The Influence of Augmented Reality on Consumers' Purchase Intention Within the Italian Online Retail Market

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ABSTRACT

Augmented reality (AR) is an innovative tool that improves online shopping experience by allowing consumers to perceive virtual goods as part of their real world. Additionally, AR is considered as one of the technologies adopted by companies in order to achieve growth. AR is perceived as interactive, intuitive and engaging, in addition to facilitating and improving consumers' shopping experience. Through the adoption of AR, consumers are able to virtually try products and observe items in a personalised context. This ultimately enhances the decision making process, confidence and reduces perceived risks of online shopping. Retaining online consumers' purchase confidence is considered one of the key long term objectives for retailers to reach success. Previous literature has studied the relationship between AR technology and online consumers' purchase intention. However, this field is not elaborately explored in some countries. For instance, with regard to Italy, it is possible to observe several research gaps. Therefore, this study aims to understand the degree to which consumers' purchase intention is influenced by online shopping with AR technology in Italy. Quantitative research with a combined sampling method (purposive and snowball), factor analysis and multiple regression analysis are adopted to explore the main factors that are considered as influential on consumers' purchase intention during online shopping. The findings of the research performed indicate a positive influence of AR tools on consumers' purchase intention. Specifically, a positive and significant relationship is observed between spatial presence and consumers' intention to purchase. However, no relationship is observed between the other two variables, perceived personalization and perceived intrusiveness, and purchase intention for Italian respondents. Additional exploratory research, conducted with ANOVA and t-test, show an absence of a relationship between participants' educational level and purchase intention, and gender and purchase intention. After comparing the findings to previous literature, several elements of influence could be crucial in affecting the outcomes. Different cultural values or other elements such as educational level, age, gender and external factors could play a role in influencing the finding of this study. The results of this study can be considered a valuable contribution to businesses, policy makers and consumers. Both Italian and international companies that want to operate within the Italian market have the possibility to understand the effects of AR tools on consumers' shopping experience, and on their intention to buy products online. This could inspire them to use this new technology within online platforms or apps in order to enhance consumers' purchase intention. Furthermore, Italian policy makers have the opportunity to comprehend how impactful AR can be on consumers' online activities and construct policies in regard to this.

KEYWORDS: Augmented Reality, Purchase Intention, Spatial Presence, Perceived Personalization, Perceived Intrusiveness

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1. Introduction

The way businesses relate with consumers is changing over time due to the impactful development of new technology. These innovations are considered by brands as a way to reduce costs and increase consumers' engagement (Romano et. al., 2020). Thus, new technology is expected to foster an exponential growth rate for companies that adopt them (Romano et. al., 2020). On the other hand, consumers perceive digital technology as effective in increasing shopping convenience by creating new channels that reduce the shopping effort (Duarte et al., 2018). Additionally, shopping convenience drives consumers' online satisfaction and enhances consumers' behavioural intention. Because of the benefits achieved when using new types of technology, brands are trying to adopt tools like Virtual Reality (VR) and Augmented Reality (AR) (Romano et. al., 2020).

AR is an innovative technology used in different ways by companies (Wang et al. 2015). Within the e-commerce fields, it enables consumers to experience the product design virtually in a real environment. AR's main characteristics are the combination of reality and virtuality, live interaction, and 3D designs (Wang et al. 2015). By being highly interactive and intuitive, the technology is also included in different online applications. AR is perceived as a strategic tool for retailing and e-commerce and can be applied to physical or online stores. AR technology allows consumers to virtually try products and accessories (Smink et al. 2020). Consumers can easily see products in different colours or shapes and this can facilitate consumers' decision making by increasing enjoyment (Romano et. al., 2020). Wang et al. (2015) also stress that nowadays consumers' purchasing behaviour is more influenced by technological innovations of online websites rather than changes on product designs. Additionally, studies by Qin et al. (2021), Smink et al. (2020) and Lixăndroiu et al. (2021) show how AR technology strongly affects consumers' purchase intention. However, little research is still done in relation to AR's influence on consumers' experience and journey (Romano et. al., 2020; Lixăndroiu et al., 2021).

Specific gaps are present in the literature in relation to the geographic area that is covered. For instance, in Italy, little research is conducted on AR and online consumers' behaviours. Due to the importance acquired by online websites and related marketing strategies in the past few years, models that are based on customers' behaviour in the online environment are becoming more and more necessary (Lixăndroiu et al., 2021). Additionally, Lixăndroiu et al. (2021) stress that the retailers' key for long term success is related to online consumers' confidence. This is influenced by perceived risk of purchasing and consumers' being positively affected by online innovations. Therefore, with the increased use of AR in the last few years, there is a need to better understand how it affects customers' behaviours. Hence, this study focuses on understanding the effect of AR on purchase intention. Based on previous literature, the following research question is developed: to what extent does Augmented Reality (AR) influence consumers' purchase intention when shopping in the Italian online retail market?

In order to answer the research question, the most important influencing factors that drive consumers' purchase intention when using AR within the Italian online retail market are considered. In order to do that, the study by Smink et al. (2020) is taken into consideration. It is conducted in the Netherlands and observes how spatial presence, personalization and intrusiveness of apps affect the persuasiveness of the AR technology by comparing an AR app and a non-AR app in two different studies (Smink et al., 2020). These are used in Smink et al. (2020) research by adopting two different samples. One of the samples analysed is only composed by female respondents and reports a significant relationship between the factors personalization and intrusiveness and purchase intention. Perceived personalisation appears to positively influence consumers' purchase intention while perceived intrusiveness reports a negative influence on purchase intention. Additionally, spatial presence appears non influential on consumers' purchase intention. On the other hand, the second study conducted by Smink et al. (2020 only shows that spatial presence positively enhances purchase intention.

The current study aims to test the robustness of Smink et al. 's (2020) findings since Italians are more reluctant to innovate and adopt new technologies such as AR. This is specifically related to the high score on uncertainty avoidance and the low level of long term orientation that are typical for Italians (Hofstede Insights, n.d.). The study by Hofstede Insight (n.d.) shows how Italians differ from Dutch in relation to the uncertainty avoidance dimension. This refers to the level of risk perceived by people when they are exposed to unexplored or non-familiar situations. Following Hofstede Insight (n.d.), Italians have a higher uncertainty avoidance score compared to Dutch. Hence, they appear more reluctant to use tools and experiences that are unknown and new. These make them anxious and lead Italians to avoid new situations. Additionally, Italian people report a lower score on long term orientation dimension compared to Dutch (Hofstede Insight, n.d.). They have reduced capabilities to adapt traditions to changed situations and look at changes with suspicion compared to other cultures (Hofstede Insight, n.d.). Therefore, they could be more reluctant to adopt AR when shopping online and more research on how to overcome that reluctance could benefit retailers. Hence, changing environments is stressful for Italians with a low propensity to unknown situations and high levels of scepticism towards changes, while Dutch have a higher ability to adapt to new conditions and look at innovations positively. Thus, by having an Italian sample with different cultural values, this study might obtain different findings compared to previous literature (Hofstede Insight, n.d.).

Furthermore, studies on AR within the Italian market are limited by only narrowing the research on a specific topic area. For instance, the study by Penco et al. (2020) explores only AR within the online food and beverage market. Cuomo et al. (2020) focus on a broader Italian retail market, but mainly for physical stores. Therefore, this study provides a novel perspective on the topic by investigating AR effects on consumers' purchase intention within the Italian online retail market. Additionally, as Monachesi (2019) shows in her research, there are important differences between Italians and Dutch people in relation to their Information and Communication Technology (ICT) use.

In the Netherlands, the use of ICT appears to be widely spread among both young and elderly people. In Italy, its usage is still not widespread among older people and among small enterprises. Monachesi (2019) observes how these differences are related to a lack of digital competences and education to new technology in Italy. Furthermore, the author explains that one third of Italian families do not have access to broadband at home due to two main reasons. First, because of the lack of digital competences and second, the internet is considered to not be useful to these people.

Moreover, there are differences between the Italian and Dutch digital markets. While the e-commerce market revenue is projected to reach US$52.89bn in 2023 in Italy, the expected e-commerce market revenue in the Netherlands in 2023 is US$30.59bn (Statista, 2022a; Statista, 2022b). Although the Italian expected revenue appears higher, it is still lower if the sizes of the population of the two countries are taken into consideration. Furthermore, according to Statista (2022a), the user penetration in Italy is predicted to be 68.2% by the end of 2023 and 72.4% by 2027. On the other hand, expected user penetration by the end of 2023 in the Netherlands is 77.4% and 76.1% by 2027 (Statista, 2022b). This shows that although the Italian market revenue is higher, the percentage of Italian users that shop online is lower compared to Dutch. Hence, the Dutch use of digital technology is higher than for Italians when shopping online.

These cultural differences might have influenced the results of Smink et al. (2020) studies and an analysis of the same influential factors on AR and purchase intention needs to be performed in Italy. Additionally, since it is unclear whether or not the factors used in Smink et al.'s (2020) study would apply to other samples or countries, this research's expectations are based on non-Italian studies.

2. Theoretical Framework

This section of the thesis provides an overview of different theoretical frameworks that are part of the literature and relates to the field of AR. First, an exploration of the AR field within Italian literature is provided. Second, a more detailed explanation of the definition of AR concept is given. Lastly, important influencing factors that affect consumers' purchase intention when shopping online with AR are introduced with the developed hypotheses (Smink et al., 2020).

2.1 AR Research in Italy

The Italian online retail market presents a lack of research in relation to AR and purchase intention. For instance, the study by Cuomo et al. (2020) gives attention to the AR and Italian retail market, but only for physical stores. The article shows how AR is influential in making additional brand value which is both emotional and functional by increasing consumers' engagement and simplifying their decision-making process. Cuomo et al. (2020) observe that some AR tools can also appear as controversial since they can foster stress and disorientation in consumers. As a consequence, retailers need to be effective in communicating and educating their customers in order to prevent their avoidance of technology (Cuomo et al., 2020). Physical stores can adopt AR technology to make the in-store shopping experience more engaging to attract consumers (Riar et al., 2021). Additionally, AR applied to online stores allows consumers to try products virtually and to have an immersive shopping experience, which increases consumers' satisfaction (Riar et al., 2021; Gaboni & Hagberg, 2019). Consumers can have a personalised and unique experience without having to visit the physical store. Furthermore, AR applied to online stores reinforces and supports consumers' purchase decisions (Riar et al., 2021). This happens specifically for wearable and cosmetic products since the technology gives an idea on how these products look on consumers. Similarly with furniture and decorations, AR helps customers in understanding how products would fit in their personal environment before buying them (Riar et al., 2021; Smink et al., 2020).

Penco et al. (2020) focus on usefulness and value creation of mobile augmented reality (MAR) apps, considering both Italian retailers' and consumers' perspective in the "Made in Italy" food and beverage context. MAR appears useful for consumers in receiving additional information about products. This increases the value creation of the product and brand loyalty. Despite the results, the authors stress the limitation of the presence and usage of MAR in the Italian market. Thus, Penco et al.'s (2020) study provides additional and new insights related to AR technology, however, its focus is limited to the food and beverage market.

