Beyond the Lens: Seeing is Feeling

Consumer Behaviour through Augmented Reality in Luxury Fashion Retail

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Abstract

This thesis explores the role of Augmented Reality (AR) try-on filters in shaping consumer behaviour within the luxury fashion retail sector, with a focus on emotional arousal, consumer engagement and purchase intention. As luxury brands increasingly adopt immersive technologies, AR try-on features have emerged as a potentially transformative marketing tool. Current research has often overlooked the emotional and behavioural dimensions of user interaction, particularly within the luxury context. This research addresses this gap by examining how AR affects consumer responses through both affective and physiological perspectives.

Drawing upon the Theory of Interactive Media Effects (TIME), the research explores how modality interactivity, defined as the user's ability to control and manipulate media content, impacts emotional arousal and behavioural engagement. A convergent parallel mixed-methods design was employed to triangulate findings. Participants (n = 45; 23 males, 21 females, 1 non-binary) engaged with full-body AR fashion filters in a semi-controlled laboratory setting. The experiment collected data via Galvanic Skin Response (GSR), observational notes and semi-structured interviews to explore cognitive and affective responses while capturing real-time physiological data.

Findings suggest that AR try-ons create emotionally engaging, playful, and convenient environments that enhance user immersion and self-expression. Our findings lead to the conclusion that AR can endorse consumer-brand relationships and improve purchase intention, provided that the interfaces are both emotionally resonant and visually compelling. The research highlights the value of physiological tools such as GSR in uncovering complex, yet highly relevant user reactions in psychological consumer behaviour research. Practical implications include tailoring AR tools to personal styling preferences and balancing immersive features with brand aesthetics to drive consumer interest and potentially increase conversion.

Keywords: Augmented Reality, Consumer Engagement, Emotional Arousal, Galvanic Skin Response, Purchase Intention

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Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.
- Robert Frost

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Through this thesis, we rediscovered the strength of friendship and camaraderie. It represents more than the conclusion of our master's degree, it embodies the journey that has brought us here including the obstacles faced, and the steadfast commitment to growth and learning. This milestone stands as a testament to persistence and resilience. We are deeply grateful to have reached this point, mindful that every step, challenge, and moment of doubt was an essential part of a path that continues to unfold beyond this chapter.

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We hope you will enjoy reading this thesis as much as we loved working on it.

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1 Introduction

This chapter introduces the research by outlining the rise of AR in luxury fashion retail and the growing need to understand its emotional and behavioural impact on consumers with background research. It identifies key gaps in the literature, particularly the lack of empirical studies using physiological data to measure real-time consumer responses. The chapter presents the research purpose, research questions, and theoretical framework. It concludes with an overview of the thesis structure, guiding the reader through the chapters that follow.

1.1 Background

Augmented Reality (AR) enables consumers to start their journey outside of physical stores by creating an ecosystem that connects them to the retail environment (Xue, Parker and Hart, 2024). "Phygital" environments, such as digital retail spaces, AR try-on apps, and virtual fashion shows that combine real and virtual worlds are becoming increasingly popular among brands (Bartoli et al., 2023). It elevates the value of high-end fashion stores with diverse ranges of products and can help consumers navigate and make their purchasing journey more efficient and productive. Consumers found it enjoyable, engaging, and it helped them become more self-sufficient because AR is effective in creating personalised shopping experiences with ease (Xue, Parker and Hart, 2024). However, luxury brands have been wary to embrace digital technology because they are concerned that more accessibility will compromise their brand value and exclusivity (Mekonnen and Larner, 2021).

Popular brands like MAC and L'Oréal, as well as a number of retailers like Ulta Beauty and Sephora, use in-store and mobile AR apps to help consumers with the buying process. Additionally, several well-known fashion retailers, such as Adidas, Gap, Nike, and Ralph Lauren, have recognised the metaverse's potential and are incorporating digital fashion into their business models by investigating virtual sampling and 3D design (Chan et al., 2024; Hu et al., 2025). As stated by Mekonnen (2024), luxury consumers are highly involved in digital social interactions, with 80% utilising social media monthly, 50% weekly, and 25% daily. They actively participate on these platforms, with two-thirds regularly creating and sharing content. By offering products that are exclusive to the metaverse and not available in traditional locations, the brands could increase personalisation. However, difficulties still exist, especially when it comes to effectively expressing product quality in digital spaces and reproducing sensory experiences. (Hu et al., 2025)

AR environments primarily stimulate the visual sense, which plays a central role in eliciting emotional responses. As stated by Daşdemir (2022), augmented reality primarily engages visual stimuli, which may elicit emotional responses by stimulating brain areas involved in emotion processing. Affective experience is often described along two primary dimensions: valence and arousal (Russell, 1980). Recent research by Xue, Parker and Hart (2023) has shown that AR is able to impact consumer experiences and produce positive responses. Marketers and retailers continuously look for ways to increase the intensity of emotional responses to gain more consumers. According to Vecchiato et al., (2010), Galvanic Skin Response (GSR) is a known measure of physiological responses to marketing media stimuli. An increase in GSR is an indicator of arousing emotional response arising from the increased sweat production of the skin. It has become a tool that has aided marketers to record instantaneous and genuine emotional responses that can help them to predict consumer behaviour based on the media they interact with.

1.2 Literature Overview

The literature review in this thesis is a comprehensive study and exploration of AR as an emerging strategy in digital technology particularly focused within the luxury fashion retail. The study begins with the exploration of the emergence of AR and accelerated shift towards immersive shopping experiences. AR has helped consumers to interact with products in real life environments through high visualisation and interactivity which contributed to higher psychological engagement. Brands across various industries have already adopted AR to enhance the consumer shopping journeys at various stages of purchasing. In the fashion industry particularly, AR has become a crucial tool to reduce the gap between online and offline shopping. Luxury brands, initially hesitant to utilise AR wary of the loss of exclusivity, have now implemented AR into their marketing strategies.

This research also examines the physiological reactions that AR causes, including emotional arousal, which is quantifiable using equipment like the GSR. AR's visual stimuli activate parts of the brain related to emotions and memories, which can affect brand perceptions, consumer engagement, and decision-making that results in a purchase. AR ability to stimulate senses even with the lack of physical touch is able to create personalised immersive environments making it effective in enhancing consumer satisfaction and increasing purchase intention. The literature highlights AR's potential while also pointing to the importance of emotional resonance, technological acceptance and strategic implementation which ultimately impacts the digital and luxury fashion retail sector.

1.3 Problematisation and Research Gap

In recent years, luxury fashion, grounded in craftsmanship, heritage, and exclusivity, has increasingly integrated digital technologies into branding, retail, and consumer engagement strategies. Brands such as Gucci, Fendi, Prada, and Ferragamo have been examined for their use of AR, virtual try-ons, and immersive digital experiences as part of a broader shift toward "phygital" retail, where physical and digital realms converge. (Bartoli et al., 2023) While these developments reflect changing consumer expectations and technological possibilities, they also raise important questions about how such innovations align with the traditional, materially anchored values of luxury fashion. In particular, the emotional and perceptual implications of AR in luxury contexts remain underexplored.

Although academic interest in digital fashion has recently increased (Hu et al., 2025), few studies offer concrete strategies for how managers can implement the metaverse in practice (Eggenschwiler et al., 2024). Zhang, Liu, and Lyu (2023) point to a lack of empirical studies examining digital fashion's influence on consumer perception and luxury brand evaluations. Similarly, while luxury brands are experimenting with immersive technologies, marketing literature remains scarce on how these "phygital" environments shape brand meaning and engagement (Bartoli et al., 2023). Moreover, key experiential elements, such as the importance of tactile interaction in technology acceptance, are still debated. Definitions of the metaverse also remain contested, not only in academic discourse, but also across industry (Hu et al., 2025)

While some research has explored AR's interactive features and brand-related effects, relatively few studies address its capacity to evoke consumer emotions. Most existing research relies on self-reported data, which is prone to bias and limits the potential to establish causality. (Javornik, 2016a; Pozharliev, De Angelis, and Rossi, 2022) Scholars have called for more rigorous, multi-method approaches that incorporate both physiological and behavioural data to examine real-time consumer responses (Yang and Lin, 2024). Notably, investigations of AR within luxury fashion retail remain particularly limited. This research therefore addresses a significant gap by examining how AR try-on experiences influence emotional engagement in luxury fashion contexts, using a semi-controlled experiment that integrates physiological measures (GSR), observational data, and post-experience interviews.

With the emerging interest in immersive technologies like AR, there is a lack of empirical research which explores how AR try-on experiences can impact both emotional and behavioural responses within luxury fashion retail. Given the luxury fashion retail emphasis on sensory experiences and brand exclusivity, it is important to understand how consumers respond to AR on both emotional and physiological levels. This research aims to address this gap by examining the emotional arousal and engagement in response to AR try-on technology to gain new understanding into the role of AR in shaping luxury fashion consumer experiences.

