The role of augmented reality in shaping purchase intentions and WOM for luxury products

Abstract

The literature examining the influence of augmented reality (AR)-driven experiences on consumer outcomes in retail is at an emerging stage, with little investigation conducted in the context of luxury products. Leveraging the affect-as-information theory and the stimulus-organism–response framework, this study examines the influence of AR-driven application experience for luxury brands on consumers' affective responses (flow, emotional involvement, and pleasure), and cognitive responses (trust and experience satisfaction). These, in turn, enhance behavioural responses, in the form of purchase intention and word of mouth. The effects are tested for products with different levels of tactile input requirement. The current study sensitizes luxury brands about the important role of AR-based applications in driving product sales and the emergence of modern technologies as part of omnichannel strategies.

Keywords: augmented reality, affective responses, experience satisfaction, luxury brands, purchase intention.

1. INTRODUCTION

Multiple advances in the domain of information technology, artificial intelligence, computing capabilities, and display quality have curated new ways for consumers to experience reality (Hoyer et al., 2020). Augmented reality (AR) is one such technology creating hybrid or 'phygital' experiences (Heller et al., 2019; Kowalczuk, et al., 2021). Within the 'X-reality' paradigm, AR is referred to as a combination of real-world elements integrated with digital information in real time (Rauschnabel et al., 2022). This is conceptually different from virtual reality (VR), which prominently involves complete immersion in the digital world. AR has applications in a variety of fields/sectors with a total valuation of USD 4.16 billion in 2020, which is expected to expand at a compound annual rate of 48.6% between 2021 and 2028.[1]

AR is increasingly deployed within the retail sector (Javornik, 2016; Jayawardena et al., 2023; Kowalczuk et al., 2021). A majority of brands have begun to offer new shopping experiences through AR applications, like Makeup Genius by L'Oréal, See by Rimmel, and Sephora-to-Go by Sephora. Modern technologies facilitating AR have made it possible for consumers to virtually experience products/services, which, in turn, instils confidence in the purchase decision (Fan et al., 2020; Hilken et al., 2018; Tan et al., 2022; Wang et al., 2023).

AR-enabled experiences strengthen the consumer-brand relationship by making the brand a part of consumers' 'augmented self' (Scholz & Duffy, 2018). This is especially relevant for luxury brands with the important role of the product's aesthetics and suitability for the buyer (McLean & Wilson, 2019). AR-driven three-dimensional product visualizations reduce product performance uncertainty, provide customers with value-added propositions at various touchpoints, generate optimal purchase experiences, and create strong engagement (Nikhashemi et al., 2021).

[1] https://www.fortunebusinessinsights.com/augmented-reality-ar-market-102553

AR applications in luxury retail need to create hedonic consumer experiences and trust in the product quality; yet, few empirical studies support the above argument (Al-Imamy & Al-Imamy, 2022). Additionally, certain categories with higher tactile input and 'need-for-touch' requirements may generate varied consumer responses to the AR application (Gatter, et al., 2022). Physical interaction for high-touch products assures the consumers about the build quality, strength, size, user fit, or other technical/non-technical features (Brengman et al., 2019). The likelihood of purchase for such categories through digital technologies, like AR, remains under-researched. To address the concerns, this study examines the extent to which the affective and cognitive responses to a luxury brand's AR application influence the consumer's behaviour. The moderating roles of a luxury product's 'touch and feel' requirements and of the category itself (luxury and non-luxury) are also investigated.

The study uses the affect-as-information theory (Zanger et al., 2022) and the stimulus–organism–response (S–O–R) framework as theoretical underpinnings (Lee et al., 2022). The proposed model relates the AR experiences, enabled by an AR-enabled application (stimulus), to the affective (pleasure/emotional involvement/flow) and cognitive responses (trust/experience satisfaction) of the consumer (organism), which, in turn, influence the purchase intention and word of mouth (WOM; response). Data collection was done across two studies and three points in time, with stage 1 (S1) in July-August 2021 (luxury; study 1), stage 2 (S2) in June-July 2022 (non-luxury; study 1), and stage 3 (S3) in November 2022 (luxury/non-luxury; study 2). The data collected from 1194 individuals across the three stages were analysed using covariance-based structural equation modelling (CBSEM). The study is expected to motivate luxury brands to leverage capable AR applications for providing rewarding 'phygital' experiences to their consumers for enhanced sales.

The remainder of this paper is structured as follows. The next two sections discuss the theoretical background. The proposed framework is then presented, followed by the research

methodology, data analysis, and findings. The paper concludes with a discussion of results, contributions, limitations, and future directions.

2. THEORETICAL BACKGROUND

2.1 Luxury products and digital technologies

Luxury products represent superior quality, authenticity, aesthetics, hedonic experiences, and brand immersion (Chandon et al., 2016; Ko et al., 2019; Kumagai, 2021; Stathopoulou & Balabanis, 2019). Such products enable the user to gain self-esteem through their prestigious ownership (Tseng, et al., 2021; Wirtz et al., 2020). The purchase and consumption experiences of luxury products are concerned as much with hedonism as with utilitarianism, which creates a strong resonance with the buyer (Holmqvist et al., 2020; Thomsen et al., 2020).

For luxury brands, the utilitarian value represents product attributes such as superior performance, quality, innovativeness, and robust design (Kwon et al., 2016). For non-luxury products, this value is reflected in the form of maximum utility for low prices (Hagtvedt & Patrick, 2009; Kumagai, 2021). Emotional value for luxury brands emerges from the brand's capability to generate personal expression, hedonic pleasure, social status and prestige (Wilcox et al. 2009). Luxury brands must maintain a positioning through product and retail-specific experiences serving both values judiciously (Mishra, 2016).

Despite possessing both utilitarian and hedonic values, consumers typically purchase luxury products as hedonic possessions due to the experiential and symbolic benefits derived from their consumption (Kwon et al., 2016; Hagtvedt & Patrick, 2009). The perceived hedonic value is stronger when the brand is defined by attributes that proffer exclusivity, heritage, and design reputation (Xu & Mehta, 2022). The ability to replicate this value through digital technologies with virtual product presentation poses an important challenge. The development of digital algorithms focuses on the cognitive aspects of information processing with serious

limitations in recreating an environment that can evoke true human feelings (Huang, 2019; Rusch et al., 2023). Such technologies cannot provide affective interactions with consumers as they cannot process the 'human' aspects of a situation (Longoni & Cian, 2020).

There is an argument that incorporating digital technologies in luxury marketing can have an adverse, rather than favourable or neutral, impact on brands with a rich heritage built largely through offline retail encounters (Pantano et al., 2017; Xu & Mehta, 2022). Yet, luxury brands represent a fast-growing sector, especially due to the emphasis on leveraging digital technologies (Javornik et al., 2021). As per a report by Bain (2021)[2], by 2025, around a third of all luxury sales will occur through facilitations by digital technologies. The recent COVID-19 pandemic has further accelerated the transition (Achille & Zipser, 2020). Yet, the literature on such implementation and its outcomes for luxury brands is emerging only now and requires greater academic focus (Bazi et al., 2020; Javornik et al., 2021; Jayaswal & Parida, 2023; Lee & Watkins, 2016).

2.2 AR and luxury retail

One of the key technologies as part of the digitization of luxury brand sales is AR, which allows users to ‘try on’ products virtually without necessarily having to visit a physical store (Dwivedi et al., 2021; Javornik, 2016). The innovations in AR-based technologies have profoundly changed the retail landscape by enabling an environment where physical and digital objects are integrated (Velasco et al., 2021). The interest among retail practitioners in such visual-enabling technologies and their influence on luxury product evaluations is high, yet, the academic knowledge on the same is severely limited (Javornik et al., 2021). This is because most of the discussion on AR and its application in marketing has remained generic and context-neutral (Ko et al., 2019).

[2] https://www.marketingmag.com.au/social-digital/how-augmented-reality-is-changing-the-face-of-luxury-retail/

AR is defined as a hybrid experience that includes context-specific virtual content, combined with the user's real-time perception of his/her physical environment using computing devices (Rauschnabel et al., 2022). Devices that enable this experience include smartphones, tablets, wearables, fixed interactive displays, and projectors. A major outcome of AR, compared to VR, is local presence, with the experiences ranging from assisted reality (low role of the physical environment) to mixed reality (high role of the physical environment). While VR creates the sense of being present in a remote (virtual) location (Huang and Liao 2017), AR brings virtual objects into the consumers' real environment (Hilken et al., 2018). The local presence curates authentic experiences as consumers can try virtual objects in a personal environment, which helps them appreciate the product, improves trial experiences, and makes the purchase decision easier (Lavoye et al., 2021).