Serravalle et al. (2020) also explore AR technology and, specifically, they focus on the importance of adoption of the technology for retailers. The authors believe that AR can easily foster companies to achieve business growth. This is because AR is able to overcome the physical barrier of e-commerce stores and it helps consumers in reaching information about products they are willing to buy. Hence, AR enables companies to be more transparent on the products they sell online. However,

Serravalle et al. (2019) identify how the use of AR technology in Italy could have adverse effects. Consumers demonstrate difficulties in understanding the functionality of the technology and, as a consequence, the technology is not widely adopted by companies. Despite the findings, Serravalle et al. (2019) stress that respondents of their study appear attracted and curious about the new AR technology. This research, by considering previous literature and focusing on AR within online retail market, would provide additional knowledge in the context of Italy.

2.2 The Effects of AR

AR and its related effects have been studied and explored by different scholars. For instance, the research conducted by Smink et al. (2020) focuses on how AR technology influences consumers' experience by bringing virtual goods into the real world. The scholars explain that with the use of AR products become interactive, visible in real time and in 3D fixed position. Thus, AR features enable a more direct and interactive consumer experience compared to the usual one that people have online. Through AR, products are observed in a personal context, which makes customers' experience realistic and personalised (Smink et al., 2020). Verhagen et al. (2014) also research the AR topic and explain that the technology shows a positive influence on consumers' behaviours. By making the product more attractive and similar to reality, AR technology is able to enrich consumers' online experience and enhance purchase intention (Verhagen et al., 2014). Smink et al. (2020) are inspired by Verhagen et al. (2014) and previous literature and observe the AR effectiveness by enhancing purchase intention within online shopping experience. Specifically, Smink et al.'s (2020) study focuses on the effect of spatial presence, perceived personalisation and perceived intrusiveness of AR on persuasiveness, and to what extent these elements enhance purchase intention. Smink et al. (2020) investigate the relationship between the variables, spatial presence, perceived personalisation and perceived intrusiveness, and purchase intention in two different studies. Specifically, the first study composed only by female participants, reports insightful outcomes by showing a relation among the variables, perceived personalisation and perceived intrusiveness, and purchase intention. An absence of relation is found on spatial presence and purchase intention. In contrast, the second study focuses on understanding the relationship between the same variables, spatial presence, perceived personalisation and perceived intrusiveness, and purchase intention, but on a different sample. Participants in the second study consist of both females and males and the findings show an absence of a relationship between both perceived personalisation and purchase intention and between perceived intrusiveness and purchase intention. Hence, the only significant relation appears between spatial presence and consumers' purchase intention.

In the next section, an exploration of the variables within Smink et al. 's (2020) study and in relation to the current literature is provided. Next, the related hypotheses are developed based on the previous research examined.

Spatial Presence

Spatial presence can be described as the individual observation of experiencing physical items in a personal environment (Verhagen et al., 2014). When spatial presence is applied to digital tools it can also be defined as telepresence. Telepresence refers to experiencing a physical object through the mediated environment. This is also defined by Verhagen et al. (2014) as local presence (LP). LP is experiencing products from a different place to the user's environment through media with a direct and simulated physical experience. Similarly, spatial presence in relation to AR, is defined as a subjective construct that explains how virtual goods are perceived as real goods (Smink et al., 2020). With AR, the product becomes part of the consumers' real world.

To better understand the significance of spatial presence, it is important to consider the situated cognition theory. A fundamental contribution in developing the theory is from Clancey (1997). The author explains that the elaboration of the information requires the consideration of the physical environment in which it occurs. Clancey (1997) stresses that cognition and learning happens in environmental settings. Additionally, physical contexts are considered as powerful in influencing cognitive processes by offering information that facilitate problem solving and thinking (Clancey, 1997). An earlier contribution on the situated cognition theory is given by Brown et al. (1989). The author introduces the concept of affordances that refers to interactions between the object and the environment offered to individuals. Brown et al. (1989) explain how physical environments offer affordances that influence the elaboration of information and guides to specific actions. Hence, the importance of the physical environment when elaborating information is found as central in cognitive processes (Brown et al., 1989). Furthermore, Clancey (1997) stresses that in addition to considering the situated aspects of cognition, technology helps in enhancing the elaboration of information. Technology mediated environments foster the development of argumentations and problems solving (Clancey, 1997). The elaboration of situated cognition theory becomes important when applied to new technologies as well. Hilken et al. (2017) draw on situated cognition theory. They argue that situated cognition allows consumers to value information about a product when the shopping experience links virtual information and real context. Hilken et al. (2017) apply these concepts to AR and define AR technology as a tool that improves consumers' online shopping experience. This is because AR shows products in a personal environment where consumers also have a physical control (Hilken et al., 2017). The possibility to interact and control the product increases the perception of spatial presence (Smink et al., 2020).

According to Wang et al. (2022), spatial presence is a psychological state in which consumers lose the perception of the technology presence within the online experience. With spatial presence enhanced by AR, products can be perceived as they are physically in front of consumers (Wang et al. 2022). Wang et al. (2022) also stress how visual aesthetics enhances consumers' unconscious participation in receiving information. AR enables a direct sensory, rich and vivid experience with the virtual product. On the other hand, online experience without AR leads to a less direct and

participative experience. Hence, when a high level of spatial presence is achieved, the distinction between virtual and real products appears to be less noticeable from consumers (Smink et al., 2020). As a consequence, the consumers react to the experience as if it is real. The perceptions of direct experiences demonstrate persuasive, stronger and long-lasting effects than indirect experiences (Smink et al., 2020). Additionally, positive benefits are also fostered by the sensory and cognitive engagement that AR provides. Brand attitude also increases with AR and benefits are also achieved by brands (Smink et al., 2020).

Daugherty et al. (2008), in their study, also focus on the relation between virtual and direct experience. They also observe that virtual experience has similarities with the direct one. When consumers are exposed to virtual experience the brand attitude improves and purchase intention increases (Daugherty et al., 2008). Daugherty et al. (2008) explain that virtual experience fosters an immersive and interactive process that appears engaging and interacting. Furthermore, virtual experience does not present limitations of direct experience such as availability and accessibility. Hence, virtual experience is considered as a valid alternative to direct experience that positively influences consumers' decision-making and behaviours (Daugherty et al., 2008). Smink et al. (2020) base their research on the positive association between consumers' perceived presence, in addition to real and direct experience. Furthermore, they consider the positive relation among direct experience, persuasiveness and positive effect. The authors stress how spatial presence positively intensifies the attitude towards AR technology by leading users to use it again. Presence is also related to reinforcing beliefs about a product while reducing the perception of the risk for buying it. Therefore, presence is associated with the enhancement of consumers' purchase intentions.

Based on these findings, the following hypothesis is formulated.

H1: Spatial presence enhanced by AR during online shopping is positively associated with consumers' purchase intention within the online Italian retail market.

Perceived Personalisation

Perceived personalisation refers to consumers identification of the exposure to personalised content (Smink et al., 2020). Since personalised content is based on peoples' preferences it has a strong persuasive power. This happens when customers' data is used by brands to show consumers personalised products based on their interests. Another example of personalisation involves the strategic marketing practice to address the email recipients by their name. Personalisation also drives positive experience (Ameen et al., 2021). This is because it is influenced by the level of customisation of the information based on consumers' needs (Ameen et al., 2021). Several dimensions of personalisation are defined. These are characterised by user interface, content and interactivity (Ameen et al., 2021). User interface is the adaptation of the online content based on consumers' devices. Content refers to the degree of customisation of the information based on consumers' preferences. Lastly, interactivity relates to the algorithms' capability to properly engage with users

(Ameen et al., 2021). Through these practices, the potential customer feels that the communication is personalised and directed to his or her needs (Smink et al., 2020).

Additionally, to better comprehend the effectiveness of personalisation, it is important to consider the elaboration likelihood model (ELM) by Petty and Cacioppo (1986). This model explains how people process the information received and the related effectiveness of the persuasive messages (Petty & Cacioppo, 1986). The ELM illustrates two main processes which receivers seem to follow when exposed to persuasive messages. These are based on some specific characteristics such as motivations and ability to capture information (Petty & Cacioppo, 1986). Hence, two routes to persuasion are defined: the central route and the peripheral route. With the central route, the elaboration of the messages transmitted is high, and information is elaborated in a rational way by people (Petty & Cacioppo, 1986). This leads to long-lasting changes in people's attitudes or behaviours. While with the peripheral route, the elaboration of information is low and there is no examination of information (Petty & Cacioppo, 1986). Thus, there is a reduction of effectiveness in changing people's behaviours and attitudes. The ELM model can be applied to personalisation since the latter can depend on the way people process information (Tam & Ho, 2005). Additionally, Petty et al. (2002) by considering ELM model, stress that personalisation has an effect on attitudes and actions. Moreover, personalisation is found to be influential for both messages processed peripherally and centrally (Petty et al. 2002). A communication with high levels of elaboration and central processing that is considered as personalised, offers a higher level of consideration than messages that are not by fostering biassed communications (Petty et al. 2002). With a peripheral information processing and low elaboration, perceived personalisation of arguments can work as a mental shortcut that leads to adopting changes in attitudes (Petty et al. 2002). Furthermore, the work by De Keyzer et al. (2015) through focusing on ELM model and personalised advertising, observes the importance of personal relevance when discussing the positive effects of perceived personalisation. In line with the ELM model, De Keyzer et al. (2015) stress that if a message is perceived as relevant the chances to obtain positive responses are higher. Consequently, when talking about personalisation it is also important to consider the model to understand the persuasiveness of personalisation practices.

In relation to AR, personalisation is present when customers have the possibility to see the goods in a personal context, this is also called context-driven personalisation (Smink et al., 2020). For instance, consumers can virtually try on clothes or look at furniture in their apartment. Additionally, the experience is customised by letting consumers' try multiple products based on their tastes and in real time in the consumer's physical world. This type of personalisation is not possible with a non-AR experience (Smink et al., 2020). Personalisation practices are considered persuasive. Smink et al. (2020) stress how personalised content attracts more consumers' attention, enhances behavioural intention and improves the attitude toward the brands by creating a positive consumer-brand association. McLean and Wilson (2019) also observe how personalisation achieved by AR is able to enhance shopping productivity. This makes the shopping experience more productive through the

perception that the technology is useful. Additionally, the authors argue that AR can combine real word and virtual world based on customers preferences and to improve the digital experience. Through AR technology consumers do not need to base their purchase decision on mental imagination. As a consequence, consumer satisfaction and future brand usage intent increase.

Based on this reasoning, the following hypothesis is developed.

H2: Perceived personalization of online shopping with AR is positively associated with consumers' purchase intention within the online Italian retail market.