1.4 Purpose and Research Questions

The purpose of this thesis is to investigate how AR try-on experiences influence consumer emotional engagement, arousal, and purchase intention within the context of luxury fashion retail. Recognising the growing integration of immersive technologies in high-end retail environments, this research adopts qualitative and quantitative methods to provide a comprehensive understanding of real-time consumer responses to AR, guided by the Theory of Interactive Media Effects (TIME), with a particular emphasis on modality interactivity. By combining physiological measures (GSR) with qualitative data from observational analysis and short structured interviews, the research addresses persistent gaps in the literature, namely, the overreliance on self-reported data and the limited empirical focus on AR within luxury contexts. To maintain a clear focus and ensure methodological feasibility, the research specifically targeted luxury fashion, thereby excluding mass-market or fast-fashion brands to preserve alignment with luxury-specific values such as exclusivity and craftsmanship. The research focused on a mixed-gender collection of garments to capture general patterns of consumer engagement across a diverse range of clothing items. All experiments were conducted in a semi-controlled environment, allowing for a balance between controlling external factors and simulating a more realistic consumer interaction with the AR technology.

Accordingly, this thesis formulates the following research questions:

RQ1 → How does AR for luxury clothing try-on experiences influence emotional arousal, consumer engagement, and purchase intention?
RQ2 → How can luxury brands optimise AR try-on experiences as a marketing tool to enhance the overall consumer experience?

1.5 Thesis Outline

This thesis, structured across seven chapters, conducts the research through an explorative convergent parallel design on how AR try-on technology affects emotional arousal, consumer engagement and purchase intention in luxury fashion retail settings. Chapter one has introduced the research topic, and outlined the research problem, aims, and questions. Chapter two provides a review of relevant literature, focusing on AR and user engagement in luxury fashion retail. Chapter three presents the theoretical framework, TIME, guiding the research with an emphasis on modality interactivity. It also details the research design, combining observational analysis and short structured interviews with physiological measures (GSR). Chapter four addresses methodological aspects, including the pre-experiment study, research approach and design, data collection techniques, analysis, research quality and ethical considerations. Chapter five presents the research findings, beginning with themes emerging from participant interviews and observations, followed by statistical analysis of Galvanic Skin Response data, and concluding with an integrated comparative analysis of both qualitative and quantitative results. Chapter six discusses these findings in relation to existing research. Finally, Chapter seven concludes by summarising its key contributions, addressing the research questions, and reflecting on both theoretical and managerial implications. The thesis closes by acknowledging its limitations and suggesting potential directions for future research.

2 Literature Review

This chapter introduces and reviews the existing studies of literature on AR, its applications in fashion and luxury retail, and its influence on consumer behaviour. It explores emotional and physiological responses to AR, drawing attention to gaps in empirical research, especially studies that rooted in qualitative and quantitative data. The review sets the conceptual foundation for understanding AR's potential as a tool for immersive, emotional, and behavioural engagement in luxury fashion retail.

2.1 Augmented Reality

Digital commerce has become a significant part of globalisation. This transformation was further accelerated with the pandemic as consumers shifted from offline to online shopping. Immersive technology is one such strategy that is riding the digital wave (Yoo, 2023), blurring the line between the physical and virtual worlds and creates a sense of immersion (Daassi and Debbabi, 2021). Immersion is "a psychological state characterised by perceiving oneself to be enveloped by, included in, and interacting with an environment that provides a continuous stream of stimuli and experiences," as stated by Witmer and Singer (1998). Immersive virtual reality allows an individual to experience and interact with a computer-generated environment which can be comparable to a real-world setting. The use of AR has become widespread in various industries. It uses cameras or transparent screens to provide a live view and can also be achieved through smartphone cameras. (Rohrbach et al., 2021). AR embodies and visually incorporates virtual elements around the user's environment. AR experiences aim to provide interaction and visualisation with virtual products in the real world. Existing AR applications can be categorised into four types - shopping, informational, entertainment and social media. AR marketing has gained the attention of marketeers who are always looking for ways to incorporate novel ideas into consumers shopping experiences. (Fan et al., 2025)

Brands like Apple has integrated AR into their core technological strategies. IKEA has launched AR to help consumers through their shopping journey to visualise their home interiors with the products they offer (Hilken et al., 2017). Synsam, a Swedish eyewear brand introduced an AR application which offered its consumers a range of eye wear options which they can try-on virtually. In the research done with Synsam, participants reported that the AR application experience impacted their purchase intention (Wakim et al., 2018). With the help of AR applications, companies such as Amazon and Target have implemented image search features that enable consumers to take images with their smartphones and search for products within the app (Qin, Osatuyi and Xu, 2021). AR games like Pokémon go, which became extremely popular over the years uses mobile tracking technology and integrate the component of user interaction in everyday life. This type of technology blurs the boundaries of the physical and digital realm, merging them through technological devices (Hamari et al., 2019). Other examples of AR technology include smart mirrors or magic mirrors and filters. Many brands turned to Snapchat by targeting millennials and younger generation through snapchat ads with its interactive augmented tools with the help of geo-filters or lenses (Boardman, Henninger and Zhu, 2019). Thus, AR technology has been merged across the various stages of consumer journey ranging from pre-purchase, purchase and post purchase and supports the marketing department within areas of advertisement, retailing and consumer experience (Qin, Osatuyi and Xu, 2021).

2.2 AR in Fashion and Luxury Retail

Mobile marketing is becoming increasingly important in marketing tactics across industries due to its accessibility and convenience. AR can enhance mobile marketing by integrating virtual experiences into the consumer journey. As per previous literature, AR is a virtual experience that integrates with the user's real-time perception of their environment. Being an interactive and immersive technology, AR has the potential to become a marketing tool that can reduce the gap between consumers and retailers both physically and socially.(Chekembayeva, Garaus and Schmidt, 2023) AR enables consumers to try-on and examines products in their own settings, making it ideal for shopping. It became apparent in recent years as people became more familiar with AR. Conforming to Davis and Aslam (2024), employing applications to allow consumers to try-on items at online fashion stores has also led to increase in sales. Several stores, like Ulta Beauty and Sephora, as well as popular brands like MAC and L'Oréal, use mobile and in-store AR apps to assist consumers during the purchasing process. Furthermore, several prominent fashion retailers, including Adidas, Gap, Nike, and Ralph Lauren, have acknowledged the potential of the metaverse and are integrating digital fashion into their business models by exploring 3D design and virtual sampling (Chan et al., 2024; Hu et al., 2025). Recalde, Jai and Jones (2024) highlight the benefits of allowing consumers to test and evaluate products at their convenience, regardless of time, location, or accessibility.

In a study by Xue, Parker and Hart (2023) investigating the consumer value of AR within high street fashion retailers it was reported that AR experiences are successful in making consumer shopping experience more enjoyable. Using AR in retail will narrow the gap with product information and improve the satisfaction of consumer journey while the brand is able to create a stronger relationship with its consumers (Xue, Parker and Hart, 2023). As digital fashion is a novel concept, most consumers have limited experience wearing digital clothing (Zhang, Liu and Lyu, 2023). Consumers began to explore and adapt AR technology which was still in development. This shift towards immersive technologies changed the engagement in the market and the overall consumer shopping experience. The beauty app You Cam makeup offered the consumers AR experience by offering the opportunity to try-on its products and filters, this highlighted the potential of AR enabling the opportunity to virtually test products in a real environment. AR fashion apps became a source for consumers to engage and re-establish their normal life during the crisis of lockdown. The AR apps effect hence changed the landscape of digital e-commerce by enhancing the experience for both consumers and retailers. (Caboni and Pizzichini, 2022) With the adoption of recent technologies, brands have started to adapt their business models in order to remain competitive within the fashion industry (Harba, 2019; Mekonnen, 2024).

Luxury brands have been cautious in adopting digital technologies, concerned that increased accessibility could undermine their exclusivity and prestigious positioning (Mekonnen and Larner, 2021). This hesitation is compounded by the ongoing challenge of defining luxury itself, as no universally accepted definition has emerged despite decades of research (Heine, 2012). The subjective nature of luxury, shaped by individual and societal norms, further complicates the development of a unified definition (Roper et al., 2013). However, brands are increasingly experimenting with "phygital" environments that blend physical and virtual experiences, such as virtual fashion shows, digital stores, and AR try-on applications (Bartoli et al., 2023). According to Hu et al. (2025), retail strategies incorporating the metaverse are typically focused on engaging younger demographics, such as Generation Z and Generation Alpha, who may not yet have the financial means to purchase high-end tangible luxury goods.

