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AUGMENTED REALITY AND PRODUCT INFORMATION IN FASHION E-COMMERCE

THE EMOTIONAL IMPACT BEHIND PURCHASING DECISIONS

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Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data-Driven Marketing

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Augmented Reality and Product Information in Fashion E-Commerce: Investigating Emotional Responses, Engagement, and Purchase Intention

by

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Master Thesis presented as partial requirement for obtaining the Master's degree in Data-Driven Marketing, with a specialization in Digital Marketing & Analytics

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STATEMENT OF INTEGRITY

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Lisbon, July 2025

Teresa Choi Santos Silva Martins

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ABSTRACT

Augmented reality (AR) is transforming the fashion shopping experience online by changing how customers interact with products. As e-commerce continues to grow, fashion brands are under pressure to replicate the sensory and emotional aspects of physical store experiences. AR creates interactive and immersive features that allow consumers to view products, try them on virtually, and interact with digital content in real-time. These experiences not only produce enjoyment and novelty but also influence emotional engagement, trust, and decision-making.

By this context, this thesis investigates how AR and product information impact emotional engagement and purchase intention in online fashion shopping. A 2 x2 between-subjects experimental study (AR: present vs. absent) × (Product Information: present vs. absent) was conducted to examine their effects. Results from PLS-SEM analysis reveal that AR significantly increases positive affective responses and emotional engagement, which together mediate its influence on purchase intention. A one-way ANOVA further showed that AR exposure—regardless of product information—led to significantly higher purchase intention. These findings highlight how AR acts as a key emotional driver in digital fashion contexts, offering both theoretical and managerial insights into how immersive technology and smart information design shape consumer behavior.

KEYWORDS

Augmented Reality; Consumer Behavior; Emotional Engagement; Fashion E-Commerce; Product Information; Purchase Intention

SUSTAINABLE DEVELOPMENT GOALS (SDG)

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
AR	Augmented Reality
AVE	Average Variance Extracted
CR	Composite Reliability
M	Mean
SD	Standard Deviation
VIF	Variance Inflation Factor
VR	Virtual Reality

1. Introduction

The fashion industry is experiencing a significant digital transformation, with Augmented Reality (AR) appearing as an innovative technology that is changing the customer shopping experience (Poushneh & Vasquez-Parraga, 2017). E-commerce sales worldwide are estimated to hit $6.42 trillion by 2025, representing 27.7% of all retail sales (eMarketer, 2024). The growth of e-commerce is not only a change in the shopping patterns of the consumer but also a need for brands to redevelop their online experience. In such a saturated and competitive online market, retailers need to adopt innovative technologies to deliver richer, more personalized shopping experiences with the capacity to create engagement, reduce purchase uncertainty, and increase conversion (Dacko, 2017; McLean & Wilson, 2019).

Augmented Reality provides interactive, immersive experiences that connect online and in-store shopping by engaging consumers in sensory-rich simulations (Hilken et al., 2021). A report by Deloitte Digital and Snap Inc. (2021) found that over 73% of consumers believe AR makes the shopping experience easier, and companies offering branded AR experiences are 41% more likely to be considered by consumers. Nearly three in four shoppers would pay more for products with the additional transparency AR provides, and AR-powered purchases resulted in a 25% reduction in returns. This implies that the availability of this technology is having a significant impact on retailer selection (Xarwin, 2023). By incorporating AR, retailers are not only fulfilling growing consumer expectations but also building emotional engagement and trust—factors shown to impact purchase intentions (Brengman et al., 2018; Javornik, 2016).

Despite previous research confirming the effectiveness of AR in influencing consumer behavior (Scholz & Duffy, 2018; Poushneh, 2018), the exact mechanisms through which AR enhances emotional engagement, reduces uncertainty, and facilitates online fashion purchasing decisions are unclear. The majority of recent research either focuses on AR in retail in general or does not conduct empirical study regarding how interactivity and media richness come together with product information to affect psychological responses (Poushneh & Vasquez-Parraga, 2017). Since younger generations such as Gen

Z and Millennials become leading consumer groups—known for valuing interactivity, personalization, and novelty—it is very important to understand the exact contribution of AR towards driving this transformation (Poushneh & Vasquez-Parraga, 2017).

It is known that AR can influence consumer engagement, satisfaction, and perceived enjoyment. It is not known, however, how the interactive and sensory features of AR, when paired with rich product information, influence positive emotional responses—such as excitement, enjoyment, and satisfaction—and how these responses translate into emotional engagement and purchase intention, especially in fashion e-commerce contexts. Also, it's not clear whether AR's influence on consumer trust and decision confidence is amplified when detailed product information is also accessible. This research gap highlights the need for a structured examination of such effects.

To address this, the study investigates the impact of AR on consumer behavior in fashion e-commerce. The specific objectives are:

(1) To examine the direct impact of AR on consumers' purchase intention.
(2) To assess how AR-induced positive affective responses (e.g., excitement, enjoyment) enhance emotional engagement and influence purchase behavior.
(3) To evaluate whether the combination of AR and detailed product information produces stronger emotional responses and confidence compared to AR or product information alone (or neither).

To explore these objectives, a quantitative approach was used, utilizing an online questionnaire distributed via social media. Participants were randomly exposed to one of four hypothetical shopping scenarios based on a 2x2 between-subjects design that manipulated the presence of AR and detailed product information. Responses were measured using established scales from prior research and analyzed to test three specific hypotheses aligned with the conceptual model.

This study contributes to both academic and practical domains. Academically, it gives understanding of the psychological and behavioral processes influenced by AR in fashion e-commerce (Javornik, 2016; Hilken et al., 2021). Practically, it offers strategic insights for fashion retailers on how to implement AR and information-rich features to enhance emotional engagement, build trust, and increase conversion (Poushneh & Vasquez-Parraga, 2017; McLean & Wilson, 2019).

The structure of this thesis is split into seven chapters. Chapter 1 defines the research problem, sets the gap in literature, and formulates the objectives of the study. Chapter 2 provides a review of the literature on augmented reality (AR), its definition, main features, use in retailing, and more importantly its use in online fashion retailing. It also explores the different variables used for the upcoming chapter. Chapter 3 defines the conceptual framework and research hypotheses. Chapter 4 outlines the research design and methodology. Chapter 5 gives the findings of data analysis. Chapter 6 interprets findings with reference to the literature. Finally, Chapter 7 concludes the thesis by discussing theoretical and practical implications, identifying limitations, and suggesting directions for future research.

2. Literature Review

2.1. Augmented Reality

2.1.1. Definition of Augmented Reality

Azuma et al. (2001) refer to AR as a system that combines computer-generated virtual objects with the real world details and registers those virtual objects in 3D, presenting the fused result to the user in real time. This initial definition highlights AR as being separate but complementary to Virtual Reality (VR) which is the total immersion of a user in an artificial environment (Javornik, 2016). Edwards-Stewart et al. (2016) categorized AR into two broad types: triggered and view-based augmentations. Triggered augmentations are activated by specific stimuli, such as markers or GPS locations, and can include complex forms that integrate multiple data sources. View-based augmentations, on the other hand, do not require specific triggers and can present digital overlays that are independent of what is viewed or enhance pre-existing static views. These classifications reflect the diversity in AR applications, which range from simple image overlays to intricate interactions requiring real-time data inputs (Dacko, 2017).

Table 1- Summary of augmented reality categories and types.

Category	Type	Examples	Characteristics
Triggered	1a. Marker-based: Paper	String (string.co), Blippar (blippar.com)	Paper marker activates stimuli.
	1b. Marker-based: Object	Aurasma (aurasma.com)	Most objects can be made into markers.
	2. Location-based	Yelp (yelp.com), PAJ (12health.dcoe.mil/positiveactivityjackpot), Instagram (instagram.com)	Overlay of digital information on a map or live camera view. GPS may activate stimuli.
	3. Dynamic Augmentation	Video Painter (itunes.apple.com/us/app/video-painter/id581539953?mt=8), Swivel (Motion; facecake.com)	Meaningful, interactive augmentation with possible object recognition and/or motion tracking.
	4. Complex Augmentation	Google Glass (google.com/glass)	Augment dynamic view and pull internet information based on location, markers, or object recognition.
View-Based	5. Indirect Augmentation	Wall Painter (itunes.apple.com/us/app/wall-painter/id396799182?my=8)	Image of the real world augmented intelligently.
	6. Non-specific Digital Augmentation	Swat the Fly (inergy.com/swatthefly), Bubbles (virtualpopgames.com)	Augmentation of any camera view regardless of location.

Note. Adapted from "Classifying different types of augmented reality technology" by Edwards-Stewart et al. (2016)

AR’s origins can be traced back to the 1950s, when early forms were used in cinematography and specialized applications (Larson et al. ,2024). However, its recognition and use began in the 1990s with advancements in computer science and display technology (Javornik, 2016). It was during the early 2000s that AR began gaining commercial traction, particularly in areas like automotive design and within the military (Azuma et al., 2001). By the 2000s, cheaper hardware and software developments allowed more use, and it began to gain a role in areas such as education, healthcare, and retail (Caboni & Hagberg, 2019).

The rapid evolution of smartphones with high-end cameras and processing power has introduced AR into general public use (McLean & Wilson, 2019). It moved from laboratory and high-end industry to everyday consumer applications, particularly through smartphones and tablets (Pantano et al., 2017). By moving into varied areas, including healthcare, retail and fashion, AR was adopted for immersive, customized experiences (Blascovich & Bailenson, 2011; Boardman et al., 2020).

AR's real-time interactivity and ability to superpose virtual and actual objects in space have made it a technology worth adopting for enhancing user engagement (Azuma, 2001). It is this aspect that distinguishes AR from other technologies, like VR, which requires total immersion and is not connected directly with the real world (Hoffman & Novak, 1996). This is critical to understanding the potential of AR in consumer products, where shoppers can expect seamless merging of real-world experience and digital enhancement (Scholz & Duffy, 2018).

2.1.2. Augmented Reality Features

The power of Augmented Reality is not only that it can overlay digital content upon the physical world but also in the multisensory realities that are created. Of its qualities, interactivity is most important to consumer engagement. In allowing people to engage with virtual objects and receive immediate feedback, AR creates sentiments of control and emotional connection with virtual products (Fiore et al., 2005; Liu & Shrum, 2002). This interactivity generates a richer experience, which is particularly worth it in fashion retailing, where experiential value and emotional involvement have a big influence on purchase behavior (Fiore et al., 2005).