AR applications which are well-designed and experiential have larger positive implications for luxury brands (Fan et al., 2020; Kim & Choo, 2021). For example, Scholz and Duffy (2018) suggest that AR-enabled hedonic experiences have a strong influence on the consumer-brand relationship, as such experiences can invoke a consumer’s self-image and brand-image congruity. Similarly, Rauschnabel et al. (2019) posit that the quality of the AR-enabled application, by generating inspirational experiences, has a positive influence on the change in a brand's attitude. While the effect of meaningful AR-enabled experiences on the consumer's relationship with the contextual brand is documented, the same for luxury brands is limited. For example, Shin and Jeong (2022) discuss how AR is a commonly adopted technology by luxury hotel brands, with Butler (2019) discussing a case study of Marriott Hotels allowing their guests to use compatible devices to personalize their room with AR art gallery. Consequently, Javornik et al. (2021), who conceptually argue that immersive experiences enabled by AR through various design-level characteristics can help luxury brands build brand equity, call for more research in this domain.

2.3 Affect-as-Information Theory and S–O–R Framework

To examine the effect of AR-based experiences on consumer outcomes for luxury brands, the current work integrates the affect-as-information theory with the S-O-R framework. The affect-as-information theory argues that emotions play an important role in the context of immersive experiences and help consumers form cognitive judgments (Schwarz & Clore, 2003). The theory supports the 'feel-and-think' philosophy and suggests that consumers process what they feel about the experience which subsequently shapes their cognitive evaluations (Zanger et al., 2022). For immersive experiences, consumers ascribe more importance to the affective states, with emotions providing credible informational value (Schwarz, 2012). When emotions are attributed to a specific object, such as the AR application or the product embedded within it, consumers attribute more value to their emotions as sources of information, and the rational processing of the experience becomes an outcome (Pham et al., 2013). Given that a luxury purchase is prominently a hedonic experience, we argue that AR experiences are expected to evoke affective responses, which, in turn, should generate cognitive evaluations as well as behavioural outcomes for the luxury product/AR application (Holmqvist et al., 2020).

In the S–O–R framework, the internal processing of the organism, an intervention between the stimulus and the response, is characterized by pleasure, emotions, flow, trust, and arousal (Han & Kim, 2020). Such processing strongly influences the willingness to pay high prices and acquire the contextual stimulus/product (Bian & Forsythe, 2012). The S-O-R framework has found wide application in retail-focused research which investigates the influence of environmental cues on a consumer's emotions and behaviours like purchase or advocacy (Do et al., 2020; Liu et al., 2018). In various shopping environments, like physical stores, mobile applications, and online stores, extant research, using this framework, has examined salient attributes of a retail environment that can influence consumer responses (e.g., Do et al., 2020; Jang et al., 2018). With the emergence of experiential retail practices, the S-O-

R framework enables the exploration of various such retail elements on consumer's attitudinal, emotional, and behavioural outcomes (Lee et al., 2022; Watson et al., 2020).

Hence, we argue that in the context of AR environments, the S-O-R framework as an underpinning is suitable. In the context of AR, the S–O–R framework indicates that the AR application should act as a trigger (S) for a consumer to showcase the 'real world' representation of the product through local presence. In correspondence with the affect-as-information theory, as an outcome of the stimulus, consumers or organisms (O) are expected to display affective responses (R) followed by cognitive ones (R) which, in turn, leads to psychological immersion and resultant behavioural responses (R; Kim & Hyun, 2016; Rauschnabel et al., 2019). The corresponding affective, cognitive, and behavioural responses are discussed next.

2.4 Affective responses to AR

This work proposes pleasure, emotional involvement, and flow as three affective responses to AR-enabled purchase experiences (Haavisto & Sandberg, 2015). In an e-commerce environment, consumers who are presented with more vivid product representations derive a more pleasurable experience (Yim et al., 2017). AR, through innovative visualizations, can help consumers create a customized enriching experience. Such virtual trials enabled by AR applications, involving three-dimensional digital models of the product, add greater pleasure to the shopping experience, compared to the two- or three-dimensional rotation-enabled tools in typical online websites (Kim & Forsythe, 2008).

Emotional involvement represents how an individual is emotionally invested in a digital experience. Banos et al. (2004) suggest that digital immersion through AR-enabled tools should trigger emotional involvement that affects users' feelings of reality. The current research on luxury branding suggests that high emotion involvement is integral to the purchase processes, including those enabled by AR (Javornik et al., 2021; Kuehnl et al., 2019).

Flow is an affective state when consumers feel a temporal disconnect, especially when the immersive task is novel and challenging (Huang & Liao, 2017). Previous studies have established the role of flow in explaining technology–human interactions and how it shapes consumer evaluations of the technology (Su et al., 2016). Thus, new applications, like AR, involving experimentation, malleability, and upgradability, should immerse users in a state of flow generating rewarding experiences (Lavoye et al., 2021).

2.5 Cognitive responses to AR

This work argues that trust (in the luxury product) and experience satisfaction are key cognitive outcomes of AR-enabled experiences. Trust in product quality is a crucial challenge for online luxury product retail (Rosa et al., 2006). Such trust is built due to the credibility of the luxury brand's seller, the product's authenticity, and physical validation, and is difficult to replicate online (Chen et al., 2015). With recent advances in technology, a high-quality AR-based application that simulates physical presence can allay these fears (Kumar, 2022).

Barutçu et al. (2015) argue that applications enabling digital shopping experiences must be designed with the primary aim of satisfying customers to evoke long-term consumer-brand relationships. Consumer dissatisfaction with new self-service technology experiences in retail is quite common (Fan et al., 2020). Hence, AR-enabled applications in retail must enrich the customers' luxury shopping experiences, and lead to greater satisfaction with the experience (Flavián et al., 2021; Pantano et al., 2017).

2.6 Behavioural responses to AR

This work proffers two behavioural outcomes to AR experiences: purchase intention and WOM. According to Triandis (1980), intentions are self-oriented procedures to achieve certain outcomes or gain benefits. Such intentions are manifestations of the consumers' cognitive and affective states, evoked due to rewarding experiences by capable technologies like AR (Huang et al., 2018; Kim & Ko, 2012). Positive purchase intentions are consequences

of the perceived luxuriousness and the corresponding experiential values concomitant to the luxury brand, as simulated by the application (Liu et al., 2017; Tseng, et al., 2021; Yu & Zheng, 2022).

The notion of WOM can be defined as the tendency of the consumer to advocate a product or a brand or, in this case, an AR application, enabled by invested loyalty (Bahri-Ammari et al., 2016; Shin & Jeong, 2022; Song & Kim, 2022). WOM includes both the quality of the information shared, as a cognitive evaluation of the experiences, and the persuasiveness of the recommendation, driven by the emotions with which the information is shared (Sweeney et al., 2012). Both components of WOM should be prominent if customers have rich experiences with an AR application that enhances the fairness evaluations for the luxury brand, as expected in an offline setting (Christ-Brendemuehl & Schaarschmidt, 2022; Zanger et al., 2022).

3. HYPOTHESES DEVELOPMENT

Based on the integration of the affect-as-information theory and the S–O–R framework, the study argues that AR application-derived experiences serve as the stimulus (S) which causes the consumers (O) to display three types of responses (R): affective (pleasure, emotional involvement, flow), cognitive (trust, experience satisfaction), and behavioural (purchase intention for product and WOM for the AR application), with the three responses in that order. The proposed model is depicted in Figure 1.

INSERT FIGURE 1 HERE

3.1 Main effects

The provision of multisensory aesthetic experiences in digital environments, including visual, auditory, haptic, somatosensory, and olfactory, is key to technology developers (Spence et al., 2019). Previous research indicates that a consumer's consumption experience is tied to their aesthetic appreciation of the AR environment (Chung & Kim, 2020). As an individual

becomes a buyer/consumer, the distant appreciation of a product's aesthetic attributes leads to values like pleasure, emotional involvement, and immersion (Mishra, 2016). This means that AR-enabled interactivity and vividness can create strong emotional and immersive user experiences (Kim & Ko, 2019; McLean & Wilson, 2019). Thus, we hypothesize:

H1$_{a/b/c}$: AR application experience positively influences affective responses (a: pleasure, b: emotional involvement, and c: flow).

Bastide (2017) and Merle et al. (2012) claim that online visualization tools in high-quality AR positively impact consumers' trust in a product. This trust is crucial for the purchase of high-value luxury items online. Al-Imamy and Al-Imamy (2022) posit that AR has the potential to provide customers with more meaningful knowledge about high-value luxury products. The enhanced trust in the product details enabled by the AR application will help reduce perceived purchase-related risks (Kumagai & Nagasawa, 2021). Thus, we hypothesize:

H2: AR application experience positively influences consumer trust in a luxury product.

