim (2019)
	PI2: visit a store because of influencer posts	Lou and Kim (2019)
	PI3: Recommend influencer's promotions to a friend	

3.3 Sample Size, Sampling and Statistical Technique

Based on the priori-sample size calculator Daniel Soper, the suggested estimated minimum sample size was 156 subjects. Participants were asked if they follow any influencer on social media to which 208 out 259 participants stated "Yes". Out of the 208 participants three more participants were sorted out because of biased answers. Two more records were identified as influential outliers based on the Mahalanobis distance.

A sample of 203 achieves the minimum sample requirement of 10 times the number of arrows pointing to latent constructs (Hair et al. 2013). Non-probability purposive sampling technique is used for data collection. This is widely used to gather responses from specific type of subjects (Sekaran and Bougie 2016). The data was gathered between Jul and Nov of 2021 online through survey savvy. The respondents were reached by posting the link of the questionnaire on social media platforms and reaching to friends, colleagues and family to motivate their network to complete the survey. The statistical technique used is structural equation modeling (SEM) by IBM SPSS AMOS v.28.

3.4 Data Screening

IBM SPSS v.28 and IBM AMOS v.28 were used for data screening. The VIF values of multicollinearity check are 3.0 or lower indicating no potential redundancy problem. Kaiser-Meyer-Olkin measure of sampling adequacy is 0.875 (Watkins 2018). Cumulative variance explained is 70.82% with the highest single variable variance being 38.39% (less than 50%). Common Latent Factor test was performed to confirm no instrument bias. Thus, common bias cannot be considered a problem in this data set.

4 Results

4.1 Profile of the Respondents

Female participants accounted to 66% of all the participants. 61% of Participants' age was between 20–25 years old. Participants came from over 20 different countries in the European Union with the majority coming from Germany (52.5%) and Great Britain (15.8%). Among the sample, the most popular social media channels are Instagram, Facebook and YouTube. Over 80% of participants spend more than 3–5 h on social media weekly and 27% spend over 10 h weekly. The different characteristics of EM examined in this study were classified as high vs low in the following manner; subjects scored 5–7 on the measurement scale were identified with a high expression of a certain characteristic and low, otherwise. Some characteristics were prominent among the sample: open mindedness (88% high vs. 12% low), control (87% high vs. 13% low), selectivity (82% high vs. 18% low), and recommendation-driven (61% high vs. 39% low). A set of characteristic could be described with a modest presence in the sample: self-expression (44% vs. 56%) and deal-driven (49% vs. 51%).

4.2 Measurement Model

4.2.1 Reliability and Convergent Validity

The convergent validity determines how well the items are measuring the specified factor compared to something else (Sun 2005). Hair et al. (2010, Chapter 13) introduced a method for examining construct validity using average variance extracted (AVE). This method is easier to perform and provide more accurate evaluation of construct validity. As for reliability, first we assess the internal consistency or reliability of the constructs through Cronbach alpha values which should be above 0.70. A Cronbach's alpha values were obtained to check for sufficient internal consistency and reliability. The Cronbach's alpha for information value was 0.730, expertise was 0.886, trustworthiness was 0.931, brand fit was 0.825, parasocial relationship was 0.808, and for purchase intention was 0.873. All values were above 0.7 and thus, acceptable (Cortina 1993).

Convergent validity is assessed by first examining the outer loadings and then by evaluating the composite reliability (CR) and the average variance extracted (AVE) (Fornell and Larcker 1981). All outer loadings in the measurement model were above 0.50 with p-value < 0.05 (see Table 2). AVE values above 0.5 explain the convergence of the constructs (Hair et al. 2009). Outer loading between 0.4 and 0.7 can be considered if it contributes to the value of CR and AVE. Considering this, outer loadings above 0.50 were retained in the model after performing necessary checks. Table 2 entails that all items and constructs had met the recommended minimum thresholds. We also assess composite reliability (CR) that should be above 0.70 to indicate sufficient consistency among items of the factors. The results of the reliability and convergent validity represent evidence that all constructs had achieved the threshold value (see Table 2).

4.2.2 Discriminant Validity

The discriminant validity refers to how distinctive a certain factor is measured through a set of items (Sun 2005). Discriminant validity provides empirical evidence that a construct is unique. We examine discriminant validity by first computing the maximum shared variance (MSV) which is the square of inter-correlation between two constructs, and then comparing MSV with AVE for each construct. We can confirm discriminant validity as MSV is less than AVE for all constructs (see Table 3).

Lastly, we re-visit Table 2 to further assess discriminant validity to ensure that all cross-loadings of a construct are greater in row than all off-loadings on other constructs (Hair et al. 2010).

Table 2. Cross loadings of measurement items and convergent validity measures

Items/Constructs	Parasocial relationship	Trustworthiness	Expertise	Purchase intention	Brand fit	Info value	
Parasocial_1	**0.513**	0.426	−0.011	0.062	−0.083	−0.021	CR: 0.813
Parasocial_2	**0.736**	−0.002	0.041	−0.012	−0.081	0.255	AVE: 0.567
Parasocial_3	**0.833**	−0.347	0.111	0.012	0.359	−0.089	
Parasocial_4	**0.759**	0.183	0.032	0.046	−0.127	−0.144	
Parasocial_5	**0.586**	0.421	−0.186	−0.070	−0.109	0.057	
Trust_1	0.035	**0.730**	0.166	−0.058	0.057	0.098	CR: 0.934
Trust_2	0.046	**0.806**	0.063	0.004	0.136	−0.013	AVE: 0.825
Trust_3	0.075	**0.797**	0.086	0.001	0.113	−0.034	
Expert_1	0.004	0.091	**0.837**	0.060	−0.017	−0.005	CR: 0.886
Expert_2	0.087	−0.036	**0.962**	−0.065	−0.131	0.014	AVE: 0.721
Expert_3	−0.091	0.207	**0.786**	−0.013	0.146	−0.091	
PI_1	0.024	−0.030	0.051	**0.873**	−0.035	0.047	CR: 0.874
PI_2	0.024	−0.038	−0.040	**0.879**	0.068	−0.012	AVE: 0.874
PI_3	−0.019	0.035	−0.034	**0.935**	−0.061	−0.022	
Fit_1	−0.057	0.501	−0.186	0.069	**0.623**	−0.077	CR: 0.855
Fit_2	−0.049	0.078	0.079	−0.041	**0.847**	0.048	AVE: 0.664
Fit_3	0.026	0.061	−0.033	−0.022	**0.844**	0.088	
Info_1	−0.111	0.067	0.274	0.106	0.004	**0.639**	CR: 0.740
Info_2	0.063	0.044	−0.086	−0.051	−0.081	**0.912**	AVE: 0.592
Info_3	0.005	−0.084	−0.081	0.013	0.273	**0.710**	

Table 3. Discriminant validity

	CR	AVE	MSV	MaxR (H)	Parasocial	Bfit	Trust	Expertise	PI	Info. Value
Parasocial	0.813	0.567	0.386	0.821	0.683					
Bfit	0.855	0.664	0.388	0.880	0.323	0.815				
Trust	0.934	0.825	0.482	0.947	0.621	0.623	0.909			
Expertise	0.886	0.721	0.482	0.890	0.539	0.561	0.694	0.849		
PI	0.874	0.698	0.159	0.877	0.399	0.290	0.313	0.345	0.835	
Info Value	0.740	0.592	0.412	0.777	0.437	0.607	0.551	0.642	0.240	0.702

Parasocial: Parasocial Relationship; **Bfit**: Brand Fit; **Trust**: Trustworthiness; **PI**: Purchase Intention, **Info. Value**: Information Value.

4.3 Structural Model

The structural model was constructed by performing bootstrapping technique. The maximum likelihood estimation method with bootstrapping was used to obtain an accurate estimation of standard errors (Byrne 2010) as reflected in p-values and confidence intervals. The dataset was cleaned by removing influential outliers based on the Mahalanobis distance. Nevitt and Hancock (2001) recommend setting the bootstrap samples at 250, we took this into consideration along with a 95 percentile and bias-corrected confidence intervals.

Following Brown's (2006) recommendation, the measurement model fit was assessed by evaluating the root mean square error of approximation (RMSEA), for absolute fit measures, we also considered observed normed chi-square χ^2/df, and Tucker-Lewis fit index (TLI), comparative fit index (CFI), Goodness of fit (GFI) and the adjusted goodness of fit (AGFI). The following cutoff values were used to assess model fit: TLI and CFI $\geq$ 0.95 (Brown 2006; Schreiber, et al. 2006), an acceptable value is also considered when over 0.90. The cutoff value for GFI is usually considered to be 0.9, and for AGFI is 0.8 (Sharma, 1996). Even though the values for GFI and AGFI do not exceed 0.9, they still meet the $>$ 0.8 cutoff suggested by Baumgartner and Homburg Baumgartner and Homburg (1996) and Doll et al. (1994) (Fig. 1).

RMSEA is acceptable when $\leq$ 0.080, also for SRMR $\leq$ 0.08 (Brown 2006; Hu and Bentler 1999). As shown in Table 4, All fit indices meet the recommended thresholds for evaluating a model fit. It can therefore be concluded that the model fits the data well and can thus be used to explain the research hypothesis.

To uncover the role of brand fit on the model, we compare the strength of the relationships with and without the presence of brand fit in the model. The effect of perceived credibility on purchase intention was strengthened to $\beta = 0.22$ from $\beta = 0.21$, the effect of perceived credibility on parasocial relationship went down to $\beta = 0.65$ from $\beta = 0.69$, and that of parasocial relationship on purchase intention went up to $\beta = 0.26$ from $\beta = 0.25$, all reported standardized coefficients are significant ($p < 0.05$). As per the mediating role of parasocial relationship, results revealed that the standardized, indirect effect

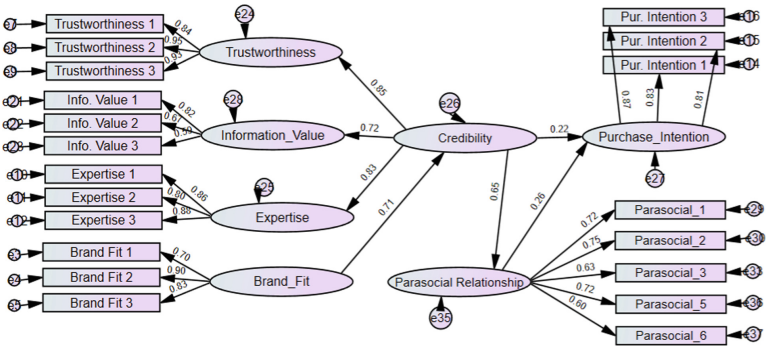

Fig. 1. Structural model

Table 4. Structural model fit indices

Measure	Abbreviation	Threshold	Value	Evaluation
Root mean-square error of approximation	RMSEA	≤0.08	0.07	Good fit
Chi-Square/df (CMIN/DF)	χ^2/df	<3.0	2.003	Good fit
Tucker-Lewis fit index	TLI	>0.95 or 0.80 < TLI < 0.9	0.921	Acceptable fit
Comparative fit index	CFI	>0.95 or 0.80 < CFI < 0.9	0.932	Acceptable fit
Goodness of fit index	GFI	>0.95 or 0.80 < GFI < 0.9	0.861	Acceptable fit
Adjusted GFI	AGFI	>0.9 or 0.80 < AGFI < 0.9	0.821	Acceptable fit
Standard RMR	SRMR	≤0.08	0.053	Acceptable fit

on the intention to purchase is significant. The full mediation model was supported. These findings are consistent with the path analysis results.

4.4 Group Comparison of European Millennials Characteristics

In this section, we report results on whether the two groups (high vs. low expressed attribute) differ on the latent variable. We follow the multiple indicator multiple cause (MIMC) approach (Jöreskog and Goldberger 1975) in multiple-group models (Jöreskog 1971; Sorbom 1974). Results are presented in Table 5.

Table 5. Group comparison results

Brand fit➔ Perceived credibility	β (low)	β (high)	p-value	Evaluation
Self-Expression	0.196	0.248	0.437	Significant
Selectivity	0.133	0.218	0.352	Significant
Deal-Driven	0.133	0.351	0.150	Significant
Control	0.262	0.182	0.837	Insignificant
Open Mindedness	0.047	0.215	0.360	Significant
Recommendation-Driven	0.316	0.113	0.269	Significant
Perceived credibility➔ Purchase intention				
Self-Expression	0.270	0.373	0.14	Significant
Selectivity	0.427	0.323	0.566	Significant
Deal-Driven	0.332	0.367	0.581	Significant
Control	0.316	0.367	0.713	Insignificant
Open Mindedness	0.467	0.354	0.579	Significant
Recommendation-driven	0.219	0.395	0.114	Significant

Significance level when $p < 0.6$

5 Conclusion and Discussion

The use of SMI as a marketing tool has become increasingly popular among companies in recent years since influencer marketing campaigns have proven to lead to higher engagement rates and a higher ROI (Martínez-López et al. 2020). Our study revealed positive significant effect of influencer credibility on purchase intention and parasocial relationship, $\beta = 0.22$ ($p = 0.010$) and $\beta = 0.26$ ($p = 0.034$), respectively. Moreover, parasocial relationship has been found to have a positive effect on purchase intention $\beta = 0.260$ ($p = 0.023$). This confirms the role of parasocial relationship in explaining how perceived credibility of SMIs affect the followers purchase intention. Liu and Kim (2019) also confirmed the mediating role of parasocial relationship on purchase intention through perceived credibility of SMI. In addition, the results revealed that brand fit has a positive effect on perceived credibility ($\beta = 0.71, p = 0.011$). Perceived brand fit with the influencers promoting it was also found to have a positive effect on the perceived credibility of social media influencers in other studies (Breves et al. 2019; Kapitan and Silvera 2016). This confirms that SMIs who promote a brand with which they share similar values is perceived as more credible by EM. Brand fit was also found to strengthen the effect of SMIs' perceived credibility on the purchase intention but weakens the effect of parasocial relationships on the purchase intention. This indicates that, with mediocre brand fit, the perceived credibility of SMI drops and this negative effect will be stronger on the purchase intention of followers. Since, brand fit weakens the effect of parasocial relationship on the purchase intention, the parasocial relationship of SMIs with their followers will not help mitigate the negative effect of a brand misfit. SMIs shall not rely

on their faith to influence their followers to push brands with mediocre brand fit, but rather, focus on enhancing their credibility to promote such brands.

The dominant approach to identifying and selecting the best SMI is a customer-centric approach, instead of putting the influencer in the center of the influencer marketing strategy, the customers are being prioritized since they are the ones who ultimately make the purchase decision (Gross and Von Wangenheim 2018; Brown and Fiorella 2013). With this strategic approach, the goal is to identify how followers make decisions and what or who impacts their decisions. In line with this, this study helps understand how different dominant characteristics of EM affect the role of perceived brand fit on credibility and thus on purchase intention. This study examined how different levels of characteristics reported by EM can help identify the set of characteristics that strengthen the effect of brand fit on influencer's credibility. Findings revealed that self-expression and deal-driven were found to strengthen the effect of brand fit on credibility and thus on purchase intention. While selectivity and open-mindedness were found to strengthen the effect of brand fit on credibility, but not that on purchase intention.

Brand fit seems to have important managerial implications and should be considered by companies when planning an influencer marketing campaign. Inline with our findings, is the recommendations by Kaptain and Silvera (2016), Breves et al. (2019) and Schouten et al. (2020) who found that brand fit between the influencer and the brand needs to be considered for a more successful influencer marketing campaign. Our findings advise that when the brand fit is mediocre, the influencer needs to put more effort in communicating a high credible message, for example, share with followers a long genuine interest in such a brand, show skills and knowledge in sponsoring an anticipated misfit product to strengthen the effect of credibility on purchase intention that is lowered by the brand misfit. The results also suggest that, in such a case, offering a very attractive deal (discount) and encouraging self-expression for EM followers boost the influencer's credibility and the followers' intention to purchase. Influencers shall explore whether the misfit brand could be considered as a social self-expressive or how it could be utilized as one (Choi and Burnham 2020).

For future research, possible factors conceptualizing SMIs perceived credibility, as in similarity and attractiveness could be considered in the model (Ismagilova et al. 2020; Martínez-López et al. 2020; Lou and Yuan 2019; Lou and Kim 2019), thus demanding a larger sample size for analysis.

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Omnichannel: Factors that Determine Adoption of Webrooming and Showrooming for Three Product Categories

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Abstract. The objective of this study was to analyse how consumers adopt webrooming and showrooming purchasing processes for different products (textile-fashion, home appliances and groceries). A crossover study was carried out in two countries, Spain and Colombia, applying an exploratory model through the analysis of PLS structural equations. The results showed differences in the adoption of this type of purchase depending on the type of product. The contributions of this study allow companies to choose and manage omnichannel processes depending on the type of products they sell.

Keywords: Retail · Omnichannel · Webrooming · Showrooming

1 Introduction

Omnichannel shopping is the commercial trend that integrates virtual and physical shopping channels in the consumer purchasing process (Aw 2019; 2020). Its use has grown along with the rise in internet use in homes and, together with the boom of mobile devices and social networks, it has transformed the traditional purchasing decision-making process (Aw et al. 2021).

That is why companies are implementing marketing strategies and business relationships with their customers (Lehrer and Trenz 2022), offering them different options for their purchase process, especially focused on the mix of traditional physical channels with virtual ones.

The concept of omnichannel then arises, which is aimed at offering customers the possibility of carrying out the purchase process starting and ending in different channels, especially combining the physical point of sale and the virtual point of sale to help them in their information search and decision making process, all to improve the sale and repurchase of products (Flavián et al. 2020).

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Two types of omnichannel integration are developed: showrooming and webrooming. Showrooming is a part of the purchase cycle related to the possibility of getting closer to the product. In this case, the product is approached in a physical store and then bought online, making consumers visit the physical store to learn about its products and services in detail, thus overcoming the obstacles of electronic commerce (trying on footwear or clothes, for example) to then make the purchase through the internet. That is, customers get informed in the physical store to finally make the purchase in the online store (Liebana Cabanillas 2019).

Webrooming, otherwise known as 'ROBO' - research online, buy offline - (Andrews et al. 2016), in contrast to showrooming, is a purchase cycle that begins with an online research to end with a physical purchase in the store. Customers first visit the virtual store to learn about the products and specifications of the desired products and services, benefiting from the advantages of this channel (compare prices quickly, for example), but complete the purchase process in the physical store, that is, they get informed in the online store and then the conversion is made in the physical channel (Viejo-Fernández et al. 2019; Andrews et al. 2016).

A new on/off commercial ecosystem then emerges, which allows multiple points of contact with products, services, brands and/or companies of interest, interactions between consumers with the same interests, a non-sequential journey from one stage to another in the purchase process and knowledge of cognitive, emotional and behavioural responses (Clark 2013). Therefore, it is necessary to delve into studies that aim to explain multichannel purchasing behaviours (Kickert 2022).

The aim of this study is to examine the specific variables that positively influence the adoption of showrooming and webrooming in three different product categories to further explore this new business context.

2 Theoretical Framework and Hypotheses

The first studies found that the purchase process was permeated by the Internet, making the search for information for the purchase decision also move to the network (Carlton and Chevalier 2001), later emerging the use of virtual and physical channels for the purchase process (Van Baal and Dach 2005; Van Baal 2014).

Subsequent studies analysed the importance of seeking utility in the purchase by searching for price information in the digital channel to make a correct physical purchase decision, identifying the webrooming process as the most used by buyers (Balasubramanian et al. 2005; Verhoef et al. 2007).

Other studies began the analysis of what are the factors that allow omnichannel sales, finding that it is something very particular to each customer and that the minimization of risks and the search for benefits in this type of process will be especially taken into account (Schröder and Zaharia 2008; Wang et al. 2016; Kalyanam and Tsay 2013).

Measurement indicators were also proposed for omnichannel integrated channels such as multi-channel conversion, multi-channel delivery and return, channel supports, and inter-dealer coordination with manufacturer in omnichannel actions (Ailawadi and Farris 2017).

Molenaar (2010) introduced an online consumer behaviour model that is a combination of different stages of the purchase decision process (orientation, information, communication and action) and where consumers use various channels for information search, many of them interconnected or not. Information is gathered following a sequential order (search engines, websites and comparison sites) before a purchase decision is made. This decision can then be executed both in an online environment and in a physical environment.

Studies delving into consumer psychology analysed whether webrooming and showrooming processes had a moderating effect on the intensity of the relationship between emotions during the purchase and on customer satisfaction, finding that emotions are very important both in physical and virtual channels, with emotions being a factor that affects post-purchase satisfaction in showrooming processes (Arora and Sahney 2018; Arora et al. 2020).

Wolny and Charoensuksai (2014) carried out an inductive study in which they explored the mapping of customer journeys in multichannel decision-making in their shopping journeys for cosmetics, describing patterns of behaviour in the use and importance of the different media and channels at each stage of the purchasing process depending on whether it is an impulsive, balanced or considered purchase.

Studies by Flavián et al. (2016); Flavián et al. (2019); Flavián et al. (2020) focused on information processing theories demonstrate that uncertainty is reduced in multichannel purchase decisions based on webrooming, specifically from the impact of e-wom on the final purchase decision.

For its part, the study by Orús et al. (2019) demonstrates that webrooming processes are more accepted by consumers to make purchases than showrooming processes, since it is more comfortable for them to start the decision-making process in the digital channel and then complete the purchase with total confidence at a physical point.

Regarding the importance of an omnichannel quality process, studies have focused on the operational requirements for its effectiveness, highlighting the importance of having the digital channel prepared (Fernández et al. 2018). The main drivers of online shopping with respect to the physical store are convenience (comfort, time savings), product availability, distance to the physical store and price.

Many aspects influence here, such as product management in marketplaces and online distributors, online price management, the brand's website and app, and all the technical support of the online process (Kuksov and Liao 2018). Buyer support must also be optimal as well as customization, customer services, product test scenarios, sales force training, among many other factors (Fernández et al. 2018). Finally, it was found that smartphones are technologies that motivate the use of omnichannel through apps (Santos and Gonçalves 2019).

The main variables that have been validated in previous studies regarding the use of omnichannel (webrooming/showrooming) are presented in Table 1.