Moreover, by being part of a community within the metaverse, consumers can develop a social identity, which in turn influences their purchasing behaviours. In fact, luxury consumers are highly engaged in digital social interactions, with 80% using social media monthly, 50% weekly, and 25% daily, and actively participate, with two-thirds regularly creating and sharing diverse content. (Mekonnen, 2024) Luxury fashion brands should approach their presence in the metaverse as a strategic, long-term component of channel management. The metaverse offers opportunities for exclusive experiences that may be impractical in the physical world due to cost or logistical constraints, while also enabling real-time consumer behaviour analysis at a lower cost and reaching new audiences. Furthermore, the brands could enhance personalisation, introducing metaverse-exclusive products unavailable in physical stores. However, challenges persist, particularly in replicating sensory experiences and accurately conveying product quality in digital spaces. (Hu et al., 2025)

2.3 Impact of AR on Consumer Behaviour

2.3.1 Emotional Arousal

In consumer research, the emotional dimension was long underexplored. Holbrook and Hirschman (1982) emphasised the importance of emotions in shaping consumption. They play a central role in consumer decision-making, often preceding or even bypassing conscious cognitive processes. Sensory input, particularly vision, is prioritised by the brain and directly shapes emotional responses, which are influenced not only by external stimuli but also by personal experiences and internal states. Emotions often operate outside of conscious awareness, yet they still influence behaviour through physiological and affective cues. Emotions manifest through involuntary physiological reactions, such as changes in heart rate, skin conductance, and facial expressions, regulated by the autonomic nervous system. Supporting this, D'Hondt et al. (2010) found that emotional arousal affects early visual processing and is linked to bodily responses controlled by the sympathetic nervous system. These signals are valuable for interpreting emotional arousal during stimulus exposure, even when individuals cannot articulate their feelings. (Zurawicki, 2010)

Neuroscientific methods are used to capture physiological and neural responses to stimuli, enabling researchers to observe real-time emotional and cognitive processes. Among these, galvanic skin response, also known as Skin Conductance (SC), is a non-invasive technique that records autonomic nervous system activity by measuring changes in skin conductivity (Lim, 2018). It has been shown to effectively capture moment-by-moment physiological arousal and has been linked to cerebral activity associated with emotional processing (Shehu et al., 2023). However, GSR reflects only the intensity of arousal and not its valence highlighting that it cannot distinguish whether an emotional response is positive or negative (Lim, 2018). To address this limitation, researchers have stressed the importance of combining physiological data with subjective measures to achieve a more comprehensive understanding of affective engagement (Bolinski et al., 2021).

AR environments primarily stimulate the visual sense, which plays a central role in eliciting emotional responses. As Daşdemir notes (2022), AR operates predominantly through visual cues, which can trigger affective states by activating brain regions associated with emotion processing. In particular, emotionally arousing visual stimuli have been shown to engage the amygdala (limbic system of the brain), crucial for assigning emotional salience and initiating emotional responses (Davidson and Irwin, 1999). Hence, it is plausible that AR-induced stimuli influence perception and attention by engaging factors known to affect internal time perception mechanisms, such as attention, arousal, and affective valence (Angrilli et al., 1997). Affective experience is often described along two primary dimensions: valence and arousal (Russell, 1980). In accordance with Grabowski et al. (2019), these dimensions can be physiologically measured and further categorised into emotion classes. These categories intersect with what are commonly referred to as the six universal emotions, found consistently across cultures: fear, anger, surprise, sadness, happiness, and disgust. This framework is particularly valuable in the context of AR, where immersive and dynamic content can provoke heightened emotional engagement through visually driven interaction.

Emotional arousal has also been shown to affect evaluative processing and attention. Furthermore, research indicates that emotional responses are heightened when stimuli are directly relevant to a task. Cunningham, Van Bavel, and Johnsen (2008) observed that during decision-making tasks the amygdala exhibits increased activity in response to both positive and negative stimuli. This indicates that emotional processing in the brain can adjust dynamically depending on what individuals are focusing on or aiming to achieve. This indicate that when consumers interact with AR environments for the purpose of assessing luxury products, the emotional salience of visual cues is likely to be amplified, deepening their affective engagement. Building on this, Storbeck and Clore (2008) observed that positive mood states combined with high arousal amplified relational processing, leading individuals to make broader associations and even recall false memories.

Responses to emotional arousal vary significantly between individuals. These reactions are shaped not only by personality but also by attitudes toward technology. For instance, Wang, Cao and Ameen (2023) found that openness and readiness to adopt innovative technologies correlated with more positive emotional responses in AR environments. Eysenck's biological theory of personality proposes that those high in neuroticism are more reactive to emotionally arousing stimuli due to increased limbic system sensitivity and tend to take longer to return to emotional baseline (Eysenck, 1967, 1994 cited in Kehoe et al., 2012). This imply that AR stimuli may elicit varied emotional and physiological reactions depending on individual differences in sensitivity. These findings imply that personality traits may moderate the emotional and behavioural effects of AR-based experiences.

2.3.2 Consumer Engagement

Phygital retailing, the integration of physical and digital environments, has been shown to positively influence consumer experience through hedonic factors such as mental imagery, aesthetics, and entertainment. Among these, mental imagery plays the most significant role, followed by aesthetics and entertainment, ultimately contributing to greater satisfaction with consumer's decision-making processes (Banik and Gao, 2023). Heller et al., (2019) further suggests that the interactive feature of AR can foster immersive sensory engagement, and shape consumers' mental imagery. Bartoli et al. (2023) also found that the aesthetic aspect is a key component of the consumer experience, with elements conveying the brand's personality and creating authentic, immersive environments. While aesthetics and immersion enhance engagement, brands must also exercise caution when exploring immersive experiences and technologies to prevent misrepresenting the quality, materiality, and design of their products and brand (Chrimes and Boardman, 2023). The research by Batat (2024) highlights that sight and touch positively influence the customer experience, the absence of tactile input in digital fashion places greater emphasis on visual and interactive realism to communicate product quality and luxury. This aligns with Mehrotra et al. (2024), who stress the need for improved immersion, interactivity, realism, and novelty in metaverse retail. Without deeper engagement, such as dressing avatars or on-screen physical bodies, consumers may struggle to develop a meaningful attachment to digital fashion (Zhang, Liu and Lyu, 2023).

A key driver of engagement is the entertainment and exploratory value of AR. Research suggests that immersive technologies increase consumer engagement by eliciting emotions (Chekembayeva, Garaus and Schmidt, 2023). Cedrola and Giovannetti (2024) argue that through gamification, the integration of playful and brand-aligned elements into digital environments, luxury brands may maintain engagement, particularly among Millennials and Generation Z. Chan et al. (2024 cited in Hu et al., 2025) similarly note that consumers perceive AR try-ons as a rewarding and enjoyable experience, increasing their emotional investment and exploratory behaviour, resulting in consumers interacting for longer on traditional online platforms. Consistent with this, the research by Yim, Chu and Sauer (2017) found that across two different product categories, sunglasses and watches, AR-based product presentations outperformed traditional web-based ones. Platforms like Snapchat have further shaped this behaviour, with 61% of consumers indicating reduced interest in physical store visits when AR alternatives are available (Snap Inc and IPG MAGNA, 2022). Smink et al. (2019) also found that AR trials elevate consumer experience by increasing perceived information and enjoyment, considering that AR applications offer a “try before you buy” experience that enhances both perceived informativeness and enjoyment. Importantly, the findings show these effects are due to the AR technology itself, not merely the inclusion of the consumer’s own image.

Beyond the moment of purchase, AR continues to support engagement. According to Publicis Media, Snap Inc and Alter Agents (2022), 96% of shoppers show interest in AR-driven after-sales experiences, further reinforcing its role in fostering long-term consumer relationships. However, Hu et al. (2025) note that despite significant efforts and investments aimed at delivering both functional and emotional benefits in luxury online experiences, there remain fundamental sources of dissatisfaction and discontent among consumers, particularly concerning the purchasing process and after-sales services, considering that in addition to immersion, entertainment, and enjoyment, the convenience of purchasing in metaverse retail is vital for consumers, as it is tied to efficient and seamless buying experiences (Madaleno, Wilson and Palmer, 2007).

2.3.3 Purchase Intention

Purchase intention is a combination of a consumer's interest and capacity to purchase a product. Positive experiences significantly increase the likelihood of a purchase (Watson, Alexander and Salavati, 2020). Since many online shopping experiences are primarily visual, the design of AR technologies plays a crucial role in shaping the consumer journey and overall satisfaction. Xue, Parker and Hart (2023) found that AR-based applications can significantly improve the consumer experience in the context of high-end fashion. By offering multiple functional benefits and interactive features, AR enables a more personalised and engaging shopping environment and helps consumers to visualise products through spatial presence, realism, and mental imagery. Prior research also indicates that technology-driven retail experiences improve ease of use and transparency, thereby boosting consumer satisfaction. Moreover, AR deepens engagement by providing multisensory interactions that improves both operational efficiency and sales performance. (Mishra et al., 2021) However, it should be noted that the primary focus is not to facilitate impulse buying, rather it offers more long-term practical solutions such as deeper engagement with the brand. (Yang and Lin, 2024)

Beyond engagement, it also drives measurable business outcomes, as 86% of brands leveraging AR, report improvements in sales, brand awareness, and consumer experience, underscoring its strategic value in e-commerce (Snap Inc and Ipsos, 2022). With over 250 million users engaging with AR daily and seven of the ten top purchase drivers tied to AR experiences, these tools are redefining consumer-brand interactions (Snap Inc, 2022). Hence, AR has shown increased consumer confidence and satisfaction, especially during the product evaluation phase. Mekonnen (2024) underscores this with evidence that AR doubles visual attention and significantly increases conversion rates which Papagiannis (2020) attributes to a 94% increase. Businesses that are currently operating in the metaverse or planning to do so may exhibit a sustainable competitive advantage with service offerings differentiating them from their competitors (Abumalloh et al., 2024).