Perceived Intrusiveness

Perceived intrusiveness is defined as a mental response to advertisements that lead to negative emotions such as irritation (Smink et al., 2020). Personalised advertising can also be seen as intrusive when they become highly personal. This can negatively affect consumers' experience. Furthermore, personalised messages can lead to message rejection (Pappas et al., 2017). Pappas et al. (2017) stressed that consumers can develop negative emotions, such as fear and anger when they are exposed to personalised messages. Furthermore, these can negatively impact the persuasion process and online purchase intention. As the authors explain, personalised messages need to be balanced by brands in order to respect consumer sensibility and privacy (Pappas et al., 2017). Alwreikat and Rjoub (2020) also observe that personalised advertising leads to consumers' perceived intrusiveness and irritation. Moreover, when consumers are exposed to personalised ads, the level of consumer engagement and brand loyalty decrease (Alwreikat & Rjoub, 2020). The negative emotions raised by the exposure to personalised ads can also lead to specific consumers' behavioural responses such as complaining and negative word of mouth (WOM) (Alwreikat & Rjoub, 2020).

These responses can be related to the psychological reactance theory (PRT) (Brehm, 1966). This is because, when people perceive that their freedom is threatened by external factors, the direct negative response that can be observed is reactance (Brehm, 1966). Consequently, once the perception of threat is clear, consumers would act to fight and reject any form of communication and message. Hence, consumers try to restore freedom when they experience a high level of intrusiveness experienced with a reduction of control of information or technology (Brehm, 1966). Reactance can be considered as a motivating phase, and it negatively affects people's attitudes and behaviours (Lee & Lee, 2009). Furthermore, the level of reactance is based on different elements such as the importance of freedom, the desire to preserve freedom in the future, the level of threat experienced and potential future threats (Lee & Lee, 2009)

Similarly, these responses can be observed within the use of AR technology (Smink et al., 2020). For instance, to use AR, the access to consumers' cameras is required and this can make consumers feel as if their personal information is not under control. By giving away access to the camera, consumers can perceive the technology as too disturbing and intrusive in consumers' personal and physical world. In a similar way, negative reactance can appear when consumers' are exposed to

location-based marketing, impacting evaluation and behaviour in a negative way (Smink et al. 2019). Additionally, AR is a new tool that consumers' are not familiar with and these elements can contribute to increasing negative feelings of intrusiveness (Smink et al., 2020). Intrusiveness can have a negative effect on consumers' responses such as avoidance and reactance (Smink et al., 2020). Furthermore, intrusiveness would retain consumers to immerse themselves in the AR shopping experience (Aw et al., 2023). Aw et al. (2023) also argue that because of the intrusiveness, AR tools could damage the shopping experience by reducing consumers' sense of control. Moreover, it can enhance negative resonances such as annoyance (Smink et al., 2020). Hence, brand responses and purchase intention are also negatively impacted (Smink et al., 2020; Smink et al., 2019).

These findings lead to the following hypothesis.

H3: Perceived intrusiveness of online shopping with AR is negatively associated with consumers' purchase intention within the online Italian retail market.

3. Method

This chapter of the research provides an explanation of the study's research design. It explores the general research method and research design with related justifications. It also introduces the sampling method, and sample characteristics by using descriptive statistics. Additionally, it presents the operationalisation of the variables used, related factor analysis and the procedure adopted to conduct the research. Furthermore, validity and reliability of the measuring instruments are introduced and described. Lastly, the data analysis performed is presented.

3.1 Design

In order to answer the research question, a quantitative research method was adopted through the use of data gathered with surveys. This was used because of the nature of the research question and it allowed for the evaluation of the factors such as spatial presence, perceived personalisation and intrusiveness in relation to AR, and their effect on consumers' purchase intention by following Smink et al. 's (2020) study. Quantitative method was chosen as it is used for deductive approaches when theories justify variables and research questions (Borrego et al., 2009). The quantitative method allows the evaluation of phenomena through the collection and statistical analysis of numerical data (Sukamolson, 2007). This method is considered a realistic way to observe the reality of phenomena from an objective perspective. Furthermore, it is considered useful to quantify opinions, behaviours and attitudes (Sukamolson, 2007). Additionally, the quantitative method was chosen after evaluating and analysing previous existing research in the field that adopted the same approach (Smink et. al, 2020).

Through quantitative studies, findings can be generalised to a broader population (Borrego et al., 2009). To achieve this, the survey method was selected and used for its power in allowing generalisation of the results (Groves et al., 2009). Thus, the use of surveys is suggested for investigating attitudes and behaviours of people that belong to the same culture and that use the same language, which is the case for this research. Groves et al. (2009) also stressed that surveys can help in the understanding of social phenomena. The survey method allows information gathering in a systematic way to explain and predict people's behaviours (Sukamolson, 2007). Self-administered questionnaires were chosen for this research. They are typically shared through a media platform and respondents fill them out autonomously (Sukamolson, 2007). This type of survey is inexpensive, time efficient through obtaining a large number of responses in a short period of time and it maintains interviewer anonymity (Sukamolson, 2007).

Therefore, a survey was distributed in Italy and used in assessing respondents' experience with AR technologies during online shopping and to observe the influence on purchase intention.

3.2 Sample

A non-probability sampling method with a combination of snowball and purposive method was adopted. This choice is related to several reasons. For instance, snowball sampling is cost-effective for collecting data, no monetary compensation was offered for participating in this survey. With snowball sampling, the researcher asks participants already identified to share the survey to friends and acquaintances by reaching the number of responses needed for the research in a shorter period of time (Emerson, 2015). Due to the researcher's network, there was the possibility to easily reach part of the target group and it was convenient to start gathering data through a snowball sampling method (Cohen & Arieli, 2011). In addition, in order to ensure quality of the data gathered, purposive sampling was adopted (Tongco, 2007). Purposive sampling allows the research to select participants based on their characteristics, knowledge or experience that they have (Tongco, 2007). The researcher chooses the respondents in order to reach participants that are able to offer the best perspective on the topic studied (Staller, 2021). This enhances a reduction of sampling bias related to snowball sampling by reaching specific predefined respondents (Shaghaghi et al., 2011). Respondents were reached by using Italian Facebook groups such as "Trova participant per gli studi" and "Questionari per tesi". By using social media, it was possible to identify the target population with a reduced effort, money and in a limited period of time. To ensure participants' eligibility of the study's criteria, the survey began with questions concerning their country of belonging and age (Dusek et al., 2015). By considering the advantages and addressing the limitations of the combined sampling method, this method was considered adequate to adopt in order to answer the research question.

The sampling size respected the master thesis guidelines that required between 150 and 250 respondents (MA Media Studies, 2022). A total of 173 responses were recorded. 163 responses were considered valid and met the criteria of identifying as Italians, being older than 18 and reaching the end of the survey. 30.1% of the respondents identified themselves as male and 69.9% as a female. The respondents' age was between 19.00 and 78.00, the mean was 43.45 with a standard deviation (*SD*) of 12.94. Concerning the level of education, 53.4% had a high school diploma followed by a master or PhD degree, 21.5%. 15.3% of the respondents completed secondary school, 9.8% had a bachelor's degree. Additionally, 93.3% of respondents were located in the centre of Italy, 3.7% were Italians who lived abroad, 2.5% were located in the north of Italy and 0.6% in the south of the country. Furthermore, the mean value of respondents that had experience with mobile apps and mobile apps for shopping was 4.99 (*SD* 1.80) and 4.77 (*SD* 1.94) in a range from 1.00 to 7.00. Participants with general experience with AR/VR technology and with AR/VR technology experience for shopping purposes reported a mean of 2.56 (*SD* 1.73) and 2.30 (*SD* 1.67) on a scale from 1.00 to 7.00. A low score would indicate an absence of experience with AR/VR technology, while a high score indicates more experience. Moreover, respondents' tendency to shop online had a mean score of 3.96 (*SD* 1.71) on a range from 1.00 to 7.00. Lastly, on a scale from 1.00 to 10.00, the tendency of preferring to see, try on and touch a product before buying it reported a mean score of 7.46 (*SD* 2.28).

3.3 Operationalization

In order to assess the level of perceived personalization, four items were used in the survey. First, a statement in relation to the consumer's experience with the Amazon app was introduced ("When using the Amazon app the experience will be…") and the respondents were then asked to indicate their option in relation to the following items "Tailored to customers' situation", "Perceived as a personal", "Matching customers' needs" and "Perceived as relevant for customers" based on Smink et al. (2020). Respondents were asked to indicate on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) whether the statement in the item applied to them. After performing a reliability analysis, *Cronbach's alpha* was found to be .93. The scale score was calculated by averaging respondents' score on the four items. It ranged from 1.00 to 7.00, with a mean score of 5.14 and a standard deviation of 1.31.

Spatial presence was measured with four items in the survey. First, a statement about consumer's perception of the experience with the Amazon app was introduced ("When using the Amazon app, consumers' perception of the experience will be…") and they were then asked to indicate their option in relation to the following items "Similar to experiencing the products in reality", "Perceived like it was in reality", "Perceived real rather than virtual" and "Realistic to the customers as in the real world" based on Smink et al. (2020). Respondents were asked to indicate on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) whether the statement in the item applied to them. After performing a reliability analysis, *Cronbach's alpha* was found to be .93. The scale score was calculated by averaging respondents' score on the four items. It ranged from 1.00 to 7.00, with a mean score of 4.45 and a standard deviation of 1.55.

Perceived intrusiveness was measured with five items in the survey. First, consumer's shopping experience with the Amazon app was introduced ("When using the Amazon app, consumers will define the shopping experience as…") and they were then asked to indicate their option in relation to the following statements "Disturbing", "Interfering", "Intrusive", "Unpleasant" and "Invasive" based on Smink et al. (2020). Respondents were asked to indicate on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) whether the statement in the item applied to them. After performing a reliability analysis, *Cronbach's alpha* was found to be .91. The scale score was calculated by averaging respondents' score on the five items. It ranged from 1.00 to 7.00, with a mean score of 3.21 and a standard deviation of 1.46.

Purchase Intention was measured with three items in the survey. First, consumer's intention to buy products on the Amazon app was introduced ("After using the Amazon app, the chance that consumers will buy the product is...") and were then asked to indicate their option in relation to the following statements "(un)likely", "(un)certain" and "small/big" based on Smink et al. (2020). Respondents were asked to indicate on a scale from 1 to 7 whether the statement in the item applied to them. These were reverse coded into new values due to the way the questions were formulated. After performing a reliability analysis, *Cronbach's alpha* was found to be .82. The scale score was

calculated by averaging respondents' score on the three items. It ranged from 1.00 to 7.00, with a mean score of 5.17 and a standard deviation of 1.54.

3.3.1 Factor Analysis

Factor analysis was conducted in order to confirm the presence of common patterns among the variables based on Smink et al.'s (2020) study. The 16 questionnaire items related to the variables measuring consumers perceptions of the use of AR and their influence on purchase intention were considered for the analysis. These are based on Likert-scale and bipolar matrix and, a factor analysis using Principal Components extraction with Varimax rotation based on *Eigenvalues*, was performed (> 1.00), KMO =.88, χ^2 (N = 163, 120) = 2129.79, p < .001. The resultant model explained 79.5% of the variance in perceived personalisation, perceived intrusiveness, purchase intention and spatial presence. The lowest *Eigenvalue* considered acceptable was .96 for spatial presence factor[1]. Factor loadings of individual items onto the four factors found are presented in Table 1. The four factors found and confirmed were perceived personalisation, spatial presence, perceived intrusiveness and purchase intention as reported in the study by Smink et al. (2020).