Table 1. Variables that influence omnichannel

Construct	Studies and authors
Social Influence: It is related to the influence of close people or influence leaders on the buyer	It has been supported as motivation for showrooming and webrooming (Kaur et al. 2019)
Price Comparison: It is an exhaustive price search to compare which is the best offer and thus make the purchase decision	It has been supported as motivation for showrooming and webrooming (Kaur et al. 2019; Santos and Gonçalves 2019)
Information Attainment: It is an exhaustive search for information. This information contributes to cognitive structures that affect decision-making and increase the consumers' evaluative ability regarding products	It has been supported as motivation for showrooming and webrooming (Santos and Gonçalves 2019)
Consumer Empowerment: It is the consumers' ability to control their choices in the decision process	It has been supported as a showrooming motivation (Santos and Gonçalves 2019)
Need for Touch: Different studies regarding purchasing processes have analysed the need of some customers to be able to physically touch a product to buy it	Some studies have shown the positive effect of the need to touch the product for omnichannel (Kaduskeviciute and Urbonavicius 2019; Fiestas and Tuzovic 2021; Flavián et al. 2019). For luxury purchases, it is not valid in webrooming processes (Shankar and Jain 2021)
Perceived Risk: Refers to consumers' uncertainty regarding the potentially negative consequences that could result from purchases	It has been supported as a decisive factor to adopt some type of omnichannel, especially linked to the risk of online purchases. (Shankar and Jain 2021; Santos and Gonçalves 2019)
Choice Confidence: The need for confidence directly influences consumers' information-processing and decision-making, which affects the reduction of uncertainty	It has been supported as a showrooming motivation (Santos and Gonçalves 2019)
Webrooming Intention	(Kaur et al. 2019; Shankar and Jain 2021)

3 Methodology

An empirical study of an exploratory nature was carried out because it only sought to find cause-effect relationships, the variables from specific previous studies were adapted to measure the use and adoption of omnichannel and the questionnaire was adapted to Spanish through a comprehension pre-test among the respondents, finding an acceptable level to apply the survey.

The data were collected using a virtual form and the questionnaire explained to the participants the ethical aspects and the handling of research data and their authorization was requested.

For the preparation of the questionnaire, the measurement scales proposed by each of the authors were taken, which are detailed in Table 1. The questionnaire was designed on a 5-point Likert scale (1 = Strongly disagree; 2 = Disagree; 3 = No opinion, 4 = Agree, 5 = Strongly agree). To examine the three categories of product analysed, questions were asked for each category of product regarding each type of Omnichannel (webrooming/showrooming).

4 Results

A non-probability sample based on the convenience method was used, relevant for a valid application of the PLS method (Hair et al. 2014). Data collection was carried out through an online questionnaire with a final sample of 168 valid questionnaires (See Table 2). The results of the demographic control variables did not show differences by gender, age, educational level or marital status between countries.

Table 2. Sample characteristics

Demographic profile		
Gender: Male: 45% Female: 55%	Age: 18–34 years old: 55% 35–44 years old: 25% 45–55 years old: 30%	Location: Spain 45% Colombia 55%
Educational level: High School 29% Technical 24% College degree 25% University graduate 22%		Marital status: Single 70% In couple 30%

The data were analysed using the Smart-PLS 3.0 statistical program given the exploratory nature of the model (Hair et al. 2019). The discriminant validity test was applied, which examines that the items measure only their corresponding variable. As a result, it was found that the loads were greater than 0.505 for all the items and other reliability tests such as Cronbach's Alpha Test (>0.70), Average Variance Extracted (>0.5), Composite Reliability (>0.6) and Rho_A (>0.70) were applied to validate the required levels (See Table 3) (Gefen et al. 2000; Henseler et al. 2014). Likewise, the correlation test between the items and the variables they measure was valid (Hair et al. 2020), and the convergent validity of the indicators (Heterotrait-Monotrait Ratio - HTMT) did not present values greater than 0.9, so the measurement tool was also validated (Henseler et al. 2014) (See Table 4 and 5).

Table 3. Measurement tool

ITEMS	LOAD*	T (O/STDEV)	p-value	Cronbach's Alpha	Composite reliability	Average variance extracted (AVE)
CC1	0.854	94.579	0.000	0.807	0.880	0.721
CC2	0.803	75.623	0.000			
CC3	0.908	79.013	0.000			
CE1	0.840	92.636	0.000	0.801	0.821	0.700
CE2	0.854	91.623	0.000			
CE3	0.833	90.449	0.000			
IA1	0.803	87.359	0.000	0.837	0.897	0.744
IA2	0.908	77.418	0.000			
IA3	0.874	99.787	0.000			
IUS1	0.934	89.181	0.000	0.846	0.929	0.867
IUS2	0.928	88.923	0.000			
IUW1	0.925	90.508	0.000	0.852	0.932	0.871
IUW2	0.941	58.179	0.000			
NT1	0.932	89.103	0.000	0.928	0.953	0.871
NT2	0.915	86.264	0.000			
NT3	0.953	77.700	0.000			
PC1	0.888	96.489	0.000	0.826	0.896	0.743
PC2	0.950	90.933	0.000			
PC3	0.834	84.979	0.000			
PR1	0.830	90.633	0.000	0.877	0.923	0.801
PR2	0.926	88.013	0.000			
PR3	0.925	88.646	0.000			
SI1	0.936	95.623	0.000	0.815	0.910	0.842
SI2	0.899	99.449	0.000			

(Notes: CC: Choice Confidence; CE: Consumer Empowerment; IA: Information Attainment; IUS: Intention to Use Showrooming; IUW: Intention to Use Webrooming; NT: Need for Touch; PC: Price Comparison; PR: Perceived Risk; SI: Social influence. * Significant at: $p < 0.05$ t-value > 1.960.)

Table 4. Convergent validity of the indicators (Fornell-Larcker Criterion)

	CC	CE	IA	IUS	IUW	NT	PC	PR	SI
CC	0.849								
CE	0.538	0.880							
IA	0.451	0.642	0.863						
IUS	0.086	0.283	0.230	0.931					
IUW	0.055	0.127	0.158	0.147	0.933				
NT	0.141	0.050	0.047	0.094	0.145	0.933			
PC	0.413	0.570	0.464	0.251	0.057	0.085	0.862		
PR	0.425	0.301	0.273	0.012	0.081	0.244	0.261	0.895	
SI	0.241	0.299	0.293	0.122	0.329	0.166	0.311	0.258	0.918

(Notes: CC: Choice Confidence; CE: Consumer Empowerment; IA: Information Attainment; IUS: Intention to Use Showrooming; IUW: Intention to Use Webrooming; NT: Need for Touch; PC: Price Comparison; PR: Perceived Risk; SI: Social influence.)

Table 5. Convergent validity of the indicators (Heterotrait-Monotrait Ratio - HTMT)

	CC	CE	IA	IUS	IUW	NT	PC	PR	SI
CC	0,689								
CE	0,565	0,679							
IA	0,100	0,369	0,253						
IUS	0,097	0,160	0,168	0,170					
IUW	0,167	0,067	0,077	0,103	0,158				
NT	0,513	0,658	0,544	0,294	0,117	0,114			
PC	0,515	0,391	0,359	0,038	0,092	0,278	0,307		
PR	0,299	0,388	0,350	0,149	0,389	0,193	0,368	0,306	
SI	0,056	0,094	0,079	0,130	0,045	0,231	0,112	0,050	0,082

(Notes: CC: Choice Confidence; CE: Consumer Empowerment; IA: Information Attainment; IUS: Intention to Use Showrooming; IUW: Intention to Use Webrooming; NT: Need for Touch; PC: Price Comparison; PR: Perceived Risk; SI: Social influence.)

A multigroup analysis was applied, defining three groups: groceries, textile-fashion, and home appliances and technology. This analysis allows detecting statistically significant differences between the parameter estimates by means of a non-parametric significance test for the difference of the specific results of each group (Hair et al. 2014).

A re-sampling applied the bootstrapping technique using 6,000 sub-samples, with a significant result at 5% probability of error level (Hair et al. 2020). However, this study does not examine model prediction, but rather the independent variables that were

supported in each group with respect to the dependent variables, use of showrooming and webrooming, were considered as results (See Tables 6, 7, 8).

Table 6. Validity of the empirical relations for Groceries

Influence between variables	Validation*	Original sample (O)	T (O/STDEV)	P values	R^2
Need for Touch -> Intention to Use Showrooming	Supported	−0.253	2.044	0.048	IUS: 0.268
Price Comparison -> Intention to Use Showrooming	Supported	0.235	1.990	0.047	
Price Comparison -> Intention to Use Webrooming	Supported	−0.288	1.988	0.039	
Choice Confidence -> Intention to Use Showrooming	Supported	−0.125	1.925	0.046	IUW:0.254
Information Attainment -> Intention to Use Showrooming	Supported	−0.209	2.000	0.040	
Information Attainment -> Intention to Use Webrooming	Supported	0.261	2.001	0.029	

(Notes: * Significant at *$p < 0.05$ t-value > 1.960. Source: Own preparation.)

Regarding the purchase of groceries (Table 6), the results of this research highlight that in the case of showrooming, customers take into account the price comparison in a positive way to do so (Kong and Cakir 2020; Cebollada et al. 2019), that is, they look for more competitive prices when they are making this type of purchase, which changes when it comes to webrooming that is influential but negatively, that is, a greater price comparison will not complete the purchase process.

The need to touch the product was only supported in the case of showrooming in a negative way, that is, for this type of product, the greater the need to touch the product physically, the lower the incentive for customers to end up buying it online, that is, they start and finish the purchase process in the physical store (Viejo-Fernández et al. 2020). In the case of webrooming, this variable was not supported.

Something similar happens in the case of information attainment, which is positively supported for webrooming, that is, people will tend to search for information on the web and then finish the purchase process at the physical point of sale, while in the case of showrooming it is negative, that is, the more information about the product customers find at the physical point, the higher the likelihood that they end up buying it there and that the online purchase process is not completed.

These results are in line with current trends in this sector, in which the latest studies highlight the demand for omnichannel, the use of digitization and automation of orders, the search for low prices and product quality, and support in order placement and customer services throughout the process (Piroth et al. 2020; Eriksson et al. 2019; Basile 2019; Kong and Cakir 2020).

Likewise, the effects that Covid-19 pandemic has brought along should be taken into account, which has encouraged the use of online orders in this sector, possibly favouring supermarkets that offer webrooming (Li et al. 2020).

Table 7. Validity of the empirical relations for Textile-fashion

Influence between variables	Validation*	Original sample (O)	T (O/STDEV)	P values	R^2
Consumer Empowerment -> Intention to Use Showrooming	Supported	0.401	2.658	0.046	IUS:0.169
Choice Confidence -> Intention to Use Showrooming	Supported	0.253	1.988	0.045	
Price Comparison -> Intention to Use Showrooming	Supported	0.220	1.970	0.044	

(Notes: * Significant at *$p < 0.05$ t-value > 1.960. Source: Own preparation.)

In the case of textile-fashion products, only aspects for showrooming were validated (Table 7), a result that is consistent with the fact that in Spain 27% of women use showrooming for this category (Liebana Cabanillas 2019), with the greater the consumer empowerment, the greater the likelihood that a purchase that starts in the store will end up in the online marketplace. The same result was obtained for choice confidence construct, given the high relationship between customer and brands (Santos and Gonçalves 2019). For example, the study by Hair et al. (2019) shows that the higher the level of perceived utility and entertainment, the greater the consumer's intention to adopt a shopping platform. These two variables (consumer empowerment and choice confidence) may be related to the fact that, for this type of products, consumers like to visit the physical points of sale of their favourite brands, although they may not purchase at that time, but later through the digital channel.

Finally, the results showed for textile fashion that the omnichannel can be motivated by the third factor supported, price comparison, that is, the greater the price comparison, the higher the likelihood that consumers start their purchase process at the physical point of sale to complete it in the digital marketplace (V. Fernández et al. 2017; Kim and Lee 2020; Viejo-Fernández et al. 2020; Santos and Gonçalves 2019), possibly because, having the digital channel, consumers can decide after the visit to buy something that they have already seen in the physical store, taking into account positive variations in prices between physical and digital stores, or because they already trust the visit to the physical store and, therefore, are encouraged to buy later through the digital channel (Kuksov and Liao 2018).

Table 8. Validity of the empirical relations for home appliances and technology

Influence between variables	Validation	Original sample (O)	T (O/STDEV)	P values	R^2
Information Attainment -> Intention to Use Webrooming	Supported	0.380	1.980	0.048	IUW:0.278
Choice Confidence -> Intention to Use Webrooming	Supported	0.220	1.955	0.040	
Price Comparison -> Intention to Use Webrooming	Supported	0.137	1.913	0.045	

(Notes: * Significant at *p < 0.05 t-value > 1.960. Source: Own preparation.)

Finally, with respect to the group of technology products and home appliances, only three relationships were supported with respect to webrooming (Table 8), a result contrary to that from other studies that associate this type of products more with showrooming (Viejo-Fernández et al. 2020), which seems to indicate that, for this type of products, consumers will always prefer to finish their purchase in the physical store and start it on the web. This is supported by three factors, the first one being information attainment since, due to the nature of the products, customers will first want to look for a lot of information before deciding to buy. Then choice confidence is supported as another relevant factor (Santos and Gonçalves 2019), again related to the search for brands that generate confidence to make the purchase and, finally, search for prices which, in this product category, will always be a decisive factor in the purchase decision, especially for a webrooming process, that is, first browsing the website of the trusted brand, compare information (Orús et al. 2019) and then go to the point of sale to pick up the product or finish the purchase.

5 Conclusion

The objective of this study explored whether there were differences in the use of purchases in physical-virtual channels when they were integrated to offer more options in the purchase process for three types of products.

The results have shown that, depending on the type of product, customers will prefer the use of webrooming over showrooming and vice versa. Likewise, the results indicate that there are some essential aspects that lead to the choice of one or another type of purchasing process.

In the case of grocery product category, the exploratory results showed that consumers tend to use webrooming and showrooming processes depending on aspects such as the need to physically touch the product, compare prices, compare information for decision-making and trust in the brand, which is key for this sector given the high competition that exits between establishments and something that must be taken into account when developing marketing and operations strategies (Piroth et al. 2020).

Regarding textile-fashion products, the results indicated in an exploratory way that here customers prefer showrooming processes if lower prices are associated with the digital channel (Kim and Lee 2020), if there is customer participation or co-creation in the process and if there is a loyalty relationship with the brand. In the case of webrooming, no variable was presented that supports the motivation to use this process. Although the results of this study do not show the intention to use showrooming for this sector, the results are in line with the tendency of large fashion stores to focus on offering a highly interactive physical point of sale with the customer (McNeill and Snowdon 2019).

Otherwise, the results were different in the home appliances and technological products category, where the preference for webrooming-type purchases was only supported if aspects of price search and detailed information are highlighted and if there is confidence in the brand, which, according to the results explored, is key for buyers to effectively complete this type of process, in which the digital channel is initially visited and the final purchase is completed at the physical point.

The implications for the line of research on omnichannel that this research provides are of great importance, since this is one of the first studies that explores whether there are differences in the preferences for these channels depending on the type of product/service, establishing a first approach to understand this context in categories where great development of omnichannel has been seen in recent years worldwide.

All strategic, operational, and technical aspects must then be taken into account when offering showrooming and webrooming purchasing processes such as price management, delivery logistics, distributors and commercial negotiation, accessibility to channels, among other key aspects.

The limitations of this research lie in the fact that only three product categories are explored, so the results cannot be extrapolated to other categories. With respect to methodology, possibly another type of analysis, such as logistic regressions, could better categorise the type of customer for each omnichannel process, whereas our study only explores possible variables that may be important in the use of the distribution and sales processes. Moreover, this study was applied in two countries that may be culturally similar and it was not analysed in other types of countries that are culturally more distant; therefore, more robust conclusions cannot be generated.

Finally, this study presents major lines of future research to address the limitations described and the development that this type of omnichannel process is experiencing.

Appendix 1. Questionnaire

Construct	Items
Social Influence (Kaur et al. 2019)	(SI1) Important people in my life like my family and friends recommend me to buy using omnichannel (showrooming/webrooming) (SI2) Other close people I know (colleagues or bosses for example) recommend me to buy using omnichannel (showrooming/webrooming)
Price Comparison (Kaur et al. 2019; Santos and Gonçalves 2019)	(PC1) I often compare product prices across retailers to get the lowest price (showrooming/webrooming) (PC2) I tend to do a price comparison every time I make a purchase (showrooming/webrooming) (PC3) It is important for me to have the best price for the product (showrooming/webrooming)
Information Attainment (Santos and Gonçalves 2019)	(IA1) I often seek out information regarding which brand to buy (showrooming/webrooming) (IA2) I spend a lot of time looking for information about products and brands before I make a purchase (showrooming/webrooming) (IA3) I like to have a great deal of information before making a purchase (showrooming/webrooming)
Consumer Empowerment (Santos and Gonçalves 2019)	(CE1) I try to be well informed to have power over my choices during the purchase process (showrooming/webrooming) (CE2) I try to have as much control as possible over my choices during the purchase process (showrooming/webrooming) (CE3) It is important for me to have influence over the outcome of my choice (showrooming/webrooming)
Need for Touch (Kaduskeviciute and Urbonavicius 2019; Fiestas and Tuzovic 2021; Flavián et al. 2019)	(NT1) I place more trust in products that can be touched before purchase (showrooming/webrooming) (NT2) I feel more comfortable purchasing a product after physically examining it (showrooming/webrooming) (NT3) I feel more confident making a purchase after touching a product (showrooming/webrooming)

(*continued*)

(*continued*)

Construct	Items
Perceived Risk (Shankar and Jain 2021; Santos and Gonçalves 2019)	(PR1) I am aware of the security risks of Internet purchases (showrooming/webrooming) (PR2) I am aware of the risks of data spoofing and the use of confidential information in a criminal way on the Internet (showrooming/webrooming) (PR3) I am aware of the risks regarding Internet sellers (showrooming/webrooming)
Choice Confidence (Santos and Gonçalves 2019)	(CC1) I try to be certain of my choice of product (showrooming/webrooming) (CC2) I have to believe that my choice of product is the right one (showrooming/webrooming) (CC3) To purchase the product, I have to be convinced of my choice (showrooming/webrooming)
Intention to Use Webrooming (Kaur et al. 2019; Shankar and Jain 2021)	(WInt1) I intend to use digital media to start the purchase of a product and finish the purchase and post-purchase in a physical store (WInt2) I tend to use digital media to start the purchase of a product and finish the purchase and post-purchase in a physical store
Showrooming Intention (Kaur et al. 2019; Shankar and Jain 2021)	(IUS 1) I intend to use physical means (visit to the point of sale) to start the purchase of a product and finish its purchase and post-purchase digitally (e-commerce) (IUS 2) I tend to use physical means (visit to the point of sale) to start the purchase of a product and finish its purchase and post-purchase digitally (e-commerce)

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The Impact of Pandemic Restrictions on Offline and Online Grocery Shopping Behavior - New Normal or Old Habits?

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Abstract. The pandemic is changing future trends in retailing and ecommerce immense. Recent research revealed a considerable increase in the use of online grocery shopping (OGS). However, less is known about whether consumers' behavior is evolving to a 'new normal' or returning to 'old habits' after pandemic restrictions. To close this research gap, we operationalize and empirically analyze different purchase patterns of consumers in between offline and online channels before, during, and after lockdown restrictions in Germany. The findings show that some consumers refrained from brick-and-mortar retail during the lockdown, but returned after pandemic restrictions. They have lost virtually no consumers entirely to OGS. Therefore, the observed consumers are still in the range of offline retailers. Because of this, offline retailers should act now to retain their consumers, e.g. by offering competitive benefits in their stores or by adding an online channel. Our findings on OGS show much more differentiated purchase patterns. Some consumers start using OGS before or during lockdown, others quit using it. OGS providers should urgently analyze the churn of their customers and derive measures for customer retention. The fact that a total of 93% of the observed consumers do not practice OGS shows that OGS is still in its infancy.

Keywords: Consumer behavior · New normal · Old habits · Online grocery shopping · Pandemic restrictions · Retail

1 Introduction

The pandemic has changed the world of retailing dramatically over a short period of time (Roggeveen und Sethuraman 2020). On the one hand, these changes pose immense challenges for brand managers and retailers. On the other hand, it also provides new opportunities for retailing and ecommerce (OECD 2022). For instance, consumers' habits have been severely restricted extrinsically, especially by lockdowns. Brick-and-mortar retail was limited to the most necessary during this period. While grocery stores had predominantly stayed open, other retail sectors did not. The resulting decline in sales and even insolvencies of entire businesses will change whole business sectors (DW: COVID 2021a, 2021b; pwc 2022). These transformations will, in turn, also affect the future of grocery shopping, e.g. in increasing opportunities to buy groceries online (Mortimer

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et al. 2016; Driediger and Bhatiasevi 2019; Alaimo et al. 2020). While the consequences of the pandemic are dramatically and existentially challenging, it also creates scope for new practices and emerging business models. Roggeveen and Sethuraman (2020) suggest that online grocery shopping (OGS) will increase as a result of the pandemic. Additionally, they expect changes in consumer behavior in the future. Figure 1 supports this view, as it shows a substantial increase in OGS during the pandemic.

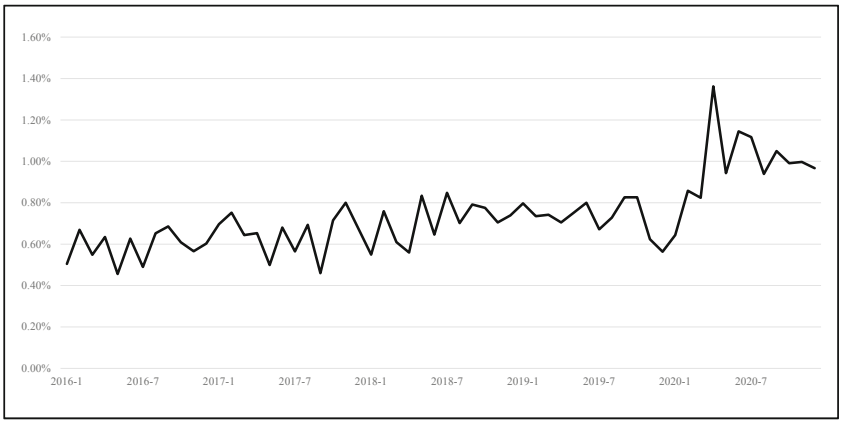

Fig. 1. Volume based share of OGS per month

OGS and the pandemic offer new opportunities to gain competitive advantage (McKinsey and Company 2022). However, companies need to know how to act on these developments. Despite this high relevance, there is still a lack of research in analyzing different consumers' purchase patterns before, during and after the pandemic restrictions. In particular, understanding the impact of pandemic restrictions (e.g., lockdown) on consumer buying behavior is important to help brand managers and retailers rapidly respond to these immense changes. In fact, "ignoring trends can give rivals the opportunity to transform the industry" (Harvard Business Review 2010).

Numerous studies have already confirmed the increase in the use of OGS during the pandemic worldwide (Bauerová and Zapletalová 2020; Grashuis et al. 2020; Li et al. 2020; Pantano et al. 2020; Al-Hawari et al. 2021; Baarsma and Groenewegen 2021; Chang and Meyerhoefer 2021; Ellison et al. 2021; Guthrie et al. 2021; Habib and Hamadneh 2021; Jensen et al. 2021). Additionally, Brüggemann and Pauwels (2022) found significant differences between also-online and offline-only grocery shoppers in both their attitudes and purchasing behavior. However, it has not yet been explored how offline and online grocery purchases are affected by pandemic restrictions. Moreover, there is a lack of research on whether a 'new normal' will emerge or whether consumers will return to 'old habits'.