3 Theoretical Framework

This chapter introduces the Theory of Interactive Media Effects (TIME), with a specific focus on modality interactivity. It explains how consumer interaction with digital content through gestures, manipulation, and control can enhance emotional arousal and cognitive engagement. The chapter establishes how this framework is applied in the thesis to analyse consumer responses during AR try-on experiences in luxury fashion, linking it directly to the experiment design and research questions. It further explores previous studies that have implemented the TIME framework in the context of AR.

3.1 Theory of interactive media effects (TIME)

To understand how consumers interact with AR in luxury fashion retail, this thesis uses the Interaction Model from the TIME with a focus on modality interaction. We use AR in luxury fashion retail to explore its effects on consumer responses through their interactions with digital products in an immersive environment. With the help of physiological metric analysis equipment such as GSR and interviews, this research aims to understand the real time consumer engagement with AR technology in luxury fashion retail on consumer behaviour. The thesis uses this framework through which GSR data and interviews are used to analyse how real-time user interactions influence consumer behaviour and emotional arousal. The TIME framework systematically analyses how media interactions correlate to psychological responses (Sundar et al., 2015). Studies have shown that interactivity can leave a strong impression on consumers through immersive experiences, such as enjoyment and trust (Javornik, 2016a). The TIME framework gives a structured model to understand how interactive media like AR can impact the emotional, cognitive, and behavioural aspects of consumer engagement (refer to Figure 1). The selection of this framework is aligned with the research goals and questions

RQ1 → How does AR for luxury clothing try-on experience influence emotional arousal, consumer engagement, and purchase intention?

RQ2 → How can luxury brands optimise AR try-on experiences as a marketing tool to enhance the overall consumer experience?

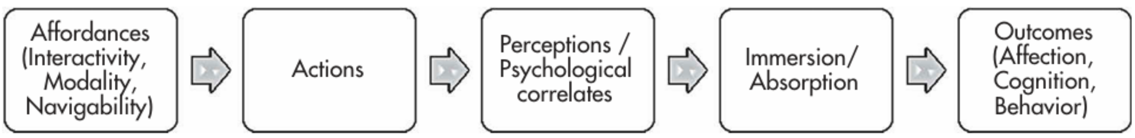

Figure 1 Model of theory of interactive media effects (Sundar et al., 2015)

3.2 Interactivity Effects Model - modality interactivity

The Interactivity Effects Model proposes that modality interaction leads to higher user engagement with the media. It refers to various methods of interaction through hand gestures like clicking, swiping, scrolling etc over digital media. Modality interactivity enables consumers to manipulate visual objects and control their movements. Thus, enhancing the depth of sensory experience through consumer engagement. Just as a 3D carousel allows its user to manually rotate several images and control the rotation, modality interactivity enables consumers to manipulate visual objects. The interactivity effects model indicates perpetual bandwidth as the key mechanism. Experiments involving interactive methods have demonstrated that participants' evaluations of the interface influence the degree of immersion they experience and shape their overall attitude towards the interface. (Sundar et al., 2015)

In our research, participants interact with virtual try-on fashion garments through AR. This process involves manipulating the technology to visualise the fit, form and styling of garments to the consumer's preference and body. In this experiment, AR attempts to recreate the physical try-on of clothing in a retail or home setting. This helps us to analyse how such immersive AR experiences can influence emotional arousal, consumer engagement and ultimately impact the purchase intention. In luxury fashion retail, AR introduces a new strategic experience into the consumer shopping journey. It evokes a sensory and emotional element and adds a layer to the consumer brand relationship driven by the perceived value, quality, and aesthetics.

The TIME framework with the focus on modality interaction helps us to analyse how the AR experience in the context of luxury fashion retail enhances the perceived realism and emotional engagement of consumers. Considering that previous studies implementing the TIME framework have been focused on AR in retail marketing or general advertisement (Gupta, Singh and Prashar, 2024; Sundar et al.,2015), this research aims to close the gap by using the framework particularly in luxury fashion retail. By implementing the TIME framework, the research explores how modality interaction in AR fashion try-on experiences can impact the emotional arousal and consumer engagement. Further the research explores how luxury brands can use AR to drive purchase intention by improving consumer experiences. The research connects real time physiological responses with consumer perceptions which can lead to showing how immersive AR technology can be both an emotional and strategic marketing tool in the luxury fashion retail industry.

3.2.1 Psychological Aspects

The theory also explores the psychological aspect of modality interactivity and has been shown through various contexts of online marketing. Previous studies have shown that interactive features contributing to high modality interactivity create a comprehensive and engaging consumer experience, which in turn leads to positive responses toward both the interactive media and the marketed product. Studies have also shown that the various aspects of modality interactivity have distinct psychological effects. (Sundar et al., 2015) In accordance with the interactivity model, increased interaction in a digital environment leads to greater cognitive and emotional involvement, which influences how users absorb information, make decisions, and build attitudes toward brands and products (Sundar, Bellur, Oh, Xu and Jia, 2014). Hence, it becomes a focal point in addressing how emotional responses to brands and products in luxury fashion retail would be decisive in consumer purchasing decisions. By incorporating GSR sensor into the research, the study applies TIME theoretically and methodologically. Previous studies have relied on self-reported surveys (Pozharliev, De Angelis and Rossi, 2022; Javornik, 2016a) and our research incorporates physiological data and qualitative insights through observational notes and interviews to capture real time emotional responses while addressing the gaps in AR consumer research. According to Sundar et al. (2015) modality interaction contributes to the emotional and cognitive immersion which in return impacts trust, satisfaction, and purchase intention. These outcomes are in alignment with the research objectives and practical implications of the research.

3.2.2 Consumer Behaviour

AR marketing combines immersive experiences with various media or brand concepts to achieve its marketing targets. Several brands like Amazon, IKEA, Nike, Sephora, and Zara have started using AR as part of their key marketing strategies, by offering virtual products across different product categories in the industry (Schultz and Kumar, 2024). The study by Javornik (2016a) confirms that AR functions differently from traditional websites. Hence, marketers must employ AR by focusing on its ability to incorporate visual elements as simulations and interact with consumers in real time. The experiments in the research showed that the technology immerses consumers into flow and thereby mediates responses and behavioural intentions (Javornik, 2016b).

Building on the framework of modality interactivity, our research further explores how AR elevate the overall shopping experiences in luxury fashion retail and whether it would motivate the purchase intention. Through an interactive experiment involving AR try-on filters consumers are able to have an immersive experience which is engaging and impacts their emotional responses, with the AR try-on acting as an external stimulus. As the participants engage with the AR interface by trying on, viewing, and exploring, they are encouraged to be involved in the experience, which could lead to higher user engagement. In this research, we analyse how AR virtual try-on of luxury fashion products through the immersive interactions of consumers can build up the user engagement and personalise the overall shopping experience. Through the framework of modality interactivity, we examine the impact of AR try-on experiences on emotional arousal, consumer engagement and purchase intention. The interactivity model proposes that real time interaction can lead to emotional arousal. In line with the interaction model, modality interactivity establishes the participant's ability to manipulate visual simulated objects and gestures to interact with the media content. Thereby implies that the more immersive the AR experience is, the stronger the emotional reaction and the overall experience will be. (Sundar et al., 2015)

In this thesis, we use GSR to measure the emotional arousal from the interactive AR experiment. Studies have shown that increased GSR values are an indicator of increased emotional arousal which imply that participants experience more emotional responses through the interaction of the AR try-on experience (Vecchiato et al., 2010). According to Sundar et al. (2015), the interaction model suggests that immersive AR experiences lead to increased emotional engagement, which in turn has a significant impact on consumer purchase intention. Modality interactivity explores the psychological aspects which result from the interactive AR experience.

The consumer engagement is enhanced through an immersive AR experience, through modality interactivity participants are able to interact freely with the technology by manipulating the AR try-on objects, the effectiveness of the interaction depends on the realistic depiction of the product through the screen. The increased accuracy and realistic feature of the AR try-on can lead to greater consumer engagement and thereby impacting their purchase intent. The greater the perceived realism, the higher the interactivity which leads to higher emotional engagement which can increase trust, satisfaction and finally the purchase intent of the consumer. The research draws on relevant theoretical framework of Modality interactivity to examine the relationships between emotional arousal, consumer engagement, and purchase intention.