Affective responses have important implications for consumers' information processing, their choice processes, and their attitudes towards advertising messages (Batra and Ray, 1986). This is especially true for hedonic luxury purchases (Liu et al., 2013). Wirtz and Bateson (1999) suggest that integrating emotional states improves satisfaction with an experience. Such satisfaction is an important lever for a company's sales (Shankar et al., 2003). Aesthetically designed AR applications are an important influence on hedonic user experiences in retail and consequently influence user satisfaction (Poushneh & Vasquez-Parraga, 2017). Thus, we hypothesize:

H3$_{a/b/c}$: Affective responses (a: pleasure, b: emotional involvement, and c: flow) positively influence experience satisfaction.

Trust, due to the reduced risk with a purchase decision, is recognized as an important driver of satisfaction (Al-Ansi et al., 2019). When consumers trust a luxury brand, they derive

greater satisfaction from the process of acquiring such products (Sirieix & Dubois, 1999). Bastide (2017) argues that a lack of realism is a drawback of online visualization tools like AR. This means that the developer's ability to recreate a 'life-like' environment or object is crucial to ensuring consumer trust in the product and resultant satisfaction with the experience (Rosa et al., 2006). Therefore, we hypothesize:

H4: Trust in the luxury product positively affects experience satisfaction.

By offering a powerful simulation of the real experience of buying a 'high-ticket item' through reality-based content, potential customers can feel better positioned to make their purchase decisions (Wagler & Hanus, 2018). Satisfaction is one of the most important factors affecting behavioural intentions, particularly for novel experiences like AR (tom Dieck et al., 2018). Hence, we argue that satisfactory purchase experiences for luxury brands, enabled by AR, have strong consequences for purchase intentions, and hypothesize:

H5: Experience satisfaction positively influences purchase intent for a luxury product.

Satisfaction with the purchase experience generates recommendation behaviour for the experience in question (Host & Knie-Andersen, 2004). Payne et al. (2001) indicate that positive WOM is the result of surprise associated with the purchase experiences of the high-involvement product, with the expectations from the experience being exceeded. In this context, the experience is supplied by the AR application and hence, WOM is directed towards it. Thus, we hypothesize:

H6: Experience satisfaction positively affects WOM for the AR application.

3.2 Moderating effects

Consumers form their product purchase beliefs based on personal knowledge, which is shaped by their 'hands-on' experiences (Hamilton et al., 2019). However, their decisions are contingent on the type of product, with those requiring higher tactile information mandating more purchase effort (Liao et al., 2016; Pino et al., 2019). AR applications, despite attempting

to replicate the 'touch' perceptions through tactile inputs in the application (Gatter et al., 2022), will have limitations in providing the 'proof-of-quality' product characteristics such as material, weight, hardness, ruggedness, and build-quality (Grohmann et al., 2007). Hence, we hypothesize:

H7: The type of luxury product (low-tactile/high-tactile) moderates the proposed model such that the relationships are higher for low-tactile luxury products.

Javornik et al. (2021) argue that digital experiences through AR play a strong role in supporting luxury brands in communicating product attributes. For non-luxury products, the primary role of AR is to drive consideration and conversion, with little focus on the creation of hedonic luxury experiences (Holmqvist et al., 2020, Lee et al., 2020; Rokka, 2021). AR applications play an important role in creating unique experiences for luxury products, beyond mere virtual representations typical of non-luxury products (Javorski et al., 2021). Such experiences, including AR-enabled ones, are part of the specific touchpoints built by a luxury brand that generate affective, cognitive, and conative outcomes. Hence, we hypothesize:

H8: The type of product (luxury/non-luxury) moderates the proposed model such that the relationships are higher for luxury products.

4. RESEARCH METHODOLOGY

4.1 Population definition and product categories

The population for the study comprised people in France who are frequent purchasers of luxury/non-luxury (context-dependent) products online, with at least one purchase within the last three months. France was chosen as it is a leading luxury market with revenues of USD 14.56 bn in 2022 and an expected growth rate of 7.72% from 2022 to 2027.[3] The capital, Paris, and the cities of Lyon and Cannes are the top three shopping destinations in France[4] and were

[3] https://www.statista.com/outlook/cmo/luxury-goods/france
[4] https://traveltriangle.com/blog/shopping-in-france/

chosen as locations for the data collection. The services of a national research agency[5] were used for this study, who deployed the central location method for data collection. The respondents were members of their panel in the three cities who fulfilled the population criteria. To manipulate tactile input as well as category (luxury/non-luxury), we opted for analogue watches (high-tactile), sneakers (high-tactile), cosmetics (low-tactile) and hats (low-tactile) as the contextual categories.

For luxury watches, generally treated as jewellery items, the important specific features like build quality, metallic feel and weight on the wrist are difficult to simulate in an AR application. Similarly, for sneakers, beyond outer appearance, it is important to experience the fit and comfort in the foot, which cannot be easily represented in an AR application (Ofek et al., 2011). Thus, both are treated as high-tactile categories. The cosmetics industry has tremendously benefitted from AR-based retailing due to the easy replication of offline aesthetics and vividness in an online format (Wang et al., 2022). Similarly, hats, like cosmetics, are more aesthetics-focussed and easier to simulate in a digital "AR mirror"[6]. Thus, these two are proposed as low-tactile categories. To validate this categorization, the perceived "need-for-touch", a measure of tactile input requirement for a product, was further evaluated by respondents (Gatter et al., 2022).

4.2 Measurement items

The measurement items were adapted from previously validated instruments to develop a questionnaire in the French language. All of the original measurement instruments were translated into French (by one expert) and then back-translated into English (by another expert). The results produced near-identical questionnaires. The variable AR application experience was measured using four items from the scale by Yim et al. (2017). Affective responses (pleasure,

[5] The name kept confidential on request

[6] https://www.forbes.com/sites/bernardmarr/2019/02/08/augmented-reality-in-retail-the-incredible-case-of-tenth-street-hats/

emotional involvement, flow) were measured using the eleven-item scale developed by Kim et al. (2020). Trust in the product was measured using Bastide's (2017) four-item scale. Experience satisfaction was measured by McLean and Oseifrimpong's (2017) three-item scale. Purchase intent was measured by the three-item scale of Merle et al. (2012), while WOM was measured by Cristau's (2003) three-item scale.

For the manipulation check between the categories (luxury/non-luxury), the perceived luxuriousness was measured by a four-item scale from Hagtvedt and Patrick (2008), whereby participants evaluated whether the product was perceived as luxurious, prestigious, attractive and high-class. To check for the manipulation of tactile input requirement, four items from the need-for-touch scale (Peck and Childers, 2003) were borrowed "I feel more comfortable purchasing this product after physically examining it", "If I can't touch this product in the store, I am reluctant to purchase it", "I feel more confident making a purchase after touching this product", and "The only way to make sure a product is worth buying is to touch it".

All scales were measured with a five-point Likert scale ranging from [1] strongly disagree to [5] strongly agree. The draft questionnaire was shown to three marketing professors and two doctoral scholars who were familiar with the selected context and language to ensure the content validity and suitability of the scales. The questionnaire was also subjected to a pre-test with 30 respondents to identify any language and/or typing errors, which were corrected.

4.3 Data collection

The data collection happened in three stages across two studies (the first two stages as part of study 1 and the third stage as part of study 2). In the first stage, the data, collected for luxury watch (high-tactile) and cosmetics (low-tactile) categories, helped evaluate the hypotheses about luxury products (H1-H7). In the second stage, data was collected for non-luxury cosmetics (low-tactile) to evaluate hypothesis H8. The third stage, as part of study 2,

was executed to check for the overall robustness of the model results with both luxury (sneakers: high-tactile; hats: low tactile) and non-luxury (sneakers: high tactile) products.

4.3.1 Stage 1 (Study 1)

In the first stage, the brand selected in the cosmetics category was L'Oréal which is a world leader in the sector and has an AR product called ModiFace. The second AR product in the luxury watch category was WatchBox. Email invitations were sent to 1800 eligible participants during June 2021 to seek in-person participation. Of these, a total of 520 respondents indicated their interest. The data collection stage took place in July-August of 2021 with 382 eligible respondents visiting the central locations. Each of the respondents was randomly allocated to the watches or the cosmetics category. The respondents tried the respective AR applications and completed the questionnaire. After removing outliers using Cook's method, a final sample size of 370 respondents was obtained, making the overall response rate 71.15%.