For instance, consumers who were already familiar with OGS before the pandemic may also shop online during and after the pandemic. However, it is also conceivable that consumers who previously purchased offline-only might also shop online during the pandemic restrictions, but return to their old habits afterwards. On the other hand, they could continue to purchase online after the pandemic restrictions, at least to some extent.

This paper provides insights on how consumers behave before, during and after the pandemic restrictions regarding OGS. For this purpose, we use household panel data from 2019–2020. We observe offline and online purchases before, during, and after the first lockdown of the pandemic in Germany from March 22 to May 05. This allows us to analyze changes in offline and online purchases of 25,038 households. To do this, we systematically operationalize several purchase patterns of the reporting households. We then assigned the observed households to these purchase patterns. This approach provides for the first time sophisticated insights into how consumers' offline and online grocery shopping behavior evolved before, during, and after the pandemic restrictions. With this study, we answer the following research question:

How does consumer purchase behavior evolve during and after the pandemic restrictions in terms of online and offline grocery shopping?

2 Data and Empirical Analysis

2.1 Data and Purchase Patterns

We use household panel data from 2019–2020 provided by *Growth from Knowledge* (*GfK*).[1] The data includes purchases from the product groups chocolate bars, coffee, hair shampoo, and laundry detergent from around 30,000 households on average. Additionally, it is also determined whether the purchases were made offline or online. The purchase data are analyzed under consideration of the first lockdown in Germany from March 22 to May 5. Only households that purchased both before and after this lockdown are included in the analysis. This way, we ensure that only continuously purchasing households are analyzed. Thus, we observe 25,038 continuous reporting households. For both offline and online purchases, we derive eight behavioral patterns to observe consumers' purchase behavior before, during and after the lockdown. To identify the different purchase patterns, we code them by attributing to each household a 0 for no purchases and a 1 for purchases in each observation period (before, during, and after lockdown). For instance, a coding of 1-0-0 means that the related household only purchased before the lockdown and neither during nor after.

2.2 Empirical Results

The offline purchase patterns before, during and after the lockdown are shown in Table 1. Based on these purchase patterns, different household types are specified (see second column).

[1] The source of the data is *GfK Consumer Panels & Services.*

The majority of consumers purchased offline before, during and after the lockdown (81.43%; 20,382). During the lockdown, 18.37% (4,597) did not purchase offline. The fact that these consumers return to brick-and-mortar retail after the lockdown shows that they (at least partially) return to their old habits and do not completely change their behavior to OGS.

Table 1. Offline grocery purchase patterns

Purchase patterns	Household types	Quantity	Share of offline grocery shopping	Share of total grocery shopping
Offline 1-0-0	The no more offline shoppers since lockdown	33	0.13%	0.13%
Offline 0-1-0	Offline shoppers while lockdown	1	0.00%	0.00%
Offline 0-0-1	New offline shoppers after lockdown	5	0.02%	0.02%
Offline 1-0-1	Non-offline shoppers while lockdown	4,597	18.37%	18.36%
Offline 0-1-1	Offline shoppers since lockdown and beyond	6	0.02%	0.02%
Offline 1-1-0	No more offline shoppers after lockdown	6	0.02%	0.02%
Offline 1-1-1	Continuous offline shoppers	20,382	81.43%	81.40%
Sum offline		25,030	100.00%	99.97%
Offline 0-0-0	Online-only shoppers	8		0.03%
Sum total		25,038		100.00%

note: 1 = purchases, 0 = no purchases; with purchases 'before-while-after' lockdown; n = 25,038

Table 2 shows the results regarding the online purchase patterns. Here, the empirical results show a more differentiated behavior than in offline purchasing behavior.

Among the (also-)online purchasing households, 33.74% (574) purchased online only before the lockdown. In other words, more than one-third of these households have not shopped online since the first lockdown. Exclusively during the lockdown, only 6.94% (118) of (also-)online grocery shoppers purchased online. Thus, the lockdown seems to have been a reason for only a few consumers to start using OGS. In contrast, after the lockdown, 29.75% (506) of (also-)online grocery shoppers chose OGS for the first time. On the one hand, this suggests that a lockdown does not greatly increase online

Table 2. Online grocery purchase patterns

Purchase patterns	Household types	Quantity	Share of online grocery shopping	Share of total grocery shopping
Online 1-0-0	No more online shopping since lockdown	574	33.74%	2.29%
Online 0-1-0	Online shoppers while lockdown	118	6.94%	0.47%
Online 0-0-1	New online shoppers after lockdown	506	29.75%	2.02%
Online 1-0-1	Non-online shoppers while lockdown	260	15.29%	1.04%
Online 0-1-1	Online shoppers since lockdown and beyond	73	4.29%	0.29%
Online 1-1-0	No more online shoppers after lockdown	33	1.94%	0.13%
Online 1-1-1	Continuous online shoppers	137	8.05%	0.55%
Sum online		1,701	100.00%	6.79%
Online 0-0-0	Offline-only shoppers	23,337		93.21%
Sum total		25,038		100.00%

note: 1 = purchases, 0 = no purchases; with purchases 'before-while-after' lockdown; n = 25,038

shopping households. On the other hand, there still is a substantial amount of fluctuation among OGS. Some consumers try out OGS, but then purchased offline-only again. Other consumers started OGS during or after pandemic restriction. Other consumers purchased (also-)online before and after the lockdown, but not during (15.29%; 260). In addition, the results show that few of the (also-)online shoppers started using OGS since the lockdown (4.29%; 73) or stopped using OGS since the lockdown (1.94%; 33). Only 8.05% (137) of the observed households purchased groceries online before, during, and after the lockdown. In comparison with offline purchases, the (also-)online purchasing households represent 6.79% (1,701). Overall, our results of the online grocery purchase patterns show strong dynamics in the use of the OGS.

3 Implications

The results of this study clearly show different purchase patterns between offline and online purchases. With a view to the offline purchase patterns, we found that almost all

of the observed consumers purchase groceries from brick-and-mortar retailers after the lockdown (99.81%; 24.990)[2]. It is particularly relevant for brick-and-mortar retailers that 18.37% (4,597) of consumers abstained from brick-and-mortar retail during the lockdown, but came back to buy groceries offline afterwards. This result shows that offline grocery shopping is mainly affected by a lockdown in the short term. Thus, consumers are still in the reach of brick-and-mortar retailers. Nevertheless, there is a risk that brick-and-mortar retailers will increasingly lose market share to online grocery retailers (see Fig. 1). Brick-and-mortar retailers should focus on generating and communicating competitive advantages over online providers (e.g., via price, experience or service), as long as this is feasible for them. For instance, consumers can haptically experience the products in brick-and-mortar retail, which is hardly possible in online stores (De Canio and Fuentes-Blasco 2021).

After all, if retailers lose consumers to online grocery retailers, influencing and winning back these consumers will be much more challenging. Brick-and-mortar retailers should also think about adding an online channel in order to reduce their disadvantages compared with online providers (e.g., shopping at any time and anywhere as well as home delivery).

Compared to the offline purchase patterns, we found considerably more divergent online purchase patterns. Since 42.62% (725)[3] of (also-)online purchasing consumers bought groceries online before or during the lockdown but not afterwards, OGS providers should critically evaluate their customer retention measures. OGS providers need to identify these consumers as well as possible reasons for their suspended OGS use.

However, these consumers are also contrasted with new consumers who have started using OGS. For instance, 34.04% (579)[4] of (also-)online grocery shoppers began shopping for groceries online during or after the lockdown. This high fluctuation brings both threats and opportunities for brand managers as well as for retailers. For instance, there is a risk that actual customers will either switch to competitive online suppliers or satisfy their needs in brick-and-mortar stores (again). However, the high dynamics of OGS can also persuade new consumers to shop for groceries online. The fact that more than 93% of households purchased offline-only during the entire observation period shows that OGS is not yet very widespread. On the other hand, it shows the immense untapped potential.

4 Conclusion

This study contributes to a better understanding of how consumer purchasing behavior evolves during and after the pandemic restrictions on online and offline grocery shopping. During the first lockdown in Germany, almost one in five consumers avoided brick-and-mortar stores. The offline purchase patterns are characterized by ‘old habits’, because after the lockdown almost all of the observed consumers visit the brick-and-mortar retail again. Thus, consumers did not completely switch from offline to online channel as a result of pandemic restrictions. For brick-and-mortar retailers, the results provide

[2] Considered purchase patterns: ‘offline 0-0-1’, ‘offline 1-0-1’, ‘offline 0-1-1’, and ‘offline 1-1-1’.
[3] Considered purchase patterns: ‘online 1-0-0’, ‘online 0-1-0’ and ‘online 1-1-0’.
[4] Considered purchase patterns: ‘online 0-0-1’, ‘and online 0-1-1’.

valuable insight that it is still possible to influence customers in their own stores, since almost all of the consumers observed still shop (also-)offline. Brick-and-mortar retailers must now develop strategies to retain their customers in the long term. Either through competitive advantages over online retail (e.g., via price, experience or service) or by adding an online distribution channel. If consumers are accustomed to online channels and increasingly purchase their groceries online, it will become much more challenging for brick-and-mortar retailers to reach out to these consumers. Fundamentally, it is key for these companies to anticipate and act on these game-changing trends to shape new standards and be successful in the long term (Harvard Business Review 2010). Otherwise the return to 'old habits' in offline purchasing behavior seen here will become a 'new normal' in the sense of an increasing migration of customers to online stores.

Our findings on OGS show an ongoing process of change due to a high level of dynamism in online purchase patterns. During the observation period, the buying behavior of (also-) online purchasing consumers changes in different ways. Some consumers started OGS before or during the lockdown, but then switched back to shopping at brick-and-mortar stores only again. Other consumers started OGS before or during the lockdown and maintained this shopping behavior afterwards. These findings indicate a 'new normal' – at least for certain consumer segments.

In conclusion, this study provides insight into the consumer purchasing behavior both offline and online before, during, and after pandemic restrictions. In particular, brand managers and retailers should take this analysis as an opportunity to consider changes in consumers' behavior in more detail in order to derive measures to increase loyalty. Additionally, these new insights provide a deeper knowledge of consumer purchasing behavior. Thus, they can derive specific marketing strategies to face future challenges in retailing and e-commerce.

However, this research has some limitations. It cannot be clearly proven that the changes in the purchasing behavior of offline and online purchase patterns are caused by the pandemic. The processes of change in consumer purchasing behavior may be also driven (at least in part) by digitization, increasing online offers, and changing demands. Furthermore, we cannot draw any conclusions about a quantitative shift in demand between offline and online purchases. For instance, it is obvious that consumers who use OGS regularly are purchasing a higher quantity and thus are more relevant for OGS providers online.

While this study specifically analyzes consumer behavior regarding offline and online purchases, further research can additionally consider the quantity sold per household. Additionally, it should be clarified whether consumers with different purchase patterns actually differ, e.g. in terms of consumer characteristics and demographics, organic and fair trade products, price consciousness or national brand preference. Further research can be focused on a combined consideration of offline and online purchase patterns. In this way, purchase patterns could be generated to simultaneously reflect the changes in consumers' buying behavior both online and offline.

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Factors Leading to the Adoption of IoT in the Home: An Exploratory Model of the Domestication Theory and Technology Adoption Theories

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Abstract. The objective of this study was to analyse the adoption of the Internet of Things (IoT) in the home. An exploratory study integrating technology adoption models and domestication theory was designed. The data was collected in Spain and Colombia and 405 online surveys were obtained. For the creation of the measurement and analysis tool, the statistical program Smart PLS was used. The results found that for the adoption of the Internet of Things in the home, the degree of importance of the Internet in people's lives is decisive, as well as the degree of perception of future benefit from its use and perceived enjoyment. The process of Internet domestication generates the intention and, therefore, the use of the Internet of Things technologies in the home.

Keywords: Internet of Things · Adoption · Homes · Technology · Human computer interaction · Disruptive technology

1 Introduction

The adoption of the Internet of Things (IoT) in the home is the future of the development of different technologies that facilitate domestic activities (Zheng et al. 2018; Minoli 2020; Abushakra and Nikbin 2019; Hermanu et al. 2022). The objective of this study was to analyse what factors people take into account for the adoption of IoT in the home (Thuya 2020; Mital et al. 2018; Weinberg et al. 2015; Tang and Ho 2019; Rahimi et al. 2020; Kumar et al. 2019; Minoli 2020; Lee 2020). Its importance is related to the possibilities in terms of improvement in the quality of life, so it was selected as one of

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the ten emerging technologies of the Fourth Industrial Revolution at the Davos Forum in 2016 (Lee 2020).

The European Research Cluster on the Internet of Things (IERC) states that the Internet of Things (IoT) enables the things/objects in our environment to be active participants, i.e., they share information with other stakeholders or members of the network; wired/wireless, often using the same Internet Protocol (IP) that connects the Internet. In this way, the things/objects are capable of recognizing events and changes in their surroundings and acting and reacting autonomously largely without human intervention in an appropriate way.

IoT refers to information and communication technology (ICT) that enables intelligent services through interaction between objects connected via wired and wireless networks (Park 2019). The Internet of Things (IoT) is emerging as the natural evolution of the possibilities of interconnection and machine-to-machine technologies (M2M). Its multi-technology, multi-protocol and multi-threaded architecture allows them to converge in the creation of an intelligent environment (Momani and Jamous 2017) (See Table 1).

The IoT concept is a system that 1) contains ubiquitous "everyday" objects that are accessible through the Internet (the ability to understand and interact with environments) 2) contains identifying and networking capabilities that allow them to communicate information about themselves, 3) involves object-object, object-person, and person-person interactions (the ability to interact with other technologies and humans), and 4) makes autonomous decisions (artificial intelligence capability) (Rayes and Salam 2019; de Boer et al. 2019).

The IoT requires various things to have a presence on a network through which some processes of data gathering or interaction can occur. At a technical level, Haller distinguishes 'Devices' from 'Things' – things being potential entities of interest to users and applications, while devices provide the means to access and interact with data (Minoli 2020).

The main reasons to have and use the IoT at home, among others, are as follows:

1. Savings: It allows savings in utilities, especially energy savings of up to 20%.
2. Security: It makes it easy for users to be connected to their homes and use recognition and access devices.
3. Information exchange: It facilitates daily routines by anticipating the actions that users carry out as well as reducing information search times.

For their part, Rahimi et al. (2020) categorised IoT into two main types: resource-management-based (including all process automation activities such as planning, allocation and automated provisioning) and service-management-based (including monitoring supports, security, management power and remote control).

Table 1. IoT examples.

Devices	Description	Threats
Smart TV	Internet-connected televisions that allow access to movies, videos, email and more	- Eavesdropping on users' daily conversations - Tracking users' watching habits and preferences
Smart speaker	Devices that enable audio and microphone to be connected via Bluetooth	- Unauthorized data collection - Distributing sensitive information to third parties
Smart plug	A compact Smart Home device, multifunctional and easy to use, allowing you to monitor and control your home's electrical appliances	- Insecure communication protocols, lack of device authentication, and a weak password policy - Threat to patient's life when implementing medical devices using smart plugs
IP camera	Video and audio available in any type of application to track anywhere in the home	- Monitoring of all private information within the field of view of the device - Unauthorized distribution of recorded video through IP camera
Smart phone	Smart phone applications connected to the internet that allow up-to-date information, connectivity and communications in different ways	- Tracking personal day-to-day information such as user location, time, and temperature - Unauthorized distribution of photos and videos stored on a user's device or cloud storage service
Smart car	Automated cars, indoor wellness sensors and outdoor safety	- Collection of driving time, distance, and location information - Collection of residence, work, and traffic information
Other devices	Appliances such as refrigerators, washing machines, stoves, heaters or vacuum cleaners. They allow you to have device information and long-distance control	- Monitoring of personal life and activity patterns - Remote control against the user's intention (lighting, door lock, gas valve, temperature control device, etc.)

Adapted from Lee (2020).

Many users are concerned not only about the opportunities it provides, but also about the potential difficulties it can bring, as the acceptance of IoT services in the home has been shown to be affected by various factors, such as the risks of privacy generated by its use. Hence the importance of legislation regulating and allowing information security and transparency in the use of information.

The IoT is a very promising area that has various benefits such as providing increased convenience, greater safety and security, a more rational use of energy and other resources, thus contributing to significant savings (Rayes and Salam 2019).

Similarly, in addition to the importance of the security and privacy of the data obtained, what everyone expects from an effective network is data transmission with minimal latency. Latency is one of those challenges that needs to be given more attention, particularly in real-time applications in smart buildings, as well as in fire events, health emergencies and entry authorization, which require extremely quick responses (Rahimi et al. 2020).

There are few studies that analyse the development of IoT adoption in the home (Wright et al. 2022), and studies on behavioural theories are especially scarce; therefore, the objective of this paper was to examine what factors determine the adoption and use of IoT in homes.

For this, we propose an exploratory empirical model that integrates the theory of Internet domestication in the home and some variables of the Unified Theory of Technology Adoption (UTAUT) in order to examine in more detail this phenomenon that will be key in the future worldwide.

This paper begins with a review of the two theories that make up the empirical model, together with the proposed hypotheses. Next, the methodology, sample, data collection and statistical analysis are detailed and, finally, the results and final conclusions are presented.

2 Theoretical Framework and Hypotheses

Domestication theory explains how people adopt and use information and internet technologies in the home, explores the complex processes of adoption and, especially, the use of technologies in everyday life (Hynes and Richardson 2009; Silverstone 1993; Haddon 2006; Wei et al. 2011; Reisdorf and Groselj 2017). This theory explains that the appropriation of a technology in the home is a process that consists of four stages that precede each other depending on the level of adoption in the home. The first stage is commodification or appropriation, the second is objectification, the third stage is incorporation, and the most complete phase is conversion (Brause and Blank 2020; Hynes and Richardson 2009).

Commodification - Appropriation of the Domestic Internet

This initial step refers to the purchase of a certain technology, its installation and the initial expectation that the adoption of the technology brings to the home. It is related to the acquisition and therefore to the physical factors and the initial technological resources (Brause and Blank 2020). This first level is related to the initial adoption of the technology. In the appropriation phase, possession and ownership are central (Hynes and Richardson 2009); this stage may be associated with the abilities to adopt IoT as, for example, facilitating conditions for its use or its perceived ease of use, or having hedonic motivations and performance expectancy.

Therefore, it is stated:

H1a: Appropriation of domestic Internet influences Hedonic motivations of the use of IoT
H1b: Appropriation of domestic Internet influences Effort expectancy of the use of IoT
H1c: Appropriation of domestic Internet influences Facilitating conditions of the use of IoT
H1d: Appropriation of domestic Internet influences Performance expectancy of the use of IoT
H1e: Appropriation of domestic Internet influences the Objectification of domestic Internet

Objectification of Domestic Internet
This stage refers to the installation and primary use of said technology in the home. It can be related to knowledge of the management of this technology, the possession of skills for its use and continuing the process of implementation of the Internet in the home (Brause and Blank 2020). It also involves both a spatial aspect (where it is placed in the house), and a temporal aspect (how it is fitted in the time structure) (Hynes and Richardson 2009).

H2a: Objectification of domestic Internet influences Effort Expectancy of the use of IoT
H2b: Objectification of domestic Internet influences Facilitating conditions of the use of IoT
H2c: Objectification of domestic Internet influences Incorporation of domestic Internet

Incorporation of Domestic Internet
Incorporation refers to the use and integration of said technology in the home, how ICTs are used, with the temporal aspect being more central in this phase (Hynes and Richardson 2009). There is already a frequency of use, routine and habit of use in the home (Brause and Blank 2020).

H3a: Incorporation of domestic Internet influences Effort Expectancy of the use of IoT
H3b: Incorporation of domestic Internet influences Performance expectancy of the use of IoT
H3c: Incorporation of domestic Internet influences Conversion of domestic Internet

Conversion of Domestic Internet
The conversion of domestic Internet is the process of domestication with the outside world, through visualisation, sharing, discussing and acquiring skills that relate to life inside and outside the home (Brause and Blank 2020). The technology is adopted not only into the household as a physical space, but also into the everyday routines of the household members and their perception of the technologies (Hynes and Richardson 2009). Therefore, a higher degree of domestic conversion is related to a greater perception of ease of use and performance expectancy of the use of IoT.

H4a: Conversion of domestic Internet influences Effort expectancy of the use of IoT

H4b: Conversion of domestic Internet influences Performance expectancy of the use of IoT

Several studies on technological adoption models have allowed us to understand which variables best describe the adoption of information and internet technologies by individuals (Davis 1993; Rogers 1995; Venkatesh et al. 2003; Venkatesh et al. 2012), especially research on all types of electronic commerce (Davis 1993; Venkatesh et al. 2003; Casaló et al. 2009; Celik 2016). Some studies have applied these models to analyse the adoption of the Internet of Things (Abushakra and Nikbin 2019).

Social Influence
Social influence is one of the most important factors validated both in behavioural theories (Ajzen 1991; Fishbein and Ajzen 1975) and in technology adoption models, especially for internet adoption (Venkatesh et al. 2003). It is related to the degree to which an individual is influenced by people in their immediate environment, whether they are family members, leaders, or people of high social status. Regarding its influence on IoT in the home, it can be argued that being a new technology is a variable that can influence people (Rogers 1995; Thuya 2020; Abushakra and Nikbin 2019; Mital et al. 2018). It is also possible that greater social influence also leads to improvements in the quality of life of households and to hedonic motivations for its use.

H5a: Social influence influences Conversion of domestic Internet
H5b: Social influence influences Hedonic motivations to use IoT
H5c: Social influence influences the use of IoT

Hedonic Motivations
This variable is related to the enjoyment obtained when doing something (Silverstone 1993; Hirschman 1984). In the case of technology adoption, studies have examined how it generates pleasure in online shopping (Sánchez-Torres et al. 2019; Chang et al. 2016). Information and communication technologies tend to offer fun and improved quality of life, something that has already been proven in previous studies (Venkatesh et al. 2012). The case of IoT adoption could show similar characteristics.

H6a: Hedonic motivations influences Intention to use IoT

Facilitating Conditions
This refers to the degree to which an individual has everything necessary to adopt a technology, including technical aspects and perceived knowledge (Venkatesh et al. 2003). Some studies have analysed all the skills related to the adoption the Internet of Things (de Boer et al. 2019; van Deursen et al. 2019; Deursen and Dijk 2019). In the case of Internet of Things services, it has been validated as a determining factor (Lee and Shin 2019).

H7a: Facilitating conditions influences Effort Expectancy of use of IoT
H7b: Facilitating conditions influences Hedonic perception of use of IoT

Effort Expectancy
The idea of ease of use found in the Technology Acceptance Model (TAM) (Davis 1989), transformed into Effort expectancy in the UTAUT model (Venkatesh et al. 2003; Venkatesh et al. 2012), corresponds to the ease of learning and managing IoT. Previous studies have validated this for IoT technologies (Lu et al. 2018; Thuya 2020).

H8: Effort Expectancy influences intention to use of IoT

Performance Expectancy
The perception by individuals that the adoption of a technology can generate benefits for them is one of the most widely validated elements in theories of technology adoption (Rogers 1995; Venkatesh et al. 2003; Davis 1993). It has been explored as an IoT adoption factor in several studies (Thuya 2020; Abushakra and Nikbin 2019).