In addition to interactivity, other factors such as *modality*, *virtuality*, and *location-specificity* support one another in the process of deciding the immersive quality of AR. *Modality* is the combination of sensory inputs—visual, audio, and sometimes even haptic feedback—providing a multisensory experience (Hoffman & Novak, 1996). *Virtuality*, the degree to which the environment includes computer-made elements, contributes to immersion, helping users feel more present in an augmented space (Blascovich & Bailenson, 2011). *Location-specificity* in AR goes beyond traditional GPS methods by using the device's camera to recognize objects or scenes in the user's environment. This allows AR to deliver highly relevant digital content in real time, making the experience more personalized and directly tied to the user's physical surroundings (Javornik, 2016).

While AR also includes features such as *hypertextuality*, *connectivity*, and *mobility*, studies indicate that in the context of retail apps and websites, these aspects are often less emphasized than the more immersive qualities of interactivity, modality, and virtuality (Javornik, 2016; McLean & Wilson, 2019).

The ability to stimulate more than one sense simultaneously, rather than through a single sensory channel, has been found to create a compelling effect on consumer reaction (Li et al., 2002). Two particularly strong sensory components of AR, Huang and Liao (2015) explain, are haptic imagery and self-location, allowing for simulation of touch sensation and presence perception within the virtual world. This perspective helps to create the feeling of reality of the experience, making digital try-ons feel more authentic and personal.

Huang and Liu (2014) found that incorporating narrative and environmental simulations into AR experiences creates more experiential value. By including cause-and-effect circumstances or object simulations in AR content, consumers tend to be emotionally invested, which leads to greater persuasive outcomes. All of these features of AR do more than merely entertain: they build involvement, simulate realism, and enable consumers to form stronger connections to brands and products that cannot be established using traditional digital content.

2.1.3. Augmented Reality in Retailing

In the last few years, AR has emerged as a transformative force in retail, reshaping how consumers interact with products and spaces across both physical and digital environments (McLean & Wilson, 2019; Scholz & Duffy, 2018). This shift has been particularly noticeable in industries like fashion and beauty, where visual engagement and personalization are essential (Poushneh & Vasquez-Parraga, 2017). Flavián et al. (2019) observe that retailers are increasingly embedding AR into their omnichannel strategies, not just to digitalize the shopping experience but to enhance its sensory richness and emotional resonance.

Three primary types of AR applications have emerged in the fashion retail landscape: *online web-based*, *in-store*, and *mobile app-based* (Caboni & Hagberg, 2019). *Online web-based* AR tools enable customers to engage with products remotely. For instance, virtual try-ons—such as those used by Ray-Ban—allow users to see eyewear frames on their own faces before purchasing, which helps reduce uncertainty and increase confidence in their choices (Poushneh, 2018; McLean & Wilson, 2019).

In-store AR integrates digital technology with physical spaces through "smart mirrors" and virtual dressing rooms, allowing shoppers to try on clothing without physically changing. By aligning body tracking with gesture-based interaction, this approach accelerates decision-making and supports dynamic browsing of various styles, sizes, and colors (Kang, 2014).

Mobile AR applications, such as those developed by IKEA and Sephora, allow users to visualize products like furniture or cosmetics within their own environments (Scholz & Duffy, 2018; Pantano et al., 2019). These experiences go beyond utility, creating deeper emotional connections between consumers and brands (Scholz & Duffy, 2018). In Sephora's case, the AR interface encouraged self-exploration and experimentation with new looks, contributing to a sense of empowerment (Pantano et al., 2019). This emotional engagement transforms the shopping experience from a purely transactional process into a more relational and personalized one (Scholz & Duffy, 2018). AR is no longer confined to product augmentation; it now integrates the store environment and consumer identity as well (Javornik, 2016). By overlaying digital information on physical store environments— real-time product information, reviews, or sustainability indicators—AR aligns the shopping experience with the increased demand by consumers for transparency and personalization (Huang & Liao, 2015). Dacko (2017) proposes that such overlays not just increase purchase confidence but also turn static displays into interactive storytelling platforms, making the shopping process more engaging and participative.

2.1.4. Augmented Reality in Online Fashion Retail: Transforming the Digital Consumer Experience

AR's overlay of digital content onto real-world environments allows consumers to view and interact with products in contextually aware, dynamic ways (Azuma et al., 2001). In e-commerce fashion shopping, this has translated into a growing world of AR features integrated in apps and websites, all designed to reduce uncertainty, enhance immersion, and support more secure purchase decisions (McLean & Wilson, 2019). Nevertheless, despite the exciting possibilities offered by these technologies, there are still challenges related to the fidelity and usability of such experiences that end up impacting how they fulfill consumer expectations (Poushneh, 2018).

Virtual try-on is most likely the most well-known example, where customers can try on clothing or accessories virtually—e.g., glasses, shoes, or jewelry—onto their actual self using a smartphone or webcam (Javornik, A., 2016). With the simulation of the physical try-on process, these technologies address directly the limitations of the traditional static product pages and allow customers to try appearance and style in real time (Boardman et al., 2020; McLean & Wilson, 2019). This generates consumer trust and can reduce product dissatisfaction or return rates (Erra & Colonnese, 2015). Meanwhile, the interactive and entertaining nature of virtual try-ons creates enjoyment and emotional engagement, contributing to a more pleasant shopping experience (Javornik ,2016). This emotional lift can cause positive affective responses, enhancing the experience and strengthening the user's psychological connection to the product and brand (Dacko, 2017).

Despite these advantages, current virtual try-on technologies are typically lacking in visual realism. Fabric texture rendering, natural folding, and accurate color is a technical challenge, which creates disparity between the AR image and the actual product (Poushneh, 2018). This problem may impact consumer confidence because deformed or unrealistic rendering can generate distrust in the technology and thereby impact purchasing behavior (Pantano et al., 2017). In addition, device constraints such as camera quality and processing power can influence the smoothness and usability of the experience (Scholz & Smith, 2016). Privacy is also relevant, where users can be hesitant to grant camera permission or allow personal body data required for certain AR operations to work, presenting adoption barriers (Poushneh, 2018).

3D product visualization is another widely adopted AR feature, letting shoppers view items as fully interactive, rotatable models. This allows consumers to inspect products from multiple angles, providing a clearer sense of the texture, construction, and detailing (Caboni & Hagberg, 2019). In contrast to 2D images, 3D representations provide a more natural and haptic digital experience, raising the level of product understanding (Amorim & Ferreira, 2022). Yet 3D visualization success relies greatly on model quality and accuracy, and for this reason there is a need for high-resolution scanning and realistic representation in order to reach AR's full potential (Grande et al., 2024).

To address sizing concerns, some stores have embraced interactive size and fit advice technology (Boardman et al., 2020; Poushneh & Vasquez-Parraga, 2017). Using body scan or avatar technology, these AR features provide measured, individualized recommendations based on one's measurements (Boardman et al., 2020). Some platforms even allow users to view how a different size would appear on an avatar, reducing uncertainty and promoting the sense of personal fit (Boardman et al., 2020). This not only addresses functional problems but also enhances emotional comfort as users feel comforted and listened to—essential components in inducing satisfaction and loyalty (McLean & Wilson, 2019).

Besides viewing products separately, AR-driven fashion styling ideas allow customers to try out and combine various outfits and accessories virtually in a common enhanced space (Poushneh & Vasquez-Parraga, 2017). These features allow consumers to combine products the same way as they do when physically in a store, making it easier to explore different outfits (Dacko, 2017). Poushneh & Vasquez-Parraga (2017) note that although AR retail adoption is on the rise, the general focus has been largely in alone product interactions and not styling experiences. Their study suggests that there is enough potential for AR to facilitate fashion consumers' experience through collaborative experiences, yet such an application is yet to be explored.

Another less common application of AR in fashion e-commerce is contextual placement, through which users are able to view products —such as a handbag or a shoe—within their real environment via the camera (Caboni & Hagberg, 2019). For example, a user can view the way a handbag would appear placed on the table or view how a shoe would look next to their outfit (Poushneh, 2018). Such a feature enhances reality by showing the way products are integrated into actual situations. While widely applied within industries like furniture retailing, it's still very restricted when applied to fashion (Amorim et al., 2022; Scholz & Duffy, 2018).

Personalization is also enabled by augmented reality through the use of user data, such as size, preferences, and purchasing history. AR platforms are able to recommend products, offer real-time fashion advice, or recommend complementary products (Dacko, 2017). Personalized application of AR turns online shopping into a more personalized and engaging activity. The more consumers feel that the experience aligns with their identity and needs, the more likely they are to form positive emotions towards the brand, which can translate into repeat purchases and loyalty (Scholz & Duffy, 2018).

However, although interactivity and engagement are enhanced with AR, their presence alone is not sufficient to generate a positive response from the consumer. Hilken et al. (2021) also mention that the emotional impact of AR depends on something more than novelty; it must be high-quality and must be accompanied by detailed product information in order to have the ability to maintain user confidence and trust. When AR is used with rich and accurate content—such as material descriptions, fit information, and care instructions—it creates enjoyment, enthusiasm, and satisfaction, which in turn strengthen brand relationships and generate purchases (Hilken et al., 2021). In addition, Yim, Chu, & Sauer (2017) identified that AR applications that include sensory, emotional, and cognitive elements have a significant influence on supporting higher perceptions of usefulness and usability among consumers. Based on their research, valuable and informative content in AR environments are significative determinants in shaping consumer decision-making processes and demonstrating how substance—along with interactivity—is essential in effective AR retailing design.

Finally, prior exposure to AR also plays an important role in shaping consumer acceptance and emotional engagement (Huang & Liao, 2015; Javornik, 2016). Javornik (2016) notes that consumers familiar with AR often show more positive attitudes and greater trust towards the technology, as prior experience reduces uncertainty and increases feelings of control. Hilken et al. (2021) also suggest that such familiarity can improve engagement and facilitate more confident decision-making, particularly in high-involvement product categories like fashion.

2.2. Product Information

Product information is a significant factor in helping consumers make informed purchasing decisions. It includes information like description of the products, materials used, usage instructions, price, and others that allow consumers to determine whether a product fits their needs (Fiore et al., 2005). When accurate and detailed product information are available, it reduces uncertainty and creates more trust in the brand or retailer (Flavián et al., 2019).