4.3.2 Stage 2 (Study 1)

For this stage, the cosmetics category by NYX, which has an AR application for its relatively less expensive cosmetics, was chosen. The data collected in this case was conducted from June to July 2022 in the same cities. The one-year gap between the first two stages ensured the general temporal robustness of the model, free of any specific effects (occasion factors) prevalent at the time of data collection (Spector, 2019). The data collection protocols were identical. For this phase, 856 eligible individuals were sent invitation emails. Of the invitees, a total of 422 agreed to participate. On the days of data collection, 208 people turned up at the location. In total, 203 complete questionnaires with no outlier responses were obtained with the response rate being 48.10%.

4.3.3 Stage 3 (Study 2)

The one-year gap in the first two stages of data collection may lead to concerns with the moderator evaluation. This is because the situational effects may be different at each time causing data aggregation and comparison of effects based on the type of category challenging[7]. Hence a third-stage data collection was done in a replication study with all data collected at one point in time.

The luxury brand Gucci's AR application was used for sneakers and hats. For benchmarking the results for non-luxury products, the Wanna Kicks AR application for non-luxury sneakers from Nike was deployed. The brands and categories were altered from the first two stages (study 1) to allow for the generalizability of the findings. The data collection was executed in November 2022. For this phase, 1699 eligible individuals were sent email invitations with a choice to participate in the luxury or the non-luxury category. Of those invited, a total of 623 and 281 respondents agreed to participate in the luxury and non-luxury categories, respectively. A total of 621 people turned up at the location, with 358 for the luxury category. Those for the luxury category were randomly allocated to sneakers and hats applications. All people filled out the questionnaires completely with no outliers, making the response rate 68.69%.

Table 1 presents the sample profile.

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5. DATA ANALYSIS

The normality check for all datasets reported that skewness and kurtosis values were within the recommended range of -2.00 to +2.00, and -7.00 to +7.00, respectively (Curran et al., 1996). We also checked for the presence of common method bias (CMB) in the entire

[7]For example, the first data collection happened just after the deadly second wave of COVID-19, with high consumer concern for safety, while the second data collection happened during a period when concerns for the pandemic had significantly reduced.

dataset using the Harman one-factor method with the principal component analysis in SPSS 26. For the three datasets, the single largest factors accounted for only 27%, 24%, and 28%, respectively, of the total variance, thus implying a lack of CMB.

A preliminary manipulation check for perceived luxuriousness and tactile input was also done. The average of the four items of perceived luxuriousness and need-for-touch was taken for each respondent and independent sample t-tests were done. The differences in perceived luxuriousness between the two luxury categories were found insignificant, both in stage 1 and 3 (S1|S3) datasets ($t_{S1\mu watch\text{-}\mu cosmetics}$=.74, p>.05; $t_{S3\mu sneakers\text{-}\mu hats}$=.89, p>0.05), and were found significant between the luxury and non-luxury categories, both in stage 1/stage2 (S1/S2) and stage 3 (S3) datasets ($t_{S1/S2\mu luxury\text{-}\mu non\text{-}luxury}$=2.66, p<.05; $t_{S3\mu luxury\text{-}\mu non\text{-}luxury}$ =3.49, p<0.05). It was the same case with tactile input with the difference of need of touch between high-tactile and low-tactile categories, for luxury brands, found significant ($t_{S1\mu watch\text{-}\mu cosmetics}$=2.84, p<.05; $t_{S3\mu sneakers\text{-}\mu hats}$=2.66, p<0.05).

The confirmatory factor analysis (CFA) using AMOS24, a CBSEM tool, was performed to check the measurement properties of the scales, with the results depicted in Table 2. The overall fit of the CFA model for all the datasets[8] was evaluated using fit indices including Standardized Root Mean Square Residual (SRMR), Goodness of Fit Index (GFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). The fit indices were found to be satisfactory, with χ^2/df=2.81, SRMR=.05, GFI=.91, NFI=.91, IFI=.91, CFI=.90, and RMSEA=.05 for the first stage dataset; χ^2/df =2.31, SRMR=.06, GFI=.92, NFI=.92, IFI=.92, CFI=.91, and RMSEA=.04 for the second stage dataset; χ^2/df =2.59, SRMR=.07, GFI=.91, NFI=.90, IFI=.91, CFI=.91, and RMSEA=.06 for luxury category in the third stage dataset; and χ^2/df =2.77, SRMR=.07,

[8] For the third dataset, luxury and non-luxury categories were analyzed separately

GFI=.90, NFI=.91, IFI=.91, CFI=.90, and RMSEA=.07 for the non-luxury category in the third stage dataset.

The loadings of all the items on their respective factors were satisfactory as they exceeded the minimum threshold of .70. Convergent validity was also established, as all of the average variance extracted (AVE) values for the constructs were above the recommended cut-off of .50 (Cheung & Wang, 2017).

INSERT TABLE 2 HERE

To establish discriminant validity for all the datasets, we followed Fornell and Larcker's (1981) criterion and compared the square root of AVE with the inter-construct correlation coefficients (see Table 3).

INSERT TABLE 3 HERE

Since the study also involved comparing the model across groups (low-tactile/high-tactile and luxury/non-luxury), multi-group analysis (MGA) in AMOS24 was deployed. MGA is a well-established technique to check for model variations in case the moderator is categorical and is expected to influence the entire model (Cheah et al., 2023). This is in contrast to an interaction-based moderation test which requires a continuous moderator which acts on a specific path(s). As part of MGA, it was prudent to first establish the measurement model invariance (Mathwick et al., 2002). The results of the invariance are displayed in Table 4. For the moderator tactile input, the MGA was executed through the data for cosmetics/hats and watches/sneakers within the luxury category in stage 1 and 3 datasets; however, for the moderator of the category (luxury/non-luxury), the MGA was executed through the dataset for cosmetics (low-tactile) only in stage 1 and stage 2 data, and for sneakers (high-tactile) only in stage 3 data.

INSERT TABLE 4 HERE

We see that the model fits generally well across all types of constraints. Furthermore, within the nested model comparison with the unconstrained model as a benchmark, it was found that $\Delta\chi^2$ was statistically insignificant once additional model constraints were imposed, thus implying measurement model invariance (Counsell et al., 2020).

After the CFA, the structural model was evaluated. For the primary paths of the model (hypotheses H1-H7), the data for respondents answering for the luxury products only was considered (S1|S3), with paths also examined separately for each luxury category. The significance of the individual paths was tested based on a t-test greater than 1.96 and a p-value of less than .05 (see Table 5). The effects of AR application experience on pleasure (β_{1aS1}=.65, t=11.64; β_{1aS3}=.54, t=9.67), emotional involvement (β_{1bS1}=.53, t=11.49; β_{1bS3}=.52, t=11.44), and flow (β_{1cS1}=.35; t=8.36; β_{1cS3}=.31; t=7.81) were respectively significant. Hypotheses H1a, H1b, and H1c are thus supported. AR application experience had a positive impact on trust (β_{2S1}=.42, t=10.55; β_{2S3}=.44, t=10.59), which supports hypothesis H2. The results showed that the effects of pleasure (β_{3aS1}=.19, t=2.79; β_{3aS3}=.30, t=7.14) and flow (β_{3cS1}=.34, t=6.03; β_{3cS3}=.33, t=5.99) on satisfaction were respectively significant, which supports hypotheses H3a and H3c. The results, however, also showed that the effect of emotional involvement on satisfaction (H3b) was not significant (β_{3bS1}=.06, t=1.748; β_{3bS3}=.03, t=.842). Trust had a significant effect on satisfaction (β_{4S1}=.75, t=13.06; β_{4S3}=.67, t=13.01); hence, hypothesis H4 is supported. Satisfaction had a positive effect on purchase intentions and WOM, thereby supporting hypotheses H5 (β_{5S1}=.81, t=17.24; β_{5S3}=.73, t=15.07) and H6 (β_{6S1}=.79, t=15.98; β_{6S1}=.72, t=15.02). In contrast, for non-luxury products, the path from pleasure to satisfaction was not found to be significant, while the path from emotional involvement to satisfaction was.