H9a: Performance expectancy influences intention to use IoT
H9b: Performance expectancy influences use IoT

Intention to Use IoT
Intention to use IoT refers to the degree to which a person has formulated conscious plans to perform or not perform some specified future behaviour using IoT (Kao et al. 2019). Carrying out a behaviour is the main predictor of behaviour, and the same applies to technology adoption (Ajzen 1991; Rogers 1995; Venkatesh et al. 2003). Finally, usage behaviour can be thought of as the ultimate measure of IoT adoption (Kao et al. 2019).

H10: Intention to use IoT generates use of IoT

3 Methodology

For the structuring of the measurement tool, the items proposed in the most recent studies on the domestication theory related to the internet in households were adapted (Scheerder et al. 2019; de Boer et al. 2019). For the variables referring to theories of technology adoption, some variables that had already been explored for IoT in other studies were adapted (Mital et al. 2018; Lee and Shin 2019) (See Table 2). The questionnaire was designed on a 5-point Likert scale (1 = Strongly disagree; 2 = Disagree; 3 = No opinion, 4 = Agree, 5 = Strongly agree).

Table 2. Measurement tool

Construct	Items
APP: Appropriation of domestic Internet (van Deursen et al. 2019; Scheerder et al. 2019)	APP1. I know how to connect smart devices to the Internet APP2. I feel confident operating smart devices APP3. I know how to connect smart devices to my Wi-Fi network

(*continued*)

Table 2. (*continued*)

Construct	Items
BI: Intention to use IoT (Mital et al. 2018; Lee and Shin 2019)	BI1. I intend to continue using IoT service in the future BI2. I will always try to use IoT service in my daily life BI3. I plan to continue to use IoT service frequently
CO: Conversion of domestic Internet (van Deursen et al. 2019; Scheerder et al. 2019)	CO1. Internet allows me to interact with my family, friends, and close people CO2. Through the Internet I can do different things inside and outside the home
EE: Effort expectancy (Mital et al. 2018)	Using the Internet-of-Things… EE1. I understand it EE2. Is easy to learn EE3. Does not require much mental effort
FC: Facilitating conditions (Lee and Shin 2019)	Using the Internet-of-Things… FC1. I think I have the resource necessary to use IoT service FC2. I think I have the knowledge necessary to use its service FC3. I think I can get help from others when I have difficulties using IoT service
HM: Hedonic motivations (Venkatesh et al. 2012)	Using the Internet-of-Things… HM1. In general, I think using the Internet of Things technologies is fun HM2. In general, I think using the Internet of Things technologies is pleasant HM3. In general, I think that using the Internet of Things technologies is entertaining
INC: Incorporation of domestic Internet (van Deursen et al. 2019; Scheerder et al. 2019)	INC1. I consider the Internet to be essential in my daily activities INC2. I could not live disconnected from the Internet to continue my routine
OB: Objectification of domestic Internet (van Deursen et al. 2019; Scheerder et al. 2019)	OB1. I have several devices that use the Internet OB2. I have different devices connected to the Internet installed at home
PE: Performance expectancy (Mital et al. 2018)	Using the Internet-of-Things… PE1. Improves living standards PE2. Improves my productivity PE3. Makes life easier
SI: Social influence (Mital et al. 2018; Lee and Shin 2019)	Using the Internet-of-Things… SI1. People who influence my behaviour would think that I should use IoT service SI2. People whose opinions I value would prefer that I use IoT service SI3. People who are important to me would think that I should use IoT service

A non-probability sample based on the convenience method was used, valid in terms of the PLS method (Hair et al. 2014). A pre-test was carried out to verify that the questionnaire did not present semantic problems and it was distributed electronically using a non-probability snowball method (Sarstedt and Mooi 2019). Data collection was carried out through an online questionnaire with a final sample of 520 valid questionnaires. The sample behaved with a greater response from females (56%) compared to the participation of males (44%), which did not affect the results of the study. In the same way, no significant differences were found between ages (Gonçalves et al. 2019), countries and other factors such as experience in using the Internet (See Table 3).

Table 3. Sample characteristics

Demographic profile		Internet and IoT experience
Gender: Male 44% Female 56%	Age: 18–34 years old 42% 35–44 years old 38% 45–55 years old 20%	Experience using the Internet: More than 10 years 100% Use of IoT: Virtual voice assistants 51% Home appliances 21% Domestic robots 14% Security systems, electricity, remote control 11% Other 3%
Education level: Primary 0% High School 11% Technical 27% Undergraduate 40% Graduate 22%	Marital status: Single 73% In couple or family 27%	Location: Spain 53% Colombia 47%

4 Results

The data were analysed using the Smart-PLS 3.0 statistical program given the exploratory nature of the model (Hair et al. 2019). The discriminant validity test was applied, which examines that the items measure only their corresponding variable. The results show that the loads were greater than 0.505 for all the items (See Table 4). Likewise, the correlation test between the items and the variables they measure was valid (See Table 5), and the convergent validity of the indicators (Heterotrait-Monotrait Ratio - HTMT) did not present values greater than 0.9, so the measurement tool was also validated (Henseler et al. 2014) (See Table 6). Finally, other reliability tests such as Cronbach Alpha Test (>0.70), Average Variance Extracted (>0.5), Compound Reliability (>0.6) and Rho_A (>0.70) validated the required levels (See Table 7) (Gefen et al. 2000; Henseler et al. 2014).

Table 4. Indicator's loads

Items	Load	t (|O/STDEV|)*	p-value*
APP1	0.820	21.341	0.000
APP2	0.849	36.582	0.000
APP3	0.807	31.277	0.000
BI1	0.709	12.601	0.000
BI2	0.924	96.986	0.000
BI3	0.948	185.308	0.000
CO1	0.952	85.410	0.000
CO2	0.901	57.890	0.000
EE1	0.873	48.380	0.000
EE2	0.856	48.801	0.000
EE3	0.778	13.881	0.000
FC1	0.843	49.026	0.000
FC2	0.852	47.771	0.000
FC3	0.726	19.545	0.000
HM1	0.923	83.552	0.000
HM2	0.912	76.328	0.000
HM3	0.915	63.801	0.000
INC1	0.924	97.156	0.000
INC2	0.917	104.410	0.000
OB1	0.938	39.546	0.000
OB2	0.895	67.197	0.000
PE1	0.901	40.976	0.000
PE2	0.886	48.665	0.000
PE3	0.861	42.450	0.000
SI1	0.859	65.263	0.000
SI2	0.899	21.726	0.000
SI3	0.765	60.825	0.000

(* Significant at *$p < 0.05$, t-value 1.960)
Notes: (APP: Appropriation of Domestic Internet; BI: Intention to use IoT; CO: Conversion; EE: Effort Expectancy; FC: Facilitating Conditions; HM: Hedonic Motivations; INC: Incorporation; OB: Objectification; PE: Performance Expectancy; SI: Social influence.)

Table 5. Convergent validity of the indicators (Fornell-Larcker Criterion).

APP	0.826									
BI	0.305	0.841								
CO	0.482	0.362	1.000							
EE	0.372	0.546	0.340	0.807						
FC	0.375	0.289	0.216	0.446	0.809					
HM	0.365	0.567	0.338	0.594	0.551	0.917				
INC	0.586	0.352	0.518	0.372	0.317	0.379	1.000			
OB	0.560	0.222	0.411	0.243	0.359	0.188	0.461	0.916		
PE	0.370	0.741	0.434	0.630	0.339	0.617	0.453	0.265	0.883	
SI	0.068	0.450	0.172	0.429	0.372	0.422	0.223	0.127	0.483	0.843

Notes (APP: Appropriation of Domestic Internet; BI: Intention to use IoT; CO: Conversion; EE: Effort Expectancy; FC: Facilitating Conditions; HM: Hedonic Motivations; INC: Incorporation; OB: Objectification; PE: Performance Expectancy; SI: Social influence.)

Table 6. Convergent validity of the indicators (Heterotrait-Monotrait Ratio - HTMT)

APP									
BI	0.371								
CO	0.551	0.373							
EE	0.483	0.662	0.386						
FC	0.475	0.381	0.247	0.614					
HM	0.432	0.641	0.355	0.605	0.671				
INC	0.673	0.358	0.518	0.421	0.363	0.398			
OB	0.698	0.260	0.453	0.309	0.460	0.215	0.504		
PE	0.451	0.660	0.467	0.661	0.428	0.699	0.487	0.314	
SI	0.095	0.573	0.186	0.534	0.489	0.484	0.245	0.149	0.573

Notes: APP: Appropriation of Domestic Internet; BI: Intention to use IoT; CO: Conversion; EE: Effort Expectancy; FC: Facilitating Conditions; HM: Hedonic Motivations; INC: Incorporation; OB: Objectification; PE: Performance Expectancy; SI: Social influence.

Regarding the validity and predictability of the model, a re-sampling was carried out using the bootstrapping technique with 5,000 sub-samples (Hair et al. 2013), obtaining that the dependent variable intention to use IoT got = 0.516 and the dependent variable IoT use got = 0.613, both being acceptable values that allow us to conclude that the model can allow a high level of prediction with a high degree of statistical validation of the variables (See Table 8). All the hypotheses have been statistically validated (See Table 9).

Table 7. Reliability test.

Variable	Alfa cronbach	Rho_A	Compound reliability	Average variance extracted (AVE)
APP	0.767	0.772	0.865	0.682
BI	0.787	0.888	0.875	0.707
CO	1.000	1.000	1.000	1.000
EE	0.733	0.778	0.847	0.651
FC	0.735	0.753	0.850	0.654
HM	0.905	0.907	0.940	0.840
INC	1.000	1.000	1.000	1.000
OB	0.812	0.849	0.913	0.840
PE	0.858	0.862	0.914	0.779
SI	0.798	0.842	0.880	0.710

Notes (APP: Appropriation of Domestic Internet; BI: Intention to use IoT; CO: Conversion; EE: Effort Expectancy; FC: Facilitating Conditions; HM: Hedonic Motivations; INC: Incorporation; OB: Objectification; PE: Performance Expectancy; SI: Social influence.)

Table 8. R^2 (predictability test)

Variable	R^2	R^2 Ajusted
Intention to use IoT	0.541	0.538
IoT use	0.578	0.573

Table 9. Validity of the empirical model.

Hypothesis	Validation	Original sample (O)	T (O/STDEV)	P values
H1a: AAP -> HM	Supported	0.112*	2.683	0.007
H1b: APP -> EE	Supported	0.166*	2.844	0.004
H1c: APP -> FC	Supported	0.101*	1.918	0.015
H1d: APP -> PE	Supported	0.166*	1.951	0.012
H1e: APP-> OB	Supported	0.560*	9.794	0.000
H2a: OB -> EE	Supported	0.119*	1.947	0.019
H2b: OB -> PE	Supported	0.270*	2.759	0.006
H2c: OB -> INC	Supported	0.461*	7.468	0.000

(*continued*)

Table 9. (*continued*)

Hypothesis	Validation	Original sample (O)	T (O/STDEV)	P values
H3a: INC -> EE	Supported	0.142*	2.501	0.012
H3b: INC -> PE	Supported	0.273*	4.416	0.000
H3c: INC -> CO	Supported	0.518*	8.256	0.000
H4a: CO -> EE	Supported	0.166*	2.844	0.004
H4b: CO -> PE	Supported	0.253*	4.192	0.000
H5a: SI -> APP	Supported	0.168*	1.987	0.043
H5b: SI -> HE	Supported	0.152*	3.224	0.001
H5c: SI -> BI	Supported	0.087*	1.996	0.045
H6: HE -> BI	Supported	0.137*	2.189	0.029
H7a: FC -> EE	Supported	0.349*	6.633	0.000
H7b: FC -> HE	Supported	0.294*	5.423	0.000
H8: EE -> BI	Supported	0.981*	1.998	0.048
H9a: PE -> BI	Supported	0.573*	8.928	0.000
H9b: PE -> USE IoT	Supported	0.451*	5.874	0.000
H10: BI -> USE IoT	Supported	0.201*	4.125	0.001

(* Significant at *$p < 0.05$, t-value 1.960. Notes: APP: Appropriation of Domestic Internet; BI: Intention to use IoT; CO: Conversion; EE: Effort Expectancy; FC: Facilitating Conditions; HM: Hedonic Motivations; INC: Incorporation; OB: Objectification; PE: Performance Expectancy; SI: Social influence.)

Which results in the validation of hypotheses 1, Appropriation of domestic Internet influences Hedonic motivations of the use of IoT, that is, the acquisition of IoT technologies for the home will generate perceptions of enjoyment, leisure and fun at home (many of the new IoT technologies are geared towards games, leisure and well-being in the home). Likewise, it is validated that the acquisition of these technologies is aligned to a perception of having what is necessary for their use, ease of use and perceived utility, key factors for adopting any technological innovation, and it is also verified that the domestic appropriation of the Internet determines the objectification of Internet at home (Garg and Cui 2022).

Hypothesis 2, related to the fact that objectification of the internet at home influences the perception of the use and performance that IoT will have to adopt in the home, as well as its influence on the next level of incorporation of the internet in the home, are also validated.

Hypotheses 3 are verified, showing that the incorporation of the Internet in the home will favour the perception of utility and positive expectations of the use of IoT in the home, as well as its influence on the conversion of the Internet in the home.

Hypotheses 4 also validate that, at this stage of maturity of internet domestication (conversion), a positive perception is also generated about the benefits that the use of IoT will have in the home and for social life (Hynes and Richardson 2009).

Regarding social influence, hypotheses 5 are validated, in line with the results from other studies (Mital et al. 2018; Abushakra and Nikbin 2019; Thuya 2020), showing that social influence leads households to adopt the Internet in the first place, which is reinforced by its positive influence on the perception of ease of use and the benefits generated by these technologies in the home. Therefore, people are buying these new technologies because others are recommending them or have previously used them.

Hypothesis 6 is validated, proving that the perception of fun and well-being is particularly important for the adoption of IoT, thus reinforcing the results obtained by Abushakra and Nikbin (2019).

Hypotheses 7 are validated, that is, having more facilitating conditions such as having the internet at home (Lee and Shin 2019; Al-Husamiyah and Al-Bashayreh 2022), knowledge of the use of IoT-related technologies, among other factors, generates a greater perception of ease of use and of the benefits they will bring to the home (Wright et al. 2022).

Hypothesis 8 proves that the perception of effort expectations related to the ease of use of the IoT will favour its adoption (Al-Husamiyah and Al-Bashayreh 2022).

Hypothesis 9 also validates that the perception of expectations in the results in the use of IoT generates greater interest in its adoption and use (Al-Husamiyah and Al-Bashayreh 2022). These two variables have previously been validated in studies in other countries and in this case their importance is verified (Mital et al. 2018; Abushakra and Nikbin 2019; Thuya 2020). Finally, it is verified that for IoT the intention to use is a guarantor of its actual use in the home.

5 Conclusions

The objective of this paper was to examine what factors determine the adoption and use of IoT in the home. The general conclusions of this paper are that IoT in the home involves technologies that are in a state of innovation where purchasing behaviour is linked to social factors, value factors such as the benefits they offer to households, and factors linked to the Internet adoption and management in each home.

The theoretical implication is that those households in which the Internet is in a mature state of adoption, that is, in the final phase of domestication, such as coverage, will tend to adopt higher level IoT technologies (Scheerder et al. 2019) and that the behavioural factors for IoT adoption are very similar to those that apply to the adoption of any innovation.

The practical contribution is oriented to the fact that IoT technologies should offer solutions that provide improvements in users' quality of life both inside and outside the home (Scott et al. 2019; Hong et al. 2020).

Likewise, the commercialisation of IoT technologies can be linked to companies that provide Internet service to the home. Co-branding strategies can be effective, given the high co-dependency of both technologies. For new marketing services and after sales service, special attention should be paid to providing technical services in homes.

Governments play a fundamental role in promoting policies to reduce the digital divide between households, since if it is high, the process of adopting IoT technologies will be slow, especially in poor and developing countries such as those in Latin America (Malaquias and Albertin 2019; Sánchez-Torres 2019).

The limitations of this study lie in the fact that it is an exploratory study that did not consider other variables that could be fundamental. In addition, since the samples do not represent the behaviour globally, there may even be differences between countries not recorded in this study. Finally, it is suggested that for future studies on the adoption of IoT in homes, other types of IoT could be taken into account or a specific one could be analysed (Garg and Cui 2022). It is also proposed to extend the study on IoT to other organisations such as companies (Lu et al. 2018; Brous et al. 2019; Rayes and Salam 2019; Kumar et al. 2022), educational and medical sectors (Tang and Ho 2019). In summary, the future will be based on IoT.

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The Highly Sensitive Person (HSP) and Online Shopping Behavior: The Impact of Visual Stimuli on Attitude Towards the Ad and Purchase Intention

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Abstract. In the digital world, consumers are constantly being exposed to an overwhelming number of visual stimuli. Online advertisements are the big new showroom for brands – all are striving for attention and attract the right customer. Generally, advertisements combine vivid colors and strong movements to encourage and capture the consumer attention, but is this always the right strategy? Literature shows that people could react differently to similar stimuli, depending on their personality traits – specifically, the visual stimuli embedded in online ads are not an exception. Thus, brands could eventually be repelling (rather than enticing) potential customers by using vivid colors, high dynamism, and information overload. The aim of this research is to assess how people with a higher sensitivity to external stimuli, commonly defined as Highly Sensitive Persons (HSPs, Aron and Aron 1997) react when exposed to ads with excessive visual stimuli (i.e., vivid colors, dynamic imagery, complex layouts). Additionally, participants' biometric responses (heart rate variability and time-response), attitude towards the ad, and purchase intention will be measured. A quantitative methodology will be used, involving an experimental design and lab data collection. Theoretical implications are discussed, and hypotheses are presented.

Keywords: Online advertising · Highly Sensitive Person (HSP) · Visual stimuli · Purchase intention · Attitude towards the ad

1 Introduction

Aron and Aron (1997) believe that a Highly Sensitive Person (HSP) has an increased central nervous system sensitivity to physical, emotional, and environmental stimuli. This trait is characterized by a Sensory Processing Sensitivity (SPS), that translates into enhanced emotional sensitivity, deeper reactivity to stimuli, both external and internal, and a complex inner self (Aron et al. 2012). HSPs are thought to be more predisposed to feeling overwhelmed and may easily become uncomfortable with different lights, colors, sounds, or specific physical sensations. These terms were first investigated by

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the psychologists Elaine Aron and Arthur Aron in the 1990s. Since then, research has grown, and an increased number of people are resonating with the characteristics found to be similar among HSPs. Although it has been a significant growth of research about people with high sensitivity, their behavior as consumers, reacting to multiple types of advertisements, remains – to the extent of our knowledge – unknown. Image-based social platforms have gained recognition during the last few years, assembling information based on visual stimuli (Choi and Sung 2018). Considering the belief that at least 20% of the population is expected to be highly sensitive (Aron 2006; Aron and Aron 1997) implies a great relevance to the investigation. Therefore, the aim of this study is to understand if the visual stimuli presented on online ads can lead to an overstimulation of HSPs and, consequently, have a negative impact on attitude towards advertisement and purchase intention. Moreover, biometric responses will be considered to assess the physical reaction to the ad's visualization. Namely, heart rate variability (HRV) and time-response (TR) will be measured. The HSP scale (Aron and Aron 1997) will be applied to assess the participants' profile. To test our predictions, we decided to settle the following independent variables associated to visual stimuli: color (vivid vs. muted), images (dynamic vs. static), layout (complex vs. minimalist). The visual stimuli will be digitally manipulated through fictitious advertisements.

2 Literature Review

2.1 Consumer Behavior and Sensory Marketing

Consumers are more sophisticated, more complicated, and more demanding than ever. Therefore, marketing has gained more responsibility in identifying what the consumer needs and wants (Štefko and Steffek 2018). Online channels bring novelty, accessibility, and more important, easiness to the consumers when it comes to assessing products and prices in the comfort of their homes without crowds or check-out lines. Consumer behavior is influenced by psychological, social, economic, technological attributes and it may determine what drives consumers when making their purchasing decisions (Ungerman et al. 2018). Providing a rich multimodal sensory experience for the customer is seen by marketeers as a must for brands that want a higher engagement and a better conversion rate. Sensory marketing can be described as a multidimensional conversation between brands and customers. It is based on sensations and perceptions that influence the consumer buying behavior and his attitude towards brands, advertisements, and products (Krishna 2012). Sensory marketing directly influences the senses of the consumer using experiential techniques which awake new emotions and sensations within the consumer. It can include sensorial, emotional, cognitive, and relational experiences that influence consumer behavior. Accordingly, the sensory experiences involve the five senses: sight, sound, smell, touch, and taste. Despite the benefits brought by the digital world, it comes with certain barriers regarding sensory stimulation, being that the main two stimuli provided online are visual and audible (Biswas et al. 2019; Krishna et al. 2016). Consequently, social media platforms with enriched audible and visual experiences are expanding exponentially. The combination of audio and visual stimuli is particularly effective in influencing the focus and the visual processing of a product (Lowe and Haws 2017). Sensory marketing seeks to consolidate the relationship between brands

and consumers through the use of sensory strategies (Krishna 2012), which have an influential role in buying processes. Using sensory cues increases consumer interest, the impetus behind buying behaviors, and can even suppress consumers' rational thinking with dominating emotional responses (Lindstrom 2005).

2.2 Stimulus-Organism-Response (SOR) and Visual Stimuli

The Stimulus-Organism-Response (SOR) theory was originally developed by Pavlov (1902), having been, later, further investigated by Mehrabian and Russell (1974). They suggested that environmental stimuli directly affect organisms, therefore influencing the behavioral response. Stimuli have been defined as the factors that cause response processes in the individual (Eroglu et al. 2001). A stimulus is a trigger that arouses consumers and can be external, for example, marketing stimuli, or internal, for example, consumer personality traits (Chan et al. 2017). Organism refers to consumers' emotional responses such as arousal, and the behavioral response indicates the consumers' reactions (Chan et al. 2017). Visual aesthetics are widely considered as a key factor to achieve the intended effect of an ad (Shaouf et al. 2016). Vision is the prevailing sense in the digital world, being, also the most studied among researchers (Biswas et al. 2019; Krishna 2012). When consumers search for and proceed to buy products, they are exposed to various specific stimuli related to brands, such as colors, shapes, product types, background design elements, slogans, mascots, and characters (Brakus et al. 2009). Ettis (2017) acknowledged that approximately 80% of the stimuli we absorb is visual – the majority of which is based on colors. Similarly, Elliot and Maier (2007) ascertain that all visual stimuli processed by humans contain color information. Colors are abundant in everyone's routine and can have a tremendous impact on consumer perceptions, engagement, behavior, and even on their feelings (Jonauskaite et al. 2016; Labrecque and Milne 2012; Singh 2006). The cool and warm variations of colors have also demonstrated differences in how they impact emotions and behaviors (Bagchi and Cheema 2012; Crowley 1993). Although a higher percentage of the color research focuses on hue, the other two dimensions, saturation and lightness, are also obtaining increasing awareness (Hagtvedt and Brasel 2016). Product images are usually displayed in either a static or a dynamic format. Individuals intrinsically prefer moving objects, as dynamism can lead to reducing heart rate and changes in brain activity (Sundar and Kalyanaraman 2004). Dynamic imagery is the typical format used in advertisements due to its capacity to capture consumers' attention resulting in higher engagement rates, thereby it is anticipated to gradually substitute static images (Cian et al. 2014). The same authors stated that when compared with static images, animated images on a web page can stimulate a higher level of pleasure, which leads to an increase in consumers' purchase intentions. The use of video formats in advertisements has been demonstrated to be a very effective tool in motivating consumers to make business transactions (Alijani et al. 2010). Animated images in online ads have been shown to create physiological arousal and a higher purchase intention (Li et al. 2002). However, the animation is not positive in all scenarios: when used as a background it was found that it can lead to negative attitudes towards the ad and, therefore, decrease purchase intentions (Stevenson et al. 2000). Advertising layout refers to the composition of images and text and it may cause an effect on consumers' attention, attitudes toward the advertisement, and purchase intentions (Pilelienė and Grigaliūnaitė

2016). Visual complexity is principally represented by the number of objects, organization, and variety of colors. The brand presented with the lowest complexity level layout is recalled better and present a greater chance to produce positive attitudes that affect purchase intention (Pilelienė and Grigaliūnaitė 2016).