Research shows that consumers will make more confident and satisfactory decisions when they receive sufficient product information (Flavián et al., 2019). According to Gill (2015), product details— as sizing and material quality—are especially important in fashion, where products cannot be tested, creating a need for detailed information. Without this, customers would remain uncertain about their choices and would delay or even cancel their purchase (Hilken et al., 2021).

In addition, consumer attitudes might also be influenced by the presentation of product information (Pantano et al., 2017; Hilken et al., 2021; Huang & Liao, 2015). Clear, well-structured, and visually appealing information enhances the shopping experience quality and purchase probability. Pantano et al. (2017) emphasize that detailed and relevant product information helps with a better decision-making and reduces perceived risk, specially with younger consumers who expect fast and clear information online.

Product details also support customers' expectations of brand values. Buyers today increasingly prefer to know about how and where a product was made, if it is sustainable, and whether it aligns with their personal values (Watson et al., 2020). A Euromonitor International (2023) report notes that younger shoppers, especially Millennials and Gen Z, are more likely to choose products that project transparency and ethnical practices that need to be communicated through open product descriptions.

2.3. Emotional Engagement

Emotional engagement is the affective connection or attachment consumers feel towards a product, brand, or experience, and has been shown to influence attention, memory, and behavior (Hilken et al., 2021). Instead of being just entertained or informed, emotionally engaged customers are more likely to be highly involved, react with more satisfaction, and make stronger intentions to act—through purchasing, recommending, or loyalty to a brand (McLean & Wilson, 2019).

Studies have consistently found that emotionally charged experiences enhance consumer decision-making by making the process more immersive and memorable (McLean & Wilson, 2019). Hilken et al. (2021) argue that emotional engagement enhances both cognitive and affective outcomes in online retail, increasing not just satisfaction but also trust in the brand. Scholz and Duffy (2018) also emphasize how emotionally resonant experiences—especially those shaped by interactive or immersive content—help reposition the brand from being a distant entity to something “present” and personally meaningful to consumers.

Their findings are in alignment with prior work by Blascovich & Bailenson (2011), where they studied the phenomenon of "affective realism"—the idea that the emotional states in virtual or mediated worlds might be reflections of genuine emotions, making digital experiences feel authentic.

Also, emotional engagement often amplifies the effect of other variables—such as entertainment, information, or aesthetic appeal—by putting them in an emotional context (Hilken et al., 2021). For example, Javornik (2016) and Varadarajan et al. (2010) argue that emotional intensity often acts as a "catalyst" in digital consumer experiences by transforming sensory stimuli into memorable brand impressions. These affective reactions are also important in consumer storytelling, where individuals use emotion-driven experiences as a basis for sharing or reviewing products and brands (Flavián et al., 2019).

2.4. Positive Affective Responses

Positive affective responses refer to the range of favorable emotions and feelings that consumers experience when interacting with products, brands, or shopping environments (Poushneh & Vasquez-Parraga, 2017). Unlike emotional engagement, which involves a deeper involvement, positive affective responses often represent immediate, pleasant emotional reactions such as joy, excitement or satisfaction (Poushneh & Vasquez-Parraga, 2017; Hilken et al., 2021). These emotions can be triggered by sensory cues, product aesthetics, user-friendly interfaces, or the overall atmosphere in which the shopping experience happens (McLean & Wilson, 2019).

Customers who enjoy shopping online and experience positive emotions while doing it are likely to hold positive attitudes towards the brand and be loyal customers, increasing purchase intention (Hilken et al., 2021). If consumers associate a brand with pleasure experiences, they tend to have repeat behavior and recommend the brand to their friends (Flavián et al., 2019). Furthermore, positive emotions are crucial in differentiating brands in highly competitive markets, where functional product benefits alone are often insufficient to secure the consumer preference (Brengman et al., 2018). Retail environments that successfully generate positive affective responses, either through product presentation or the shopping interface, can create memorable experiences that influence not only purchase behavior but also brand equity and consumer trust (Hilken et al., 2021; Scholz & Duffy, 2018).

2.5. Purchase Intention

Purchase intention is a key concept in consumer behavior, referring to a consumer's conscious plan or likelihood to buy a product or service soon (Poushneh & Vasquez-Parraga, 2017; Pantano et al., 2017). It is one of the strongest predictors of actual buying behavior, making it very important for marketers and retailers who want to turn interest into sales (Poushneh & Vasquez-Parraga, 2017).

Cognitive evaluations are very important in considering to purchase—consumers consider the usefulness, value for money, product quality, and trustworthiness of the brand or seller before deciding (Flavián et al., 2019). Positive views on these aspects reduce uncertainty and risk, making consumers more likely to commit to buying. Past positive experiences and satisfaction with the brand also strengthen purchase intentions (Hilken et al., 2021).

While purchase intention has been generally related to rational choices, emotions play a role as well. Anticipation, excitement, and confidence are some of the emotions that may increase the likelihood of purchase, especially in situations where shopping is more about pleasure or experience (Watson et al., 2020). The shopping setting itself, either online or in-store, also affects intention. Easy-to-use websites, fast loading times, personalized suggestions, and reviews or blog postings by influencers all encourage consumers to buy (McLean & Wilson, 2019; Lee & Leonas, 2018).

The usability and interactivity of digital platforms, mobile apps, or augmented reality tools make the shopping process smoother and influence consumers' decisions (Nikhashemi et al., 2021; Pantano et al., 2017). Features like simple checkout and integrated payment methods reduce obstacles in the process, helping to increase purchase intention (Nikhashemi et al., 2021).

Finally, ethical concerns and sustainability have become important in the last few years. Consumers are more likely to intend to buy products they see as environmentally friendly or socially responsible (Amorim & Ferreira, 2022), highlighting the need for honest and transparent marketing.

3. Conceptual Model

This conceptual model explains the impact of Augmented Reality (AR) on consumer behavior within the fashion industry. Through engaging, interactive, and information-rich shopping experiences, AR influences fundamental psychological and behavioral concepts that motivate purchase behavior. This model outlines three primary effects: (1) AR's direct influence on purchase intention, (2) its ability to induce positive affective responses that enhance emotional engagement and influence purchase intention, and (3) the combined effect of AR and detailed product information, which together generate positive affective responses (Hilken et al., 2017; McLean & Wilson, 2019).

<u>Hypotheses:</u>

AR's ability to enhance consumer decision-making is particularly significant when compared with traditional non-augmented shopping apps. Traditional digital platforms normally use static product images and text descriptions, with limited sensory stimulation and interactivity. Compared to conventional digital platforms, AR brings online shopping closer to reality because it offers consumers the chance to interact with the products—try them on virtually, view them in 3D, and personalizing them in real-time. This interactivity provides a more engaging experience, creating more confidence in purchase decisions. (Caboni & Hagberg, 2019; Erra & Colonnese, 2015).

Research has shown that consumers who shop using AR-based apps feel a more significant sense of reality and control during their shopping experience compared to those using non-augmented apps (Scholz & Duffy, 2018). The interactive nature of AR enables consumers to view and increases motivation to purchase. Additionally, AR reduces perceived purchase risk by providing a richer information environment, making consumers feel more certain about their choices (Dacko, 2017).

Furthermore, AR has been linked to higher engagement and purchase conversion rates than conventional digital shopping experiences (McLean & Wilson, 2019). By providing enriched product interaction, minimizing uncertainty, and increasing consumer confidence, AR is more effective at stimulating purchase intention than conventional non-augmented apps.

H1: The presence of Augmented Reality in fashion apps and websites (vs. non-augmented) generates higher purchase intention.

Customers are emotionally impacted by AR technology's sensory elements and immersive nature. Augmented reality offers a rich and dynamic experience that enhances the pleasure of shopping by appealing to a variety of senses- visual, audio, and occasionally haptic (Azuma et al., 2001; Huang & Liao, 2015; Li et al. 2002). This sensory stimulation will generate positive affective responses like enjoyment, excitement, surprise, satisfaction and even pleasure (Amorim et al., 2022; McLean & Wilson 2019). These emotional states are not merely casual feelings, but rather meaningful psychological outcomes that help to influence how consumers perceive and interact with digital retail environments, as they contribute to a deeper sense of presence and psychological involvement (Javornik, 2016).

Positive affective responses are also triggers of emotion, deepening consumers' engagement and involvement with the brand. They are especially significant in the context of fashion retailing, where hedonic and experiential features drive consumer attitudes and behaviors (Dacko, 2017; Fiore et al., 2005). Customers are more likely to develop an emotional connection with a brand or product if they are thrilled or enthusiastic while using AR features, such as trying on clothes virtually or seeing objects in real-world environments. (Brengman et al., 2018; McLean & Wilson, 2019; Scholz & Duffy, 2018).

This emotional bond leads to emotional engagement, a deeper level of psychological investment characterized by enthusiasm, personal relevance, and mental immersion (Javornik, 2016). Emotional engagement is a vital driver of purchase-related outcomes, particularly purchase intention and brand loyalty (Scholz & Duffy, 2018). According to Watson et al. (2020), when consumers experience joy and excitement via AR experiences, it strengthens their intentions to buy and interact with the brand.

The interactivity and personalization that AR offers further amplifies positive affect by enabling consumers to visualize themselves using the products, creating a sense of ownership, self-relevance, and personal attachment (Brengman et al., 2018; Hilken et al., 2017). This personalization effect also fosters a psychological sense of presence, in which users feel as though they are truly “there” within the digital environment—an aspect that heightens emotional reactions and increases trust and commitment (Blascovich & Bailenson, 2011; Scholz & Duffy, 2018).

The media richness of AR—its capacity to provide realistic, interactive, and vivid representations—improves these emotional reactions by making the experience more immersive and psychologically satisfying (Amorim et al. 2022). In a similar vein, McLean and Wilson (2019) discovered that these emotional impacts directly improve satisfaction, engagement, and eventually purchase intention.

H2: Augmented Reality generates a stronger positive affective response, which enhances emotional engagement and increases purchase intention.

In online fashion shopping, the availability of detailed product information—such as material, size, texture, and ethical sourcing—plays a central role in enabling informed decision-making by reducing uncertainty (Dacko, 2017; Erra & Colonnese, 2015). Beyond its cognitive utility, this information also contributes to positive affective responses, including satisfaction and reassurance, by increasing consumers’ confidence and sense of control throughout the shopping experience (Caboni & Hagberg, 2019; Hwangbo et al., 2017).