INSERT TABLE 5 HERE

For the moderating variables, MGA was used to test the difference in specific paths across the model. For every path for which the significance of difference was to be checked, the contextual path was constrained to be equal across the two levels of the categorical moderator in the AMOS 24's structural weights protocol, and the $\Delta\chi^2$ along with its significance at 95% level were evaluated. A significant $\Delta\chi^2$ implied that the models are different and that the paths are significantly different (Floh &Treiblmaier, 2006). Table 6 shows that most of the path values for low-tactile products in the luxury category were higher than those for high-tactile ones (S1|S3), except for the paths from AR application experience to flow (both significant) and emotional involvement to satisfaction (both non-significant). The result is identical for luxury products in stages 1 and 3 of data collection. Hence, hypothesis H7 is largely supported. For hypothesis H8, it was found that for luxury products, the path values for the model were higher than non-luxury products for most paths, except for the path from emotional involvement to satisfaction. Hence, hypothesis H8 is also largely supported.

INSERT TABLE 6 HERE

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6. DISCUSSION

In the domain of omnichannel retailing which has revolutionized the luxury retailing market, the changes in customer migration from physical to 'phygital' options have encouraged luxury brands to find effective ways to combine brick-and-mortar experiences with online ones. (Ameen et al., 2021). However, digital experiences lack the human touch which is a key source to seamless and realistic customer experiences (Pangarkar et al., 2022). AR is one technology that fills that gap and hence, this study examines the impact of AR application experience for a luxury brand on the affective (pleasure/emotional involvement/flow), cognitive (trust/experience satisfaction), and behavioural responses (purchase intention/WOM) of consumers.

With a three-stage data collection across two studies, the study found a positive effect of AR experience on pleasure, emotional involvement, and flow, which implies that good navigation, high-quality content, interface smoothness, and the effectiveness of the AR application create positive affective engagement. The findings align with previous studies in the context of interactive AR-based technologies and gaming applications, and demonstrate the enabling role of modern digital technologies, like AR, in generating rewarding emotional experiences for consumers (Hoffman & Novak, 2009; McLean & Wilson, 2019; Yim et al., 2017).

The significant relationship between the AR application experience and product-oriented trust means that the 'reality-simulating' experience, ensuring local presence, reinforces the authenticity of the luxury product (Bastide, 2017). When users feel that their experience is close to reality through self-defined parameters, they define the whole experience as representative and authentic (Al-Imamy & Nadeem, 2022). This upholds the validity of AR application as a complement to physical experiences, as part of an omnichannel strategy, to induce trust in the expensive purchase to be made by the consumer.

It was found that pleasure and flow had a positive influence on satisfaction. It means that these 'in-the-moment' affective responses, invoked by an immersive AR-enabled shopping experience and reflecting a brand's equity, can promote positive assessments of the purchase experience (Huang & Liao, 2017; Javornik et al., 2021). However, emotional involvement is not found to influence satisfaction, despite theoretical evidence (Shankar et al., 2003; Wirtz & Bateson, 1999). The lack of effect may be because luxury products are purchased predominantly through offline channels where consumers can physically evaluate and instantly acquire them (Lee et al., 2020). Hence, despite the AR application being immersive, the experiences may not permit consumers to invest emotions in the way that they can do in a physical setting for some luxury products, which may mandate a complementary multi-channel

'phygital' strategy for such brands (Javornik et al., 2021). The argument is substantiated by the significance of this relationship for non-luxury products (Ko et al., 2016).

The results also highlight that the greater the consumer's satisfaction with the experience, the more positive their purchase intent is for the luxury product as well as the willingness to spread WOM for the AR application. Further, the strong indirect effect of trust on the product, through experience satisfaction, on purchase intention and WOM showcases the important role played by experience with the AR application and the satisfaction with it in converting the trust to behavioural outcome. This is unlike other online experiences, where trust may be a direct antecedent to purchase intentions (Bashir et al., 2018; Oliviera et al., 2017). These findings support the emerging role of capable AR applications in enabling sales of luxury products through such immersive digital technologies (e.g., Bahri-Ammari et al., 2016; Shankar et al., 2003). The AR application can be an independent retail channel in its own right for a luxury brand to induce a purchase, without necessarily the need for the consumer to make a physical visit to the store, which helps the brand save the costs of owning a physical space.

Finally, our study supports the moderating role of the product's tactile input and product category. For low-tactile products, compared to high-tactile ones, the effect of the AR application experience on affective responses is higher. This supports the argument that a consumer's offline brand experiences are necessary for products with higher tactile input and the affective responses to AR-based experiences for such categories will be limited, mandating the need for a suitable combination of online and offline retail strategy for such high-tactile luxury products (Kapferer & Bastien, 2009). Except for the effect of emotional involvement on experience satisfaction, it was found that all the model paths were higher for luxury products over non-luxury products. Further, as highlighted earlier, it can be argued that the implications of positive experience satisfaction, out of meaningful trust-evoking experiences with AR application for behavioural outcomes are higher for luxury products. This reinforces the critical

and emerging role of the AR application in shaping hedonic and cognitive experiences for luxury products, more than non-luxury ones (Zanger et al., 2022).

7. THEORETICAL CONTRIBUTION

The study makes several theoretical contributions. First, this is one of the first studies to propose the chain effect highlighting the role of AR-enabled experiences as important determinants of a luxury product purchase. While prior studies have discussed AR applications with a focus on technical attributes (e.g., Kim & Choo, 2021; McLean & Wilson, 2019; Poushneh & Vasquez-Parraga, 2017), debates on their behavioural or psychological outcomes are limited. By providing a serial pathway from AR-driven experiences with applications for luxury products to the consumer's intention to buy the physical product, this work adds value to the theme of digital experiences as part of omnichannel retailing. The findings emphasise how AR-driven experiences encourage luxury customers to utilize emotion-evoking and trust-enthusing digital technologies for purchasing luxury products (Chiu et al., 2021; Javornik et al., 2021; Nikhashemi et al., 2021; Rauschnabel et al., 2022; Tan et al., 2022). Such experiences help luxury brands develop suitable customer-focused omnichannel processes (Ameen et al., 2021).

Second, for high-value luxury goods where consumers have an enhanced need for product authenticity, this study confirms that an 'almost-real' representation, and a 'hands-on' experience of the luxury product within the AR ecosystem, to generate the necessary trust, is critical to purchasing 'high-ticket' items, more so than regular non-luxury ones (Hamilton et al., 2019; Kim et al., 2018; Lăzăroiu et al., 2020; Rauschnabel, 2021; Tan et al., 2022). This study also argues that such authenticity is needed more for luxury products with high-tactile information to convey their functionalities; hence, the AR application may have limited utility for categories in which a physical 'try-on' is viewed as essential (Pino et al., 2019). In the literature on omnichannel retailing, there are limited studies which examine the role of such

digital technologies in trust building with the luxury buyer (Pangarkar et al., 2022). The results of this work, especially those of the moderators, emphasise the need for a 'phygital' experience, composed of a suitable combination of physical and digital experiences, as part of omnichannel strategies of luxury brands selling products with high need-for-touch to build the trust needed for purchase as well as long-term enduring buyer-seller relationships (Arli et al., 2018). Additionally, the findings offer an argument that online sales using immersive digital technologies are not only driven by a brand's equity or the quality of its online presence, including the AR application but also by the physical evaluation of the 'high-touch' product to judge its overall quality (Han & Kim, 2020; Rauschnabel et al., 2019; Wu et al., 2021).

Third, while multiple studies, in the context of modern retail technologies, use the S-O-R framework to investigate consumers' behavioural responses to technological stimuli, they primarily focus on VR-enhanced technologies, with few of them investigating consumers' experiences with AR-enhanced retail technologies (Baytar et al., 2020; Lee et al., 2022). The context of AR applications has moved to a phase where cognitive and emotional outcomes of AR-driven experiences and subsequent influence on shopping behaviours need to be examined (Fan et al., 2020; McLean & Wilson, 2019; Poushneh & Vasquez-Parraga, 2017; Scholz & Duffy, 2018). Further, much of the AR-enabled retail literature on AR using the S-O-R framework focuses on a particular characteristic of the technology rather than holistic experiences, that too in a general product context (e.g., Kim et al., 2020; Watson et al., 2020). Hence, by measuring the consumer experiences with the relatively mixed nature of AR-enhanced technologies and their outcomes using the S-O-R framework for luxury products, this study adds value to the application of the framework in the modern retail technologies domain (e.g., Do et al., 2020; Javornik, 2016).

Finally, this study integrates the affect-as-information theory and the S–O–R framework. While previous studies have examined the affective, cognitive, and behavioural

responses to AR (e.g., Kowalczuk et al., 2021; Kumar, 2022), they have not necessarily established a flow of such responses in the process (e.g., Javornik, 2016; tom Dieck et al., 2018; Zanger et al., 2022). Similarly, the S–O–R underpinning represents a progression from previous studies that use adoption models (e.g., Yavuz et al., 2021). The integration of these two theories, as a first-time contribution to extant retail literature, highlights the hierarchical process through which capable AR applications can encourage luxury buyers to purchase such products to fulfil their need for distinctiveness and differentiation (Jebarajakirthy & Das, 2021).