2.3 Attitude Towards the Ad, Purchase Intention, and Biometrics

The attitude towards advertisements is characterized as the predisposition to respond positively or negatively to a particular advertising stimulus during a particular experience (MacKenzie and Lutz 1989). Consumers' thoughts and feelings influence their attitude towards advertising, and it was found that the development of attitude is one of the main predictors for advertising effectiveness (Mehta 2000). The reasons behind the choices of customers and target markets have been exhaustively studied by marketing researchers, to achieve a better understanding of the consumer behavior and his purchases intentions (Shah et al. 2012). Purchase intention implies a higher probability of a future purchase or a greater willingness to buy a certain product (Wu et al. 2011). The leading factors motivating purchase intentions are attitudes, assessments, and perceptions of brands (Wang and Li 2012). Research shows a significant relationship between purchase intention and actual purchasing when it comes to lower risk purchases (Morwitz et al. 2006). Online purchase intention becomes a crucial component to foresee the efficacy of online stimuli (Amaro and Duarte 2015). The interest on human emotions has been extended, from the field of psychology to other disciplines, such as neuroscience, product, and experience design (Gatti et al. 2018). Physiological and bodily reactions are commonly measured to assess the responses to diverse stimuli. In consumer behavior, examples of the recorded parameters are related to the vascular system (blood volume pulse, heart rate), and individuals' reaction times to startle reflexes, variation in skin and body temperature, and variation in the skin conductance (Lang 2014). Bell et al. (2018) argue that physiological and neuroscientific techniques can lead to a better understanding of consumer research by providing insights into the unconscious mechanisms. Therefore, researchers could better predict the consumer behavior.

2.4 The Highly Sensitive Person (HSP)

Sensitivity is a complex concept. There are major differences between individuals and their response to external stimuli (Belsky and Pluess 2009). The Highly Sensitive Person (HSP) is characterized by increased awareness and noteworthy readiness to react to environmental stimuli, especially significant in social circumstances. Higher sensitivity is often mistaken with shyness, weakness or even, unsociability (Aron and Aron 1997). This type of person has a more intricate sensory processing with more prominent attention to detail (Aron and Aron 1997). Sensory Processing Sensitivity (SPS) is conceptualized as a personality trait and not a disorder (Aron et al. 2012). It is related to other traits such as irritability, introversion, and emotional negativity. All of these have demonstrated high sensitivity to external stimuli. HSPs have a three-factor structure involving ease of excitation, low sensory threshold, and aesthetic sensitivity (Aron and Aron 1997). Past research concluded that HSPs are more sensitive and responsive to slight contrasts in colors, sounds, and textures (Acevedo et al. 2014; Aron and Aron

1997). Aron et al. (2012) defines Sensory Processing Sensitivity (SPS) as a mechanism in which sensory information, such as visual experiences, people's feelings, and loud noises, are retrieved and processed by the brain. HSPs have increased susceptibility to environmental stimuli that can lead to: strong emotional manifestations; depth of sensory information cognitive processing; sensitivity to subtle detail and predisposition to over-stimulation. People with high sensitivity take a lot, if not all, of the subtlety's others miss, what seems ordinary for the majority like strong lights and colors and loud music can be hyper-stimulating and even overwhelming to HSPs (Aron and Aron 1997). Therefore, highly sensitive individuals tend to respond to a lower threshold of stimuli, being easily frustrated by the overwhelming number of external stimuli they must embrace in their quotidian. Therefore, the degree of arousal in the same situation, with the same amount of stimulation, differs considerably between HSPs and non-HSPs (Aron and Aron 1997). Thus, when confronted with the same ad, consumers could react differently accordingly to their level of sensitivity – this response could easily lead to sensory overload for HSPs (Krishna 2012).

2.5 Hypotheses Formulation

All consumers experiences are based on the integration of sensory inputs, such as marketing stimuli, that affect latter responses and behavior (Krishna 2012). As HSPs are more predisposed to overstimulation when compared to what is considered normal in terms of sensory processes, we expect that HSPs would become overstimulated when exposed to specific visual stimuli (vivid colors, dynamic imagery, and complex layout). Therefore, attitude towards the ad would be more negative, leading to a decreasing of online purchase intention. A biometric approach will be applied to deeply explore our predictions in terms of physiologic reaction (heart rate variability and time-response). Thus, we present the following hypotheses:

H1: For HSPs, vivid colors lead to a more negative attitude towards the ad, when compared to non-HSPs.

H2: For HSPs, dynamic imagery lead to a more negative attitude towards the ad, when compared to non-HSPs.

H3: For HSPs, a complex layout lead to a more negative attitude towards the ad, when compared to non-HSPs.

H4: A negative attitude towards the ad has a negative impact on HSPs purchase intention.

3 Method

This research will be conducted in two separate stages: (1) online questionnaire, and (2) experimental study. First, an online-based questionnaire on Typeform will be used to determine which participants have the highest and lowest scores in the HSP scale to continue to the laboratorial data collection. The questionnaire includes: (1) the HSP scale (Aron and Aron 1997), measured through 27 items using a seven-point Likert-type scale (1 = Not at all; 7 = Extremely), and (2) a demographic section comprising the

participants' diseases (e.g., anxiety, depression, cardiovascular and respiratory disorders). Second, an experimental study involving data collection in the lab, to validate our hypotheses. The setup will consist in a set of digitally manipulated advertisements. Conditions include: color (vivid vs. muted), images (dynamic vs. static), layout (complex vs. minimalist). Moreover, biometric responses will be measured – heart rate variability (HRV) and time-response (TR) – to assess the physical reaction to the ad's visualization. The experience will be conducted on the Open Sesame software that allows the randomization of the different images and the processing of biometric responses. The purchase intention (Freling et al. 2011) and attitude towards the ad (MacKenzie and Lutz 1989) will be the dependent variables and will be measured for each ad, rated in a seven-point Likert type scale. To determine their purchase intention, participants will be asked to rate if they would be likely/unlikely, possible/impossible, probably/improbably to purchase the product. To rate their attitude towards the advertisement, participants will be asked to rate if the ad is good/ bad, pleasant/unpleasant, and favorable/unfavorable.

4 Conclusion

The Highly Sensitive Person (HSP) trait means that one has a higher sensitivity to stimuli. Considering the scarce investigation on HSPs consumer profiles, this research seeks to fill in this gap. From a managerial point of view, a better knowledge of the specificities of HSPs would help companies to improve and customize their marketing strategies and adjust their advertising accordingly. This research also aims to make a theoretical contribution to consumer behavior literature by introducing a new consumer profile based on the HSP trait. We believe this research will inspire future studies on this relevant topic.

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Online Customer Engagement in the Aftermath of COVID-19: Opportunities for the Luxury Industry

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Abstract. The pandemic brought businesses to a standstill, and the luxury sector was no exception. In order to survive, business activities are digitalizing fast, but the question is whether this direction is suitable for luxury – an industry that needs to preserve exclusiveness as well as direct human contact. This study proposes the application of the "online customer engagement cycle" model to luxury businesses, to bring about the most effective way to strengthen and manage customer activities when digitizing, thereby supporting luxury brands to stand firm and set a foundation for post-pandemic success.

Keywords: Customer engagement · Luxury · Fashion · Online · COVID-19

1 Introduction

Traditionally, luxury and the internet have been seen as inherently incompatible for two reasons: (a) the mass reach and access that the internet provides, and the price transparency it enables contradicts the very nature of luxury as exclusive and rare, and (b) the personalized in-store service and attention provided in store – fundamental in creating a luxury experience – is considered as not replicable online (Kapferer and Bastien 2012). As such, the luxury sector, despite some exceptions (Arrigo 2014), has been relatively reluctant to embrace the internet as part of its operations. This left the industry vulnerable and unprepared for the disruption brought by the COVID-19 pandemic.

By limiting access to physical stores, the pandemic significantly damaged the luxury industry, which relies heavily in personal contact. In the beginning of the pandemic luxury brands was estimated to suffer 93% profit loss (McKinsey 2021), with many luxury fashion brands considered "almost dead" (Amed and Berg 2021). Despite the dire consequences of COVID-19, it has also opened new paths for marketing opportunities and accelerated the digitization of companies. The record first-half performance in 2021 of LVMH - in which a considerable part of revenue came from online sales (LVMH 2021) - epitomized signs of revival and further development for the industry.

The increased digitization brought on by the pandemic has raised the bar in consumers' empowerment and expectations in their buying behavior, and relationship with brands. Consequently, understanding and managing Customer Engagement (CE) online

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has become an imperative for companies aiming to reap benefits beyond mere monetary transactions (Venkatesan 2017). Understanding and managing CE online is key for companies in their digitization journey.

Although online sales have become the mandatory channel for survival, it remains a controversial topic for luxury players. How luxury brands should react if online channels become the most dominant one, or how customer behaviors are heavily affected for a long period of online shopping. On this ground, we found that the interpersonal relationships between customers, sellers, and online community members on the Internet have been underestimated (Simon and Tossan 2018), in which maintaining and improving CE is quintessential within this period. The luxury industry needs to adapt quickly to this new reality to ensure future success, and move beyond a limited, transactional view of the internet, towards one that takes advantage of the internet's full range of abilities to increase Consumer Engagement (CE).

The present paper focuses on the fashion luxury sector, and uses the Sashi (2012) CE cycle model, revised to better fit the online context. Using the revised Sashi CE model, the current paper aims to provide a comprehensive guide for the luxury fashion industry on how to use the internet to strengthen CE, managing their old and new customers, and preparing for post-pandemic success.

2 Online CE Cycle and the Luxury Fashion Industry

The process of turning a stranger to a customer and a customer into a fan can be intriguing yet complicated in multiple aspects of the business. Many scholars proposed different routes that can lead to CE, such as interaction (Gelter 2010) or satisfaction (Rajah et al. 2008). To facilitate this process, Sashi's model (2012) had synthesized various routes to engagement and turned CE into a sequential steps process known as the "CE cycle". Sashi's contribution to CE study is remarkable but cannot be totally compatible with the current modern context, especially since the rapid digitalization movement of the COVID-19 pandemic. Therefore, we have revisited the model by adding another theme – Experience –, building on Sashi's existing framework (Fig. 1). Within the scope of this paper, we focus on CE activities within the model, as customer spending may vary in different organizations and environmental contexts which we believe could be revisited in follow-up studies.

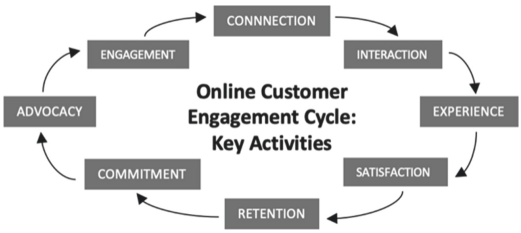

Fig. 1. Online CE cycle: key activities (revisited model by authors)

Due to the pandemic, several luxury fashion brands have transformed and represented themselves differently on the internet. According to BOF Team (2021), certain

firms like Kering pivoted to online sales on websites to adapt instantly. In contrast, Chanel steadfastly refuse to turn to online sales, focusing instead on engagement through online fashion shows on social media. Although these brands took hits at the beginning, subsequent figures demonstrate a recovery in different aspects. For example, Kering has returned to their pre-pandemic sales volume by early 2021 (Kering 2021). In this paper, the online CE cycle model is proposed to organize the online presence of luxury fashion brands. In other words, depending on the engagement purpose, luxury brands can direct their resources accordingly to the desired theme in the cycle. In particular, improving the website interface can benefit customer experience, or focusing on the social media community can better manage the brand's advocates. For this reason, we aim to employ insights from previous observations to construct a general theoretical framework for online CE in the luxury fashion industry. Each dimension is addressed as follows.

Connection commences the model as a cost-effective method that can help businesses reach a high level of CE (Elsharnouby and Mahrous 2015). Within this stage, personalization is critical in establishing digitized connections with customers (Liu et al. 2019). Having the high-involvement characteristic in their products, luxury brands can choose to direct their resources on building personalized connection strategies for their customer segment on their designated platform. As online shoppers tend to be more price-sensitive (Guercini et al. 2020) and luxury buyers through social media tend to be materialistic (Colella et al. 2021), affordable luxury – accessible products from luxury brands like Chanel's perfume or Hermes' wallet – is a noteworthy segment for online connection. Besides, to ensure the first impression, the online platform needs to be attractive, whether its purpose is to stimulate sales or brand building. On the other hand, to reinforce multiple revisits, brands need to focus on convenience as it is the highest motivation for online luxury shopping (Kim et al. 2015). When a convenient feature is highlighted, customers can overcome the initial struggle of digital shift. Furthermore, convenience does not dilute brand desirability or scarcity (Kluge and Fassnacht 2015). By preparing certain initial essential touchpoints, customers could comfortably proceed to the next CE stage.

Interaction represents the on-stage activities with customers to improve understanding of customer needs and make necessary modifications if needed (Sashi 2012). When digitized, interaction activities are facilitated when responding speed is accelerated, along with novel interaction tools such as live streaming or private message. However, human interaction remains to be the most crucial interaction for the luxury industry, whether it is in traditional or digital form (BOF Team 2021). Luxury buyers always prefer to have human-assisted service and it is imperative to translate those human-based activities online. By foreseeing this need, even before the pandemic, reputable brands such as Burberry have provided virtual stores or fitting rooms, and interestingly, young buyers are comfortable with those online interactions (Lee et al. 2020). While creating virtual interactions, companies need to maintain consistency across channels, since a high level of information is required for luxury products (Lee et al. 2019). Another noteworthy point is that personalization can be a double-edged sword, as customers can be threatened with the amount of information that luxury brands can acquire (Kozlenkova

et al. 2017). Therefore, it is essential for luxury brands to know their boundaries and respect privacy for each customer they cherish.

Experience is not implicitly included as a part of the original CE cycle model, but we believe it deserves a separate spot in the model due to its important role for online context, as any form of prior experience with the brand can lead to a higher chance of online purchase afterwards (Straker and Wrigley 2016). As online customer experience can never be as realistic as offline, managing experience for luxury goods becoming the hardest part in the online CE cycle, especially since the critical experiences – including touch, feel or smell the product – are eliminated (Kapferer and Bastien 2012). However, online experiences could be improved with modern equipment, such as VR, electronic wallets or virtual fitting room that can stimulates sensory and displays a shopping atmosphere online (Blazquez 2014). Those intriguing technology could help customers spend more quality time online, which can strengthen customer attachment and set the initial foundation for a desirable customer experience (Islam et al. 2019). Moreover, there are certain criteria while providing interactions online for luxury shoppers for potential repeat purchases. Customers need to locate the brand's website easily, with a friendly web interface that displays both functional and hedonic values while having unified online experiences across different brands' platforms (Bilgilhan et al. 2016). Depending on how customers perceive their experience, their emotions are constituted in this stage, allowing them to proceed to the next stage of the model.

Satisfaction from customers can be gained when their experiences are skillfully handled that allow them to finish a transaction successfully. The online environment might be different from the traditional one, yet the key to satisfying customers is always "reducing customer effort and risk" during transactions (Seck and Philippe 2013). To perform this in the luxury industry, we need personalization for quick and responsive online service delivery (Podar et al. 2018), while maintaining consistency and efficiency across channels (Lee et al. 2019). Besides, to reasonably create satisfaction, companies can emphasize utilitarian or hedonic features of the product because both can create positive effects online. In the luxury industry, utilitarian with the provision of information, collection, and online display of products also somewhat evokes a sense of self-satisfied (Ramadan et al. 2018). However, recent studies have evaluated hedonic features to be better than utilitarian in driving customer buying, since customers are also looking for experiential value (Bilgilhan et al. 2014). When hedonic products such as luxury goods can better meet the emotional needs of customers to ensure subsequent customer retention, brands can emphasize hedonic features on their online presences, such as service quickness or receptiveness (Busalim 2019). Another noteworthy point that can be useful for future field research is that hedonic features are suitable for the shape attitude towards the affordable luxury segment (Kim and Jang 2014).

Retention: As customers start to evaluate their after-sales experiences and decide if they should stick to the brand, forming relationships with them at this Retention stage can be crucial (Payne and Frow 2014). It would be ideal for firms to stay consistent by further developing hedonic values in the luxury industry while keeping an eye on functional values as retention can be boosted when the two values are combined (Zhang et al. 2017). Although social media was once overlooked (Simon and Tossan 2018), it

represents both values (Tynan et al. 2010) and also possess numerous effective means that can publish information about luxury items, manage dynamic customer relationships and promote positive attitudes towards brands in luxury marketing (Dhaoui 2014). By maintaining prominent social media marketing activities such as photo or video sharing, the customer to some extent will be motivated enough to proceed to commitment.

Commitment: When firms invest in providing additional functional and hedonic values, these two value types can be transformed into calculative and affective commitment respectively. In the luxury industry customers tend to be hedonic in nature (Wiedmann et al. 2009), in which prioritizing affective commitment can strengthen customer behavior towards advocacy (Fullerton 2005). Also, many luxury buyers will not want to commit to just one brand, because they want to express multiple identities (Parrott et al. 2015). With this particularity, a luxury firm should not necessarily strive to make their committed customers become exclusive to themselves, but should instead improve themselves by creating diversity in their products, while maintaining the enrichment of their offerings. Creating an online community is also very important when commitment will be strengthened (Schau et al. 2009) and this can also set a foundation for business advocates to operate in the future.

Advocacy is nurtured through interactions with the brand after a unified online experience (Bilgilhan 2016). When committed customers are ready to take action for the brand, their tied motivation is activated (Eelen et al. 2017) and they decide to take a leap from emotional to the behavioral-dominant stage, thus becoming advocates. In the online domain, social media is more dominant (Schivinski and Dabrowski 2016) where communities can be established for committed customers to play the advocacy role. Developing C2C on this platform can be ideal, as brands can cover their limited control that takes place in the communities. For the luxury context, brands should devote more attention to active advocates who tend to publicly promote their favorite brands or express their opinions, rather than passive advocates who choose to stay behind and observe (Arrigo 2018). Those active advocates can act as product experts and voluntarily promote their favorite brands (Solomon et al. 2006). It is noteworthy that customers can advocate multiple brands (Parrott et al. 2015), therefore it is important for a luxury brand to keep themselves attractive and let their current active advocates be involved in big events, in which those advocates can have more chances to perform their active role.

Engagement can be reached when customers develop both emotional and relational bonds with the brand, which can be the brand's initial success. Rather than being the final key CE activity, we consider Engagement as the first success, and companies should prepare for new connections when the CE cycle recirculates. However, a remarkable point is the adverse consequences from luxury brands' advocates, as when their expectations are seriously violated, they can perform anti-brand activities (So et al. 2014). With the knowledge they gained from the brand they cherished, the consequences can be substantial if they choose to deliberately sabotage the brand. Therefore, it is essential to conduct field research on how experts from luxury brands manage their engaged luxury customers while listening to the voice of highly engaged luxury consumers.

3 Conclusion

The pandemic may present obstacles when luxury brands can no longer benefit from physical boutiques' strengths and when customers, being very attuned to online shopping and developing behavioral patterns that are hard to predict. However, we consider this pandemic as an opportunity for the luxury brands, as they can accelerate and improve their online CE activities, thus opening paths for new market opportunities and segments. Besides increasing online presence and boosting the appeal of online shopping platforms, good management of CE activities is crucial to prepare luxury brands for both the present and long term – with or without COVID-19. By combining this study with field research, we hope to carve out a new, clearer path for the luxury sector to better improve luxury brands' CE activities and prepare for potential post-pandemic threats. We will seek to collect data on affordable luxury buyers and experts in the overlooked emerging market (Sharda and Bhatt 2019) which contain high value for the affordable luxury segment (Kumar et al. 2020).

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The Effect of Electronic Word-of-Mouth (eWOM) on Consumer Ratings in the Digital Era

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Abstract. Electronic word-of-mouth (eWOM) in reviews and ratings has taken a substantial role in the consumer decision-making process. It has gained popularity amongst marketers and consumers, while both parties look for the highest rating. Multiple studies have comprehensively analyzed eWOM as a purchase decision driver and, ultimately, its impact on sales. However, little is known about the rating drivers. Hence, this study aims to apply the theory of social conformity as a form of majority influence towards ratings and reviews. A survey with 198 participants analyzed positive and negative rating influence towards rating outcome, emotional impact, and strength of conformity. Descriptive statistics and regression analyses support the theory and show that it holds especially within ambiguous situations. As informational conformity was found to significantly impact rating outcomes and emotional perception, several strategies to target this bias on rating platforms and a different approach to rating assessments based on emotions are proposed.

Keywords: Social conformity · eWOM (electronic word-of-mouth) · Rating bias · Consumer reviews · Consumer decision-making process

1 Introduction

The rise of e-commerce brought through electronic word-of-mouth (eWOM), a new form of web communication, which facilitates the information sharing between service providers and consumers and opinions between consumers themselves. With the increased availability and acceptability, ratings, and reviews as a form of eWOM became a strong driver in consumers' decision-making process. They become a crucial information source as they qualify to search for detailed and reliable information by sharing past consumption experiences and thus providing an indirect purchase experience (Yoo and Gretzel 2009; Tussyadiah et al. 2008). Hence consumers tend to rely on eWOM as it allows them to obtain sufficient information to reduce their level of perceived uncertainty (Ye et al. 2011) In addition, 60% of consumers consider reviews necessary when researching products (Smith and Overbeck 2013). This disruption in consumers' habits through eWOM affects today's industries, from tourism and service to entertainment. Within the latter, consumer movie reviews have gained tremendous popularity and influence due to the intangible characteristics of movies. Moreover, the movie industry is

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significantly dependent on good ratings as those might define whether the box office will be a success or failure (Basuroy et al. 2003; Duan et al. 2008b; Moretti 2011).