According to Fiore et al. (2005), the richness of product content presented through digital channels enhances consumers’ perceptions of the retailer and increases satisfaction with the shopping experience. When product information is transparent, relevant, and trustworthy, it creates positive emotions like optimism and comfort in the process of making a purchasing evaluation (Hilken et al., 2021).

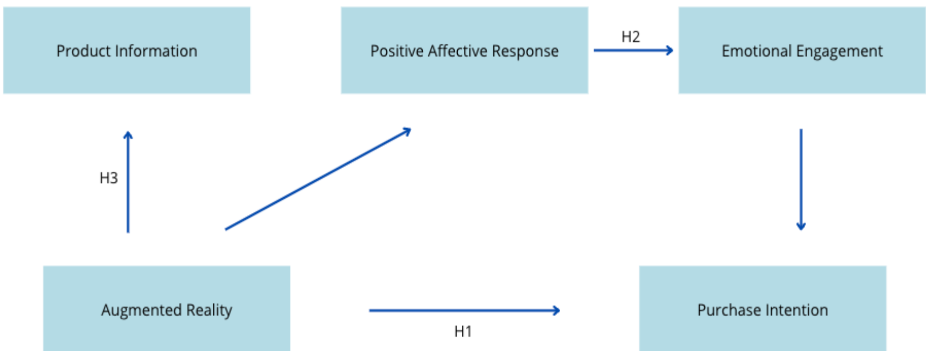
Augmented Reality (AR), when applied over product information, is an interactive interface that offers interactivity and experiential value (Poushneh & Vasquez-Parraga, 2017). When used independently, AR can create consumer engagement and enjoyment, particularly through applications such as virtual try-ons and product visualizations (McLean & Wilson, 2019; Watson et al., 2020). However, research suggests that AR is most effective when combined with clear and reliable product information, which helps consumers make more informed and satisfying purchase decisions (Amorim & Ferreira, 2022; Amorim et al., 2022).

Hilken et al. (2021) explain that high media richness combined with depth of information, generates cognitive processing as well as positive affective responses -such as enjoyment and satisfaction. Amorim and Ferreira (2022) also found that AR interfaces that have product-specific information lead to a bigger emotional positivity, including trust and mood improvement, by reducing decision uncertainty and enhancing the sense of control.

In summary, information-rich product information was shown to support positive affective responses by reducing uncertainty and increasing perceived credibility (Fiore et al., 2005), and AR enhanced that effect because it presents such information in a visually stimulating, and interactive format (Amorim & Ferreira, 2022; Hilken et al., 2021). This synergy has been shown to produce feelings of satisfaction, reassurance, and emotional uplift through enhanced consumer trust, perceived control, and general pleasure during the shopping experience (Scholz & Duffy, 2018; McLean & Wilson, 2019).

H3: The presence of AR *and* product information positively influence positive affective responses.

Figure 1- Conceptual Model



Note. Figure made by the author.

4. Methodology and Research Design

The present study aims to examine the impact of Augmented Reality (AR) on consumer engagement and purchasing behavior within the fashion industry. In order to collect data for hypothesis testing, an online questionnaire was designed to capture consumer responses related to customer behavior in AR-enhanced fashion retail experiences. A quantitative method was selected to allow for objective measurement of consumer perceptions and behaviors across experimental conditions, enabling statistical comparison and hypothesis testing. This approach aligns with previous studies on technology acceptance and retail innovation (e.g., Javornik, 2016; Hilken et al., 2021).

The questionnaire was conducted on Qualtrics and shared through social media platforms, including Instagram, Facebook, and WhatsApp. The sampling approach relied on convenience sampling by sharing the survey link with friends, relatives, and social media contacts.

This study was submitted for ethical approval to the NOVA IMS Ethics Committee and received approval prior to data collection. Supporting documentation is available in Appendix A.

To ensure relevance to the research context, the questionnaire (Appendix B) began with a filter question that excluded respondents who did not shop for fashion products online. Only participants confirming that they are online fashion consumers were allowed to proceed with the survey. This filter ensures the study's sample consists of individuals with direct experience in the online fashion shopping context, thereby enhancing the validity of the collected data.

To ensure respondents had a shared understanding of the context, the questionnaire began with a brief description of AR. This was provided to standardize comprehension across participants, especially for those with limited prior exposure to AR technologies.

Participants were then presented with one of four hypothetical online shopping scenarios, simulating a sunglasses shopping experience on a mobile app. Each scenario included a descriptive text and a supporting image to increase immersion and realism. The scenarios followed a 2x2 between-subjects design, manipulating two variables: the presence of AR features and the presence of detailed product information. Participants were randomly assigned to one of the following four conditions:

(1) AR with product information
(2) AR without product information
(3) Product information without AR
(4) Neither AR nor product information

Table 2 - Experimental Design: Augmented Reality and Product Information Conditions

1	Yes	Yes	AR + PI (High Richness)
2	Yes	No	AR Only
3	No	Yes	PI Only
4	No	No	Control (Baseline)

Note. Table made by the author.

The condition combining AR and detailed product information represented a high media richness experience—aligned with Hilken et al. (2021)—offering both vivid, interactive visual features and informational content. In contrast, the fourth group served as the control or baseline condition, reflecting a typical low-interactivity shopping experience with minimal sensory or cognitive stimulation. This setup allowed the study to isolate and compare the individual and combined effects of AR and detailed product information on consumer responses.

In Section 3 of the questionnaire, participants responded to statements on a 7-point Likert scale (1 = Strongly Disagree to 7 = Strongly Agree) designed to test the study's three hypotheses. For H1, which examines whether the presence of Augmented Reality (AR) in fashion apps and websites increases purchase intention, AR was introduced through an experimental scenario, and purchase intention was measured using five items adapted from Watson et al. (2020). In H2, the focus shifts to whether exposure to AR elicits stronger positive affective responses and emotional engagement, which in turn increase purchase intention. Thus, H2 includes the same AR condition and purchase intention items from H1, with the addition of positive affective response statements from Hilken et al. (2021) and emotional engagement items from McLean and Wilson (2019). Finally, H3 explores how Perceived Product Information (PPI)—such as the clarity, detail, and completeness of product descriptions—interacts with AR features to influence positive affective responses. H3 incorporates PPI items adapted from Flavián et al. (2019), alongside the positive affective response measures from H2. This design ensures that AR is treated as a consistent experimental factor across all hypotheses, while the relevant psychological and behavioral constructs are assessed through validated measurement scales. *(See Table 3 – Variables, statements and sources.)*

Following the hypothesis testing statements, a manipulation check question was included to verify whether participants correctly perceived the experimental conditions presented in their assigned scenario. This was necessary to ensure that the presence or absence of Augmented Reality and detailed product information was effectively recognized by the respondents.

In the demographics section, we gather useful information such as age, education level and how often they shop for fashion products online, details that are important to contextualize the survey results.

At the end of the questionnaire, a set of general statements regarding Augmented Reality (AR) in fashion shopping was included to get a better understanding of participants' familiarity and perceptions of the technology. These items mention themes about prior use, perceived usefulness, realism, and the extent to which AR supports confident decision-making in their purchases. Including this section is important because prior experience and attitudes towards AR can influence user acceptance and engagement with these technologies (Javornik, 2016). Also, the realism and accuracy of AR representations are very important for building consumer confidence during online shopping, especially for products like clothing or accessories (Poushneh & Vasquez-Parraga, 2017). Therefore, this section, while not directly tied to hypothesis testing, helps in explaining how these variables might moderate responses to AR features in fashion retail.

Before publishing the main survey, a pre-test was conducted with 11 participants to ensure the clarity and functionality of the questionnaire. Of these, 2 participants did not proceed past the filter question “Are you an online consumer of fashion products (clothing, shoes, accessories)?”, which was designed to exclude respondents outside the target population. The remaining participants completed the full survey and reported no difficulties or confusion regarding the content or structure. As a result, no modifications were necessary to begin the data collection.

For the data analysis, two software tools were used: SmartPLS and SPSS. SmartPLS was used to perform Partial Least Squares Structural Equation Modeling (PLS-SEM), which is suitable for complex models with latent variables and smaller sample sizes. It allowed for the assessment of measurement models and structural paths. SPSS was utilized for preliminary data analysis, including data cleaning, descriptive statistics, and reliability testing. The combination of these tools ensured both rigorous statistical analysis and a robust model validation.

Table 3- Variables, statements and sources

Variable	Statement	Source
Purchase Intention (PI)	PI1 – I would consider buying fashion items after using AR tools.	Watson et al. (2020)
	PI2 – I am more likely to purchase products when AR is available.	
	PI3 – AR features increase my intention to complete a purchase.	
	PI4 – I would choose a fashion website/app with AR over one without.	
	PI5 – Using AR motivates me to make faster purchase decisions.	
Positive Affective Response (PAR)	PAR1 – Using AR in online shopping makes me feel excited.	Hilken et al. (2021)
	PAR2 – I feel more joy when interacting with AR features.	
	PAR3 – AR creates a pleasurable shopping experience.	
	PAR4 – I experience positive emotions when I use AR tools.	
	PAR5 – Shopping with AR is enjoyable and fun.	
Emotional Engagement (EE)	EE1 – I feel emotionally involved when using AR features.	McLean & Wilson (2019)
	EE2 – AR captures my emotional attention.	
	EE3 – I feel connected to the products when AR is used.	
	EE4 – I become more absorbed in the shopping process with AR.	
	EE5 – AR makes me feel emotionally immersed in fashion shopping.	
Perceived Product Information (PPI)	PPI1 – Detailed product information helps me evaluate fashion items better.	Flavián et al. (2019)
	PPI2 – I feel more informed when product descriptions are clear and complete.	
	PPI3 – Product information improves my trust in online purchases.	
	PPI4 – When I understand product materials, size, and fit, I feel more secure.	
	PPI5 – The more complete the product information, the more I enjoy shopping.	

Note. Table made by the author.

5. Data Analysis

The data analysis process was conducted in two main stages, using both SPSS and SmartPLS software tools.

Initially, SPSS was used for data cleaning, descriptive statistics, and to categorize participants based on the experimental conditions to which they were exposed in the questionnaire. This allowed the creation of categorical variables reflecting the four experimental groups, which were later used in comparative analyses and moderation testing.