Perceived Personalisation. This factor reported a *Cronbach's alpha* value of .93, and included items related to the perception of personalisation of consumers' experience through AR based on the video respondents watched. This includes items such as: tailored to customers' situation, matching customers' needs, perceived as personal and perceived as relevant for customers.

Spatial Presence. This included items related to the perception of reality rather than virtuality of the experience perceived by respondents through the AR video. Items part of the factor were: customers' experience with AR was perceived real rather than virtual, realistic to the customers as in the real world, similar to experiencing the products in reality and perceived like it was in reality. The *Cronbach's alpha* value obtained was .82.

Perceived Intrusiveness. Here, items related to the intrusiveness of the experience lived with AR were included such as: intrusive, unpleasant, invasive, interfering, and disturbing. *Cronbach's alpha* value reported was .91.

Purchase Intention. *Cronbach's alpha* value for this factor was .84. This factor refers to the influence that AR has on consumers' intention to purchase products online. Items included in this factor were: small/big, uncertain/certain and unlikely/likely.

[1] The factor, despite having the lowest *Eigenvalue* of .96, had already been validated in the study by Smink et al. (2020), therefore it made sense to take it into account. This was also acceptable because the factor loadings offered a superior solution while keeping the four components.

Table 1: Factor and Reliability Analysis for Consumers' Perception of AR Online Experience and Purchase Intention (*N* =163)

Item	Perceived Personalisation	Perceived Intrusiveness	Spatial Presence	Purchase Intention
Tailored to customers' situation	.92			
Matching customers' needs	.91			
Perceived as a personal	.91			
Perceived as relevant for customers	.83			
Intrusive		.91		
Unpleasant		.91		
Invasive		.89		
Interfering		.87		
Disturbing		.72		
Perceived real rather than virtual			.93	
Realistic to the customers as in the real world			.88	
Similar to experiencing the products in reality			.89	
Perceived like it was in reality			.89	
Small/big				.94
Uncertain/certain				.79
Unlikely/likely				.78
Eigenvalue	6.62	3.51	.96	1.63
Cronbach's alpha	.93	.91	.82	.84

3.4 Procedure

The data was collected during April 2023. By asking respondents for consent in participating in the research, respondents were informed that the participation was anonymous, voluntary and that the purpose of the study was academic. Additionally, information about the confidentiality of the data was given. Furthermore, respondents were informed about the possibility to stop the survey at any time without penalties as shown in Appendix A. The questionnaire was in Italian to facilitate the possibility of reaching respondents and was created and developed through the Qualtrics platform. The expected duration of the survey was five minutes (Appendix B).

Since some respondents could have been unfamiliar with the use of AR technology while shopping online, a video that represented the AR shopping experience was shown to all respondents (Qin et al., 2021). In order to answer the research question, the brand tested was Amazon since the company recently integrated AR technology on the Italian app for certain products such as shoes (Baldini, 2022). First, users were asked to answer questions about age, gender, level of education, nationality and area of residency to ensure they were part of the target audience. Respondents that did not identify themselves as Italian, were referred to the end of the survey by explaining that they did not fit into the target group of the research. Second, they were required to watch the Amazon short video about AR technology. A sentence explained to participants that in the following section of the survey, a video on the Amazon app experience with the use of AR was shown. They were asked to watch the video carefully and answer a number of following questions. After clicking on continue, respondents could access the following page that presented the video. Instructions above the video explained that respondents could activate the video by clicking on any part of the screen. Additionally, they were informed that after the video was played a button would appear to move to the next session of the survey. This is because a 35 seconds timer was set in advance to ensure that respondents would have watched the entire video before answering the questions. The video showed how the Amazon online shopping experience changed by allowing consumers to virtually try on products and easily changing colours or style of the product. Subsequently, questions related to AR factors and their effects on purchase intention were presented by considering Smink et al. (2020) measurements. Final questions about consumers' experience with mobile technology and AR/VR features were included.

3.5 Validity and Reliability

Validity is defined as the degree to which a concept is precisely assessed in quantitative studies (Heale & Twycross, 2015). Validity of the data collection tools need to be taken into account when conducting research (Heale & Twycross, 2015). Different types of validity are defined, among the most important are content validity, construct validity and criterion validity (Heale & Twycross, 2015).

Content validity refers to the extent to which a survey measures all the aspects of a construct (Mellinger & Hanson, 2020; Heale &Twycross, 2015). Additionally, content validity relies on theories for the content that needs to be measured (Mellinger & Hanson, 2020). Construct validity focuses on ensuring that a research instrument covers the intended construct (Heale & Twycross, 2015). Lastly, criterion validity refers to a research tool's degree of connection to other tools used to measure the same variables (Heale & Twycross, 2015). In order to guarantee the different levels of validity of the measurement instruments adopted, the study by Smink et al. (2020) was taken into consideration. Since the factors such as perceived personalisation, spatial presence, perceived intrusiveness and purchase intention were already validated by Smink et al. (2020), the different degrees of validity of the study can be guaranteed. This is because by considering the convergence, construct validity can be

ensured (Heale & Twycross, 2015). Content validity was also guaranteed by ensuring that the survey adequately covered all the content related to the constructs (Heale & Twycross, 2015). Additionally, criterion validity was achieved by adopting reliable and well established measures. Moreover, multiple measures for the constructs were included (Heale & Twycross, 2015). Furthermore, an additional type of validity that was guaranteed in this research is external validity. External validity is defined as the degree to which a study's results can be extended or applied to populations, places, or conditions other than the particular sample and environment in which it was executed (Campbell & Stanley, 1963). By considering the sample method adopted, a combination of a purposive and snowballing sample ensured a more diverse characteristic of the participants of the study (Kirchherr1 & Charles, 2018). In contrast to one of the samples adopted by Smink et al. (2020), this research sample showed to be more balanced in terms of gender, age and level of education. This increased the external validity of this study compared to the one conducted by Smink et al. (2020) (Kirchherr1 & Charles, 2018).

Reliability was ensured by having consistency of measurements (Heale & Twycross, 2015). It implies the adoption of standardized measurement tools and the spread of clear instructions to respondents. Additionally, by keeping uniform measurement processes, measurement errors are reduced (Heale & Twycross, 2015). Reliability was also guaranteed by considering homogeneity, which refers to items on a scale that measure a specific construct (Heale & Twycross, 2015). Homogeneity is also defined as internal consistency and *Cronbach's alpha* tests were performed to ensure it. The related reliability scores from the tests were considered acceptable since all of them were above 0.70 (Heale & Twycross, 2015). Additionally, reliability was guaranteed by supplying precise operationalizations and definitions of the variables being investigated. Moreover, through the clear definition of measurement techniques and scales used to quantify the variables, reliability was ensured (Allison, 1999).

3.6 Data Analysis

The data was analysed by using the software program SPSS 28.0.1.0 version. To answer the research question and the related hypotheses, regression analysis was performed. This research tested the direct effects of the factors, as well as the interaction effects on purchase intention through regression analysis (Sykes, 1993). Additionally, tests to check for multicollinearity of the variables were conducted. Multicollinearity is defined as a situation that happens in regression when variables are correlated to each other (Lavery et al., 2017). This was investigated since it might affect the model's estimate and interpretation (Lavery et al., 2017). Furthermore, two exploratory research were conducted through ANOVA and t-test. These are statistical methods usually adopted to compare means between groups (Mishra et al., 2019). ANOVA was used to observe a potential relationship between participants' educational level and purchase intention, while t-test was chosen to investigate a relationship between gender and purchase intention.

4. Results

This results section explores the outcomes obtained from the data analysis. First, multiple regression analysis and multicollinearity tests are introduced together with the results obtained. Second, two types of exploratory research are presented, ANOVA and t-test, along with the related outcomes. Lastly, discussion, managerial implications, limitations and suggestions for future research are provided.

4.1 Multiple Regression Analysis and Multicollinearity Test

A linear regression analysis is conducted. This test is important to understand the relationship between consumers' purchase intention and the three variables including perceived personalisation, spatial presence and perceived intrusiveness. The results show that the model is significant, F (3, 159) = 19.30, $p < .001$, $R^2 = .27$. This means that the predictors together explain a proportion of variance ($R^2 = .27$) in consumers' purchase intention. Additional analysis shows that among the predictors, only spatial presence is found to have a significant and positive relationship with consumer purchase intention ($\beta = .49$, $p < .001$),. This result means H1 is confirmed. On the other hand, perceived personalisation ($\beta = .03$, $p = .728$) and perceived intrusiveness ($\beta = -.03$ $p = .702$) are not significant predictors on consumers' purchase intention. Therefore, H2 and H3 are not confirmed. Moreover, tests to check for collinearity of the variables are performed through testing the *Variance Inflation Factor* (*VIF*) and *Tolerance*. These are used to ensure that the variables are not explaining the same variance in consumers' purchase intention. The tests report an absence of multicollinearity among all the variables. First, the test is performed between perceived personalisation and spatial presence and perceived intrusiveness (*VIF* = 1.01, *Tolerance* = .99; *VIF* = 1.01, *Tolerance* = .99), as well between spatial presence and the other variables, perceived personalisation and perceived intrusiveness (*VIF* = 1.08, *Tolerance* = .93; *VIF* = 1.08, *Tolerance* = .93). Lastly, it is performed between perceived intrusiveness and the variables perceived personalisation and spatial presence (*VIF* = 1.77, *Tolerance* = .57; *VIF* = 1.77, *Tolerance* = .57).

4.2 ANOVA

An exploratory analysis with ANOVA is conducted to understand a possible relationship between the dependent variable, purchase intention, and the educational level of participants as the independent variable. The analysis does not reveal any significance between the two variables, F (3, 159) = .46, $p = .709$, partial $\eta^2 = .01$. Similarly, Tukey post-hoc comparison does not reveal a significant relationship between any of the four levels of education, secondary school ($M = 5.44$, $SD = 1.78$), high school ($M = 5.17$, $SD = 1.61$), university bachelor's degree ($M = 5.19$, $SD = 1.33$) and master's degree or PhD ($M = 4.96$, $SD = 1.54$), and purchase intention. The relationship with the lowest p-value is participants with a secondary school graduation who display a higher desire to

purchase when compared to responders with a master's or PhD (p = .643). However, this value cannot be considered as significant.

4.3 T-Test

In order to provide a more comprehensive analysis of the data, a t-test is performed to investigate a possible relation between gender and their purchase intention. The t-test shows that participants who identify themselves as females have a higher intention to make a purchase (M =5.28, SD = 1.49) than participants that identify themselves as male (M = 4.91, SD = 1.65). However, the relation between the two does not appear to be significant t (161) = -1.4, p = .241. Hence, purchase intention of online products for female respondents is not significantly higher when compared to male participants.

4.4 Discussion

This section aims to explore the outcomes obtained from the analysis in relation to the hypotheses tested and to the literature previously explored. Furthermore, it investigates potential influences that could affect the factors considered and, consequently, the results obtained from the analysis.