3.3 Previous literature and TIME framework

Sundar et al. (2015) introduced the TIME framework to analyse the media effects in interactive environments such as news marketing and digital storytelling. Javornik (2016b) later applied the interactive media theory to AR in marketing, which showed that interactivity mediates flow, enjoyment, and behavioural responses. In the research conducted by Gupta, Singh and Prashar (2024), the authors state that perceived interactivity and augmentation in AR eyewear applications influence consumer experience and prepurchase intention. By using TIME framework, it highlights the role of consumer experience and effect of perceived risk. However, there is a limited product category as it only focuses on Mobile AR eyewear application. The research falls short to capture how emotional engagement is impacted through the AR interaction. Based on the research by Lee, Xu and Porterfield (2021) the TIME framework was adopted to explore how media characteristics like interactivity and augmentation affect the attitudes, intentions, and telepresence of consumers. However, the study does not assess emotional reactions during the AR interaction that followed. Recent studies done by Pozharliev, De Angelis and Rossi (2022) had begun to explore AR’s emotional impact, however this was limited to self-reported surveys and conducted in general retail contexts.

4 Methodology

This chapter outlines the methodological approach used in the thesis. It begins with a pre-experiment background study which outlines the digital technology journey that laid the groundwork for the experiment design. The chapter then outlines the research approach and design undertaken for the research. It details the experimental setup, including the use of Galvanic Skin Response sensors, observational notes, and short structured interviews, and underlines the reasoning for using both qualitative and quantitative data. The chapter also addresses participant recruitment, data analysis, research quality and ethical considerations.

4.1 Pre-experiment background study

This chapter presents our initial research journey with the development of a self-made AR filter for the experiment. The pre-experiment background study was an experimentation to develop the filter using Snapchat Lens Studio and Clo3D. Due to the limitations, technical constraints and time, the research journey further took us to AR application - WANNAWEAR and DRESSX. We then conducted a walkthrough method to motivate which application's design, functionality, and user experience would be best suited to conduct the AR try-on experiment.

4.1.1 Trial Documentation: 3D Full-Body Tracking for AR Fashion

With the completion of an AR filter prototype (Appendix A), this research initiated with a pre-experiment study of 3D full-body garment tracking in Lens Studio. To understand the process of 3D full-body tracking, we referred to a YouTube tutorial from Snap AR (2022) (Appendix B). Given the time constraints and challenges, we explored alternative solutions, which led to the discovery of TikTok Effect House. However, its technical limitations were comparable to those of Lens Studio (TikTok, 2025). 8th Wall was another option on our list, and it was from the search on YouTube: "8th wall tutorial try-on fashion" that we came across "Clothes Virtual Try-On: WANNAxValentino" by WANNA (2023). This application being exclusively available on the App Store, we borrowed the Digital Business Lab's iPhone. At the early stage of research, while reviewing the studies by Zhang, Liu, and Lyu (2023), we came across a reference to DRESSX, a platform powered by Snapchat, which we selected as the final AR try-on application for our experiment, motivated by a walkthrough method.

4.1.2 Walkthrough Method of WANNAWear Vs DRESSX

During our initial stage of research, we came across two applications that can assist with the AR filter for luxury clothing for the experiment: WANNAWear and DRESSX, available on mobile App Store or Google Play Store. The following walkthrough method systematically analyses each app's design, functionality, and user experience. The method enables us to determine the application's user interface and understand how the consumer experience is shaped through the technicalities and cultural references that are built in the system. The method follows a step-by-step process which involves observations and documentation of the flow of activity of the user while using the app. The process analyses the app's vision, operating model, and governance (Light, Burgess and Duguay, 2018).

4.1.2.1 Vision

WANNAWear clothes virtual try-on focuses on the accessibility of luxury e-commerce for consumers. WANNAWear aims to guide luxury fashion brands to improve their business performances by enhancing their digital fashion experiences. It instils the use of AR technology to contribute to carbon savings and to reduce the overall environmental impact (WANNA, 2025b). DRESSX is a software application that acts as a digital fashion retailer which contains multi-brand digital fashion collections. Through the app these digital looks are applied in AR. Since its introduction in August 2021, it has integrated 3D fashion and AR and has developed dynamic digital fashion experiences. The app's vision also focuses on circular economy as consumers benefit from getting access to high-end garments, giving access to 3D designers and fashion brands to sell and distribute digital clothing which in return can slow down the production of fast fashion. (Ellen Macarthur Foundation, 2021)

4.1.2.2 User and Usage

The primary focus of WANNAWear lies on luxury fashion brands who are looking to enhance their digital fashion businesses. The app provides brands with 3D and AR experiences. The app allows consumers to preview the features it offers to luxury brands. The app has worked with brands like Balenciaga, Valentino, Dolce and Gabbana, Farfetch etc. The brands cater to users who are Gen Z and millennials who dwell and explore the digital fashion world (WANNA, 2025a). The DRESSX platform is open to designers, fashion brands and consumers. The design and production of digital garments once reaching completion gets uploaded to the platform. Here again, the end user caters to Gen Z and Millennials who are actively participating in social media and are tech savvy. They also aim to enable luxury digital fashion brands and designers to launch wearable NFTs. (Ellen Macarthur Foundation, 2021)

4.1.2.3 Affordances and Architecture

Consumers are able to download WANNAWear app on the App Store only, while DRESSX is available for both IOS and Android users. In the case of WANNAWear, because the application only supports IOS, its access is limited. Currently, the app preview only has a few selections from Valentino’s womenswear displayed. The app functions as a prototype, displaying the services it can offer to luxury brands by providing users with an overview of its key features. It enables consumers to virtually try on garments from a curated collection, capture photos or videos, and share their experience across social media platforms. Additionally, the app displays detailed information about each item and includes direct links to the respective brand’s website, allowing users to further explore and purchase the product (refer to Figure 2). It enables the user to reach out to them for collaboration or other business purposes. According to WANNA (2025a), the brand collaboration with Valentino had an increase of 200% in open rate for newsletters, Dolce and Gabbana saw a 6% increase in conversion rate and Balenciaga saw an increase in user engagement through virtual try-on.