8. PRACTICAL IMPLICATIONS

This study offers several managerial contributions. First, it demonstrates that AR applications can facilitate the triggering of consumer pleasure, emotional involvement, and flow through immersion in the shopping experience while also promoting consumer trust in trying the luxury product. Thus, AR application developers need to make their online applications as immersive and 'reality-simulating' as possible for consumers by creating intuitive navigation designs, curating high-quality content for use in AR applications, regulating the pace of product scrolling in the interface, and ensuring applications are configurable to individual needs. Such qualities can be expected to evoke affective responses towards rather expensive luxury products. For omnichannel retailers, relational digital exchanges through the AR application, comprising purposeful interactions, can complement/replace physical experiences and are expected to build strong emotional connections with the customer. As an example, Dior, a luxury brand, launched its B27 sneakers range in its immersive AR application which allowed users to try on the sneakers at home followed by an option to purchase. Just this AR lens-based application helped improve Dior's sales by around 6.2 times in 2022, combined with over 2.3 million views for its products online[9].

[9] https://www.marketingmag.com.au/social-digital/how-augmented-reality-is-changing-the-face-of-luxury-retail/

Second, the study establishes the important role of trust as an enabler of the purchase experience for luxury products through an AR application. Consumer satisfaction is backed by trust, a reassurance that the product is authentic and high-quality, and hence, luxury retailers need to focus on innovatively creating customer trust through digital technologies. Luxury brands, more so than non-luxury ones, must create AR-based experiences, through cutting-edge programming and background engines, that mimic, and not over- or under-represent, the actual product and create the necessary trust-evoking satisfaction. Further, omnichannel retailers need to supplement digital experiences by giving a choice to consumers to further visit a physical store to evaluate the product in reality and compare the experiences, if needed. Tan et al. (2022) proffer that customers inherently trust immersive AR applications, and feel reliant on such cutting-edge tools to make the eventual purchase. This is substantiated by a NeilsonIQ 2019[10] survey where 56% of shoppers feel confident about product quality experience through capable AR, with 61% preferring to shop through such AR experiences.

Third, our research found that while the effect of an AR-based application on behavioural outcomes was relevant for luxury brands, the effects were stronger for low-tactile products. AR application developers need to ensure that for products requiring tactile inputs to facilitate better quality judgements, applications should be designed to better replicate the physical design of products, including their texture and finish. For products with a greater need for a physical 'try-on,' applications can include an advisory for consumers to physically examine the product at their nearest store. In other words, for luxury brands selling high-tactile products, it is critical to ensure a combination of physical and digital experiences to ensure believability in the product. An example of such a case is the jewellery brand Caratlane and premium eyewear brand Lenskart in India which were pioneers of online sales in their respective categories. Over the years, the brands have offered customers the option to buy

[10] https://nielseniq.com/global/en/insights/analysis/2019/augmented-retail-the-new-consumer-reality-2/

expensive jewellery/eyewear through their AR virtual try-on application, but at the same time have multiple offline brick-and-mortar stores in India for customers to evaluate the same products offline. Both brands have reaped tremendous benefits from the application with close to 20% of their sales happening through it[11]. Alternately, some brands can allow in-store customers to experience their AR application in specially developed 'digital zones' so that the customers can gradually migrate to the digital ecosystem for future purchases. Such a strategy can also be used by luxury brands selling a combination of high- and low-tactile products.

Finally, the study found that AR application-derived hedonic and cognitive experiences followed by behavioural outcomes were largely stronger for luxury products, compared to non-luxury ones. This reaffirms that brands selling luxury products should adopt a stronger focus on the development of engaging AR applications to generate higher rates of purchase conversion. However, AR applications can also be useful in driving online sales of non-luxury products, and brands in such categories should endeavour to deploy AR applications for their purposes. Non-luxury brands need to build emotional involvement in their applications, possibly through stereoscopic AR, as only then would consumers be motivated to buy such products. This is referred to as ‘bespoke personalization’ by Javornik et al. (2021) where AR deployment by non-luxury brands helps them during the consideration phase. They further argue that brand managers of luxury products need to focus on AR-enabled visualizations that reflect luxuriousness. Luxury brands, thus, should focus more on building a pleasurable application through the spatial presence of the consumer within the application (Wang, Ko, and Wang, 2022).

9. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

[11] https://brandequity.economictimes.indiatimes.com/news/digital/ecomm-sites-like-caratlane-lenskart-turn-to-virtual-trial-technology/49449561

Despite its contributions, this study has a few limitations. The first is that the research model considered AR application experience as a unidimensional construct encompassing navigation, content, the pace of content delivery, and overall efficiency. However, as an extension, it may be more prudent to consider each of these design elements separately to evaluate their effect on hedonic and cognitive outcomes. Future researchers may seek to focus on specific attributes of the AR-based application, for example, visual, information, ergonomics, and interface design elements (Mishra, 2016).

The second limitation is that specific AR applications for each category were deployed. Consumers' experiences may evolve with different applications for the same category. Thus, in line with the first limitation, future studies may wish to manipulate an AR application for the same category and check for incremental improvements in the experiences based on the additional attributes embedded in the AR application. Such manipulation could also be achieved by moving the application from one device to another.

The third limitation relates to the generalizability of our results to other categories in the luxury/non-luxury market. The current study chose watches, sneakers, cosmetics and hats as test categories. However, many other categories can also be classified as luxury, including apparel, premium eyewear, perfumes, and a few others. The same applies to the non-luxury category. The ability of an AR application to do justice to these categories may be different. While this study tested the model across categories based on 'touch-and-feel' requirements, there may also be further differences such as the appeal of the product to other primary senses, like taste or smell. Future studies may choose to evaluate the model differences across various types of categories with specific determinant attributes.

Finally, the study established the influence of trust on experience satisfaction. There are multiple studies, however, that claim the directionality to be opposite in other contexts (e.g., Melián-Alzola & Martín-Santana, 2020). Our primary argument is that the perceived

consumption value from an AR application is an inherent source of experience satisfaction (Al-Imamy & Gnoth, 2022). However, such value also has significant effects on the perceived risk and trust with the product shown in the application, and once the risk is low and trust is high, due to the luxury brand's equity, the resultant experience is rewarding leading to greater satisfaction (Wu et al., 2018). The directionality of the relationship may change based on the context of the study, and thus, future research can explore such contextual conditions.

10. CONCLUSION

This work validates the importance of AR-enabled experiences for luxury brands in shaping affective and cognitive experiences, culminating in behavioural outcomes. The important roles of tactile input of the product, as well as the type of category (luxury/non-luxury) in moderating the relationships, are also examined. Modern technologies like AR and VR are changing the landscape of global retail and are envisioned to be an integral part of people's lives in the future. Competition between the two technologies has also ensued. For example, there are contradictory verdicts on the concept of Metaverse which aims to migrate people to a virtual world through VR technology. While Meta founder, Mr. Mark Zuckerberg, is convinced of the VR-enabled future, many, like Snap founder, Mr. Eval Spiegel, and Apple marketing head, Mr. Greg Joswiak, have raised doubts on the VR's promise as a mass-market technology application[12]. Both latter firms, with their respective AR applications in the works, suggest that AR has greater implications for most consumer industries with the gradual decline of smartphones and the ascendence of AR-enabled wearables[13]. Irrespective of the outcome of this debate, going forward, AR-enabled technologies and devices are going to be critical for the growth of the retail industry, especially for the traditional 'offline' luxury category, by creating authentic and trust-inducing purchase experiences (Rauschnabel et al., 2022).