Following this preparation, SmartPLS was used to evaluate the measurement and structural models within a Partial Least Squares Structural Equation Modeling (PLS-SEM) framework, suitable for testing the proposed relationships between constructs and mediation effects in the conceptual model. SPSS was also used again for further analysis.

After the initial data collection, a total of 215 responses were recorded. As part of the data cleaning process, responses were excluded if participants refused to participate, indicated they were not online consumers of fashion products, or did not complete the survey. Additionally, 15 responses were filtered out due to incorrect answers to the manipulation check question. After applying these criteria, the final dataset consisted of 169 valid responses that were used for analysis, ensuring the relevance and integrity of the data for the study.

The sample's range was between 22 and 63 years old.The most frequently reported age groups were between 25 and 34 years (49.7%) and 45+ years (26%), while the remaining age groups (18-24) and (35-44) were represented in lower percentages (M=36.06, SD=7.15).

The majority of the participants have an academic degree, with 49.1% (n = 83) having completed a Bachelor's degree and 19.5% (n = 33) a Master's or postgraduate degree. In addition, 29.6% (n = 50) of respondents completed high school, while a smaller number (1.8%, n = 3) had only primary school education.

Regarding online shopping frequency for fashion products, 42.0% (n = 71) of participants reported shopping frequently, followed by 37.9% (n = 64) who shopped occasionally. A smaller portion of the sample (20.1%, n = 34) indicated that they shop very frequently online.

5.1. Measurement Model

The evaluation of the measurement model's reliability and validity was the first step in assessing the structural model. According to Hair et al. (2014), factor loadings should ideally exceed 0.7 to ensure item reliability. In our analysis, all items demonstrated factor loadings above this value. Cronbach's alpha was also calculated to assess the internal consistency of each scale, with a minimum acceptable value of 0.7 (Henseler et al., 2009). The results showed that all constructs met or surpassed this benchmark, confirming the reliability of the measurement instruments (Appendix C and Appendix D).

To validate the constructs, convergent and discriminant validity were both considered. Convergent validity can be confirmed by evaluating the composite reliability (CR) and the average variance extracted (AVE) for each construct. Composite reliability for all the constructs in this study is more than 0.90, far beyond the criterion value of 0.70 (Hair et al., 2016), which indicates a very high internal consistency. Also, all the AVE values are more than the minimum acceptable of 0.50 (Henseler et al., 2009), confirming that most of the variance is explained by the latent variables. These results, as presented in Table 4, provide evidence that the constructs possess good convergent validity.

Table 4 - Reliability and Validity Measures (CR, AVE, and Fornell–Larcker) of Variables

Emotional Engagement (EE)	4.53	1.69	**0.962**	0.448	0.822	0.703
Perceived Product Info (PPI)	5.59	0.95	0.448	**0.855**	0.584	0.675
Positive Affective Response (PAR)	5.15	1.47	0.822	0.584	**0.951**	0.912
Purchase Intention (PI)	5.09	1.53	0.703	0.675	0.912	**0.954**
CR			0.980	0.911	0.973	0.975
AVE			0.926	0.731	0.904	0.910

***Note**: Diagonal values represent the square root of the AVE (in bold). Off-diagonal values are inter-construct correlations.*
CR = Composite Reliability; AVE = Average Variance Extracted;
EE = Emotional Engagement, PPI = Perceived Product Information, PAR = Positive Affective Response, PI = Purchase Intention

Table made by the author.

Discriminant validity was further assessed using both the Fornell–Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). According to Fornell and Larcker (1981), the square root of the AVE of each construct must be higher than its correlations with other constructs, as shown in Table 5. For the HTMT values, most were below the recommended threshold of 0.90 (Henseler et al., 2015), indicating an acceptable discriminant validity. However, a few HTMT values, such as between Emotional Engagement and Positive Affective Response (0.923), and between Positive Affective Response and Purchase Intention (0.940), slightly exceed this threshold, suggesting these constructs are closely related. Despite this, the overall model demonstrates strong composite reliability, average variance extracted, and satisfactory Fornell–Larcker criterion results. This provides additional support for the adequacy of the measurement model.

Table 6 - Loadings and cross-loadings

Item	Emotional Engagement	Perceived Product Information	Positive Affective Response	Purchase Intention
EE1	**0.959**	0.204	0.845	0.803
EE2	**0.966**	0.146	0.870	0.813
EE3	**0.966**	0.178	0.891	0.844
EE4	**0.959**	0.177	0.868	0.814
EE5	**0.961**	0.177	0.863	0.841
PAR1	0.854	0.158	**0.947**	0.887
PAR2	0.864	0.210	**0.952**	0.859
PAR3	0.851	0.163	**0.949**	0.870
PAR4	0.827	0.163	**0.941**	0.866
PAR5	0.890	0.184	**0.965**	0.870
PI1	0.841	0.247	0.880	**0.961**
PI2	0.792	0.180	0.871	**0.958**
PI3	0.819	0.256	0.861	**0.948**
PI4	0.816	0.224	0.875	**0.942**
PI5	0.811	0.248	0.877	**0.960**
PPI1	0.114	**0.817**	0.127	0.180
PPI2	0.077	**0.832**	0.054	0.108
PPI3	0.178	**0.872**	0.162	0.213
PPI4	0.194	**0.879**	0.204	0.260
PPI5	0.154	**0.874**	0.160	0.196

Note. Table made by the author.

5.2. Structural Model

After confirming the reliability and validity of the measurement model, the structural model was evaluated to test the relationships between constructs made by the hypothesis. This evaluation considered the significance and strength of path coefficients, the explanatory power of the model through R^2 values, and the potential for multicollinearity through Variance Inflation Factor (VIF) statistics.

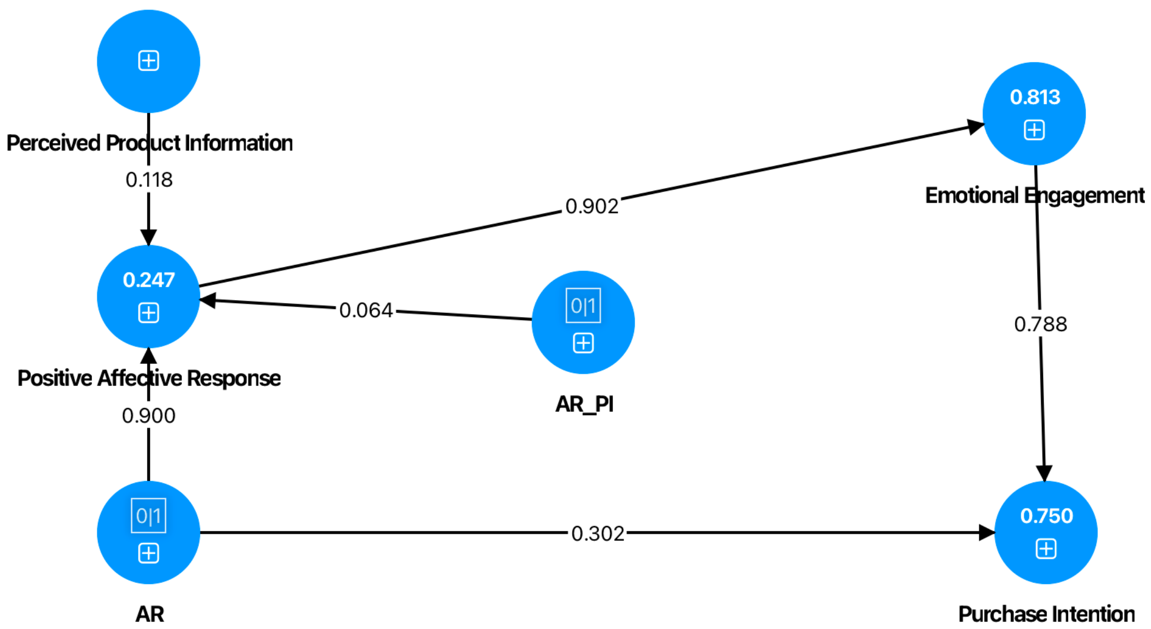
To facilitate analysis, a new composite variable—AR_PI—was created to represent respondents who were exposed to both Augmented Reality (AR) and enhanced Product Information (PI) in the experimental scenario. This was necessary because AR exposure and Product Information (PI) were manipulated independently and randomly in the study, making a direct path from AR to PI conceptually inappropriate. The study included four experimental conditions with different number of participants: (1) AR only (42 participants), (2) PI only (40 participants), (3) both AR and PI -AR_PI- (42 participants), and (4) a control group with neither AR nor PI (45 participants). By combining the two conditions of AR and PI into the composite AR_PI variable, it became possible to connect their exposure to Positive Affective Response, as specified in the third hypothesis (H3). Also, Perceived Product Information (PPI) was retained as a variable capturing the respondents' opinions of the usefulness of product information. While PPI is not strictly required to test H3, including it enriches the model by accounting for how their perceptions and evaluations of product information can contribute to emotional reactions.

In terms of explained variance, the model presents a great explanatory power for Emotional Engagement (R^2 = 0.813; Adjusted R^2 = 0.812) and Purchase Intention (R^2 = 0.750; Adjusted R^2 = 0.747), both of which are greater than the 0.50 benchmark suggested by Chin (1998) for substantial variance explanation in endogenous constructs. Positive Affective Response shows a weaker explanation (R^2 = 0.247), aligning with Hair et al. (2019), who state that R^2 values of 0.25, 0.50, and 0.75 may be considered weak, moderate, and substantial, respectively, depending on the field and context. (Appendix E)

Initial path coefficient estimates indicated that AR had a strong and positive effect on Positive Affective Response (β = 0.900) and a moderate effect on Purchase Intention (β = 0.302). Positive Affective Response was a strong predictor of Emotional Engagement (β = 0.902), which in turn showed a substantial effect on Purchase Intention (β = 0.788). Weaker effects were observed from AR_PI (β = 0.064) and PPI (β = 0.118) on Positive Affective Response. While these preliminary coefficients helped outline expected relationships in the model, their statistical significance was formally tested using bootstrapping. (Appendix F)

All VIF values remained below the conventional threshold of 10, indicating no serious multicollinearity concerns (Hair et al., 2010). The highest VIF observed was 9.967 (EE2), which is acceptable within PLS-SEM frameworks (Appendix G).

Figure 2 - Structural model



Note. Figure made by the author.