Furthermore, once a movie has established a rating, it will maintain it, unlike a product or service that can react to reviews and improve accordingly. Today customers can choose from a wide range of online movie review sites where movie enthusiasts can exchange opinions and provide ratings and reviews that measure the quality of movies. The most known sites are RottenTomatoes.com. or the Internet Movie Database IMDb.com. The latter - a sub-brand of the e-commerce platform Amazon.com - can be considered one of the world's most extensive movie databases, which provides ratings and reviews to almost six million movie productions (IMDb 2022). Facing the increasing importance of eWOM, previous scholars in entertainment, specifically the movie industry, have analyzed the effect of online consumer reviews on two facets: the effect that ratings have on boxing office (Basuroy et al. 2003; Duan et al. 2008b; Moretti 2011) and the life cycle of rating scores which according to studies decrease over time (Godes and Silva 2012; Hu and Li 2011).

Lastly, this study aims to analyze if eWOM, such as customer reviews, could positively or negatively affect an individual to the extent that he would align his opinion towards the majority's view. Therefore, the movie industry was chosen for the study's purpose as experts agree that WOM plays a crucial factor in defining a movie's staying power, ultimately providing financial success (Elberse and Eliashberg 2003). Moreover, the movie industry is well represented in previous eWOM studies, allowing in-depth comparison with previously gathered results.

2 Literature Review

The most known definition of electronic word of mouth communication is described by (Hennig-Thurau et al. 2004, p. 39). They defined it as *"any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet"*. Whether online or offline, word-of-mouth can be characterized as individual product reviews from the first-person perspective, which addresses other customers (Dellarocas et al. 2014). Thereby, eWOM provides the ability to exchange information between customers beyond temporal or geographic limitations (Chen et al. 2011; Dellarocas et al. 2014). Moreover, eWOM differs crucially from traditional WOM given by reviewer anonymity and the increased amount and variety of judgments (Pan and Zhang 2011).

Characteristics of online reviews such as star ratings, the valence of reviews, and the number of ratings (Sparks and Browning 2011) and such of review providers as expertise level (Vermeulen and Seegers 2009) positively influence revenues while for customers are assisting purchase decisions. Nevertheless, since consumer ratings are based on individual opinions that are usually displayed as an aggregated total rating, the accuracy of the rating outcomes can be biased as consumers have different horizontal preferences. However, research that attempts to identify what impacts an online review or rating is limited to the underlying good and service that the review will depend on (Mudambi and Schuff 2010). Therefore, this research aims to further analyze influential factors such as the relationship between "established reviews" and "consumer review behavior".

In order to address the research purpose, this study applies the social conformity theory, also referred to as "yielding to group pressure" or "majority influence" (Crutchfield 1955).

Moreover, while various forms of eWOM such as forums or blogs (Duan et al. 2008a) are covered through Hennig-Thurau et al. (2004), this study focuses mainly on online customer reviews (movie reviews) as a crucial part of the eWOM concept. Online customer reviews are defined as *"peer-generated product evaluations posted on company or third-party websites"* (Mudambi and Schuff 2010, p. 186). A commonly used concept of reviewing is to specify a rating on a scale (stars, nominal) first to indicate the overall evaluation and provide a written review that may justify the given rating (Lee et al. 2011).

The "rule of the majority" is an established concept often used to settle arising conflicts between individuals in groups. This concept lies in the principle that a group is statistically more likely to make a better decision than an individual alone (Arrow and Maskin 2012; Grofman and Feld 1988). However, when individuals influence each other, the benefit of group decision-making disappears (Ladha et al. 1991). A disadvantage arises when individuals comply with group choices due to the discomfort of standing alone. Thus, the majority view becomes more appealing than one's own beliefs (Cialdini and Goldstein 2004). Over the last century, there has been debate contentiously about the reasons for social conformity behavior. "Conformity" generally involves compliance or obedience as it refers to any behavioral change that occurs through others' influence (Basuroy et al. 2003). Conformity is also referred to as "yielding to group pressure" or "majority influence" (Crutchfield 1955).

The study will focus on how social conformity impacts individuals through customer ratings. Early studies in social conformity showed that individuals conform to group norms in ambiguous situations (Jenness 1932). Whereby an ambiguous situation has no correct answer, different interpretations might apply. Moreover, ambiguity is often accompanied by uncertainty, while the overlap between the two concepts depends on how one defines each concept. Informational conformity is characterized through internalization – an individual accepts the views and beliefs of the majority and adopts them to its belief system (Kelman 1958). This means an individual publicly adopt the group view while privately (internally) agreeing with it. Hence, we propose the first two hypotheses:

H1: Consumers will rate a movie low (lower than five) if they know the low (lower than five) movie rating given by the majority (online community).
H2: Consumers will rate a movie great (higher than seven) if they know the great (higher than seven) movie rating given by the majority (online community).

In the case informational conformity involves internalization, one could expect the consumer to align his rating and his perception of the movie towards the majority view, which is indicated by reviews and ratings. Considering this line of reasoning, the third and fourth hypotheses read:

H3: Consumers will not enjoy a movie if they know the low (lower than five) movie rating given by the rating community.

H4: Consumers will enjoy a movie (the rate greater than seven) if they know the great movie rating given by the rating community.

3 Method

This study will use a descriptive method, as the objective is to analyze how social conformity as a form of eWOM influences users in their rating behavior. Precisely, a quantitative study was executed in the form of a survey in order to test the stated hypothesis. An analysis between two groups was conducted, whereby either a positive or a negative condition was randomly assigned and presented to participants. The survey was executed through Qualtrics.com and the gathered data were analyzed using SPSS. A total of 198 responses were recorded. Thirty-four of those responses were eliminated due to survey incompletion, limiting the sample to 164 valid individual responses, which were considered for the final analysis. The highest dropout was registered after the first question segment, assuming the second segment represented a higher barrier as it required to watch a short clip which might have affected the willingness of participants to proceed. However, we can assume that the remaining participants who passed that barrier proceeded attentively. The survey was distributed through different social media platforms (Facebook, LinkedIn, Instagram, WhatsApp) and a survey polling platform (SurveyPoll.com) to generate a broad range of responses throughout different demographics. The final sample is composed of 56% women ($M_{age} = 27.33$; $SD = 10.42$) and respectively 44% man ($M_{age} = 27.10$; $SD = 5.90$). The majority (76.8%) were aged 22 and 28, while 15.2% were over 28 years old and 5.8% were under 22 years old. The total age range varies from 17 to 65 years. While the total sample includes 28 nationalities, the majority is clearly represented by Germans (57.4%), followed by Portuguese (11.8%) and Romanians (6%).

4 Results

Defined by the rating scale from 1 "awful" to 10 "exceptional", participants who were confronted with the negative condition (exposed rating of 4.8) rated the short film lower (Skewness = .15) than those participants who were confronted with the positive condition (exposed rating of 9.8) (Skewness = −.64). Comparing the mean values obtained for the positive condition ($M = 6.60$, $SD = 2.41$) and the negative condition ($M = 5.53$, $SD = 1.97$) clearly shows that participants in the positive condition rated the short movie higher as predicted by H1 and H2. Computing the ANOVA confirms that these results are statistically significant ($p < .01$). Therefore, we can state that consumers will rate a movie aligned with the majority view, high in the positive and low in the negative conditions as stated in H1 and H2.

H2 and H3 aim at analyzing the relationship between the rating output and the emotional state of the customer in order to differentiate between informational and normative conformity. On a scale from 1 *"Extremely enjoyed"* to 5 *"Not enjoyed at all"* the level of *"Enjoyment"* was computed for both conditions. With a mean value of $M = 2.68$ ($SD = 1.16$) for the positive condition and a mean value of $M = 3.29$ ($SD = 1.07$) for the negative condition, the results show a higher enjoyment rate for the positive

condition. Stating that participants exposed to positive ratings and reviews enjoyed the short movie more than participants in the negative condition. Additionally, the level of *"Enjoyment"* shows a strong linear relationship towards the rating output ($r = .695$ $p < .001$). Moreover, a regression analysis supports these results ($p = .001$). Hence, the level of *"Enjoyment"* significantly influences the rating and vice versa, supporting H3 and H4. The enjoyment rate can explain more than 80% of the rating outcome ($B = -.834$; $p < .001$).

5 Discussion

The results indicated changes in rating scores and enjoyment factors, clearly showing that provided ratings and reviews of products or services significantly impact the customers' quality perception and purchase decision. Furthermore, users tend to align their views towards established ratings, as proven by the study. For example, most participants indicated within the positive condition (high rating) that they would consider watching the movie, while it was the opposing case for the negative condition (low rating). Thus, the underlying customer rating seems to be regarded by users as a secure predictor of quality that can be used to evaluate decision-making options.

That finding should be concerning, given that the results provide evidence that customers align their own rating score towards the majority view (H1 and H2) and internalize their perception of quality towards the majority view as hypothesized in H3 and H4. Meaning that ratings and reviews are prone to informational conformity bias (Kelman 1958), affecting the customer positively or negatively when it comes to ambiguous situations such as evaluating an experienced product such as a movie. Hence, informational conformity explains why the majority enjoyed the movie positively, showing positive ratings. Conversely, the majority in the negative condition indicated a lower enjoyment rate for the same movie.

Overall, the gathered study results provide evidence that the impact of social conformity is relevant in the form of direct physical exposures to group majorities and indirect ones in the virtual form. Nevertheless, the absence of physical group pressure might explain why normative conformity (Kelman 1958) does not hold.

5.1 Practical Implications

Results of the underlying study indicated that users tend to be biased by informational conformity while assessing and providing a rating. In order to overcome that bias, rating platforms could hide user ratings until a predefined number of ratings is generated so that other users do not influence users. Moreover, the results showed evidence that experts are less prone to rating conformity. Therefore, besides the average consumer ratings, rating platforms could provide an expert rating as an additional quality indicator. Furthermore, a combined rating tool based on experts and general audience view with a higher weight on experts might improve the rating quality.

5.2 Theoretical Implications

Previous studies in social conformity have analyzed the effect of *Individualism* vs. *Collectivism*, picking up those concepts throughout different periods of history, thereby evaluating the robustness of concepts over time. Conformity theory as an imprecise concept varies with the different findings on social influence studies – it has been continuously improved ever since. Other studies use different experimental paradigms to focus on the relationship between cultural values and other responses to social influence in terms of internalization. While those studies have provided some ground setting contributions in the field of social conformity – most have been conducted within the pre-era of the world wide web and thus could not consider that through e-commerce and social media –, new forms of majority thinking and group pressure in a virtual form as eWOM could arise. Therefore, the findings of this current research make several theoretical contributions to conformity theory by it in a new context of eWOM.

5.3 Limitations and Suggestions for Future Research

Despite its valuable findings and implications, this study entails limitations that warrant future research. First, the applicability of findings to the general population is an issue, as the sample is primarily restricted to students aged between 22 and 28 (76.8%). Moreover, the study included participants mainly from Germany and Portugal, which restricts the geographic applicability to those two locations. Therefore, future research should target a broader sample allowing for investigation towards different age groups and nationalities while also considering broader user habits.

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Effects of Endorsers Popularity and Gender on the Audience's Attention to the Advertisement from a Neuromarketing Perspective: An Eye-Tracking Study

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Abstract. Nowadays, advertisement is known as one of the essential promotional components of marketing tools. Hence, advertisement plays a crucial role in companies' marketing strategies and policies. Accordingly, the present study aimed to determine the role of endorsers and their gender on the amount of attention paid to the elements in advertisements. The current research was a quasi-experimental study. The statistical population of this study consisted of all students at Ferdowsi University in Mashhad. Out of all students, 80 individuals were selected as the research sample. An eye-tracking device recorded eye movements. Research findings indicated that endorsers' popularity had a significant effect on the number of fixation and fixation duration of the elements existing in advertisements. On the other hand, the effect of gender on the number of fixations and fixation duration was not significant. According to these determinations, the popularity of the endorser plays a vital role in advertisements; however, the gender of the endorser does not have a significant impact.

Keywords: Endorser · Advertisement · Eye-tracking · Attention · Neuromarketing · Fixation duration · Area of Interest (AOIs)

1 Introduction

Nowadays, advertisement has surrounded such a broad spectrum that it does not even leave people in their sleep. Thus, every organization tries to find and use an advertisement to reach its target market. According to the model proposed by Robert and Stahl (1993), the effectiveness of advertising starts with the audience's attention, and each specific advertising stimulus must first attract the attention of consumers. The next step after interest is the audiences' desire to buy, and the last stage is action, meaning that consumers decide to buy a product (Robert and Stahl 1993). Undoubtedly, marketing techniques can affect attention and enhance the effectiveness of advertising in

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several ways (Ferreira et al. 2011). On the other hand, customers often engage in pre-purchase investigation behavior to reduce the perceived pre-purchase risk (Mitchell and Greatorex 1993; Mitchell 1999). Their sources of information can be their memory, personal resources (word of mouth from friends and acquaintances), marketing resources (advertisements and other marketing-related factors), experimental resources (their own experiences), and independent resources (reputation) (Blackwell et al. 2001). With information resulting from the company's marketing efforts, independent resources seem to be more reliable and credible (Pornpitakpan 2004). Information sources are generally deemed reasonable only when considered honest and valid (Wilson and Sherrell 1993). Hence, advertising managers utilize product endorsements to convey valid messages.

2 Literature Review

McCracken (1989) illustrates employing famous and reputable individuals as endorsers as a marketing technique as follows: A person who is known publicly and takes advantage of their reputation by standing by a product in an advertisement in favor of a consumer product (Knoll and Matthes 2017). Famous individuals or celebrities frequently appear in market communications to facilitate brand familiarity and advertising differences in cluttered and chaotic media environments (Atkin and Block 1983; Erdogan and Baker 2000; McCracken 1989; Patel 2009). Approximately 20 to 25% of advertisements generally utilize celebrities as endorsers to demonstrate the products (Sliburyte 2009). Especially in recent decades, employing famous male and female endorsers has increased exponentially (White et al. 2009). Although the gender of the endorser has generally been seen as significant (Erdogan 1999; McCracken 1989), few studies have explicitly addressed this variable in their empirical research. The lack of research on the impact of gender is relatively surprising because compelling research has shown that men and women react differently to male and female endorsers. Marketers and advertising directors frequently believe that a large proportion of human decisions are automatic, often without conscious effort and control (Matukin et al. 2016). More extended visual stability leads to high levels of processing both at attention and memory level (Just and Carpenter 1976) and the subconscious level because viewers extract the information in their glare (Nummenmaa et al. 2006; Wedel and Pieters 2000). In the 1800s, the American psychologist William James stated: We cannot claim that an object that was once noticed will remain in memory, but something that has been ignored will leave no path (Adil et al. 2018).

Eyes and their movements are described as a window to the mind. They recreate a vital role in expressing an individual's desires, cognitive processes, and emotional states (Underwood and Foulsham 2006). The importance of eye movements is connected to how we gather the information necessary to identify the features of the visual world. If we track eye movement with high levels of accuracy, we can find out which areas of the visual space are precisely processed, including visual attention (Duchowski and Duchowski 2017; Gamito et al. 2014). Since eye movements are an indicator of hidden visual attention (Posner 1980), eye tracking techniques can provide new insights into the processing of visual stimuli (e.g., print ads, web pages, packaging) and consumers' decision-making (Wedel and Pieters 2008). For example, eye movements can determine if a particular feature of an ad (static or video) is of interest to the user. Consequently,

studying such movements can potentially improve marketing strategies and influence potential consumers. Thus, recording eye movements can help manage how customers maximize profits (Rosa 2015).

Falsarella et al. (2017) employed an eye-tracking device in Brazil to examine how the audience paid attention to the endorser. Their discoveries revealed that people paid more attention to brands and products endorsed by a celebrity. Also, Felix and Borges (2014) also operated an eye-tracking study and analyzed the famous endorser without considering the crucial initial stage of information processing and focused on the audiences' visual attention to the endorser. According to their results, the endorser had a positive relationship with the attractiveness of the advertisement and the recipient's attitude towards the ad. In this context, Adil et al. (2018) examined the presence of face and gaze direction in print adverts using an eye-tracking device and investigated their impact on consumer responses. Findings illustrated that the presence of the face had a strong influence on the audiences' attention, their assessment of the advertisement and the brand, and their intention to purchase a product of the advertised brand. Darabi et al. (2018) also performed a study entitled "Processing and analyzing electroencephalographic signals to assess the effect of sports advertisements on customers." They concluded that recording the customers' brain waves using electroencephalography could discover the effect of Nike advertisements in customers' brain waves (alpha, beta, delta, and theta). They also showed that by processing and analyzing signals, it could be concluded that advertisements expanded the customers' focused and analytical thinking. In another study, Ferguson and Mohan (2020) examined the effect of a celebrity or non-celebrity in a B2B print ad. Their findings indicated that the presence of a well-known endorser made managers pay more attention to the advertisement. Furthermore, Zhu et al. (2020) also examined how social media endorsements influenced consumers' perceptions of brands, product attractiveness, and motivation to purchase the product. According to their research findings, consumers' attitude to the brand was influenced by the endorser's attractiveness and self-confidence. Finally, Gilal et al. (2020) also conducted a study entitled "Celebrity endorsement and brand enthusiasm among air travelers: theory and evidence." They showed that the attractiveness of celebrities had the most significant impact on travelers' enthusiasm for the brand. Thus, it could be argued that the presence of the endorser is quite crucial for the advertisements of organizations and companies on the one hand. On the other hand, also, the researcher found that neutral marketing tools were not used much in studies on endorsements. Hence, the present study aimed to use an eye tracker to answer the following question: *Will endorsers and their gender influence the customer's visual attention to the elements in the ads?*

3 Method

The statistical population of this study consisted of all male and female students studying at Ferdowsi University, Mashhad, Iran, in the academic year of 2018–2019. Out of all students, 80 individuals (40 male and 40 female students) were volunteered to participate in the study (Felix and Borges 2014). First, the researcher designed the poster. In this regard, an image of men's sunglasses and women's sunglasses were selected, and a logo was designed for it. These images were repeated in all advertising posters to ensure that the product's shape and appearance or logo would not affect people's attention. Two sunglasses were selected for the poster because the subjects were both male and female. A logo was also designed so that familiarity with a particular brand would not affect participants' attention. Then a photo of two famous athletes, Saeed Maroof (the male endorser) and Kimia Alizadeh (the female endorser), were selected for the poster. In addition, a photo of an unknown male and an unknown female similar to Saeed Maroof and Kimia Alizadeh was selected in terms of their physical appearance, body, and clothing.

It should be noted that all posters were designed in the same way so that the poster design would not affect people's attention. Also, the placing of the endorser, the product, and the logo were different in the posters to control the effect of place or direction on people's attention (Rebollar et al. 2015). As a result, four posters were designed to display the endorser and one without any individual. Each of the first four posters was then triplicated into three separate posters by changing the location of the endorser, the product, and the logo on the poster. Besides, the poster without the presence of an endorser was also duplicated with the different placing of the product and the logo. Finally, 14 posters were designed. Then, to control the effect of the order of the posters, they were displayed in a random order for each participant. Each participant was asked to sit on a chair in front of the monitor and wear eye-tracking glasses (Fig. 1). They had to have a 50–60 cm distance from the monitor only to see the computer screen (Felix and Borges 2014). Then, the participant was asked to look at the screen without moving. The glasses were calibrated to ensure the correct placement of the glasses on the participant's eyes. In the last step, the images were presented to the participants. All participants viewed all 14 advertising posters for 210 s (15 s each) (Felix and Borges 2014).

In this study, the SMI-ETG2 eye-tracking glasses were used to monitor the participants' eye movements. This device was used to record the participants' gaze behaviors. The stimulus was displayed on the monitor screen and the infrared cameras, embedded in the glasses' frame, recorded eye movements when viewing the screen at a sampling rate of 60 Hz/s. The I-view software was used to record the eye movements, and the BeGaze software was used for initial data analysis. Three Area of Interest (AOI) were defined in the BeGaze. In addition, all participants' number of fixations and fixation duration were calculated and analyzed in the statistical analysis.

Fig. 1. Subject recording the data

4 Results

4.1 Fixation Durations

Endorser AOIs. Results of a two gender (male and female) × two popularity (popular, non-popular) ANOVA showed that there was a significant effect of popularity on fixation duration on body AOIs: $F(1,79) = 19.68$, $p < .001$, $\eta^2 = .17$. However, gender ($p = .722$) and interaction effect of popularity in gender ($p = .308$) were not significant.

Glasses AOI. Results of a two gender (male and female) × two popularity (popular, non-popular) ANOVA showed that only the main effect of gender was significant: $F(1,79) = 32.23$, $p < .001$, $\eta^2 = .290$ and the main effect of popularity ($p = .631$) and interaction of popularity in gender ($p = .459$) were not significant.

Logo AOI. Results of two gender (male and female) × two popularity (popular, non-popular) ANOVA showed a significant main effect of popularity: $F(1,79) = 4.01$, $p = .048$, $\eta^2 = .048$; and gender: $F(1,79) = 36.50$, $p < .001$, $\eta^2 = .316$. However, the interaction of popularity in gender was not significant ($p = .904$).

4.2 Fixation Counts

Endorser AOIs. Results of a two gender (male and female) × two popularity (popular, non-popular) ANOVA showed that the main effect of gender was significant: $F(1,79) = 49.66$, $p < .001$, $\eta^2 = .386$. However, the main effect of popularity ($p = .195$) and the interaction of popularity in gender ($p = .203$) were not significant.

Glasses AOI. Results of a two gender (male and female) × two popularity (popular, non-popular) ANOVA showed that there was a significant main effect of gender: $F(1,79) = 33.39$, $p < .001$, $\eta^2 = .297$. However, the main effect of popularity ($p = .897$) and interaction of popularity in gender ($p = .465$) were not significant.

Logo AOI. Results of a two gender (male and female) × two popularity (popular, non-popular) ANOVA showed that the main effect of gender was significant: $F(1,79) = 8.57$, $p = .004$, $\eta^2 = .098$. However, the main effect of popularity ($p = .359$) and interaction of popularity in gender ($p = .950$) were not significant (Fig. 2).