[12] https://www.gadgets360.com/apps/news/snap-metaverse-slammed-augmented-reality-evan-spiegel-apple-greg-joswiak-3463240
[13] https://bigthink.com/the-future/ar-will-make-us-superhumans/

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LIST OF TABLES

Variable	Category	L (Stage 1) N (%)	NL (Stage 2) N (%)	L/NL (Stage 3) N (%) - L	L/NL (Stage 3) N (%) - NL
Gender	Male	157 (42.4)	88 (43.3)	148 (41.3)	122 (46.4)
	Female	213 (57.6)	115 (56.7)	210 (58.7)	141 (53.6)
Age	18-25 years	178 (48.1)	102 (50.2)	172 (48.0)	135 (51.3)
	26–35 years	101 (27.3)	54 (26.6)	91 (25.4)	64 (24.3)
	36–50 years	56 (15.1)	37 (18.2)	49 (13.7)	41 (15.6)
	51+	35 (9.5)	10 (4.9)	46 (12.8)	23 (8.7)
Marital status	Married	167 (45.1)	84 (41.4)	142 (39.7)	119 (45.2)
	Single	203 (54.9)	119 (58.6)	216 (60.3)	144 (54.8)
Education	Undergraduate or below	118 (31.9)	69 (34.0)	116 (32.4)	76 (28.9)
	Graduate	119 (32.2)	60 (29.6)	108 (30.2)	82 (31.2)
	Postgraduate	96 (25.9)	49 (24.1)	85 (23.7)	69 (26.2)
	Doctorate	37 (10.0)	25 (12.3)	49 (13.7)	36 (13.7)
Income (annual) Euros	5000-20000	30 (8.1)	19 (9.4)	32 (8.9)	27 (10.3)
	21000-40000	72 (19.5)	41 (20.2)	67 (18.7)	51 (19.4)
	41000-60000	108 (29.2)	57 (28.1)	101 (28.2)	62 (23.6)
	61000-100000	138 (37.3)	75 (36.9)	147 (41.1)	118 (44.9)
	>100000	22 (5.9)	11 (5.4)	11 (3.1)	5 (1.9)
Category	Watches/Sneakers	185 (50.0)	0 (0.0)	179 (50.0)	263 (100.0)
	Cosmetic/Hats	185 (50.0)	203 (100.0)	179 (50.0)	0 (0.0)
City	Paris	159 (42.9)	72 (35.4)	141 (39.4)	135 (51.3)
	Lyon	117 (31.6)	64 (31.5)	126 (35.2)	81 (30.8)
	Cannes	94 (25.5)	67 (33.1)	91 (25.4)	47 (17.9)

L: Luxury; NL: Non-luxury

Table 1: Sample profile

Measure	Item	Mean	Loadings S1L|S2NL|S3L|S3NL	CR	AVE
AR Application Experience (ARE)	I like the quality of navigation of the AR application	3.56|3.98|3.66|3.71	.79|.82|.81|80	.86|.87|.85|.90	.61|.63|.59|.70
	I like the way the content was displayed in the AR application	3.53|3.66|3.76|3.87	.77|.86|.71|.88		
	I feel control over the pace of viewing the products in the AR application.	3.52|3.85|3.79|3.82	.74|.79|.74|.86		
	The AR application meets my specific needs quickly and efficiently	3.51|3.61|3.72|3.59	.81|.72|.81|.81		
Pleasure (PL)	Using the AR application is fun for me.	3.47|3.63|3.58|3.98	.77|.73|.74|.76	.87|.86|.86|.87	.64|.62|.61|.62
	Using the AR application is enjoyable for me.	3.31|3.87|3.87|3.78	.79|.89|.82|.87		
	Using the AR application is entertaining for me.	3.38|3.71|3.77|3.48	.82|.76|.79|.74		
	Using the AR application makes me happy.	3.35|3.67|3.66|3.59	.83|.76|.77|.78		
Emotional Involvement (EI)	I am completely involved in the AR experience.	3.77|3.71|3.79|3.81	.81|.72|.87|.72	.82|.83|.85|.83	.61|.62|.65|.62
	I am deeply impressed with the AR experience.	3.86|3.90|3.92|3.75	.76|.92|.82|.87		

Flow (FL)	I feel total empathy with the AR experience.	3.86|3.88|3.85|3.87	.78|.71|.73|.77	.86|.86|.87|.88	.61|.60|.64|.66
	When I use the AR activity, I am totally captivated.	3.82|3.79|3.71|3.73	.76|.73|.78|.79		
	When I use AR activity, time seems to pass very quickly.	3.85|3.81|3.85|3.84	.71|.78|.80|.88		
	When I use the AR activity, I forget about all the concerns.	3.85|3.86|3.89|3.84	.82|.85|.87|.82		
	Using AR activity often makes me forget where I am.	3.65|3.72|3.79|3.76	.85|.75|.77|.74		
Trust (TR)	This product makes a good impression on me.	3.58|3.69|3.78|3.72	.88|.83|.79|.91	.88|.89|.88|.91	.65|.69|.64|.71
	This product makes me feel safe.	3.81|3.82|3.89|3.87	.79|.76|.77|.79		
	This product suits my safety requirements.	3.82|3.91|3.89|3.67	.81|.86|.81|.84		
	This product suits my style	3.74|3.78|3.77|3.76	.75|.87|.83|.82		
Experience Satisfaction (SAT)	I am satisfied with my experience.	3.82|3.92|3.93|3.84	.82|.83|.81|.76	.88|.87|.86|.81	.72|.71|.68|.59
	The experience is exactly what I wanted.	3.77|3.57|3.49|3.55	.88|.86|.78|.72		
	The experience works as well as I thought it should.	3.73|3.66|3.67|3.79	.85|.84|.87|.82		
Purchase Intentions (PI)	I can see myself buying this product with this AR application.	3.75|3.86|3.81|3.82	.87|.77|.77|.75	.91|.91|.89|.85	.77|.78|.72|.66
	The next time I purchase this product, I will take this AR application into consideration.	3.84|3.79|3.77|3.81	.88|.91|.88|.83		
	I would be very interested in purchasing this product on this AR application	3.85|3.89|3.88|3.91	.89|.94|.89|.85		
Word-of-Mouth (WOM)	I like to talk about this AR application with other people.	3.68|3.84|3.78|3.77	.91|.86|.85|.74	.92|.88|.85|.87	.79|.72|.65|.70
	I tell stories about this AR application to other people.	3.73|3.78|3.71|3.67	.87|.84|.80|.86		
	I explain to others why they may find it beneficial to use this AR application	3.77|3.84|3.76|3.78	.89|.85|.77|.90		

Note: S1: Stage 1; S2: Stage 2; S3: Stage 3; L*:* Luxury, NL: Non-luxury*;* CR: Composite Reliability; AVE: Average Variance Extracted

Table 2: Measurement properties

(S1L|S2NL|S3L|S3NL)	ARE	PL	EI	FL	TR	SAT	PI	WOM
ARE	.78|.79|.77|.84							
PL	.44|.42|.48|.47	.80|.79|.78|.79						
EI	.41|.53|.55|.51	.34|.39|.33|.39	.78|.79|.81|.79					
FL	.24|.32|.29|.33	.56|.45|.57|.59	.59|.55|.51|.52	.78|.77|.80|.81				
TR	.57|.49|.52|.54	.45|.47|.49|.48	.43|.47|.46|.49	.51|.55|.53|.52	.81|.83|.80|.84			
SAT	.51|.55|.57|.55	.41|.42|.48|.47	.35|.38|.39|.42	.49|.52|.53|.51	.74|.71|.70|.72	.85|.84|.82|.77		
PI	.52|.49|.49|.53	.39|.45|.49|.47	.38|.41|.43|.44	.43|.45|.44|.42	.71|.72|.72|.73	.74|.75|.71|.69	.88|.88|.85|.81	
WOM	.46|.47|.48|.51	.32|.33|.35|.34	.32|.36|.39|.39	.49|.48|.52|.51	.66|.69|.66|.68	.73|.68|.65|.69	.72|.70/.70|.71	.89|.85|.81|.84

Note: S1: Stage 1; S2: Stage 2; S3: Stage 3; L*:* Luxury, NL: Non-luxury; AVE: Average Variance Extracted

The diagonal items are square root of AVE values, and the non-diagonal ones are inter-construct correlations; for acronyms, please refer to Table 2.