Table 7 - Path coefficients after Bootstrapping

Path	β (Original Sample)	t-value	p-value
AR -> Positive Affective Response	0.900	6.657	0.000
AR -> Purchase Intention	0.302	3.117	0.002
AR_PI -> Positive Affective Response	0.064	0.402	0.688
Emotional Engagement -> Purchase Intention	0.788	19.205	0.000
PPI -> Positive Affective Response	0.118	1.783	0.075
Positive Affective Response -> Emotional Engagement	0.902	54.269	0.000

Note. Table made by the author.

To check the statistical significance and stability of the path coefficients, bootstrapping with 5,000 resamples was utilized, which generates empirical standard errors and confidence intervals, providing a more stable estimate of the parameter significance compared to the original path coefficients alone (Hair et al., 2019). Path coefficients around 0.30 represent moderate effects, and t-values above 1.96 with p-values below 0.05 are considered statistically significant (Hair et al., 2019).

As shown on table 7, the results confirmed that AR had a strong and statistically significant effect on Positive Affective Response ($\beta = 0.900$, $t = 6.657$, $p < 0.001$), and a moderate, significant effect on Purchase Intention ($\beta = 0.302$, $t = 3.117$, $p = 0.002$). These findings provide a good empirical support for the idea that AR content triggers emotional engagement and enhances consumers' behavioral intentions—validating the assumptions of H1 and the first part of H2.

The emotional path sequence proposed in H2 was also clearly supported. Positive Affective Response had a strong, significant effect on Emotional Engagement ($\beta = 0.902$, $t = 54.269$, $p < 0.001$), and Emotional Engagement exerted a powerful influence on Purchase Intention ($\beta = 0.788$, $t = 19.205$, $p < 0.001$).

In contrast, the AR_PI construct did not significantly influence Positive Affective Response (β = 0.064, t = 0.402, p = 0.688). Perceived Product Information (PPI) had a small positive but non-significant effect on Positive Affective Response (β = 0.118, t = 1.783, p = 0.075).

Table 8 - Direct, indirect and total effects

Path	Direct Effect (β)	Indirect Effect (β)	Total Effect (β)
AR → Positive Affective Response	0.900	–	0.900
AR → Emotional Engagement	–	0.811	0.811
AR → Purchase Intention	0.302	0.639	0.942
AR_PI → Positive Affective Response	0.064	–	0.064
AR_PI → Emotional Engagement	–	0.058	0.058
AR_PI → Purchase Intention	–	0.046	0.046
Perceived Product Information → PAR	0.118	–	0.118
Perceived Product Information → EE	–	0.106	0.106
Perceived Product Information → PI	–	0.084	0.084
PAR → Emotional Engagement	0.902	–	0.902
PAR → Purchase Intention	–	0.710	0.710
Emotional Engagement → Purchase Intention	0.788	–	0.788

Note. Table made by the author.

The structural model was further examined through direct, indirect, and total effects (Table 8). Total effects analysis highlighted AR as the most influential factor on Purchase Intention (β = 0.942, p < .001), through both direct and indirect effects. Positive Affective Response also significantly influenced Purchase Intention (β = 0.710, p < .001), primarily via Emotional Engagement (β = 0.902, p < .001), which itself strongly predicted purchase behavior (β = 0.788, p < .001). In contrast, AR_PI showed no significant effects.

5.3. Mediation Analysis

To test Hypothesis 2, a serial multiple mediation analysis was conducted using Hayes' PROCESS macro (Model 6) in SPSS. This analysis examined whether the effect of AR on Purchase Intention is transmitted through Positive Affective Response (PAR) and Emotional Engagement (EE). Bootstrapping with 5,000 resamples was applied.

Table 9 - Results of the Serial Multiple Mediation Analysis for Hypothesis 2

Model / Path	Coefficient (Effect)	SE	t	p	95% CI Lower	95% CI Upper
Outcome: PAR						
Constant	4.4581	0.1390	32.0813	0.0000	4.1838	4.7325
AR → PAR	1.4045	0.1983	7.0830	0.0000	1.0130	1.7960
Outcome: EE						
Constant	-0.8074	0.2127	-3.7953	0.0002	-1.2274	-0.3874
AR → EE	0.0698	0.1293	0.5395	0.5903	-0.1856	0.3251
PAR → EE	1.0309	0.0443	23.2897	0.0000	0.9435	1.1183
Outcome: Purchase Intention						
Constant	0.3611	0.1818	1.9865	0.0486	0.0022	0.7199
AR → Purchase Intention (direct)	0.2485	0.1061	2.3424	0.0204	0.0390	0.4580
PAR → Purchase Intention	0.7733	0.0749	10.3194	0.0000	0.6254	0.9213
EE → Purchase Intention	0.1383	0.0636	2.1742	0.0311	0.0127	0.2639
Indirect Effects of AR on Purchase Intention						
Total Indirect Effect	1.2960	0.1727	—	—	0.9567	1.6245
Indirect via PAR only	1.0861	0.1740	—	—	0.7638	1.4434
Indirect via EE only	0.0096	0.0222	—	—	-0.0217	0.0696
Indirect via PAR → EE (serial)	0.2002	0.1076	—	—	-0.0038	0.4207

Note. Table made by the author.

The mediation analysis for Hypothesis 2 examined whether Augmented Reality (AR) influences Purchase Intention indirectly through two mediators: Positive Affective Response (PAR) and Emotional Engagement (EE). The results indicated that AR has a significant positive direct effect on Purchase Intention (effect = 0.2485, SE = 0.1061, t = 2.34, p = 0.0204), showing that AR exposure directly increases consumers' intention to purchase.

Looking at the mediators, AR significantly predicted Positive Affective Response (coefficient = 1.4045, SE = 0.1983, t = 7.08, $p < 0.001$), confirming that AR exposure substantially increases positive emotional reactions. Positive Affective Response, in turn, strongly predicted Emotional Engagement (coefficient = 1.0309, SE = 0.0443, t = 23.29, $p < 0.001$), highlighting a strong link between positive feelings and emotional engagement. However, AR did not significantly predict Emotional Engagement directly (coefficient = 0.0698, SE = 0.1293, t = 0.54, p = 0.5903), indicating that AR's effect on emotional engagement operates primarily through positive affective response.

Both Positive Affective Response (coefficient = 0.7733, SE = 0.0749, t = 10.32, $p < 0.001$) and Emotional Engagement (coefficient = 0.1383, SE = 0.0636, t = 2.17, p = 0.0311) were significant predictors of Purchase Intention, reinforcing the mediating roles of these emotional constructs.

The total indirect effect of AR on Purchase Intention through the mediators was 1.296 (BootSE = 0.173, 95% CI [0.957, 1.625]), which is statistically significant and indicates that a substantial portion of AR's effect on Purchase Intention is transmitted via emotional responses. Specifically, the indirect pathway through Positive Affective Response alone was significant (effect = 1.086, BootSE = 0.174, 95% CI [0.764, 1.443]), while the indirect effect through Emotional Engagement alone was not significant (effect = 0.010, BootSE = 0.022, 95% CI [-0.022, 0.070]). The serial mediation pathway—AR affecting Purchase Intention through Positive Affective Response leading to Emotional Engagement—showed a marginally significant effect (effect = 0.200, BootSE = 0.108, 95% CI [-0.004, 0.420]), suggesting tentative support for this sequential process.

In summary, these findings indicate that Augmented Reality enhances consumers' Purchase Intention both directly and indirectly, primarily by increasing Positive Affective Response, which then generates greater Emotional Engagement. This supports the hypothesis that emotional reactions play a critical role in how AR influences consumer behavior in digital fashion contexts.

Table 10- Results of the Simple Mediation Analysis for Hypothesis 3

Path	Coefficient (b)	SE	t	p	95% CI Lower	95% CI Upper
AR_PI → PPI	0.4720	0.1663	2.838	.005	0.1436	0.8003
AR_PI → PAR (direct effect)	1.0176	0.2529	4.023	< .001	0.5181	1.5170
PPI → PAR	0.1524	0.1149	1.326	.187	–0.0745	0.3794

Note. Table made by the author.

Hypothesis 3 proposes that the presence of augmented reality combined with product information (AR_PI) positively influences positive affective responses (PAR). To test this, a mediation analysis was performed using PROCESS Model 4 to explore whether this effect occurs directly or through the perceived importance of product information (PPI). This approach helps clarify the role of product information perception in shaping emotional responses when consumers interact with AR-enhanced fashion content.

The results showed that AR_PI significantly predicted PPI ($b = 0.472$, $SE = 0.166$, $p = 0.005$), indicating that exposure to AR with product information increased participants' perception of product information importance. Furthermore, AR_PI had a strong and significant direct effect on PAR ($b = 1.018$, $SE = 0.253$, $p < 0.001$), meaning that participants exposed to AR_PI reported higher positive affective responses.

However, the mediation analysis revealed that the indirect effect of AR_PI on PAR through PPI was positive but not statistically significant (indirect effect = 0.072, BootSE = 0.061, 95% CI [-0.038, 0.209]). This suggests that while AR_PI enhances positive affective response, this effect is not significantly explained by perceived product information as a mediator.

Overall, these findings support Hypothesis 3 in terms of a direct positive effect of AR_PI on positive affective responses but do not provide evidence for mediation by perceived product information.