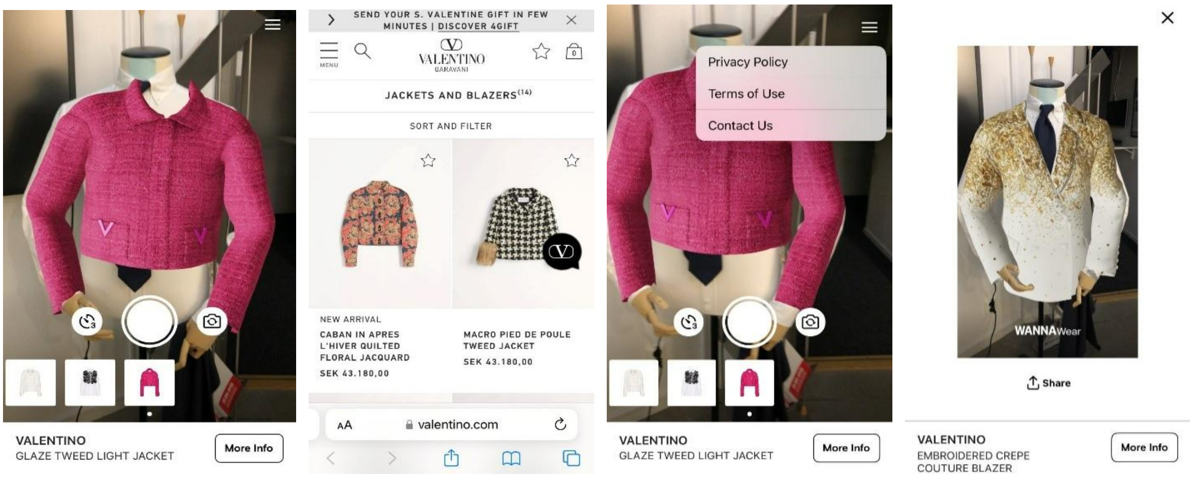

Figure 2 Screenshots from WANNAWear AR try-on app

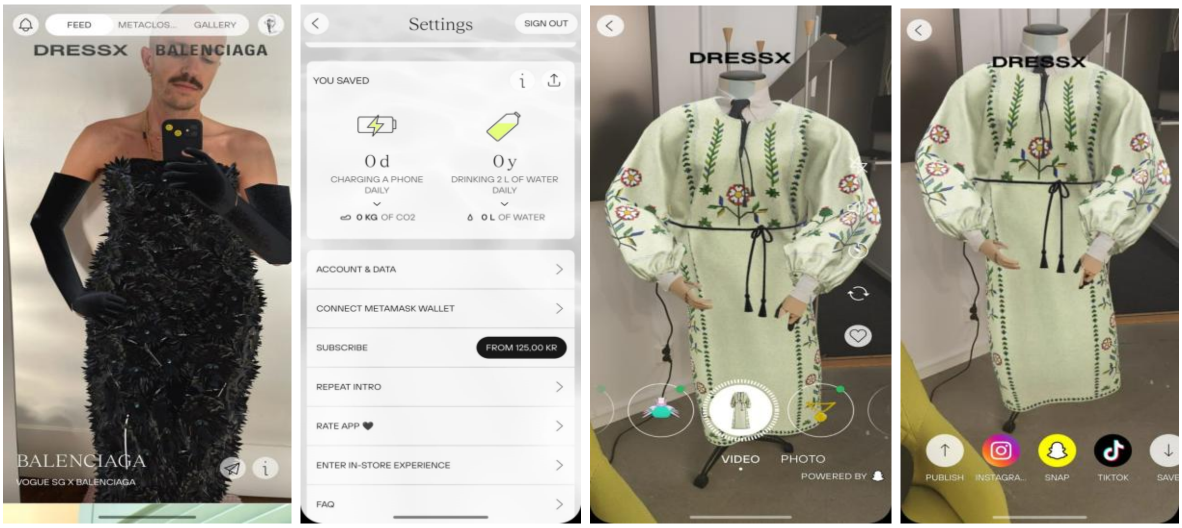

Figure 3 Screenshots from DRESSX AR try-on app

The consumers are able to create an account which they can customise in DRESSX. The user journey starts with an account feed, showing notifications and news of brand collaborations, 3D designs and shared socials. The user can then be directed to a Meta closet and Gallery. In this meta closet they can explore digital designs, use the AR feature to take real time pictures and videos which can then be shared through various social media platforms. It contains collaborative designs from various luxury brands for both menswear and womenswear. The user is also provided with a direct purchase option for digital outfits and NFTs and also integrates various platforms by using gaming avatars and metaverse platforms. DRESSX provides a user-friendly interface through finger gestures and movements to personalise their collections and is easy to use. The app, powered by Snapchat, uses real time body-tracking and captures motion to develop a more enhanced AR experience. This is also implemented with the help of high-resolution 3D garment rendering which adds to the overall consumer experience (refer to Figure 3).

4.1.2.4 Cultural, Social and Economic Aspects

WANNAWear focuses on digital fashion as a means to styling and fitting, it enables the user to visualise their products in real time through virtual try-on before making a purchase. It focuses on helping brands to reinforce their digital fashion businesses (WANNA, 2025b). DRESSX moves forward with the vision of digital fashion as luxury and a collective experience. It provides users with high end designs that can be tried on virtually. It brings forward consumers to explore fashion through metaverse and NFT's (Ellen Macarthur Foundation, 2021). DRESSX has a strong focus on multiplatform collaboration and content creation. It promotes sustainability awareness, displaying digital fashion as a way to reduce consumption (Ellen Macarthur Foundation, 2021). WANNAWear focuses on building digital and retail shopping experiences. It does not have social media collaboration and does not strongly emphasise it (WANNA, 2025b). While WANNAWear acts as a platform for brands to improve their retail shopping experiences, DRESSX aims to create a digital fashion commerce by promoting digital fashion sales. DRESSX is able to provide the user with an interactive luxury fashion experience which can support the experiment in order to measure the emotional engagement as consumers engage with the virtual fashion through AR. DRESSX provides a collection of luxury menswear and womenswear which enables the research to be open for a diverse sample for data collection. DRESSX offers a wide variety of detailed digital garments which can heighten the AR interaction.

4.2 Research Approach

The research conducted a convergent parallel design, following an explorative approach through qualitative and quantitative methods. The study is done by conducting quantitative and qualitative data collection simultaneously, analysing the data independently and then merging the results for cross comparison. This method helps to corroborate quantitative metrics while making observations throughout the study (Creswell and Clark, 2018). Bryman (2012) points out that mixed method research helps to close the gap between statistical and practical significance which makes the findings more concrete. For the exploration of digital fashion, researchers are advised to use diverse research approaches such as qualitative or mixed method analysis method, which is now followed in this study (Zhang, Liu and Lyu, 2023). Previous research on skin conductance responses have shown that causal modelling presents much more validity as compared to traditional methods. Causal modelling provides an analytically strong framework for psychometric analysis. By identifying the key variables, establishing a relationship between the variables, the causal model is then used to predict the outcome. This provides the thesis with evidence supported framework for the research. (Bach and Friston, 2013)

4.3 Research Design

This research follows a convergent parallel design by conducting quantitative and qualitative data collection simultaneously. The research combines the physiological data from its quantitative data collection with observational notes and short structured interviews (Appendix D) to analyse the emotional arousal and consumer engagement during the AR try-on filter experience. The research initially proceeds with the experiment design, where the set up and protocols are established. The experiment design involves 24 AR try-on filters which are selected from the DRESSX application by the researchers. A pilot test was then designed and conducted to test the efficacy of the experiment procedures and comprehensibility for the participants. The pilot test enabled the research to make improvements for the efficiency of the experiment and the interviews and observational data recorded. The final experiment is then conducted in two phases simultaneously.

The GSR data observations and collection phase where the participants are equipped with GSR sensor to gather the real time data of their physiological arousal. The data was collected by the sensor, while at the same time the researcher manually makes observational data on their filter order, peak SCL's recorded and the filters they engaged with. Simultaneously, observational data of the participants interactions during the experiment is made as notes. After the experiment, a short and structured interview was conducted to collect subjective perceptions of their experience during the experiment. The research then proceeds to the data analysis phase, during which qualitative and quantitative data are analysed independently. The qualitative data analysis initiated with a systematic transcription of interviews and observational notes. Following with a colour coded system to identify the recurring themes. For the quantitative analysis, the GSR data were first sorted by AR filter, and the corresponding average and final SCL values were calculated for each participant per filter. This is then followed by a statistical analysis of Paired T-test and a linear mixed effects model to test the hypothesis. The findings from the quantitative and qualitative data analysis were then further analysed through a comparative analysis to draw integrated interpretations of quantitative + qualitative (QUAN+QUAL).

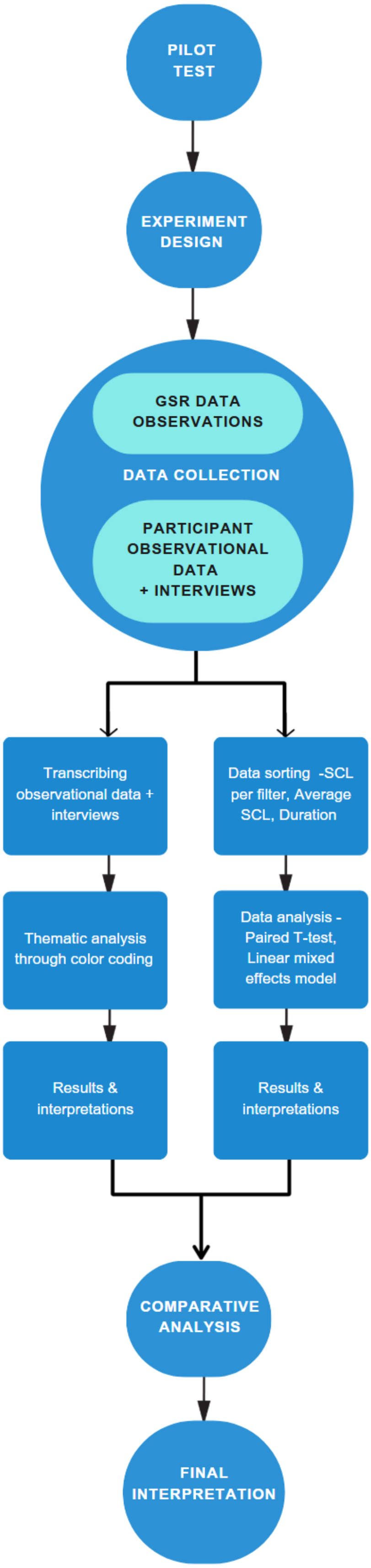

Figure 4 Flowchart and research design (Created by the authors, 2025)

4.4 Galvanic Skin Response

GSR or skin conductance also referred to as electrodermal activity, is a measurement of conductance of small electrical current applied to the skin. Emotional arousal leads to a sweat reaction, which by its level of indication is measured through the small electrical current applied to the skin. GSR measures the electrical conductance of the skin, which varies with its moisture level. When an individual is emotionally aroused, their sweat glands become more active, increasing skin conductance (Shimmer, 2015). The skin conductance is divided into two separate components. The SCL is measured from the tonic and is a habitual measure of arousal, while the Skin Conductance Response (SCR) corresponds to a phasic measure of arousal and is stimulus specific. The skin conductance and skin resistance are inversely proportional (Alexander et al., 2005). GSR signals are best measured on the skin surface of fingers or hands (see Figure 5). The Shimmer3 GSR+ module measures GSR at SCLs ranging from 0.2µS to 100µS (10kΩ to 4.7MΩ). The Shimmer3 GSR+ unit measures skin conductance between two residual electrodes attached to two fingers on one hand (Shimmer, 2015).