Table 3: Discriminant validity evaluation

Cosmetics vs. Watch (S1|S3)									
Constraints	**$\Delta\chi^2$**	**p-value**	**χ^2/df**	**SRMR**	**GFI**	**NFI**	**IFI**	**CFI**	**RMSEA**
Unconstrained	-		2.81|2.92	.05|.06	.91|.90	.91|.90	.91|.91	.90|.90	.06|.07
Measurement Weights	18.8|19.2	.12|.10	2.75|2.77	.06|.06	.90|.90	.91|.91	.90|.90	.90|.90	.05|.06
Structural Covariance	36.4|41.4	.14|.12	2.68|2.71	.06|.06	.90|.90	.90|.90	.90|.90	.90|.90	.05|.06
Measurement Residuals	79.2|82.5	.17|.13	2.65|2.68	.06|.06	.90|.90	.90|.90	.90|.90	.90|.90	.05|.06
Luxury vs. Non-Luxury (S1/S2|S3)									
Constraints	**$\Delta\chi^2$**	**p-value**	**χ^2/df**	**SRMR**	**GFI**	**NFI**	**IFI**	**CFI**	**RMSEA**
Unconstrained	-		2.47|2.41	.06|.06	.92|.91	.92|.91	.91|.91	.91|.90	.05|.06
Measurement Weights	22.7|23.8	.14|.15	2.44|2.45	.06|.06	.91|.91	.91|.91	.90|.90	.91|.90	.05|.06
Structural Covariance	28.9|27.8	.16|.17	2.39|2.41	.06|.06	.91|.91	.90|.90	.90|.90	.91|.90	.05|.05
Measurement Residuals	33.3|32.6	.19|.22	2.31|2.38	.06|.06	.91|.91	.90|.90	.90|.90	.91|.90	.04|.05

Note: S1: Stage 1, S2: Stage 2, S3: Stage 3

Table 4: Measurement Invariance: Measurement Model

Hypotheses	**Estimate (LT S1|S3)**	**Estimate (HT S1|S3)**	**Estimate (L) (S1| S3)**	**Estimate (NL) (S2|S3)**	**Result (L)**	**Result (NL)**
H1a: ARE→PL	.71**|.66**	.62**|.56**	.65**|.54**	.34**|.29**	S	S
H1b: ARE→EI	.60**|.67**	.49**|.47**	.53**|.52**	.25**|.32**	S	S
H1c: ARE→FL	.36**|.31**	.34**|.32**	.35**|.31**	.22**|.21**	S	S
H2: ARE→TR	.51**|.58**	.37**|.41**	.42**|.44**	.34**|.29**	S	S
H3a: PL→SAT	.26**|.34**	.17**|.28**	.19**|.30**	-.02|.01	S	NS
H3b: EI→SAT	.07|.03	.05|.03	.06|.03	.24**|.22**	NS	S
H3c: FL→SAT	.45**|.36**	.29**|.22**	.34**|.33**	.13**|.11**	S	S
H4: TR→SAT	.88**|.76**	.68**|.59**	.75**|.67**	.72**|.37**	S	S

H5: SAT→PI	.89**|.81**	.73**|.64**	.81**|.73**	.58**|.54**	S	S
H6: SAT→WOM	.84**|.77**	.71**|.69**	.79**|.72**	.45**|.42**	S	S

**p<0.05; S1: Stage 1, S2: Stage 2, S3: Stage 3; L: Luxury, NL: Non-luxury; LT: Low Tactile, HT: High Tactile; S: Supported, NS: Not Supported

Table 5: Path analysis results

Category	Links	Path Difference (S1|S3)	$\Delta\chi^2$ (S1|S3)	p-value (S1|S3)	Outcome
Path Difference (Low Tactile-High Tactile): H7	AR Application Experience→Pleasure	.09|.10	12.81|12.92	.00|.00	Support
	AR Application Experience→Emotional involvement	.11|.20	13.06|21.62	00|.00	Support
	AR Application Experience→Flow	.02|-.01	.34|.22	.55|.64	No Support
	AR Application Experience→Trust	.14|.17	15.53|18.67	.00|.00	Support
	Pleasure→Satisfaction	.09|.06	12.35|9.98	.00|.00	Support
	Emotional involvement→Satisfaction	.02|.00	.36|.01	.54|.92	No Support
	Flow→Satisfaction	.16|.14	17.91|15.49	.00|.00	Support
	Trust→Satisfaction	.20|.17	22.24|18.59	.00|.00	Support
	Satisfaction→Purchase Intention	.16|.17	18.05|18.68	.00|.00	Support
	Satisfaction→WOM	.13|.08	15.21|11.45	.00|.00	Support
		Difference (S2|S3)	$\Delta\chi^2$ **(S2|S3)**	**p-value (S2|S3)**	**Outcome**
Path Difference (Luxury-Non-Luxury): H8	AR Application Experience→Pleasure	.37|.27	45.44|34.94	.00|.00	Support
	AR Application Experience→Emotional involvement	.35|.15	42.39|19.66	.00|.00	Support
	AR Application Experience→Flow	.14|.11	18.75|14.58	.00|.00	Support
	AR Application Experience→Trust	.17|.12	22.54|18.99	.00|.00	Support
	Pleasure→Satisfaction	.28|.27	32.17|31.15	.00|.00	Support
	Emotional involvement→Satisfaction	-.17|-.19	23.25|26.38	.00|.00	Refuted
	Flow→Satisfaction	.32|.11	41.97|14.56	.00|.00	Support
	Trust→Satisfaction	.16|.22	20.04|28.84	.00|.00	Support
	Satisfaction→Purchase Intention	.31|.10	40.16|13.68	.00|.00	Support
	Satisfaction→WOM	.39|.27	49.87|34.65	.00|.00	Support

CR: *Critical ratio of difference*, CR values are compared with the 1.96 cut-off, with higher values implying the paths are significantly different at 95% level of significance

S1: Stage 1, S2: Stage 2, S3: Stage 3

Table 6: Moderation analysis

LIST OF FIGURES

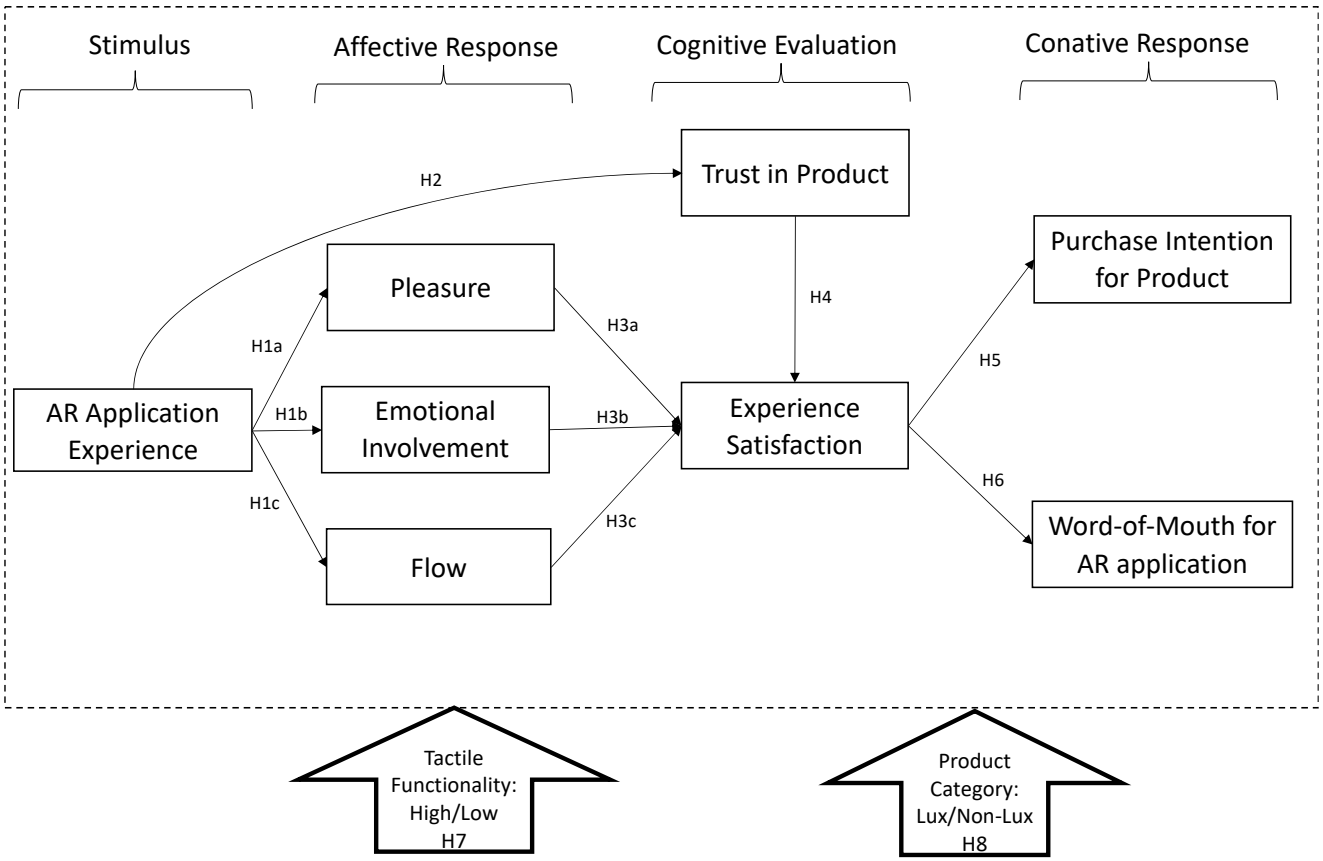

Figure 1: Proposed model (2-column)