4.4.1 Spatial Presence Validation

The findings of the research partially confirm the results obtained in the study previously conducted by Smink et a. (2020). Data obtained from this research only validate the study by Smink et. al (2020) in terms of spatial presence. Hence, the findings regarding spatial presence can be considered applicable to the Italian population. As a result, the product experienced with AR technology, during online shopping, is perceived as real for Italians. This is found to be in line with Smink et al.'s (2020) research among Dutch consumers. Therefore, the possibility to manage and engage with the product increases the level of spatial presence as supported by Smink et al. (2020). Additionally, it proves that a lower perceived difference between a virtual and physical product results from increased perception of spatial presence. Thus, Italian customers enjoy watching the online shopping experience performed and perceive it as real. This result is in line with Lombard and Ditton's (1997) conceptualisation of "it is here". The authors introduce the concept of presence as transportation by explaining that presence includes the idea of transportation. Specifically, through "it is here" Lombard and Ditton (1997) argue that a sense of presence transports objects and context from another place to the users' environment. Hence, when media users are not able to perceive the difference between virtual and real world they have a direct response to the message without decoding or considering it as symbolic.

This finding also supports the study by Daugherty et al. (2008), who stress that when consumers interact with virtual experiences, the levels of brand attitude and purchase intention

increase. Thus, virtual experience, in terms of spatial presence, can be recognized as a valuable substitute for direct experience (Daugherty et al., 2008). This is because it is perceived as an immersive and interactive process for consumers. As Li et al. (2001) conceptualise, virtual experience results as a vivid and engaging psychological state that consumers experience when they interact with virtual products through technology mediated context. Virtual experience results as a simulation of the reality that corporates elements of both direct and indirect experience (Li et al., 2001). Hence, it offers a richer experience by including several benefits such as giving the possibility to interact and engage with products and for allowing consumers to inspect objects in an accurate way by zooming in on or inspecting all angels (Li et al., 2001).

4.4.2 Cultural Values' Influence on Perceived Personalisation and Perceived Intrusiveness

In contrast to Smink et al.'s (2020) findings, no relation between perceived personalization, perceived intrusiveness of online shopping with AR, and consumers' purchase intention within the online Italian retail market is found. Therefore, Smink et al. (2020) findings in relation to perceived personalisation and perceived intrusiveness are not applicable to the Italian population. Several reasons could be related to the contrasting results obtained. For instance, the different cultural backgrounds of the two studies, one conducted in Italy and one in the Netherlands, could affect the results. Hofstede's (1984) theory could partially explain this difference presented in the findings. The two countries score differently on uncertainty avoidance dimension, which appears to be higher for Italians than for Dutch (Hofstede Insights, n.d.). Italians have trouble adapting to new circumstances because of the low affinity they have towards unknown territories. Furthermore, compared to other cultures, Italians exhibit a higher attitude towards upholding traditions and viewing changes with mistrust (Hofstede Insights, n.d.). On the other side, the tendency to avoid uncertain situations is lower among Dutch, who score lower on the uncertainty avoidance scale (Hofstede Insights, n.d.). This indicates that whereas Italians tend to view changes with greater scepticism, Dutch are better able to adjust themselves to new circumstances. However, these cultural values could play a less important role in relation to spatial presence. This is because the spatial presence participants experience with AR appears stronger, more enhanced, and more vivid, compared to the one people are used to during traditional online shopping (Weibel & Wissmath, 2011). With stronger feelings of immersion and involvement, cultural biases could be less influential on participants. Additionally, personal traits are highly influential on spatial presence (Weibel & Wissmath, 2011). Certain personality traits, such as a propensity to stay focused or be involved in tasks, increase the likelihood that a person may experience spatial presence (Weibel & Wissmath, 2011). These could be considered as additional reasons why cultural values would affect the factor in a different way compared to perceived personalisation and intrusiveness (Weibel & Wissmath, 2011).

Additionally, the lack of knowledge of modern technology and digital competencies, which is more pronounced for Italians, could also impact the results (Monachesi, 2019). The findings may also possibly be related to Serravalle et al.'s (2021) study which stresses that Italians are more reluctant to innovate and adopt new technology such as AR. This could explain why the perceived personalisation variable is not found to influence consumers' purchase intention for Italians, in contrast to Dutch people. Italians, being sceptical to new changes, upholding the traditions and having a reduced technological education, could observe a lack of personalisation of the experience while using AR features (Hofstede Insights, n.d.; Monachesi, 2019). On the other hand, these cultural values could also influence the results regarding spatial presence and consumers' purchase intention while shopping with AR in a positive way. This is because, as Smink et al. (2020) argue, presence reinforces beliefs about a product while reducing the perception of the risk for buying. Spatial presence leads to an enhanced experience by improving product representation and fluency in the decision-making process (Kumar, 2022). Hence, decision-making comfort and satisfaction increase, and the risk to purchase is reduced. This could be crucial for Italians who have the tendency to avoid risky and unknown situations. By relying on spatial presence, Italians would avoid uncertainty and risk, in line with Hofstede Insights (n.d.).

4.4.3 Exposure to ICT and Perceived Intrusiveness

In relation to the results of perceived intrusiveness, additional reasons could play an important role. Within Smink et al.'s (2020) research findings, perceived intrusiveness is negatively associated with purchase intention, while this research demonstrates an absence of relation between the two. Some reasons could refer to the difference in ICT use and digital competence between Italians and Dutch (Monachesi, 2019). The fact that ICT is largely adopted in the Netherlands by both young and elderly people and that digital competences are higher compared to Italians, could influence the level of awareness related to privacy concerns and perception of being under surveillance, between the two populations (Smink et al. 2020; Monachesi, 2019, Park & Jang, 2014). Italians, by having less experience with new technology, could present a reduced level of privacy concerns, which results in an absence of relationship between perceived intrusiveness and consumers' purchase intention while shopping with AR. Consequently, the related negative effects influencing perceived intrusiveness, such as consumers' perceived intrusiveness, irritation, and message rejection, are not recognized by Italians, as observed in the Dutch sample. These appear to be influential in the study by Smink et al. (2020) in which the level of technology acceptance and education is higher (Monachesi et al. 2020).

4.4.4 Educational Level, Gender and Purchase Intention

Lastly, this study conducts a specific analysis between different levels of education and purchase intention and on gender and purchase intention which do not appear to be significant. In terms of educational level and purchase intention, this research cannot be considered in line with the

study by Kian et al. (2017). Kian et al. (2017) stress in their research that people with a higher educational level tend to present a higher intention to buy than people with a lower level of education. Similarly, the study conducted by Chandra and Sinha (2013) reports a high and positive relationship between higher levels of education and attitudes towards online shopping. Thus, online shopping is more appealing for people with a higher educational level (Chandra & Sinha, 2013). Buettner (2020) shows as well that highly educated people tend to buy products online more than people with a lower education level. Differently from these findings, the study by Chi (2018) explains that people with lower-level educational degrees report more satisfaction related to the use of technology and they appear more willing to purchase compared to people with higher education.

However, the results obtained by this study seems to be in line with the findings obtained by Choudhury and Dey (2014). The authors' research shows an absence of relation between online shopping and educational qualification. Choudhury and Dey (2014) stress that the type of education degree presented by participants does not appear to have any influence on online shopping. Following Lee et al.'s (2013) research, the different findings obtained in these studies could be related to cultural differences. By considering Hofstede's (1984) theory, different cultural dimensions could influence the way different populations adapt to innovation and ICT. For instance, by presenting low uncertainty avoidance levels, people could be more open to new technology. On the other hand, high levels of uncertainty avoidance would drive the population to avoid technologies (Lee et al., 2013). Furthermore, the adaptation to new technology could also be influenced by other elements, such as personal attributes (Franke et al. 2018). Users' personality can influence the way ICT is adopted and used (Franke et al. 2018). Hence, the level of education could be affected by cultural values as well as individual characteristics and being influential only in certain conditions.

In relation to gender and intention to purchase, this research is not in line with what Lin et al. (2018) and Shaouf et al. (2016) argue. They explain that males, by having a reduced perception of risk, appear more willing to purchase online compared to women. Although females spend more time on online shopping websites, male consumers make more purchases online (Lin et al., 2018). In contrast to what Lin et al. (2018) argue, the study by Zhang et al. (2020) confirms the finding of this study based on the Italian sample. According to their research, no significant relationship is observed between gender and online purchase intention with virtual and innovative technologies. Although Zhang et al. (2020) were expecting a relationship between females and intention to buy for their enjoyment of online shopping innovations, no relationship is reported. Additionally, taking into consideration the study by Kudeshia and Kumar (2016), other elements play a role in the decision-making process to buy products online, such as the type of product and personal characteristics of consumers. These and other additional elements could play a role in these studies and influence the different findings.

4.5 Managerial Implications

Based on the findings, this research could be considered valuable within the entrepreneurial and data protection fields. AR technology allows consumers to virtually try products in different colours and shapes by reducing the perception of risk of buying products online (Smink et al. 2020). Additionally, AR features increase shopping convenience and reduce shopping effort (Duarte et al., 2018). This research gives managers and leaders at companies the possibility to understand how AR technology is beneficial in influencing consumers' online intention to purchase. Additionally, companies can understand how enhancing spatial presence can lead to an increase in consumers' purchase intention. Company managers could implement their online platforms or apps and include AR technology within the online shopping experience. In this way, they would obtain benefits such as having customers with an increased intention to buy products online. Furthermore, by showing an absence of negative relation between perceived intrusiveness and purchase intention, consumers did not appear to be irritated by the technology. Hence, no negative correlations were shown related to the use of the AR tools on consumers.

These insights would also be useful for marketers. They could include this information to develop further research on the topic to better understand the technology and its benefits. Additionally, once AR would be integrated on a company website or app, marketeers could promote the implementation of the online shopping platform or app. This could be considered as an additional way to attract valid consumers that would present an increased intention to buy products online. Furthermore, this research could also bring new insight to policy makers. Italian legislators could benefit from this study by understating how AR technology has an effective impact on consumers' online purchase intention. Such insights could be used by policy makers in order to investigate and potentially define new legislations that would protect consumers online behaviours. For instance, governments or agencies dedicated to consumers' protection could consider implementing regulations to protect consumers from unethical practices related to AR and its power to enhance purchase intention. In order to increase consumers' awareness, policy makers could require companies to provide accurate information about the possible effects and impacts of AR on consumers' intention to purchase. These could be spread also by governments through educational campaigns. Furthermore, policy makers could provide guidelines and instructions related to the use of AR within marketing activities that would need to be followed by marketeers. In order to ensure that the regulations are respected by companies, governments or other policy makers could monitor and eventually impose penalties when needed.

Lastly, the research would also benefit platform designers in understanding new effective technological trends that companies would utilise within future projects. Platform designs could include the new technology on future platforms in order to improve online shopping experience by giving consumers the possibility to try and observe virtual products with a reduced shopping effort. Additionally, this would benefit the company with consumers that present an increased intention to

make a purchase (Smink et al., 2020; Duarte et al., 2018). Hence, this study on AR technology and its relationship to purchase intention would be an important contribution for companies, policy makers and consumers. It would be useful to understand how to balance the usability of the AR technology in order to bring benefits to all parties and to reduce potential negative effects.