Table 1 GSR Response time characteristics (Anon, 2023)

GSR Components		Reaction time
Emotional response to stimuli	SCR latency	1 to 5 seconds
Emotional response to stimuli	SCR Duration	10 to 30 seconds
Alertness level/stress	Tonic component fluctuations	Tens of seconds to several minutes

Through the stimuli that alter the body's resting state, the sympathetic nervous system triggers physiological reactions. Additionally, autonomic nerve responses happen when we experience stress or emotional reactions like surprise, fear, or anger. The more intense the emotion, the greater the reaction. GSR measures the conductance, or ease of passage, of a continuous low-current circuit (often 0.5V) between two electrodes that make contact with the skin. Higher conductivity, which is interpreted as emotional arousal, is thereby correlated with increased perspiration. SCR in response to an emotional event will start between 1 second and 5 seconds after the event begins. (Anon, 2023)

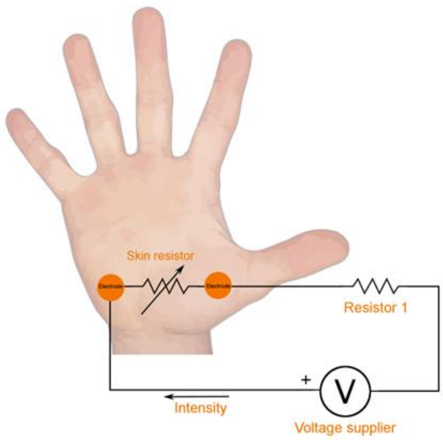

Figure 5 GSR sensor schematics (Anon, 2023)

Table 2 Shimmer GSR Technical Specifications (Team, 2022)

Parameter	Specification
Current Consumption[1]	60 µA
Measurement Range[2]	10 kΩ – 4.7 MΩ (0.2 µS – 100 µS) ± 10% 22 kΩ – 680 kΩ (1.5 – 45 µS) ± 3%
Frequency Range[3]	DC – 15.9 Hz
Connections	- GSR Input 1 (Red), GSR Input 2 (Black): Hospital-Grade 1mm Touchproof IEC/EN 60601-1 DIN42-802 jacks - Auxiliary Analog/Digital input: 3.5mm 4-position jack
Bias Voltage Across GSR Input	0.5 V
Input Protection	RF/EMI filtering, current limiting, GSR inputs include defibrillation protection (survive only, not repeat)
Dimensions	65 mm × 32 mm × 12 mm

1. Calculated specification assuming that on-board EEPROM is inactive, and no external sensor is attached and powered via the analog/digital input channels; exact value is subject to environmental and component variation
2. % Error is tabulated average across the measurement range
3. Calculated specification, exact value subject to environmental and component variation

4.5 Pilot Study

The pilot study was conducted over the duration of five days using a convenience sampling method, with 11 participants (5 females, 6 males). The initial filter selection included 28 filters which included both menswear and womenswear. On average, each session lasted approximately 6 minutes and 22 seconds, with interview durations ranging from 2 minutes and 6 seconds to 15 minutes and 35 seconds. The interview guide comprised initially three questions. The experiment set up was designed in a way that the participants were instructed to stand in front of the AR set up consisting of an iPhone 8 with a resolution of 1334 x 750, which was connected to a TV screen (70”-80”) with a resolution of 3840 x 2160. The phone was set up on a podium on a tripod stand. The researchers initially sat down in from of the participants to make the observational notes, which were taken manually for both qualitative and quantitative data.

After the completion of the pilot test the following changes were made to the final experiment design. The number of filters used in the experiment was reduced from 28 to 24 to minimise technical issues, such as glitching, and streamline the selection process for participants to conform to the time limit decide by the researchers. The experimental setup was adjusted to ensure optimal camera placement, allowing for full-body visibility and freedom of movement. Researcher positioning was changed to one researcher seated in front of the participant to document observational notes, while the other sat behind to monitor physiological data, thereby reducing potential distractions. The pilot study led to the development of a structured Excel-based data logging sheet, facilitating more accurate and efficient quantitative data entry during the experiment. Additionally, the interview guide was expanded from three to six concise, structured questions to enhance the depth of qualitative data collection.

4.6 Experiment Design

This research employed a semi-controlled experiment design to investigate participants' emotional engagement with AR in the context of luxury fashion. Drawing on previous research indicating that media interactivity significantly shapes behavioural and cognitive responses (Javornik, 2016a; Rauschnabel, Felix and Hinsch, 2019), the thesis sought to balance methodological rigour with ecological validity by creating a semi–controlled environment. Insights from the pilot study were used to refine several aspects of the procedure, including the clarity of consent materials, the positioning of sensors, and the flow of participant instructions. Upon arrival, participants were introduced to the study's purpose and invited to sign a consent form. They were then equipped with Shimmer GSR sensors, positioned on their non-dominant hand to minimise interference from movement. A relaxation duration of one minute was undertaken which acted as the baseline measurement for the experiment.

The interactive component involved engaging with AR filters from the DRESSX mobile application, which was projected onto a TV screen via HDMI (see Figure 6) for easier observation. Participants were free to select and explore any of the 24 AR try-on fashion filters, from a curated collection of womenswear and menswear combined (see Figure 8) in any order, using gestures and poses of their choosing, and for a self-determined duration (see experiment video in Appendix F). The garment filters were picked based on their luxury aspect such as brand name (Balenciaga, Fendi, Eden Tan etc.), fabric movement simulation and quality of material from a virtual perspective. These criteria reduced the filter selection from the initial 28 to 24 AR try-on filters. This flexibility aimed to promote a more naturalistic experience, aligning with Orne's reinterpretation of Brunswik's concept that ecological validity encompasses both the realism of perceptual cues and the generalisability of findings to real-world settings (Kihlstrom, 2021).

During the session, one researcher monitored the GSR data to ensure accurate logging and baseline stability, while both researchers independently recorded the order in which AR filters were selected. Simultaneously, the other researcher took observational notes, documenting non-verbal behaviours such as facial expressions, spontaneous comments, and reactions. This facilitated the linking of specific emotional responses, both observed and physiological, to particular digital garments and strengthened the reliability of the data through cross-validation. Once participants signalled the end of the experiment, they were given the opportunity to review the GSR metrics as visualised on the screen (see Figure 7), enhancing transparency and participant engagement. To ensure mental clarity, a short structured interview comprising six core questions, along with demographic and background questions, was conducted immediately after the session concluded. Participants were informed about the start and end of the audio recording and given space to reflect on their experience. The GSR recorded data at a frequency of 100.20Hz (100 data points per second).

Figure 6 AR try-on setup, inward-facing camera application

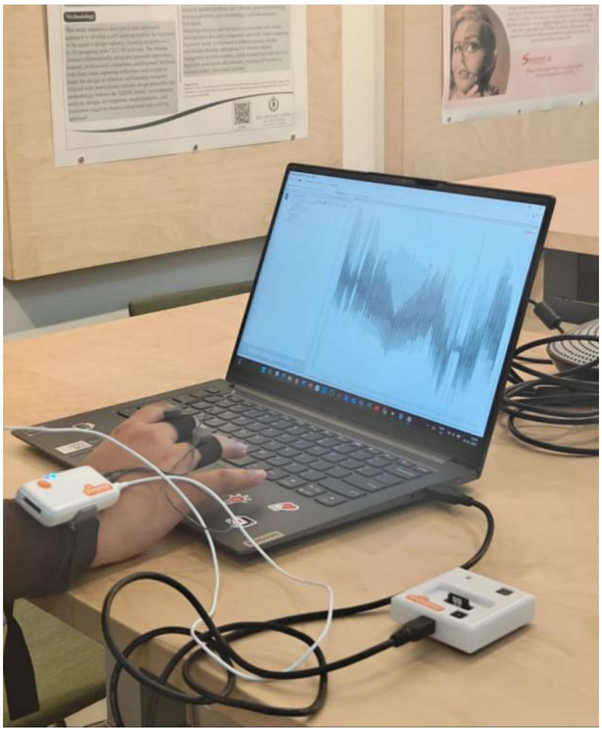

Figure 7 GSR set up

Figure 8 Pre-selected womenswear and menswear AR filters

4.7 Data Collection and Sampling

From the standpoint of time constraints and accessibility of participants convenience sampling is preferred for this research (Bryman, 2012). A total of 45 participants, 23 males and 21 females and 1 non-binary within the age group 18-40 were sought for the experiment phase of the study. Participants were recruited through various channels, including word of mouth, LinkedIn posts, student email chains, and printed flyers distributed in person at Högskolan i Borås (Appendix C). They were autonomous in choosing a time slot of their choices on a shared Google Spreadsheet. Previous studies have shown that consumers who belong to generation Z and Y exhibit an interest towards digital fashion content, being visual and static content exploring digital fashion clothing. The Gen Z consumers also show a significant purchasing power towards luxury fashion products (Zhang, Liu and Lyu, 2023).