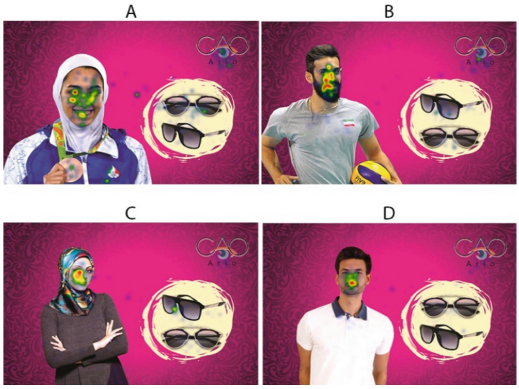

Fig. 2. Heatmap for A) Female-popular, B) Male-popular, C) Female-non-popular, and D) Male-non-popular

5 Discussion

Attracting the attention of advertisement audiences has always been an essential concern of the owners and designers of the ads. One of the elements that have attracted the audiences' attention was using people in the ads. Marketing methods can influence the audiences' attention and improve the effectiveness of advertising in several ways (Ferreira et al. 2011). Thus, the present study aimed to examine the amount of attention paid by audiences to ads with popular and non-popular endorsers. Research findings indicated that the presence of an endorser on an advertising poster could attract the attention of audiences. This finding was consistent with the results of the studies by Adil et al. (2018), Falsarella et al. (2017), Felix and Borges (2014). Weaver and Lauwereyns (2011) stated that humans paid more attention to the people and their faces among the stimuli in the ads. Also, according to the arguments made by Langton et al. (2008) and Theeuwes and Van der Stigchel (2006), humans and the human face attract the most amount of attention. Even babies prefer the human face to other faceless objects in their early years. This preference only increases with age (Frank et al. 2014). The findings of this study were indicative of the significant relationship between these variables and confirmed it.

As a tool for visual communication, advertising will only be successful if the viewer pays enough attention to its message. Advertising executives often believe that the more designers can draw viewers' visual attention to what the ad deems essential, the better. The common assumption is that the longer the gaze, the higher the levels of attention and interest. It is also assumed that greater interest equals positive reactions and even attraction to the advertised product (Matukin et al. 2016). In this hypothesis, analyzing the variables of the total mean duration of the gaze and the mean number of the gazes showed that the presence of the endorser in the ad could attract the audience's attention to the ad. As a result, the use of endorsers in advertising could be a factor as far as attracting the audience's attention was concerned. Another part of the research focused on examining the role of the endorser's gender to analyze the level of effectiveness of the endorser on the audiences' attention in more detail. Research findings suggested

no difference between the attention paid to the male and the female endorsers. This finding was compatible with the results obtained by (Freiden 1984). Therefore, they can draw the audiences' attention to the advertised product/service. Whereas in Iran, such attractions cannot be used due to the existing restrictions. As a result, no difference was seen between the participants' attention to male and female endorsers. Thus, it could be concluded that this lack of difference could most likely prevent the effect of the endorser's gender on the advertisements. In the present study, it was specified that the presence of the endorser drew the audiences' attention to the ad, meaning that using a person in advertising could attract people's attention to the ads. Besides, it was also found that people drew more attention than other stimuli in the ad. In addition, another study showed that the endorser's gender did not impact the audience's attention. Nonetheless, it must be noted that paying attention to an individual, a logo, or a product did not necessarily arouse interest. Therefore, the association between visual attention and positive attitude might depend on other variables not measured in this study. In sum, future studies could focus on this gap.

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Influencers' (Parasocial) Relationships with Their Followers: Lessons for Marketers and Influencers

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Abstract. As influencer marketing is growing, research related to the field is following suit. The relationship between influencers and their followers, most often referred to as parasocial relationships, has become of particular interest as it holds the ability to affect the influencer's career, followers' responses and the success of influencer-brand collaboration. Consequent to secondary research and an empirical study conducted in South Africa, this opinion paper concludes with five lessons for influencers and strategic marketers. The lessons emanate from the power of parasocial relationships and are viewed as fundamental principles to be considered prior to the tactical implementation of influencer-brand collaborations.

Keywords: Social media marketing · Instagram · Influencers · Parasocial relationships

1 Introduction

"How can you squander even one more day not taking advantage of the greatest shifts of our generation? How dare you settle for less when the world has made it so easy for you to be remarkable?"

These wise words by marketing guru Seth Godin (Boyd 2013) can also be applied to the world of social media marketing. Not only is social media a rapidly growing phenomenon, with more than 4.6 billion global users in 2021 (Hootsuite 2022), but it is also a platform that enables marketers to reach niche market segments at a fraction of the cost of more traditional advertising methods. In essence, it can be argued that firms that want to be "remarkable" should embrace the power of social media marketing.

Instagram is a popular social media platform that mainly focuses on capturing and sharing visual content (Kim et al. 2017). Since its inception in 2010, Instagram has grown to more than 1 billion active users in 2021 (Statista 2022) and it is one of the most popular social network sites that marketers can incorporate into the marketing mix (De Veirman and Hudders 2019). Influencer marketing is an attractive advertising method used on Instagram (Wallsbeck and Johansson 2014), whereby the influence of key individuals or opinion leaders is used in an attempt to exercise a positive impact on consumers' brand awareness and their purchase intentions (Lou and Yuan 2019).

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Despite a growing research focus across the globe, empirical research pertaining to influencer marketing in South Africa is dearth. Therefore, a research project was undertaken to investigate influencer marketing from a South African perspective. During the research process, it was noted that a large portion of research pertaining to influencer marketing focuses on understanding the determinants and consequences of successful influencer marketing, most often within the context of Youtube, Twitter and Facebook with extant Instagram-based inquiry more limited, but on the rise. The importance and power of parasocial relationships also became apparent. These research trends sparked an interest in a deeper conceptual understanding of influencers' parasocial relationships with their followers and the fundamental requirements these relationships impose. This paper should be viewed as an opinion piece and continues to discuss influencer marketing and parasocial relationships and consequently concludes with five key lessons directed towards influencers and marketers.

2 Theoretical Perspective

2.1 Influencer Marketing

An influencer is an individual who enjoys public recognition and uses this recognition to promote goods and/or services to consumers (Bergkvist and Zhou 2016). The use of influencer marketing on Instagram can be argued to be effective because of the meaning transfer that occurs between an influencer and their target audience. By following an influencer, certain identity characteristics are transferred from the influencer to the follower (Jin and Muqaddam 2019). In many instances, influencers are individuals who followers perceive as their "future selves" and they act as role models for consumers who follow them (Ge and Gretzel 2018). It can, therefore, be argued that followers tend to re-enact and follow the behaviour, habits and norms of the influencer (Fleck et al. 2012).

When Instagram users search for influencers who seem appealing to them, it is important to ensure that the content linked to the influencer is credible (Sokolova and Kefi 2019). Two components can influence an individual's credibility in an Instagram context, namely user-generated content (UGC) and system-generated cues (SGC) (Jin 2018). UGC is a way through which individuals express themselves and communicate with others in an online environment (Roma and Aloini 2019), while SGC are quantitative indicators that can influence an individual's identity, popularity and credibility (Lin et al. 2016). Instagram users typically rely on UGC and SGC to evaluate an influencer's credibility (Djafarova and Trofimenko 2018) and once credibility has been established, followers also use UGC and SGC to determine whether they want to form a so-called parasocial relationship with a specific influencer (Sokolova and Kefi 2019). Followers on Instagram often form parasocial relationships with influencers as a method for curbing loneliness and developing their online identity (Essamri et al. 2019). Before selecting an influencer, brands should, however, ensure that parasocial relationships do exist between the influencer and their target audience (Sokolova and Kefi 2019).

2.1.1 Parasocial Relationships

The term parasocial relationship, was coined by Horton and Wohl (1956) to describe the pseudo-friendships that form between members of an audience and media personalities or characters. Parasocial relationships can be defined as one-sided relationships that media audiences or users establish with public figures such as politicians and celebrities, and in more recent cases, influencers (Escalas and Bettman 2017). Parasocial relationships, despite some commonalities with actual interpersonal relationships (e.g. developing from recurring exposure over time) (Tolbert and Drogos 2019), are self-established and the other members of the audience and the public figure could be unaware of the relationship (Sokolova and Kefi 2019). Therefore, parasocial relationships can be described as an illusionary experience where people incorrectly believe that they are engaged in a two-way conversation and develop a so-called false sense of intimacy (Jin 2018). The perceived relationship often grows as a result of knowledge accumulated by followers through exposure to an influencer's content, such as information about their style, personality, preferences, and personal life (Hwang and Zhang 2018). Parasocial relationships are maintained through engagement and by means of accessibility, community and intimacy (Van Eldik et al. 2019).

Previous research has indicated that the entertainment value of the content generated by an influencer, their expertise, trustworthiness, attractiveness, and the extent to which followers perceive themselves to be similar to their favourite influencers, are all positively related to the parasocial relationships between influencers and their followers (Lou and Kim 2019). It is this content that builds the influencer's perceived identity, but also the online and offline identity and sense of belonging of their followers (Van Eldik Kneer et al. 2019; Essamri, Mckechnie and Winklhofer 2019). Research has also indicated that a strong parasocial bond with an influencer will probably result in more time devoted to consuming the influencer's content (Tolbert and Drogos 2019; Folkvord et al. 2019). Furthermore, a Youtube-based study suggested that strong parasocial relationships can negate the potential negative effect of disclosing the selling intent of an influencer's content (Boerman and Van Reijmersdal 2020). Thus, it can be argued that influencers may even affect brand perceptions and consumption-related decisions (De Veirman et al. 2019).

Globally, there is a strong research focus on followers' parasocial relationships with social media influencers (in particular Instagram-based influencers), but from a South African perspective, research in this field is scant. To address the knowledge gap in this regard, an experimental research study ($2 \times 2 \times 2$ between-subjects factorial experiment) was conducted in South Africa to assess the possible influence of advertising disclosure, number of followers and authority heuristics on source credibility, brand attitude, parasocial relationships and purchase intention. It was found that source credibility and parasocial relationships were significantly influenced by advertising disclosure – respondents signalled a stronger source credibility and parasocial relationship when no advertising disclosure accompanied an influencer endorsement (Beyers 2020). The finding related to parasocial relationships and advertising disclosure contrasts with research from other geographical areas that provocate for greater disclosure and transparency as a sign of authenticity. As stated before, the contrasting results triggered the need for a deeper understanding of influencers' parasocial relationships with their followers and

the fundamental requirements these relationships impose. Secondary research showed that there are many tactical suggestions for being a more successful influencer and for improved influencer marketing. However, before implementing tactics, there seem to be lessons that are fundamental to a sustained career as an influencer and to effective influencer marketing. This opinion paper concludes with five lessons for consideration by influencers and strategic brand marketers.

3 Lessons for Marketers and Influencers

Many influencers hope for a long and prosperous business career – an endeavour that is quite impossible without the continued support of the brands they endorse and their followers. From the previous discussion, a number of lessons for sustained success to be considered by influencers and strategic marketers can be extracted.

3.1 The Importance of Showing Up

Influencers' continuous and consistent engagement with followers builds parasocial relationships and negatively influences distrust (Baek et al. 2013). In a world where trust is often low, an influencer that consistently "shows up" can play an important role in building trust and facilitating the transfer of positive associations to the brands they endorse (Carrillat et al. 2010). A follower is likely to make the assumption: "if the influencer can trust the brand, so can I." Research reveals that trust is important as it contributes positively to long-term customer relationships. Further, social media influencers have been found to contribute positively to trust levels across the consumer decision-making journey (Pop et al. 2021). It is therefore important for strategic markers that wish to embrace the power of social media to collaborate with social media influencers that consistently engage with followers and the brands they endorse – a tactic that can lead to trust, commitment and ultimately follower loyalty towards a brand.

3.2 A Clear Identity as Foundation

According to Melewar et al. (2017) identity, along with strategy, is critical for driving communication and for building stakeholder trust, loyalty and commitment. A clear identity guides purpose and forms the foundation of a strong brand. Thus, clarifying identity should be an influencer's first priority when pursuing a career in influencer marketing and it should guide follower engagement and brand endorsement decisions. Endorsing brands that are not aligned with the influencer's identity will most likely be perceived as unauthentic, will negatively impact parasocial relationships with followers and could ultimately lead to an undesired image. Although strategic marketers are encouraged to assess the parasocial relationships between influencers and their followers (Sokolova and Kefi 2019), they have little influence in these relationships. Therefore, collaborating with influencers whose identity is clear, consistent and in sync with the brands they manage is critical for a mutually beneficial brand-influencer relationship.

3.3 Meaningful Collaboration

Influencers are encouraged to strive towards forming meaningful collaborations with the strategists of the brands they endorse. It means that collaborations should be intentional and directed towards achieving a significant, pre-determined outcome (Röll 2017). For instance, meaningful influencer-brand collaborations infer joint planning, agreed-upon implementation (e.g. product trials, social media posts, and the use of relevant hashtags) as well as relevant measurement – all centred on the achievement of mutually beneficial outcomes. It is recommended that influencers who seek to retain their authenticity and credibility in such collaborations improve and showcase their practical know-how of the brands they endorse. Strategic brand marketers, in turn, will benefit from stipulating the influencer's brand knowledge and usage demonstration in the influencer contracts they confirm.

3.4 An Ethos of Disclosure?

Previous research on disclosure has been paradoxal. Some findings have indicated the potential negative impact of advertising disclosure on source credibility and parasocial relationships (Beyers 2020). Such results should, however, not act as an impetus for non-disclosure. Rather, the influencer is encouraged to consider their disclosure ethos, e.g. their moral views and beliefs pertaining to disclosing their commercial involvements and/or brand support. Such ethos can be stipulated in a policy statement to manage the expectations of followers. The policy statement can serve as a tool for clarifying the influencer's approach to brand endorsement, meaningful collaboration and advertising disclosure – it can positively enhance parasocial relationships by inviting followers into the relationship with the brand, instead of only viewing advertising disclosure as a legal requirement. Influencers with a clear disclosure ethos are more attractive to strategic marketers as it clarifies expectations, signifies trustworthiness, and can direct performance standards.

3.5 Power Requires Responsibility

It can be argued that parasocial relationships exist as a result of followers' interest in, interaction with and even admiration for an influencer. The influencer is often seen as an opinion leader and thus holds power based on traits such as the information they have access to, their expertise, their achievements and the referrals they trigger (Lamb 2019). Examples are ample of how such power has influenced the perceptions, attitudes, well-being and behaviour of followers over the years – think of the scandals surrounding James Charles' grooming of younger men (Widjojo 2021) and the Stauffer parents who rehomed their adopted child (Komar 2020). It has become imperative that influencers acknowledge the power they hold and assume the consequent required responsibility. Advertising disclosure is governed by many countries, but assuming accountability for the impact they have, remains the prerogative of the influencer – a mammoth undertaking, not only for the influencer, but also for marketing teams selecting and collaborating with these influencers.

4 Conclusion

This study extends the scope of research and dialogue on influencer marketing by focusing specifically on the parasocial relationships that exist between Instagram influencers and their followers. A theoretical investigation, backed by a primary study that was conducted in South Africa, enabled the authors to suggest a number of lessons that can be used fruitfully by strategic marketers and influencers in an Instagram context. It is believed that the insights of this paper can assist firms to be "remarkable" – to echo the wise words of Seth Godin.

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Innovation, Commercialization, and Sustainability of Earth Observation in Space Business: Tensions and Paradoxes

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Abstract. Due to globalization, digitalization, and technological advancements, the space business sector and satellite-based Earth Observation (EO) are growing exponentially. Through satellites, EO enables the monitoring of atmosphere, land, rivers, lakes, and oceans. Numerous applications for numerous industries can be developed. All these factors are bringing new tensions and paradoxes for leaders of EO organizations. This article addresses five major tensions and paradoxes. First, should leaders look at EO sustainability from financial and/or environmental/social perspectives? Should EO projects and EO companies be public and/or private funded? Second, should they be tech-push and/or market-pull? Should the communication focus on technical attributes and/or buyers' market pains? Should the price be cost-based and/or market-driven? Third, should EO eCommerce solutions be developed for the global and/or local markets? How to pass the message to the global and/or local market? Should EO leaders focus on benefiting from economies of scale and/or satisfying customized needs? Fourth, should the business models of EO marketplaces and online stores be centralized and/or decentralized? Should they bring the suppliers and customers on-board earlier, during, and/or late in the process? Finally, which governance model should be adopted for large consortia and EU projects? How to manage cooperation and/or competition in business and innovation ecosystems?

Keywords: Innovation · Business models · Sustainability · eCommerce · VCW – Value Creation Wheel Method · Earth Observation · Satellites · Horizon 2020

1 Introduction

Nowadays, the space business sector is dealing with numerous tensions and paradoxes. Space business relates to all the economic activities conducted by public and private organizations towards the development, manufacturing and commercialization of components that go into Earth's orbit or beyond, including ground stations and all the satellite-related activities used to provide Earth Observation (EO) enabled products and services

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to intermediary and final users (Bromberg 2000; OECD 2016, 2019a). EO is being used to support numerous remote sensing activities, which observe objects from platforms (e.g., satellites, drones) that are distant from the object being observed. Satellite-based EO remote sensing data allows individuals and organizations to map, monitor, and help to manage critical resources across major fields such as air quality management, coastal and marine, agriculture, forestry, natural disasters, urban areas, oil and gas, renewable energies, and security (see Copernicus 2019). After being processed, EO images are used to develop an extensive range of applications to assist governments and industries. For example, they might be used for defense purposes, to monitor fire and deforestation areas, to manage the impact of agriculture, fishing, and aquaculture activities, to help to establish urban settlements and housing, to assess the potential for the development of transportation routes, to discover and monitor the places for renewable energies installations (e.g., wind, solar, hydropower), for internet and communication purposes, and for tracking the progress on the Sustainable Development Goals (SDGs). As such, Earth Observation Service Providers (EO-SPs) quite often face the paradox of choice (Schwartz and Schwartz 2004) to identify the target markets and market applications with more potential.

Due to the EO remote sensing potential, markets, competitors, and buyers in this sector are increasingly global and new challenges are constantly emerging. EO-SPs, which had a long tradition of providing customized local solutions, are now being asked to provided mass-customized solutions that can be used across the planet. The borders between industries, market segments and market players are becoming less clear. Both incremental and radical innovations are resulting from collaborations across different industries and partners spread across different countries. Simultaneously, while end-users become increasingly demanding and sophisticated, there is an escalating saturation of technological solutions in most markets. Consequently, the pressure exists to change the focus from technological-orientation to market-orientation. Also from a governance perspective, many new challenges emerge. The socio-economic value of satellite EO is yet to be measured (Tassa 2020). Companies that were previously competing, are now encouraged to cooperate to have access to the support of governmental agencies. Mergers and acquisitions are becoming more common. While some governments prefer to control their own satellite navigation systems (e.g., GPS, Glonass), the EU prefers to make it open and under civilian control (Galileo).

Due to globalization, digitalization, and competitiveness, tensions, and contradictory demands in the EO sector are constantly increasing. I present in this exploratory paper five tensions that are currently affecting EO leaders (executives, managers, engineers, scientists, and public policy makers). Leaders might address these tensions as being trade-offs, compromises, or paradoxes. A trade-off looks for "an either/or decision as leaders strive to select between alternatives—A and B—that each pose advantages and disadvantages". A compromise implies finding a common ground between different options. It tries to find a "blended solution", where "A and B are combined to form a new option, C." Finally, paradoxical management seeks a "both/and" solution and "to engage competing demands simultaneously, rather than focus on one side or develop a blended solution" (Lewis et al. 2014, pp. 61, 62). To address these tensions, practitioners are encouraged to adopt a "paradox lens" and follow a dynamic equilibrium (Smith and

Lewis 2011). I recommend following a paradoxical leadership style, which allows leaders to be agile and adopt practices that help to manage "both/and" solutions for the various EO challenges. I start by presenting the evolution of space business and satellite based EO sectors. Then, after presenting the five types of tensions and paradoxes in EO, I conclude the article with managerial and public policy implications.

2 Space Business, and Satellite EO: Past, Present, and Future

Globally, governments invest in space capabilities for governance purposes, to develop innovation and research capacities, and to address several socio-environmental motivations aligned with the SDGs and the European Green Deal (EC 2019, 2022). Investment in space business and its activities had an increase of 44% during the last decade, having surpassed USD 75 billion during 2017 with public investments representing the bulk of funding (OECD 2019b). Although private investment in space companies is small compared to public funds, it achieved a record of USD 14.5 billion during 2021 (Sheetz 2022).

Major evolutions in digitalization, science, and technological innovation have supported the development of the space sector during the last century and led to different cycles of space development (see OECD 2016, 2019b). The pre-space age was initiated during the first half of the 20th century with the launch of the first Goddard and V-2 rockets. In 1957, the Soviet Union launched Sputnik, the first satellite in orbit. During the first cycle of space development (1958–1972), we had the first humans in space and the first military EO applications supported by spy satellites. During the second cycle of space development (1973–1986), major players (China, Europe, Japan) entered the space race, and the USA and Russia further developed its military applications and systems (GPS and Glonass). EO took its initial steps in civilian and commercial applications. During the third cycle (1987–2002), more actors entered the space market and the number of space and satellite EO applications for military, civilian and commercial purposes increased exponentially (OECD 2019c). During the fourth cycle (2003–2018), the EU introduced Galileo as Europe's global navigation satellite system, designed, and developed by the European Space Agency (ESA). This is the first and only public owned satellite navigation system that is under civilian control. It is the most accurate satellite navigation system in the world, providing precise global position and timing accuracy, which can be used for unlimited governmental and commercial applications (Galileo 2021, 2022).

These days, we are in the fifth cycle of space development (2018–2033). The investment in space-related start-ups is essentially from public funding and private investment is still in an early stage (European Investment Bank 2019). However, there are more than 80 countries with a registered satellite in orbit, representing an increase of 64% during the last decade. The EO value chains are more global and numerous actors are entering the EO market launching a significant number of applications for military, civilian and commercial purposes. While some activities are reasonably mature (e.g., first generation of satellites, space launchers, security projects), there are many emerging space activities (e.g., space tourism, in-orbit servicing, space mining, and resource extraction) that still need to prove their long-term sustainability (OECD 2019b).

3 Tensions and Paradoxes in Satellite EO

3.1 Focus of EO Sustainability and Funding: Financial and/or Environmental/Social

Globally, there is an inconsistent usage of the term sustainability in the EO sector. In this paper, I address sustainability from a "triple bottom line" (TBL) perspective (Elkington 1997) aligned with the holistic EU viewpoint. EO projects using this term often refer to one or two of three known sustainability lines (social, environment, and economy). These lines are also known as the 3Ps- People, Planet and Profit. In essence, the TBL perspective tries to manage the tensions among these three lines and works as a framework for measuring performance. It is not realistic to follow a "pure" profit/economic approach for sustainability in the EO sector. Numerous EO-based services are still in an early stage of technological development and far from go-to-market. Moreover, the EO sector has a significant social and environmental impact and is very much associated with the SDGs. From an EC perspective it is aligned with all the 6 EC 2019-24 priorities, namely the ones regarding a Europe fit for the digital age, European Green Deal (EGD) (EC 2022), and corporate social responsibility (see e.g., Directive 2014/95/EU - NFRD & 2021 CSRD). This justifies why organizations in the EO sector are being funded mostly by public funds.

Nowadays, the EGD for the EU and EU citizens is also putting a strong focus on these social and environmental challenges. The EGD is a critical component of the European Commission's strategy to implement the United Nation's 2030 Agenda and the SDGs (EC 2019). EO-based services are often associated with the social perspective of the EGD which "aims to transform the EU into a fair and prosperous society (…). It must put people first, and pay attention to the regions, industries, and workers who will face the greatest challenges" (EC 2019, p. 2). These practices provide value to society and "give back" to the community. Similarly, EO-based services are often aligned with the EGD environmental perspective. The EGD (EC 2019, p. 2) "(must) protect the health and well-being of citizens from environment-related risks and impacts. (…) It aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use". A strategic security question for Europe's EGD ambition is safeguarding the supply of critical resources and raw materials required for "clean technologies, digital, space and defense applications" (EC 2019, p. 8). Similarly, the TBL refers the need to engaging in practices that do not compromise environmental resources for future generations, such as the appropriate use of forestry and energy resources, reducing greenhouse gas emissions, and minimizing the ecological footprint (Goel 2010).