4.6 Limitations and Suggestions for Future Research

This research presents some limitations that are related to different elements. The first limitation refers to the sample. The sample is composed of both males (30.1%) and females (69.9%). Additionally, the mean age is 43 years old, and the age range is between 19.00 and 78.00 years old. These sample characteristics could play an important role in impacting the results of the research. In the next section, these are introduced and explained. Additionally, the sample also differs from the ones adopted in previous research. For instance, Smink et al. 's (2020) study presents two samples with different gender dispersion, different mean age of participants, which is 21 years old, and different levels of education. These factors would also possibly contribute to explaining the difference in the findings.

4.6.1 The Influence of Gender

This research reports a positive relationship only between spatial presence and purchase intention. Smink et al. (2020) observes, as part of their findings, a positive relation between perceived personalisation and purchase intention, while a negative relation is observed between perceived intrusiveness and purchase intention. These contrasting results could be related to different reasons. For instance, Hsu et al. (2021) explains how people define different experiential values in relation to the technology. Consumers usually associate the online shopping experience to one of two following values, utilitarian or hedonic (Hsu et al., 2021). With the utilitarian value, consumers evaluate efficiency and convenience, while with hedonic value, customers focus on cost effectiveness of the experience (Hsu et al., 2021). Additionally, the utilitarian values are driven more by rationality, whereas hedonic value is more personal and guided by the level of happiness, fun and how playful the experience is (Hsu et al., 2021).

Furthermore, the study by Yang and Lee (2010) observes how hedonic values appear stronger in females rather than males when using mobile devices. Hedonic motivations are also observed as relevant for females in the study by Kim and Forsythe (2008). They show that while experiencing virtual try-on technology, hedonic motivations are higher in females rather than male participants. Furthermore, Kim and Forsythe (2008) also stress that males are more task oriented. Additionally, as Kudus et al. (2016) argue, the hedonic values can be created when users experience personalisation by actively participating in the co-creation process of the experience and enjoying the active involvement. Hence, it is possible that, due to a more balanced inclusion of both male and female participants in this sample, this research could not find any relationship between perceived personalisation and purchase

intention. Italian male respondents could act in a more task oriented way rather than enjoying the personalisation of the experience. This results in a reduced perception of personalisation and a consequent absence of a significant relationship between perceived personalisation and purchase intention in this research.

On top of that, other elements are found to be influential in the relationship between gender and purchase intention. For instance, the type of product that consumers are exposed to seems to largely affect people's intention to purchase (Kudeshia & Kumar, 2016; Pascual-Miguel et al., 2015). The intention to buy appears influential on what consumers want to purchase (Pascual-Miguel et al., 2015). This introduces an additional element that can be considered as a highly influential factor in this research. This study does not show a significant relationship between female respondents and purchase intention. However, the relation appears to be higher in female participants than males. Therefore, both hedonic and product type could still play an important role in influencing the findings of this research. Hence, future studies should address these gaps by elaborately investigating both, the distribution of the gender in the sample and its influence and a possible effect that other elements could have on purchase intention, such as product types. For instance, by including an equally balanced gender distribution, it would be possible to guarantee a mitigated presence of both hedonic or utilitarian values experienced by participants while using AR tools and the related influence on purchase intention. This would contribute to better understanding their relationship by controlling biases related to that. Future studies could also control the type of product to which participants are exposed to and observe potential influences related to that.

Additional elements that could be influential on the other factor, perceived intrusiveness, could be related to both gender and age characteristics of the sample. As Dhir et al. (2017) observe in their study, females present greater privacy concerns than males. Additionally, women have a higher perception of risk when shopping online (Smink et al. 2020). The level of experience with privacy related topics also increases women's level of privacy risk. Therefore, they appear less comfortable in disclosing personal information (Frye & Dornisch, 2010). This could also explain why in this research, where both male and female participants are present, the relationship between perceived intrusiveness and purchase intention is absent. Male respondents, through being less concerned about privacy protections and risks related to online shopping, could affect the findings by not showing a negative relation between perceived intrusiveness of AR and purchase intention. In future research, the inclusion of an equally balanced gender distribution and the consideration of influences related to gender such as privacy risks and concerns could lead to a better understanding of the results and to avoid biases. Therefore, it would be possible to understand if gender affects the relation between the variables or if other factors have a greater influence, such as the level of technological education (Monachesi, 2019; Dhir et al., 2017; Frye & Dornisch, 2010; Smink et al., 2020). The reduced exposure of Italians to ICT, could also affect the results by decreasing the perception of intrusiveness of the technology for Italians (Monachesi, 2019). Therefore, by paying attention to the characteristics

of the sample it would be possible to have a clear understanding of the relation between gender and the relationship between perceived intrusiveness and purchase intention.

4.6.2 The Influence of Age and ICT Exposure

The perceived intrusiveness factor could also have been affected by other sample characteristics. The Italian sample, by being old and with less experience with new technology, would present a reduced level of privacy concerns (Monachesi, 2019). This could reduce the perception of intrusiveness of the AR technology and related negative influence on purchase intention (Smink et al. 2020; Monachesi, 2019, Park & Jang, 2014). Additionally, as observed by Dhir et al. (2017), young adults present more privacy concerns compared to older people. Moreover, they appear to be active in managing social privacy by protecting their data in a more consistent way compared to adults (Dhir et al., 2017). Participants of this research could perceive the intrusiveness of AR technology in a less impactful way compared to younger people. Additionally, as they could be less accustomed to controlling their internet privacy protection than younger people, the age range of the sample could also account for the lack of a relationship between perceived intrusiveness and intent to purchase (Dhir et al., 2017). Moreover, the fact that Italians are less exposed to the use of ICT and have reduced digital competences compared to other cultures, could make Italians less conscious of privacy risks and perception of being surveilled (Monachesi, 2019; Park & Jang, 2014). This could contribute to explain the absence of relation between perceived intrusiveness and purchase intention.

Future research should give a greater importance to the age distribution as well as the level of ICT exposure and digital skills of the sample studied. In this way, it would be possible to have an equal dispersion of the level of privacy concerns of the respondents in the sample. Therefore, high levels of privacy risks of young respondents would be mitigated by the reduced privacy concerns of older participants. Additionally, respondents with low ICT exposure and reduced digital competences would be compensated with respondents that are usually exposed to ICT and with proper digital skills. This would be important to better understand the eventual presence of a negative relationship between perceived intrusiveness and purchase intention.

4.6.3 The Influence of Educational Level

Furthermore, after performing additional research, the Italian respondent sample does not present a positive relationship between any educational level and purchase intention. These results can be affected by multiple elements. For instance, following the study by Lee et al. ’s (2013), cultural differences could play a role on the relation between educational level and purchase intention in this finding. Specifically, these can be related to the cultural characteristics and the way Italians approach ICT. Italian people are more generally sceptical to innovation with a high level of uncertainty avoidance (Hofstede, n.d.). Furthermore, the fact that Italians are afraid of new technology would lead them to reject the technology, showing an absence of relation between the level of education and

purchase intention. Additionally, the hedonic and utilitarian values associated with the shopping experience with AR by female and male participants could also be crucial in affecting the results of this research (Kim & Forsythe, 2008; Yang & Lee, 2010). Moreover, personality traits are also considered a driver in the use and acceptance of new technology (Franke et al., 2018). Hence, a combination of cultural values, gender biases and personal characteristics may influence the relation between level of education and purchase intention. In future research cross cultural studies could help in the understanding of how cultural values affect the relation between the two. By comparing countries and identifying absence or presence of a relationship between the variables, it would be possible to further investigate the topic. Therefore, it would be possible to determine whether the relationship between AR and purchase intention is impacted by educational level and if cultural values or other elements, such as gender distribution and personality traits, play an influential role in that.

4.6.4 The Influence of the Survey Structure

Lastly, it is important to consider the way participants are analysed in relation to AR in this research. To ensure that Italian respondents are aware of the way that AR features work within online shopping, a video is displayed at the beginning of the questionnaire. They are asked to watch a video that is portraying another person's augmented reality-enhanced buying experience and, as a result, they are not exposed to the technology first hand. The study conducted by Smink et al. (2020) adopts a different procedure. The questionnaire is distributed in a university lab where respondents are first given instructions on how to use the AR technology. Next, they are asked to use the app and experience AR features, and then subsequently answer the questionnaire. The different approach adopted could affect the findings of the study. It is important to consider that some elements could be influential on respondents only if exposed to AR in first person. For instance, as Kokolakis (2017) argues, privacy concerns level increases in relation to incomplete information, bounded rationality and psychological biases experienced by consumers when shopping online. These are not applicable to Italian respondents since they are not experiencing the shopping process. Furthermore, as Fan and Zan (2010) stress in their study, many other elements influence web questionnaires responses. Factors such as questions writing, and visual display affect the response rate of the survey, as well as the type of answer given by respondents. More specifically, factors such as content, presentation, type of delivery, and software used in the survey could affect the type of response (Fan & Zan, 2010). This research measures factors previously analysed in the literature, but with different survey development, delivery, completion and return (Fan & Zan, 2010). Hence, these elements could be highly influential on the responses given by participants as well as on the results of the study. Future research should address these gaps and let participants experience online shopping with AR in first person. In this way, they would be able to get a full understanding of the technology and of the overall experience. This would also decrease any lack of information and psychological biases increasing the validity of the study.

5. Conclusion

This research aims to understand the extent to which AR technology influences consumers' purchase intention when shopping in the Italian online retail market. By considering the variables spatial presence, perceived personalisation and perceived intrusiveness and by analysing the data gathered among Italian respondents, it is possible to provide a response to the research question. The findings show that consumers' purchase intention is positively influenced by AR technology when shopping in the Italian online retail market. The results demonstrate that the variable spatial presence is positively associated with customers' purchase intention. Therefore, spatial presence, which is enhanced during online shopping with AR, stimulates consumers intentions to purchase within the online Italian retail market. In line with Smink et al. (2020), Italian respondents in this research perceive a reduced difference between virtual and real objects. Additionally, the possibility to interact and engage with the product is a valuable benefit to the Italian participants. This increases their perception of presence and, hence, their intention to buy is enhanced.

In contrast to the study conducted by Smink et al. (2020), the findings of this study indicates that perceived intrusiveness and perceived personalization do not significantly influence consumers' intention to make a purchase. Therefore, perceived personalization and perceived intrusiveness of online shopping with AR are not associated with consumers' purchase intention within the online Italian retail market. Hence, perceived personalisation cannot be considered as important for Italian respondents in enhancing purchase intention. In relation to perceived intrusiveness, Italian respondents do not appear to be irritated by the technology. Differently from Smink et al.'s (2020) study, negative emotions that could be provoked using the technology are not present in this research, as well as the consideration of AR as an intrusive tool. Thus, an absence of negative reactions is observed in the Italian sample.