5.4. Moderation Analysis

A one-way ANOVA was conducted to analyze whether there were significant statistical differences in purchase intent between the four experimental conditions, and with combinations of Augmented Reality (AR) exposure and Product Information (PI) availability: (1) No AR + No PI, (2) No AR + PI, (3) AR + No PI, and (4) AR + PI. The ANOVA indicated that significant differences existed between groups, $F(3, 165) = 20.16$, $p < .001$, showing that the exposure to AR influenced the participants purchase intention. (Appendix H)

In addition to statistical significance, the effect size was also examined to see if these findings carry practical implications. The eta squared (η^2) value was 0.268, and the omega squared (ω^2) was 0.254, both of which indicate a large effect size according to the standards by Cohen (1988), who classifies values above 0.14 as large. This means that approximately 25–27% of the variance in purchase intention can be attributed to the differences in scenario exposure, reinforcing the practical significance of the effect. (Appendix I)

To explore the nature of the differences between the groups, post hoc comparisons were conducted using the Tukey HSD test, and they showed several significant pairwise differences. Specifically, participants in the AR + PI condition ($M = 6.05$, $SD = 1.15$) reported the highest purchase intention among all groups. Compared to the No AR + No PI group ($M = 4.16$, $SD = 1.39$), the difference was statistically significant (mean difference = 1.89, $p < .001$). The difference between the AR + PI group and the No AR + PI group ($M = 4.52$, $SD = 1.67$) was also significant, with a mean difference of 1.53 ($p < .001$). These results confirm that the presence of AR combined with product information improves purchase intention compared to scenarios without AR or without both elements. However, when comparing the AR + PI group with the AR + No PI group ($M = 5.70$, $SD = 0.98$), the difference in purchase intention was not statistically significant (mean difference = 0.35, $p = .636$). This indicates that while AR alone has a strong influence on purchase intention, adding product information in the AR context does not result in a statistically significant additional effect. (Appendix J)

Lastly, the homogeneous subsets analysis also shows groupings based on mean purchase intention scores. There were two distinct subsets: the No AR + No PI and No AR + PI groups, with lower means of purchase intention (M = 4.16 and 4.52, respectively), and another with the AR + No PI and AR + PI groups, which had higher means (M = 5.70 and 6.05, respectively). This shows a clear separation between groups with AR exposure to those without, supporting the conclusion that the use of AR is a powerful driver of purchase intention. (Appendix K)

6. Results and Discussion

This study was set out to examine how augmented reality (AR) and enhanced product information influence consumers' emotional and behavioural responses in the context of online fashion shopping. Participants were randomly subjected to one of four brief shopping scenarios that varied by the presence or absence of AR and product information, and then reported on general affective and behavioural reactions.

The first hypothesis (H1), which proposed that AR would increase purchase intention compared to non-AR conditions, was clearly supported. AR had a significant direct effect on purchase intention, with participants in the AR conditions consistently reporting stronger buying intentions. Although the AR + product information group received the highest mean score, it was not significantly different from the AR-only group, indicating that AR in isolation is already a powerful driver. The findings are in accordance with earlier research that observed that AR creates consumer confidence and decision-making as it provides an interactive and engaging shopping experience (Poushneh & Vasquez-Parraga, 2017; Hilken et al., 2021). AR also appears to increase perceptions of control and product tangibility, which in turn enable stronger purchase intentions (Brengman et al., 2018; Watson et al., 2020).

The second hypothesis (H2) focused on the emotional pathway, suggesting that AR would boost positive affective responses, which would then enhance emotional engagement and ultimately purchase intention. The data supports this sequence: AR presence significantly boosted positive affective reactions, which in turn increased emotional engagement. Emotional engagement also emerged as a strong predictor of purchase intention. Importantly, this emotional pathway was statistically validated through a serial mediation analysis, confirming that positive affect and emotional engagement jointly mediated the relationship between AR and purchase intention. This aligns with recent findings that AR can generate a deeper emotional connection with products by enhancing realism and presence (Scholz & Duffy, 2018). These immersive qualities are especially impactful in fashion contexts, where visual appeal and emotional resonance often outweigh rational product evaluation (Watson et al., 2020). AR's capacity to simulate try-on experiences and product interactions can activate both affective involvement and behavioral intent, even in short exposure scenarios.

The third hypothesis (H3) predicted that integrating product information into AR would further enhance affective responses. However, the results were different from what was expected. While AR alone generated strong emotional reactions, combining it with product information did not significantly increase the affect. Also, product information alone did not produce strong emotional effects. This was confirmed by the absence of significant interaction effects and non-significant moderated mediation results, suggesting that product information did not meaningfully influence the affective or emotional engagement pathway. This can be explained by the nature of product information itself, which typically engages consumers on a rational level, helping them compare options or feel reassured about their choices (Caboni & Hagberg, 2019), rather than generating immediate affective responses. Also, the brief exposure in this experimental method may not have given enough time or relevance for the information content to influence emotions in a meaningful way.

This pattern points to a possible ceiling effect: once an experience is immersive and emotionally engaging through AR, adding static product details may not add further affective value—and could even diffuse attention. Past research suggests that overly complex or information-heavy interfaces in immersive settings can overwhelm users and reduce clarity (Hilken et al., 2021). However, it is important to note that these findings do not imply that product information is unnecessary or not important in general. Rather, in the context of this brief, experimental exposure, product information's emotional impact may be limited. Future research should explore how different timing, depth, and formats of product information presentation within AR environments influence consumer engagement and decision-making.

Together, the results support recent studies that indicate that AR is a very powerful experiential driver in fashion online shopping. Beyond being used as a technological novelty, AR is demonstrated to be used as a platform that engages with consumers in a sensory and emotional level, ultimately driving them towards a stronger behavioral outcome (McLean & Wilson, 2019; Dacko, 2017). This is particularly relevant to fashion retailing, where the emotional levels of self-image, aesthetic judgment, and perceived fit are most important in consumer decision-making (Watson et al., 2020).

Practically, the research provides recommendations that fashion brands need to have AR integration at the center of their online platforms as a core component of the shopping experience. Emotional engagement appears to be the key factor that links immersive features to behavioral outcomes, and this should be a primary consideration in user experience design. Product information remains relevant for certain stages of the decision process but may need to be included in ways that complement the emotional flow of AR.

In summary, this study adds to growing empirical evidence that AR in fashion e-commerce not only influences logical outcomes like purchase intention but does so more through emotional and experiential ways. Product information, while useful, appears to have a limited role in enhancing affective responses when paired with AR. The findings have important theoretical and managerial implications regarding the influence of immersive technologies on consumer behavior in high-involvement, hedonic product categories.

Table 11- Conclusion of Results

Hypothesis	Description	Result	Key Statistics	Notes / Interpretation
H1	AR increases purchase intention compared to non-AR	Supported	AR → Purchase Intention (significant); AR + PI not significantly different from AR only	AR alone is a strong driver of purchase intention; aligns with Poushneh & Vasquez-Parraga (2017), Hilken et al. (2021)
H2	AR boosts positive affective responses → emotional engagement → purchase intention	Supported	Significant serial mediation confirmed	Emotional pathway validated; AR enhances emotional connection and behavioral intent (Scholz & Duffy, 2018; Sung et al., 2021)
H3	AR + product information further enhances affective responses	Not supported	No significant interaction or mediation effects	Product information alone or combined with AR did not significantly increase affect; possible ceiling effect or rational vs emotional content difference (Caboni & Hagberg, 2019; Hilken et al., 2021)

Note. Table made by the author.

7. Conclusion and Implications

AR is not just a trendy feature. It has a more intrinsic role in the shopping experience. It closes the space between the physical and digital environments by allowing consumers to see or "try on" products in a natural and realistic way. For product categories like fashion—where decision is guided by taste, identity, and emotions—such an experience is very powerful. Purchase intentions were not only stronger under AR conditions, but were also strongly mediated by emotional engagement, further validating the hypothesis that in hedonic contexts, affect can have more weight than an analytical evaluation.

7.1. Theoretical Implications

The current study offers a number of theoretical contributions to the existing literature regarding augmented reality (AR) usage in online fashion consumption. To begin, the study confirms that AR has a direct and positive influence on purchase intention, in line with previous research that considers AR to be a powerful influence on consumer decision-making. In addition, this study extends existing literature by offering understanding into the emotional mechanism through which this phenomenon functions. Specifically, the findings show that AR increases positive affect, which further increases emotional engagement and, as a result, leads to stronger purchase intention. This confirms a serial mediation process and underscores the salience of emotional engagement as a fundamental path in the consumer response to AR.

Second, the findings contradict assumptions that the combination of AR and enhanced product information necessarily produces stronger consumer response. Whereas AR alone was effective in producing both emotional and behavioural responses, including product information didn't realize an effect that could be measured to any significant degree. This could suggest that in immersive experiences, cognitive features such as product details might not prove beneficial in terms of generating positive affective responses.

Methodologically, the paper makes a contribution by using a controlled experimental designg to separate the impact of AR and product information, enabling clearer interpretations. The addition of a serial mediation model further serves to make clearer the emotional variables' influence on consumer behavior. This approach completements earlier research, which tended to rely on correlational data, adding empirical strength to the theoretical framework.

7.2. Practical Implications

The findings of this study have several managerial implications for fashion retailers considering adopting augmented reality on their online stores. Most importantly, the finding that AR by itself increases purchase intention considerably is an assurance that AR has transcended being just a fun feature, but it can effectively contribute towards influencing consumer behaviour when properly integrated into the online shopping experience.

Retailers need to focus on developing AR features that are interactive and emotionally engaging. Since emotional engagement was found to be one of the purchase intention drivers, AR applications need to be developed to enhance enjoyment, immersion, and sense of control. A few examples can be virtual try-on, interactive product examination, or personalisation features that allow users to interact with products in a realistic and playful way.

The results also show that the inclusion of additional product information does not enhance affective responses when AR is already employed. This can suggest that in brief, immersive interactions, the emotional impact of product information may be limited compared to more sensory and experiential features like AR. This does not diminish the functional importance of product information, particularly in more advanced stages of decision-making. Instead, it highlights that the timing and context of its presentation may influence its effectiveness in shaping affective responses.

Another important implication is that AR technology is particularly suited to fashion, a category where visual appearance, emotional connection, and perceived fit are important aspects of decision-making. Fashion retailers should consider AR as a strategic way of creating emotional connections with consumers, particular targeting younger audiences that are already familiar with similar technologies through social media and mobile apps.

In addition, the research confirms that AR can overcome the disadvantage of online shopping that people cannot touch products. By simulating a more interactive and touch-based shopping environment, AR can reduce uncertainty and increase confidence in their purchase decisions.

7.3. Limitations and future research recommendations

While this study offers valuable insights of how AR and product information affect online shopping behavior, inside fashion retail, there are several limitations that need to be mentioned. These limitations will create opportunities for further research inside the theme.

First, the study used a single, brief exposure to simulated shopping scenarios. This helped isolate the effects of AR and product information, but it doesn’t fully capture how people shop in real life. Online shopping often involves repeated visits, comparisons of different products, and more time spent browsing the website. Emotions and intentions might evolve differently in those more natural interactions. Future studies could use more immersive designs, like running experiments within real e-commerce platforms.

Second, the study relied on responses from a questionnaire to measure emotional reactions, engagement, and purchase intention. While these are widely accepted measures, they don’t always reflect what people actually feel or what they do. These are typical measures but don't necessarily identify what individuals feel or do. Respondents might answer based on what they think they should feel, or might struggle to explain their actual opinion in a fixed 1-to-7 Likert scale statement. So future research could incorporate behavioral data—like time spent interacting with AR features—or even indicators like physiological indicators. These methods could offer a more complete picture of how AR really impacts consumer experience.