3.2 EO-Based Services and Organizational Teams: Tech-Push and/or Market-Pull

EO organizations are facing the challenge of moving from science-led and tech-push organizations to more hybrid market-pull and tech-push ones. An extensive review of over 150 EO websites by the NextLand H2020 project, revealed that the EO-SPs platforms still present numerous barriers for intermediary-users, and end-users. Although

the Copernicus website presents 233 use cases (Copernicus 2022), EO websites rarely present successful use cases or examples demonstrating the added value of EO solutions from a buyer perspective. There is a lack of price transparency and only a few present catalogues of selected services. The great majority of EO websites are tech-oriented and present a vague and incomplete description of EO service attributes. Nevertheless, many already understood that customers buy benefits. Consequently, they are being forced to change their tech-positioning and their speech, which was previously focused on the "what" (i.e., the technology), to bring on board "the why?" (i.e., the benefits). However, to do so they must face several sources of organizational constraints and inertia (Fonseca et al. 2018; Lages 2016).

From 2008 up to 2020, the EU has invested over EUR 8 billion through its Copernicus program to support the whole EO value chain. The EO value chain has three levels (see: Copernicus 2019). First, the EO upstream industry includes infrastructure manufacturing (the satellites), launching operations and the ground segment for managing satellite operations. Second, the EO midstream industry (or "higher-downstream") consists of EO-SPs, which are EO experts working with data acquisition, data storage, and data processing. Finally, there is the EO downstream industry (or "lower-downstream") which includes consultants, intermediary users, and service providers that create value-added services from EO-based data for the "non-EO expert". They often advise the end-users on both EO-based and non-EO competing solution (e.g., drone-based data, software, apps and in-situ solutions). Typically, EO tech-oriented people tend to work in organizations which operate higher in the value-chain. The closer they are to the end-users and non EO-experts, the more they tend to be market-pull because end-users demand an explanation of the benefits generated by the EO value-chain. The great majority of end-users are non-EO experts and look to EO as one of many possibilities to solve their current challenges. This the case of governments, regulatory authorities, and organizations which might be interested in having access to EO added-value solutions to monitor and manage their activities in different fields but look to them as just one of many solutions versus existing alternatives.

Due to the large amount of financial and human resources that are required, there is a reduced number of organizations that operate across the whole EO value chain. Few have the capabilities to hire highly qualified people that are simultaneously tech-push and market-pull (exceptions include Airbus Defence and Space, Maxar, Planet Labs). As such, most companies focus their efforts in just one of the three main parts of the EO value chain and are just tech-push or market-pull. I encourage EO organizations to implement actions which allow them to find the right balance between tech-push and market-pull strategies, to benefit from economies of scale while satisfying users' needs (Lages 2016).

3.3 EO Ecommerce: Glocalization and Mass Customization

Global EO buyers (often treated as "local users" by EO experts) are becoming more dynamic, demanding, proactive, and sophisticated in looking for solutions to solve their problems. This occurs in business to business (B2B), business to government (B2G), and business to consumer (B2C) markets. As such, EO companies need to excel simultaneously at the global and local levels, while aligning global technological development with

local market needs. Despite the digital and technological advancements, to our knowledge, there are no EO platforms prepared for mass customization. Similarly to what is happening in many other services (e.g., financial services, retail companies, and software creators), mass customization allows the discovery of multiple opportunities, combining personalization of custom-made products/services through flexible processes, with the low unit costs associated with high volumes (Da Silveira et al. 2001; Franke et al. 2010). Although there are several IT challenges associated with the mass customization of services (see Peters and Saidin 2000), EO organizations should consider overcoming these challenges to explore the benefits of mass customization and remain competitive.

Nowadays, EO organizations are expected to be GloCal, that is to think and act globally, and think and act locally. To become GloCal, EO organizations need to be global and/or local and manage the commonalities across regions without ignoring the local differences (Lages et al. 2013). This is well demonstrated by a previous EO case study where an EO-SP faced a GloCal paradox (see Fonseca et al. 2018). The Value Creation Wheel (VCW) team applied the VCW method using a wide range of criteria at both the global and local levels to identify the geographical market with the highest potential for an EO-based service. To do so, it generated different Value Creation Funnels (VCFs). The initial global VCF started with 193 United Nations countries and arrived at the USA after the application of 6 criteria. Then, the first local VCF started with 50 states and after 6 criteria arrived at Kansas. Finally, the second local funnel, started with 105 counties and after 4 criteria arrived at Stevens.

The GloCal paradox is much aligned with the paradox of choice (Schwartz and Schwartz 2004) in an internationalization context. It has been demonstrated that the large the number of options that an EO-SP has, can lead to paralysis and poor choice, and decrease satisfaction with the final choice. We strongly recommend managing the GloCal and Choice Paradoxes, using VCW-Value Creation Wheel method (Lages 2016) supported by the Value Creation Funnel and/or Multicriteria Decision Analysis (Marttunen et al. 2017). During the last eight years, this approach has already been extensively applied across a wide range of sectors as well as by numerous EO and EC H2020 projects in the context of space business (e.g., BETTER, Marine-EO, MyFarm, NextGEOSS, NextLand, NextOcean, SenSyF). The impact of the VCW method can be verified in Lages et al. (2020).

3.4 Business Models for EO Marketplaces: Centralized and/or Decentralized

Due to ever-increasing globalization and digitalization, the creation of value-added services from EO-based data for end-users has increased significantly and EO-SPs are constantly developing new services and their own eCommerce operations. Naturally, this is promoting the creation of new EO eCommerce marketplaces and online stores. Probably because it is an emergent trend, the existing ones have several limitations (e.g., price transparency, unclear EO service attributes, catalog format). These new platforms tend to follow more centralized business models, such as cost-per-click or agency models in terms of control and process. In the first model, the EO platform acts as an aggregator of EO-based services and are like catalogs. In an initial stage, to develop the platform and increase the number of service providers, they might be invited for free. Once it becomes well known, the service provider will start paying the platform every time their

listing is clicked by a potential buyer, regardless of whether a sale is made. In the second model, the platform charges buyers directly for the service, and the platform pays the suppliers while retaining a commission.

Although these two models are the simplest ones to implement, I expect that similarly to what has already occurred in a wide range of mature sectors (e.g., financial, tourism), the more decentralized Peer-to-Peer (P2P) business model will become established in the EO sector during this decade. To my knowledge, there are no P2P EO marketplaces or online stores, where buyers might communicate directly with EO-SPs and downstream service providers (and vice-versa). The existing ones are centralized and require the involvement of an intermediary contact point. After discussing this issue with different EO executives, the main justification was that organizations avoid providing standard EO online services and EO services are very complex because they need to be customized. However, evidence reveals that many other sectors which in the past were offering brick and mortar customized solutions, nowadays are offering P2P solutions for both B2C and B2B operations.

In the financial sector, Zopa launched in 2005 one of the first P2P financial platforms. At that time, many users were not happy with the traditional brick and mortar financial players (e.g., the young digital generation, and people without a fixed income who were not able to get loans). To address this challenge, Zopa's P2P platform enabled individuals to obtain loans directly from other individuals, cutting out the financial institution as the middleman. Nowadays, there are numerous P2P financial platforms across the globe (e.g., USA, UK, Germany, France, Baltic countries) and this market is already saturated and very segmented. For example, while some P2P platforms operate in the B2B market (e.g., Funding Circle), others operate in the B2C local market (e.g., Upstart, Prosper) and others were developed for international non-residents (e.g., Bondora, Kutflink). Similarly to the financial sector, in the mature Online Travel Agents (OTAs) sector, P2P became a common digital eCommerce practice with well-established players (e.g., Airbnb, Couchsurfing). Numerous P2P companies were created in the mid and late 1990s (see von Briel and Dolnicar 2021 for an extensive list of more than 60 P2P platforms). More recently, many start-ups and well-known companies (e.g., Booking.com) have also added P2P accommodation to their offerings.

3.5 Public and Private Governance of Joint EO Projects: Cooperation and/or Competition

From a public policy perspective, there are strong indications that the EU is seeking to address many of the previously discussed tensions and paradoxes. One of the most challenging ones has to do with governance models supporting coopetition. In a wide range of EU funded projects, it is common for organizations to simultaneously compete and cooperate among each other to explore synergies and achieve a common goal (e.g., commercialization of EO joint services). To address this challenge, the EU created the legal entity of European Economic Interest Grouping (EEIG). This helps consortia to take part in EU programs, and to make it easier for companies in different countries to do business together. However, past experiences revealed that quite often the creation of a common a legal entity is not feasible or desirable by the different partners of a consortium, who do not want to create dependencies between different competing institutions.

The EU has created Horizon 2020 (H2020), the biggest EU Research and Innovation program ever, with nearly €80 billion of funding available. A major focus of this program is for EU organizations to co-create and work with everyone across the globe, including their own competitors, to bring ideas to European and global markets (EC 2020). These H2020 projects are very positive from an innovation perspective and have the capability of creating many constructive tensions across the whole value chain. Multiple consortium players are expected to simultaneously validate the technical and economic viability of services or products in an operational environment, while collaborating at the vertical and horizontal levels of the value chain (EC 2018). As an example, there is the H2020 NextLand project where 11 EU organizations and numerous beta-users with technological know-how in forestry and agriculture interact to develop commercial solutions. Among others, forestry users expect to benefit from EO solutions that will address their needs in terms of forest health and inventory, clearcutting detection, and fire impact and risk assessment. Agriculture users expect to have access to a wide range of commercial services to address a wide range of challenges, such as support to irrigation, early stress and anomaly detection, improved crop monitoring and yield prediction, among others. A second example is the H2020 NextOcean project, where 10 EU partners are working with a wide range of beta-users in the fishing and aquaculture sectors, many of them without technological know-how, to develop commercial EO services. The major goal is to transfer EO data across the value chain to solve the real challenges of intermediate and end-users. This project expects to support trade sustainability, minimize bycatch, identify fish provenance and ecolabeling, provide early warning of pollution events, and help to monitor the locations of fish cages and the environmental impact of fish farms. Both NextLand and NextOcean projects are well-aligned with the EC proposals in these fields. The EC highlights that farmers and fishermen are critical to managing the transition to the EGD and proposes that "the new EU forest strategy will have as its key objectives effective afforestation, and forest preservation and restoration in Europe" as well as a sustainable 'blue economy' (EC 2019, pp. 13–14).

Overall, these H2020 EO projects often promote communication across different points of view and different players of the EO value chain who are used to competing with each other. In addition to the tensions previously discussed, another great challenge is how to keep the Consortium together and sustainable after the end of the EU funding. To achieve this goal, all the partners will need to agree on the intellectual property strategy, business plan, distribution of costs and revenues, which legal entity should take charge (e.g., one of the entities, a new association, a European Cooperative or an EEIG), among others. To succeed, all these challenges require from the different consortium partners "a creative, both/and approach that leverages the benefits of each side separately, while also tapping into their synergistic potential" (Lewis et al.: 62). They must be willing to communicate, share and discuss sensitive information (e.g., pricing strategy, business models, governance models, sustainability strategy) for the common good of all the partners.

4 Managerial and Public Policy Implications

In EO and space business, there is a wide range of leaders with different profiles, such as executives, managers, engineers, scientists, and public policy makers. To succeed

these leaders must manage a wide range of tensions like the ones previously discussed. Paul Polman, ex-CEO of Unilever (2009–2019), mentioned that "the difference between average and outstanding firms is an 'AND Mentality'. We must find and create tensions—force people into different space for thinking…This is not just a performance issue but a survival issue, because managing paradox helps foster creativity and high performance.". I also believe that to foster innovation and successful services in the EO sector, it is critical to manage paradoxes and incorporate in the decision-making process ideas coming from technology late adopters and devil's advocates (Jahanmir and Lages 2015, 2016). Both managers and public policy makers must overcome five main obstacles when addressing the various paradoxes. First, the inertia and the lack of a set of embedded routines to manage constant change. Second, the dulled motivation associated with changing previously successful practices for operating in the EO market (e.g., excessive dependency of public funds). Third, the distorted perception associated with EO technological myopia, limited knowledge of management principles, and importance of managing paradoxes. Fourth, the political impasses associated with the change of EO priorities and reallocation of resources to those priorities. Finally, being capable of managing the opportunity paradox, where "focus may be just as important as flexibility, and, counterintuitively, a company's focus may even influence its flexibility and vice versa." (Bingham et al. 2014, p. 29).

There are many positive signals that EO and the space sector are moving from a pure tech-push to a more balanced approach between technology and market needs. However, after various decades of pure research and development (R&D) projects, and billions of dollars invested in well-trained technological people and technologies with low technology readiness levels (TRLs), it is extremely challenging for the complex space ecosystem to become more commercially oriented.

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Is a Video Worth More Than a Thousand Images? A Neurophysiological Study on the Impact of Different Types of Product Display on Consumer Behaviour in e-Commerce

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Abstract. Considering the importance of e-commerce in the global market, git is essential to delve into how consumers make decisions in the e-commerce environment. Until now, countless research has looked at different aspects of consumer behaviour in different types of e-commerce. However, most of those studies have been developed based on declarative techniques, which are inevitably limited to bias, subjective considerations or even to memory-based choice (Hsu 2017) and neuroscientific techniques have been rarely applied to the study of the e-commerce environment.

Given this gap, the aim of this research is to assess consumer neurophysiological responses to different product display formats used in the e-commerce environment. To achieve it, 72 participants (36W–36M) between 18–29 years old were exposed to 36 stimuli according to three types of product display (product image, image of product in use and 360° video) in an unknown fashion e-commerce, while their unconscious reactions were recorded with an electroencephalogram (EEG) and galvanic skin response (GSR). After the exposure, the participants were asked about their attitude towards each format, preferences, and purchase intention.

The declarative results showed a better attitude towards the more interactive format, but the preferences and purchase intention of participants did not correlate with the display format. Implicit results showed greater emotional activation and positive valence for images of the product in use and, although there are no significant differences in the EEG cognitive load among the three formats, the EEG engagement index appears to be correlated to the visual simplicity of the product display.

Keywords: e-commerce · Neuromarketing · User experience · Engagement

1 Introduction

Due to the pandemic situation, consumers were forced to stay home and physical stores to close. Consequently, in-store sales fell dramatically while e-commerce rebounded to reach $26.7 trillion in 2020 (UNCTAD 2021), becoming the fastest-growing channel in

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the last decade. By 2025, e-commerce is expected to account for half the growth in the global retail sector (Euromonitor 2021).

This rapid digital transformation has brought challenges to traditional business models which need to reassess their online strategies to stay competitive in this ever-growing digital world. Despite the growing attention given to e-commerce usability, little is known about the factors that contribute to the user's decision to buy products online (Junaini and Sidi 2005). According to Semerádová and Weinlich (2020), among the factors that influence the user experience in e-commerce, the context (aesthetic and the functional layout) and the content (texts, images, or multimedia) directly affect user satisfaction and perceived usability.

Product information in e-commerce is typically communicated through visual elements such as text and images. An adequate arrangement of these objects is known as "visual hierarchy" and can make it easier for the user to understand the product information (Faraday 2000). The visual hierarchy can be affected by the product display format chosen, which means, the way for the suppliers display product details to the buyer.

The product display may vary according to different factors such as movement or animation, size, colour, style (visual, audiovisual, text, etc.) and/or location (Rodrigues et al. 2017). The level of movement or animation of a product display is related to the concept of interactivity in the product presentation that "illustrates product features, assisting consumers to produce mental images of how a product may be utilized" (Lim et al. 2013, p. 2.).

Three main levels of interactivity are generally applied in e-commerce to display products: (1) static images, (2) videos and (3) virtual product experiences (Xu 2021; Lim et al. 2013). The aim of this study is to assess implicit and declarative consumer reactions to two types of static images: (1) product image and (2) image of the product in use, and (3) a 360° video, which corresponds to a progressive continuum of interactivity in product display formats (see Fig. 1).

Fig. 1. Continuum of interactivity in product display formats

2 Theoretical Background

Compared to static images, dynamic images appear to be more interesting and aesthetically appealing (Kim et al. 2007, 2020). Visual interactivity in product presentation helps consumers visualize how a product can be utilized, therefore positive feelings are

amplified as interactivity increases (Jiang and Benbasat 2007). Based on this, it is hypothesised that ***H1. "The attitude of participants towards the display format increases as the interactivity of the format increases".***

Previous studies have shown that dynamic product images lead to more favourable product evaluation, in terms of functionality, performance, and features, than static images (Algharabat et al. 2017; Choi and Taylor 2014; Jiang and Benbasat 2007). Therefore, it can be plausible that ***H2. "Consumers show higher levels of preference for products displayed by using more dynamic formats".***

On the other hand, the way products are displayed is an important issue since interactive presentation formats can significantly shape information processing and decision making in e-commerce environment (Zhang et al. 2019; Choi et al. 2019; Li et al. 2016). According to previous research (Xu 2021; Kim et al. 2020; Algharabat et al. 2017), as interactivity increases, the details and accuracy of product information increase. That enables the consumer's ability to quickly recognize, interpret and recall images, leading to stronger purchase intention. Based on that, the third hypothesis is stated as ***H3. "A higher level of interactivity in product di play can lead to higher purchase intention".***

In terms of consumer emotions, animated images are likely to increase emotional impact while static graphics are likely to arouse greater cognitive interest. It happens because in the presence of static images, consumers must connect the incoming information with the prior knowledge, to interpret the content (Vi et al. 2013). According to Kim et al. (2007, 2020) animated images can induce higher levels of arousal than static images, mainly because consumers feel more stimulated in the presence of animated images. In this line, we hypothesised that ***H4. "A higher level of interactivity in the product display can lead to greater emotional arousal and positive valence".***

When consumers explore any e-commerce, they must invest cognitive resources to be able to process the information exposed and carry out the purchase task. Regarding images, cognitive load is defined as the amount of resources needed to interpret a visualization (Anderson et al. 2011). Oh et al. (2019) found that consumers exert varying levels of cognitive effort when exploring online products presented in different formats because in more interactive presentations, consumers must pay attention to dynamic changes and spatial orientation. Therefore, they are likely to spend more resources and effort on processing interactive product images (Hong et al. 2004). In contrast, when viewing static product images, they can effortlessly control information acquisition (Kim et al. 2020). Based on that, the fifth hypothesis is stablished as ***H5. "A higher level of interactivity in product display can lead to greater cognitive load".***

Alongside cognitive load, engagement is an important measure in e-commerce context as it shows how cognitively engaged a person is in a task (Nuamah and Seong 2017). The EEG engagement index is related to processes involving information gathering, visual scanning, and sustained attention. Workload and engagement work concordantly or independently, depending on the task environment. When the individual requires large amounts of effort to complete the task, the level of engagement decreases (Berka et al. 2007). Therefore, it is logical to state that ***H6. "A higher level of cognitive load induce by higher levels of interactivity in product display can lead to lower levels of consumers' engagement".***

3 Materials and Methods

72 people (36W–36M) between 18–29 years old (M/SD = 22,3/2,8), were recruited to participate in the study by using convenience sampling. None of them informed us of any history of neurological or psychiatric illness, nor visual problems. The research was conducted in compliance with the guidance of the Helsinki Declaration. All participant signed informed consent forms before participation and received monetary compensation at the end of the experiment.

The within-subjects experiment was based on exposing the participants to 36 stimuli according to three types of product display (product image, image of product in use and 360º video) in an unknown fashion e-commerce. A total of 72 stimuli were developed to distinguish between men's and women's clothing and avoid any gender bias.

The unconscious reactions were recorded with an EEG and GSR. The declarative measurements (attitude towards the display format, preferences, and purchase intention) were collected by applying a questionnaire. All instruments and the measurements provided by each technique are described in Fig. 2.

	Instruments	Measurements
Neuroscientific Techniques	EEG	Frontal Alpha Asymmetry (Valence)
		Cognitive Load
		Memory Encoding
	GSR	Emotional Arousal
Declarative Methodology	Questionnaire	Attitude toward each format
		Preference toward the products
		Purchase Intention

Fig. 2. Instruments and measurements

4 Results

In line with Kim et al. (2007, 2020) findings, our results showed that dynamic images seem to be more interesting and aesthetically appealing than static images ($F_{(1.82,129.44)} = 26.50$, $p = 0.00$). Therefore, H1 was completely contrasted as the participants' attitude towards the display format increased as the extended interactivity of the format increased. Regarding preference (H2) and purchase intention (H3), the results obtained revealed they were not correlated with the display format. It means that the level of interactivity used for displaying the product does not influence the preference for the product or the purchase intention. Therefore, H2 and H3 were not supported.

The evaluation of emotional reactions of the participants showed that there were no statistically significant differences in emotional arousal among the tested formats ($F_{(2,130)} = 0.91$, $p = 0.38$). No differences was found in terms of valence ($F_{(2,136)} = 0.88$, $p = 0.42$). Consequently, H4 was not supported.

Concerning the cognitive evaluation, although there were no statistically significant differences in the EEG cognitive load among the three ($F_{(2,136)} = 1–064$, $p = 0.348$), the average score obtained showed that processing a higher level of interactivity in displaying

product leads to higher cognitive load. Therefore, it can be said that H5 was partially supported. Finally, our result supported H6 since when a greater effort is required from the participant, the level of engagement decreases ($F_{(2,136)} = 380$, $p = 0.02$).

5 Conclusions

The relevance of digital transformation and its huge potential for society makes it imperative to better understand how consumers interact in the digital environment to enhance the user experience, eliminate the friction in the purchase process and facilitate conversion. The present study was motivated by the lack of evidence of the neurophysiological reactions of consumers to the different product display formats in ecommerce. In this sense, the results yield two conclusions.

First, visual interactivity in product presentation evokes positive feelings in consumers. However, because more interactive presentations force consumers to spend more resources and effort processing interactive product images (Hong et al. 2004), their engagement may suffer. This finding suggests that the format efficacy might follow an inverted u-curve revealing a positive relationship between interactivity and engagement until a tipping point is reached where the effort to process the content excessively increases the required cognitive load. Further research is needed to delve into this relationship.

Second, the results obtained showed that images of products in use can provoke more positive emotional reactions than videos. These results seem logical since it is well known that individuals are very emotionally sensitive to human faces. However, this finding suggests that not only interactivity is important when choosing the format to display a product in e-commerce. As Semerádová and Weinlich (2020) stated, the context is as important as the content in influencing the user experience.

Finally, the present study provides evidence on the usefulness of neuroscientific techniques to have an objective measure of consumer reactions to product display formats and to find new and useful insights that cannot be detected with declarative methodologies (García-Madariaga et al. 2019).

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Author Index

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