Lastly, exploratory research is conducted in order to understand a possible relation between participants' educational level and purchase intention, and gender and purchase intention. Female respondents appear to have a higher purchase intention compared to male participants. However, the study conducted shows an absence of relation between the variables of both analyses. The level of degree of respondents does not appear to be crucial in shaping consumers' intention to buy products. Similarly, no significant relation is observed between gender and intention to purchase and consumer purchase intention does not appear to be affected by the gender of Italian participants. Consequently, this study demonstrates how the factors, already analysed in the Netherlands by Smink et al. (2020), present different results in Italy. The different findings could be attributed to several factors, including cultural values, gender, age, level of education and differences in methodological structures adopted in the study. These could be addressed in future research to have a better understanding of what might be influential in the relation between the variables analysed.

References

Allison, P. (1999). *Multiple regression: A primer.* Pine Forge Press.

Alwreikat, A. A. M., & Rjoub, H. (2020). Impact of mobile advertising wearout on consumer irritation, perceived intrusiveness, engagement and loyalty: A partial least squares structural equation modelling analysis. *South African Journal of Business Management, 51*(1). https://doi.org/10.4102/sajbm.v51i1.2046

Ameen, N., Tarhini, A., Reppel, A., & Anand, A. (2021). Customer experiences in the age of artificial intelligence. *Computers in Human Behavior*, *114*, 106548. https://doi.org/10.1016/j.chb.2020.106548

Aw, E. C.-X., Tan, G. W.-H., Ooi, K.-B., & Hajli, N. (2023). Tap here to power up! Mobile augmented reality for consumer empowerment. *Internet Research*. https://doi.org/10.1108/intr-07-2021-0477

Baldini, M. (2022). Nuovi modi per narrare. L'intreccio tra letteratura per l'infanzia e realtà aumentata [New ways of narrating. The intertwining of children's literature and augmented reality]. *MeTis. Mondi Educativi. Temi, Indagini, Suggestioni*, *12*(2). https://doi.org/10.30557/mt00242

Borrego, M., Douglas, E. P., & Amelink, C. T. (2009). Quantitative, qualitative, and mixed research methods in engineering education. *Journal of Engineering Education*, *98*(1), 53–66. https://doi.org/10.1002/j.2168-9830.2009.tb01005.x

Brehm, J.W. (1966). *A theory of psychological reactance.* Academic Press.

Brown, J.S., Collins, A., & Duguid, S. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.

Buettner, R. (2020). The impact of trust in consumer protection on internet shopping behavior: An empirical study using a large official dataset from the European Union. *2020 IEEE Sixth International Conference on Big Data Computing Service and Applications (BigDataService)*. https://doi.org/10.1109/bigdataservice49289.2020.00018

Campbell, D.T., & Stanley, J.C. (1963). *Experimental and quasi-experimental designs for research*. Houghton Mifflin.

Chi, T. (2018). Mobile commerce website success: Antecedents of consumer satisfaction and purchase intention. *Journal of Internet Commerce*, *17*(3), 189–215. https://doi.org/10.1080/15332861.2018.1451970

Choudhury, D., & Dey, A. (2014). Online shopping attitude among the youth: A study on university students. *International Journal of Entrepreneurship and Development Studies*, 2(1), 23-32.

Clancey, W.J. (1997). *Situated cognition: On human knowledge and computer representations*. Cambridge University Press.

Cohen, N., & Arieli, T. (2011). Field research in conflict environments: Methodological challenges and snowball sampling. *Journal of Peace Research, 48*(4), 423–435. https://doi.org/10.1177/0022343311405698

Cuomo, M. T., Tortora, D., Festa, G., Ceruti, F., & Metallo, G. (2020). Managing omni-customer brand experience via augmented reality. *Qualitative Market Research: An International Journal*, *23*(3), 427–445. https://doi.org/10.1108/qmr-11-2017-0142

Daugherty, T., Li, H., & Biocca, F. (2008). Consumer learning and the effects of virtual experience relative to indirect and direct product experience. *Psychology and Marketing*, *25*(7), 568–586. https://doi.org/10.1002/mar.20225

De Keyzer, F., Dens, N., & De Pelsmacker, P. (2015). Is this for me? How consumers respond to personalized advertising on social network sites. *Journal of Interactive Advertising*, *15*(2), 124–134. https://doi.org/10.1080/15252019.2015.1082450

Dhir, A., Torsheim, T., Pallesen, S., & Andreassen, C. S. (2017). Do online privacy concerns predict selfie behavior among adolescents, young adults and adults? *Frontiers in Psychology*, *8*. https://doi.org/10.3389/fpsyg.2017.00815

Duarte, P., Costa e Silva, S., & Ferreira, M. B. (2018). How convenient is it? Delivering online shopping convenience to enhance customer satisfaction and encourage e-wom. *Journal of Retailing and Consumer Services*, *44*, 161–169. https://doi.org/10.1016/j.jretconser.2018.06.007

Dusek, G., Yurova, Y., & P. Ruppel, C. (2015). Using social media and targeted snowball sampling to survey a hard-to-reach population: A case study. *International Journal of Doctoral Studies*, *10*, 279–299. https://doi.org/10.28945/2296

Emerson, R. W. (2015). Convenience sampling, random sampling, and snowball sampling: How does sampling affect the validity of research? *Journal of Visual Impairment & Blindness*, *109*(2), 164–168. https://doi.org/10.1177/0145482x1510900215

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behavior*, *26*(2), 132–139. https://doi.org/10.1016/j.chb.2009.10.015

Franke, T., Attig, C., & Wessel, D. (2018). A personal resource for technology interaction: Development and validation of the affinity for technology interaction (ATI) scale. *International Journal of Human–Computer Interaction*, *35*(6), 456–467. https://doi.org/10.1080/10447318.2018.1456150

Frye, N. E., & Dornisch, M. M. (2010). When is trust not enough? The role of perceived privacy of communication tools in comfort with self-disclosure. *Computers in Human Behavior*, *26*(5), 1120–1127. https://doi.org/10.1016/j.chb.2010.03.016

Groves, R. M., Fowler Jr., F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). Web surveys. In R. M. Groves, G. Kalton, N K. Rao, N. Schwarz, C. Skinner (Eds.), *Survey methodology* (pp. 377-390). Wiley & Sons.

https://alraziuni.edu.ye/book1/nursing/ebooksclub.org__Survey_Methodology__Wiley_Series_in_Survey_Methodology_.pdf

Hair, J.F. (2011). Multivariate data analysis: An overview. In: M. Lovric. (Ed.), *International Encyclopedia of Statistical Science (*pp. 904–907). https://doi.org/10.1007/978-3-642-04898-2_395

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence Based Nursing*, *18*(3), 66–67. https://doi.org/10.1136/eb-2015-102129

Hilken, T., de Ruyter, K., Chylinski, M., Mahr, D., & Keeling, D. I. (2017). Augmenting the eye of the beholder: Exploring the strategic potential of augmented reality to enhance online service experiences. *Journal of the Academy of Marketing Science*, *45*(6), 884–905. https://doi.org/10.1007/s11747-017-0541-x

Hofstede, G. (1984). *Culture's consequences: International differences in work-related values.* SAGE Publications.

Hofstede Insight. (n.d.) *Country Comparison.* https://www.hofstede-insights.com/country-comparison/italy,the-netherlands,the-usa/

Hsu, S. H.-Y., Tsou, H.-T., & Chen, J.-S. (2021). "Yes, we do. Why not use augmented reality?" Customer responses to experiential presentations of AR-based applications. *Journal of Retailing and Consumer Services*, *62*, 102649. https://doi.org/10.1016/j.jretconser.2021.102649

Kian, T. P., Boon, G.H., Fong, S. W. L. & Ai, Y. J. (2017). Factors that influence the consumer purchase intention in social media websites. *International Journal of Supply Chain Management.* 6. 208-214. https://ijis-scm.bsne.ch/ojs.excelingtech.co.uk/index.php/IJSCM/article/download/1808/1808-6384-1-PB.pdf

Kim, J., & Forsythe, S. (2008). Adoption of virtual try-on technology for online apparel shopping. *Journal of Interactive Marketing*, *22*(2), 45–59. https://doi.org/10.1002/dir.20113

Kirchherr, J., & Charles, K. (2018). Enhancing the sample diversity of snowball samples: Recommendations from a research project on anti-dam movements in Southeast Asia. *PLOS ONE*, *13*(8). https://doi.org/10.1371/journal.pone.0201710

Kokolakis, S. (2017). Privacy attitudes and privacy behaviour: A review of current research on the privacy paradox phenomenon. *Computers & Security*, *64*, 122–134. https://doi.org/10.1016/j.cose.2015.07.002

Kudeshia, C., & Kumar, A. (2016). Social ewom: Does it affect the brand attitude and purchase intention of brands? *Management Research Review*, *40*(3), 310–330. https://doi.org/10.1108/mrr-07-2015-0161

Kudus, S. I. A., Campbell, R. I., & Bibb, R. (2016). Customer perceived value for self-designed personalised products made using additive manufacturing. *International Journal of*

Industrial Engineering and Management, *7*(4), 183-193. www.iim.ftn.uns.ac.rs/ijiem_journal.php ISSN 2217-2661

Kumar, H. (2022). Augmented reality in online retailing: A systematic review and research agenda. *International Journal of Retail & Distribution Management*, *50*(4), 537–559. https://doi.org/10.1108/ijrdm-06-2021-0287

Lavery, M. R., Acharya, P., Sivo, S. A., & Xu, L. (2017). Number of predictors and multicollinearity: What are their effects on error and bias in regression? *Communications in Statistics - Simulation and Computation*, *48*(1), 27–38. https://doi.org/10.1080/03610918.2017.1371750

Lee, G., & Lee, W. J. (2009). Psychological reactance to online recommendation services. *Information & Management*, *46*(8), 448–452. https://doi.org/10.1016/j.im.2009.07.005

Lee, S.G., Trimi, S., & Kim, C. (2013). The impact of cultural differences on technology adoption. *Journal of World Business*, *48*(1), 20–29. https://doi.org/10.1016/j.jwb.2012.06.003

Lin, X., Featherman, M., Brooks, S. L., & Hajli, N. (2018). Exploring gender differences in online consumer purchase decision making: An online product presentation perspective. *Information Systems Frontiers*, *21*(5), 1187–1201. https://doi.org/10.1007/s10796-018-9831-1

Lixăndroiu, R., Cazan, A.-M., & Maican, C. I. (2021). An analysis of the impact of personality traits towards augmented reality in online shopping. *Symmetry*, *13*(3), 416. https://doi.org/10.3390/sym13030416

Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication*, 3(2). doi:10.1111/j.1083-6101.1997.tb00072.x

MA Media Studies. (2022). *Methodological guidelines thesis research.* https://canvas.eur.nl/login

McLean, G., & Wilson, A. (2019). Shopping in the digital world: Examining customer engagement through augmented reality mobile applications. *Computers in Human Behavior*, 101, 210–224. https://doi.org/10.1016/j.chb.2019.07.002

Mishra, P., Singh, U., Pandey, C., Mishra, P., & Pandey, G. (2019). Application of student's t-test, analysis of variance, and covariance. *Annals of Cardiac Anaesthesia*, *22*(4), 407. https://doi.org/10.4103/aca.aca_94_19

Monachesi, P. (2019). Sustainable development and ICT use among elderly: A comparison between the Netherlands and Italy. *Human Aspects of IT for the Aged Population. Design for the Elderly and Technology Acceptance*, 450–462. https://doi.org/10.1007/978-3-030-22012-9_33