Also, the product information provided in this study was basic and text-based. It didn't reflect the variety of ways information is usually delivered in real online shops—through visuals, interactive tools, user reviews, or videos. More detailed or richer product information might have different behavior within AR experiences. Future research could explore how different formats or levels of detail affect the user, and whether presenting information in more dynamic ways makes it more emotionally meaningful or more useful.

Finally, individual differences weren't the focus of this study, but they likely matter. People are different in how comfortable they are with technology, how engaged they are shopping for fashion items, and in how much they use emotion as opposed to reason when it comes to making a choice. It would be useful for future research to look at how factors like these change responses to AR and product information. This could help businesses tailor experiences more effectively to different kinds of customers.

In conclusion, while this study provides a good start to understand how AR affects emotional and behavioral responses in online fashion retail, there's still so much to explore—especially when it comes to real-world settings, diverse consumers, and more complex shopping behaviors.

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Appendix

Appendix A – Nova IMS Ethics Committee Approval

IMS
Information Management School

This is to certify that

Project No.: **DDMKT2025-3-242471**

Project Title: **AR's impact in consumer engagement and purchasing behavior in the fashion industry**

Principal Researcher: **Teresa Martins**

according to the regulations of the Ethics Committee of NOVA IMS and MagIC Research Center this project was considered to meet the requirements of the NOVA IMS Internal Review Board, being considered **APPROVED** on 3/24/2025.

It is the Principal Researcher's responsibility to ensure that all researchers and stakeholders associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Ethics Committee, via amendment or progress report, of

- Any significant change to the project and the reason for that change;
- Any unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role or any other change in research personnel involved in the project.

Lisbon, 3/24/2025

NOVA IMS Ethics Committee
ethicscommittee@novaims.unl.pt

Appendix B – Questionnaire

Thank you for participating in this short study. The survey will take approximately 3 minutes to complete and will focus on your experiences with augmented reality (AR) in fashion shopping. There are no right or wrong answers, and your responses are anonymous. Participation in this survey is entirely voluntary—you may choose to participate or not, and you can withdraw at any time without any consequences.

Please note that your responses are important and will only be used for academic purposes related to my thesis on augmented reality in fashion marketing.

By proceeding, you confirm that you are 18 years or older and agree to participate in this research. You understand that your participation is voluntary, and you may leave the survey at any time without penalty. All data collected is confidential and will be used solely for academic purposes.

-Yes I agree to participate

-No, I disagree to participate

Section 1: Filter Question

Are you an online consumer of fashion products (clothing, shoes, accessories)?

-Yes

-No (If answered "No," the participant is redirected to the end of the survey)

Information: Augmented Reality (AR) is a technology that overlays digital content—like images, text, or 3D objects—onto the real world through your phone or tablet. Unlike virtual reality, which creates a completely digital environment, AR adds virtual elements to what you already see. Some examples include virtually trying on clothes or makeup, previewing furniture in your space, or even viewing a product online in 3D to explore it from all angles.

Information: In this survey, you will experience a hypothetical online shopping journey through a mobile app for sunglasses. The app includes features such as the ability to virtually try on sunglasses and view additional product information. Please focus on the experience presented to you and imagine you are considering making a purchase.

Section 2: Hypothetical Scenario

(Image + Text of AR scenario, randomly appearing)

AR with Product Information: You can try the item on virtually using AR, view it in 3D, and access detailed product information such as fabric, sizing, and customer reviews in real time.

AR without Product Information: You can try the item on virtually using AR and see it in 3D, but you're not given any additional product details like fabric, sizing, or reviews.

No AR with Product Information: You can view static images of the product, but detailed product information such as fabric, sizing, and customer reviews is provided.

No AR and No Product Information: You can only view basic images of the product, and no extra details such as fabric, sizing, or reviews are provided.

Section 3: Hypothesis Testing

(Please indicate your level of agreement with the following statements about AR in fashion shopping): 1 = Strongly Disagree, 7 = Strongly Agree

1- I would consider buying fashion items after using AR tools.

2- I am more likely to purchase products when AR is available.

3- AR features increase my intention to complete a purchase.

4- I would choose a fashion website/app with AR over one without.

5- Using AR motivates me to make faster purchase decisions

1- Using AR in online shopping makes me feel excited.

2- I feel more joy when interacting with AR features.

3- AR creates a pleasurable shopping experience.

4- I experience positive emotions when I use AR tools.

5- Shopping with AR is enjoyable and fun.

1- I feel emotionally involved when using AR features.

2- AR captures my emotional attention.

3- I feel connected to the products when AR is used.

4- I become more absorbed in the shopping process with AR.

5- AR makes me feel emotionally immersed in fashion shopping

1- Detailed product information helps me evaluate fashion items better.

2- I feel more informed when product descriptions are clear and complete.

3- Product information improves my trust in online purchases.

4- When I understand product materials, size, and fit, I feel more secure.

5- The more complete the product information, the more I enjoy shopping

Section 4: Manipulation Question

According to the scenario you saw earlier, please indicate whether the following features were present or not in your shopping experience:

The experience as AR-based / The experience was not AR-based

Product information was available / Product information was not available

Section 5: Demographics

-Please indicate your age

- Indicate the highest degree you have completed

a) Primary school

b) High School

c) Bachelor Degree

d) Master or postgraduate degree

e) Doctorate Degree

-How often do you shop for fashion products online?

-Occasionally

-Frequently

-Very Frequently

Section 6: Experience with AR (Control Variables)

Please indicate your level of agreement with the following statements about AR in fashion shopping): 1 = Strongly Disagree, 7 = Strongly Agree

-I have used an AR feature in a fashion app or website

-I find AR features (e.g. virtual try-ons, product visualization) useful in fashion shopping

-I think AR helps me visualize how fashion products will look in real life

Appendix C – Factor Loadings

Indicator	AR	AR_PI	Emotional Engagement	Perceived Product Information	Positive Affective Response	Purchase Intention
AR	1.000					
AR_PI		1.000				
EE2			0.967			
EE3			0.967			
EE4			0.965			
EE5			0.963			
PAR1					0.947	
PAR2					0.952	
PAR3					0.949	
PAR4					0.941	
PAR5					0.965	
PI2						0.958
PI3						0.948
PI4						0.942
PI5						0.960
PI1						0.961
PPI2				0.830		
PPI3				0.891		
PPI4				0.930		

Appendix D- Construct reliability and validity: Cronbach's Alpha

Construct	Cronbach's Alpha	Composite Reliability (ρ_a)	Composite Reliability (ρ_c)	Average Variance Extracted (AVE)
Emotional Engagement	0.976	0.976	0.982	0.933
Perceived Product Information	0.875	0.986	0.915	0.783
Positive Affective Response	0.973	0.974	0.979	0.904
Purchase Intention	0.975	0.975	0.981	0.910

Appendix E – R-square

Dependent Variable	R^2	Adjusted R^2
Emotional Engagement	0.813	0.812
Positive Affective Response	0.247	0.233
Purchase Intention	0.750	0.747

Appendix F – Path coefficients

Path	Coefficient (β)
AR → Positive Affective Response	0.900
AR → Purchase Intention	0.302
AR_PI → Positive Affective Response	0.064
Perceived Product Information → PAR	0.118
Positive Affective Response → Emotional Engagement	0.902
Emotional Engagement → Purchase Intention	0.788

Note: AR_PI refers to participants exposed to both Augmented Reality and Product Information in the scenario.

Appendix G – Collinearity statistics (VIF)

Indicator	VIF
AR	1.000
AR_PI	1.000
EE1	8.382
EE2	9.967
EE3	9.914
EE4	8.630
EE5	8.615
PAR1	6.433
PAR2	6.989
PAR3	6.821
PAR4	5.783
PAR5	9.304
PI2	7.938
PI3	6.766
PI4	5.984
PI5	8.321
PPI1	1.946
PPI2	2.641
PPI3	2.411
PPI4	2.470
PI1	8.221

Appendix H – ANOVA: Purchase Intention

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	106.044	3	35.348	20.160	< .001
Within Groups	289.313	165	1.753		
Total	395.357	168			

Appendix I – ANOVA Effect Sizes

ANOVA Effect Sizesa	**Point Estimate**	**95% Confidence Interval**	
		Lower	Upper
PurchaseIntentionMean			
Eta-squared	0.268	0.151	0.362
Epsilon-squared	0.255	0.135	0.350
Omega-squared Fixed-effect	0.254	0.135	0.349
Omega-squared Random-effect	0.102	0.049	0.151

Appendix J – Multiple comparisons

Multiple Comparisons						
Dependent Variable: PurchaseIntentionMean	Tukey HSD					
(I) ScenarioGroup	(J) ScenarioGroup	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
NO AR + NO PI	NO AR + PI	-0.36195	0.28589	0.586	-1.1039	0.3800
	AR + NO PI	-1.54244*	0.28589	<.001	-2.2844	-0.8004
	AR + PI	-1.88762*	0.28410	<.001	-2.6250	-1.1503
NO AR + PI	NO AR + NO PI	0.36195	0.28589	0.586	-0.3800	1.1039
	AR + NO PI	-1.18049*	0.29246	<.001	-1.9395	-0.4214
	AR + PI	-1.52567*	0.29071	<.001	-2.2802	-0.7712
AR + NO PI	NO AR + NO PI	1.54244*	0.28589	<.001	0.8004	2.2844
	NO AR + PI	1.18049*	0.29246	<.001	0.4214	1.9395
	AR + PI	-0.34518	0.29071	0.636	-1.0997	0.4093
AR + PI	NO AR + NO PI	1.88762*	0.28410	<.001	1.1503	2.6250
	NO AR + PI	1.52567*	0.29071	<.001	0.7712	2.2802
	AR + NO PI	0.34518	0.29071	0.636	-0.4093	1.0997

Appendix K – Post Hoc tests

PurchaseIntentionMean		**Subset for alpha = 0.05**	
ScenarioGroup	N	1	2
NO AR + NO PI	45	4.1600	
NO AR + PI	41	4.5220	
AR + NO PI	41	-	5.7024
AR + PI	42	-	6.0476
Sig.		0.593	0.629

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