Nielsen, M. B., & Einarsen, S. (2008). Sampling in research on interpersonal aggression. *Aggressive Behavior*, *34*(3), 265–272. https://doi.org/10.1002/ab.20229

Pappas, I. O., Kourouthanassis, P. E., Giannakos, M. N., & Chrissikopoulos, V. (2017). Sense and sensibility in personalized e-commerce: How emotions rebalance the purchase intentions of

persuaded customers. *Psychology & Marketing*, *34*(10), 972–986. https://doi.org/10.1002/mar.21036

Park, Y. J., & Mo Jang, S. (2014). Understanding privacy knowledge and skill in mobile communication. *Computers in Human Behavior*, *38*, 296–303. https://doi.org/10.1016/j.chb.2014.05.041

Pascual-Miguel, F. J., Agudo-Peregrina, Á. F., & Chaparro-Peláez, J. (2015). Influences of gender and product type on online purchasing. *Journal of Business Research*, *68*(7), 1550–1556. https://doi.org/10.1016/j.jbusres.2015.01.050

Penco, L., Serravalle, F., Profumo, G., & Viassone, M. (2020). Mobile augmented reality as an internationalization tool in the "made in Italy" food and beverage industry. *Journal of Management and Governance*, *25*(4), 1179–1209. https://doi.org/10.1007/s10997-020-09526-w

Petty, R. E., Barden, J. S. & Wheeler, J. S. (2002). The elaboration likelihood model: Developing health promotions for sustained behavioral change. In R.J. Di Clemente, R.A. Crosby, and M. Kegler, (Eds.), *Emerging Theories in Health Promotion Practice and Research* (pp. 71-99). Jossey-Bass. https://psycnet-apa-org.eur.idm.oclc.org/record/2009-19878-007

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Communication and Persuasion*, 1–24. https://doi.org/10.1007/978-1-4612-4964-1_1

Qin, H., Peak, D. A., & Prybutok, V. (2021). A virtual market in your pocket: How does mobile augmented reality (MAR) influence consumer decision making? *Journal of Retailing and Consumer Services*, *58*, 102337. https://doi.org/10.1016/j.jretconser.2020.102337

Riar, M., Korbel, J. J., Xi, N., Zarnekow, R., & Hamari, J. (2021). The use of augmented reality in retail: A review of literature. *Proceedings of the Annual Hawaii International Conference on System Sciences*, 638-647. https://doi.org/10.24251/hicss.2021.078

Romano, B., Sands, S., & Pallant, J. I. (2020). Augmented reality and the customer journey: An exploratory study. *Australasian Marketing Journal*, *29*(4), 354–363. https://doi.org/10.1016/j.ausmj.2020.06.010

Serravalle, F., Viassone M., & Vanheems R. (2019). Consumers' perception of augmented reality: An application to the "made in Italy" brand. *Impresa Progetto - Electronic Journal of Management*, 2, 1-30. https://dx.doi.org/10.15167/1824-3576/IPEJM2019.2.1208

Serravalle, F., Viassone, M., & Vanheems, R. (2020). The dark side of retailers regarding digital growth strategies: An exploratory study on augmented reality perception. *Sinergie Italian Journal of Management*, *38*(3), 71–88. https://doi.org/10.7433/s113.2020.05

Shaghaghi, A., Bhopal, R. S., & Sheikh, A. (2011). Approaches to recruiting 'hard-to-reach' populations into re-search: A review of the literature. *Health promotion perspectives*, *1*(2), 86–94. https://doi.org/10.5681/hpp.2011.009

Shaouf, A., Lü, K., & Li, X. (2016). The effect of web advertising visual design on online purchase intention: An examination across gender. *Computers in Human Behavior, 60,* 622–634. https://doi.org/10.1016/j.chb.2016.02.090

Smink, A. R., Frowijn, S., van Reijmersdal, E. A., van Noort, G., & Neijens, P. C. (2019). Try online before you buy: How does shopping with augmented reality affect brand responses and personal data disclosure. *Electronic Commerce Research and Applications*, *35*, 100854. https://doi.org/10.1016/j.elerap.2019.100854

Smink, A. R., van Reijmersdal, E. A., van Noort, G., & Neijens, P. C. (2020). Shopping in augmented reality: The effects of spatial presence, personalization and intrusiveness on app and brand responses. *Journal of Business Research, 118*, 474–485. https://doi.org/10.1016/j.jbusres.2020.07.018

Staller, K. M. (2021). Big enough? Sampling in qualitative inquiry. *Qualitative Social Work, 20*(4), 897–904. https://doi.org/10.1177/14733250211024516

Statista. (2022, n.d. a). *eCommerce - Italy.* https://www.statista.com/outlook/dmo/ecommerce/italy

Statista. (2022, n.d. b). *eCommerce - Netherlands.* https://www.statista.com/outlook/dmo/ecommerce/netherlands

Sukamolson, S. (2007). Fundamentals of quantitative research. *Language Institute Chulalongkorn University*, *1*(3), 1-20. file:///C:/Users/hp/Downloads/SuphatSukamolson.pdf

Sykes, A. O. (1993). Introduction to regression analysis. *CoaseSandor Working Paper Series in Law and Economics*, *20*, 1-34. https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1050&context=law_and_economics

Tam, K. Y., & Ho, S. Y. (2005). Web personalization as a persuasion strategy: An elaboration likelihood model perspective. *Information Systems Research*, *16*(3), 271–291. https://doi.org/10.1287/isre.1050.0058

Tongco, Ma. D. (2007). Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications*, *5*, 147. https://doi.org/10.17348/era.5.0.147-158

Verhagen, T., Vonkeman, C., Feldberg, F., & Verhagen, P. (2014). Present it like it is here: Creating local presence to improve online product experiences. *Computers in Human Behavior, 39*, 270–280. https://doi.org/10.1016/j.chb.2014.07.036

Wang, C.-H., Chiang, Y.-C., & Wang, M.-J. (2015). Evaluation of an augmented reality embedded online shopping system. *Procedia Manufacturing*, *3*, 5624–5630. https://doi.org/10.1016/j.promfg.2015.07.766

Wang, Y., Ko, E., & Wang, H. (2021). Augmented reality (AR) app use in the beauty product industry and consumer purchase intention. *Asia Pacific Journal of Marketing and Logistics*, *34*(1), 110–131. https://doi.org/10.1108/apjml-11-2019-0684

Weibel, D., & Wissmath, B. (2011). Immersion in computer games: The role of spatial presence and flow. *International Journal of Computer Games Technology*, *2011*, 1–14. https://doi.org/10.1155/2011/282345

Yang, K., & Lee, H. (2010). Gender differences in using mobile data services: Utilitarian and hedonic value approaches. *Journal of Research in Interactive Marketing*, *4*(2), 142–156. https://doi.org/10.1108/17505931011051678

Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*, *9*(2), 79–94. https://doi.org/10.20982/tqmp.09.2.p079

Zhang, T., Wang, W. Y., Cao, L., & Wang, Y. (2019). The role of virtual try-on technology in online purchase decision from consumers' aspect. *Internet Research*, *29*(3), 529–551. https://doi.org/10.1108/intr-12-2017-0540

Appendix A

Consent Request for Participating in Research

Description

You are invited to participate in research about Augmented Reality (AR) and the associated shopping experience with it. The purpose of the study is to understand how AR influences online consumer behaviour. Your acceptance to participate in this study means that you accept to participate in a survey.

Risks And Benefits

I am aware that the possibility of identifying the people who participate in this study may involve risks such as privacy concerns and biases. For that reason, I will not keep any information that may lead to the identification of those involved in the study. I will use the data gathered from the survey for academic work.

Time Involvement

Your participation in this study will take approximately 5 minutes.

Payments

There will be no monetary compensation for your participation.

Participants' Rights

If you have decided to accept participation in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty.

For questions about the study, contact:

Erika Del Vero, 661016ev@eur.nl

- ○ I agree with the above mentioned terms.
- ○ I don't agree with the above mentioned terms.

Appendix B
Survey

Q2. Do you identify yourself as Italian?

- ○ Yes
- ○ No

Q3. Where are you located in Italy?

- ○ North
- ○ Centre
- ○ South
- ○ Living abroad

Q4. How old are you? (Please specify in numbers)

- ○ _____

Q5. What gender do you identify with?

- ○ Male
- ○ Female
- ○ Other
- ○ Prefer not to say.

Q6. What is the highest level of education you have completed?

- ○ Secondary school
- ○ High school
- ○ University bachelor’s degree
- ○ Master’s degree or PhD

Q7. On the next page a video on the Amazon app experience with the use of Augmented Reality (AR) will be shown. Please watch the video carefully and answer to the following questions.

Q9. Please watch the video below. After the video is played a button will appear to move to the next session. (Please click on any part of the screen below to start the video)

https://youtube.com/shorts/ZVr3pQ59v_0?feature=share

Q10. When using the Amazon app the experience will be…

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Tailored to customers' situation	○	○	○	○	○	○	○
Perceived as personal	○	○	○	○	○	○	○
Matching customers' needs	○	○	○	○	○	○	○
Perceived as relevant for customers	○	○	○	○	○	○	○

Q11. When using the Amazon app, consumers' perception of the experience will be…

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Similar to experiencing the products in reality	○	○	○	○	○	○	○
Perceived like it was in reality	○	○	○	○	○	○	○
Perceived real rather than virtual	○	○	○	○	○	○	○
Realistic to the customers as in the real world	○	○	○	○	○	○	○

Q12. When using the Amazon app, consumers will define the shopping experience as...

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Disturbing	○	○	○	○	○	○	○
Interfering	○	○	○	○	○	○	○
Intrusive	○	○	○	○	○	○	○
Unpleasant	○	○	○	○	○	○	○
Invasive	○	○	○	○	○	○	○

Q13. After using the Amazon app, the chance that consumers will buy the product is...

	1	2	3	4	5	6	7	
Likely	○	○	○	○	○	○	○	Unlikely
Certain	○	○	○	○	○	○	○	Uncertain
Big	○	○	○	○	○	○	○	Small

Q14. How are you familiar with mobile apps in general?

	Not Familiar	Slightly Familiarity	Neutral	Moderately Familiar	Extremely Familiar
					

Q15. How are you familiar with mobile apps for shopping?

	Not Familiar	Slightly Familiar	Neutral	Moderately Familiar	Extremely Familiar
					

Q16. How often do you do shop online?

Never	Rarely	Sometimes	Frequently	All the time

Q17. How are you familiar with Virtual Reality (VR) or Augmented Reality (AR) technology?

Not Familiar	Slightly Familiar	Neutral	Moderately Familiar	Extremely Familiar

Q18. How are you familiar with Virtual Reality (VR) or Augmented Reality (AR) technology when shopping online?

Not Familiar	Slightly Familiar	Neutral	Moderately Familiar	Extremely Familiar

Q19. When purchasing clothing and/or cosmetics, how important is for you to actually see/touch/try them on?

Not Important	Slightly Important	Neutral	Moderately Important	Extremely Important