4.7.1 Participants Demographics

Over the span of 30 days, a total of 45 participants took part in the experiment and composed of 23 males, 21 females and one non-binary, within the age group 19-36 (refer to Figure 9). To contextualise the findings, the following graphs provide an overview of the participants' demographic characteristics. These include age range and educational background (refer to Figure 10). More than half of the participants within the age group of 21–25, followed by those in the age group of 26–30, with the fewest in the 36–40 age group. In terms of education, most had a background in textiles and fashion, followed by engineering and technology, and economics and business.

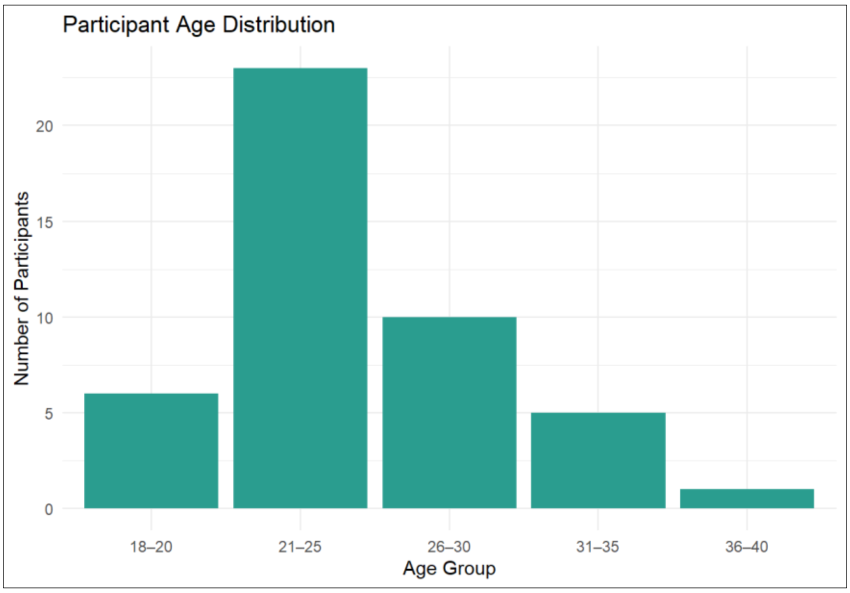

Figure 9 Participant age range distribution (Created by the authors in RStudio, 2025)

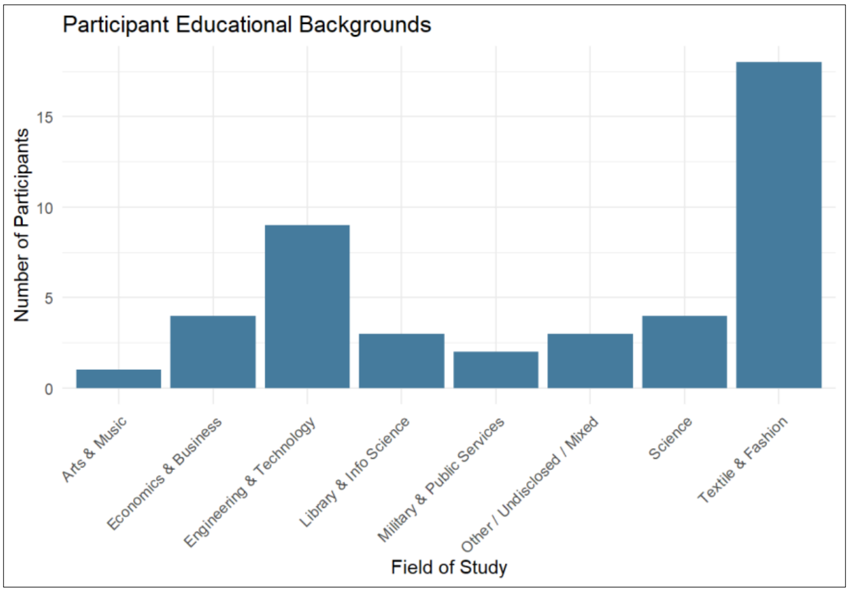

Figure 10 Participant background distribution (Created by the authors in RStudio, 2025)

4.8 Data Analysis

4.8.1 Coding and Thematic Analysis

The data analysis process began with transcription of the interview recordings using Microsoft Word's transcription tool, followed by manual proofreading and corrections. In parallel, the analysis began with familiarisation, during which the researcher noted recurring patterns and emerging themes. As suggested by Bryman (2012), an important early stage of analysis involved reviewing and segmenting the data into smaller, manageable parts to build familiarity and support a more focused and structured coding process (refer to Figure 11).

In addition to the transcribed interview data, observations of participants' comments and body language during the AR try-on experiments were initially recorded by manually by the researcher. Such observations were crucial in offering a multidimensional understanding of emotional engagement. Upon completion of data collection, these observational notes were systematically digitalised into an Excel spreadsheet, with each participant assigned a dedicated table where specific observations were aligned with corresponding quotations. This provided rich contextual information, enabling the researcher to assess alignments or discrepancies between verbal responses and non-verbal cues.

Following transcription and integration of observational material, data coding commenced using a primarily deductive approach informed by the study's research questions and theoretical framework. Only non-verbal reactions such as laughter, smiling, or gestures that were accompanied by verbal commentary or occurred within a clearly interpretable context were coded. This approach was taken to avoid overinterpretation of ambiguous behaviours and to ensure that emotional or engagement-related cues were grounded in participants expressed intentions or experiences.

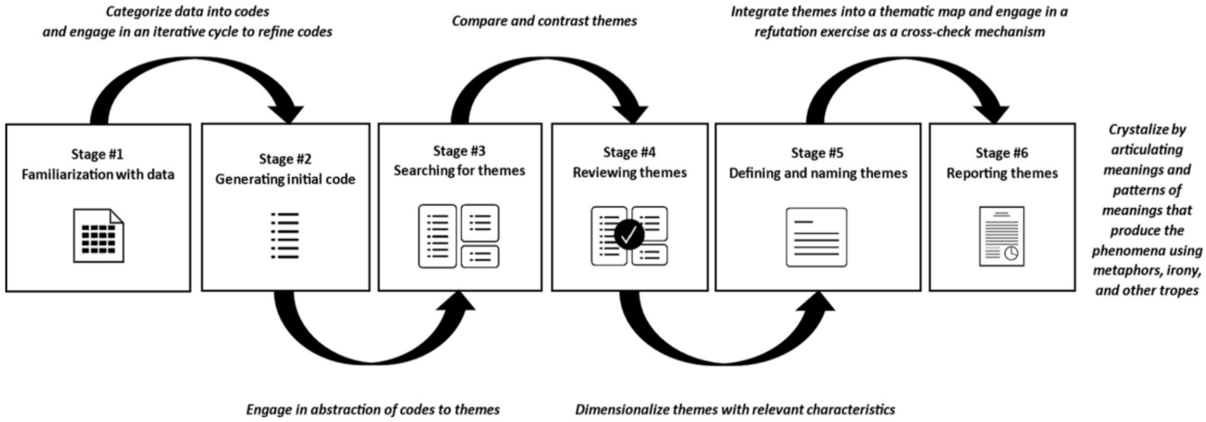

Figure 11 Thematic analysis inspired by Braun, Clarke and Spiggle (Lim, 2025)

4.8.2 Statistical Analysis

4.8.2.1 Paired T-test

In order to determine the impact of AR try-on experiences on emotional arousal through the statistical significance of the findings, the data from Shimmer GSR experiment and by the testing of the hypothesis, A paired T-test is done. The purpose of the test was to evaluate if there is a statistical difference between baseline SCL values and average, final SCL values recorded during the AR interaction experience. This aligns with objective of the research of exploring whether AR experiences can evoke measurable emotional responses and addresses research questions.

In the case of dependent samples where the same subjects are observed under different conditions, T-test for the mean difference is used. The difference of each pair of cases is calculated initially followed by calculating the mean of differences. The paired T-test looks at the mean of differences (Argyrous 2000). The maximum level of statistical significance is determined with the acceptable level at $p < 0.05$ at a confidence level of 95% (Bryman, 2012). The basic assumption of the test is that the sample should meet the conditions of normality, equal variances, and independence. Paired sample T-test is a robust method to analyse paired data (Talikan et al., 2024). Often a non-parametric alternative is selected such as the Wilcoxon signed rank test, used without regards to parameters like normality, variance, skewness etc of the observations. Nonparametric tests implies that no assumptions are made on the characteristics of the sample distribution. The Wilcoxon test is a test on equality of shapes of distribution. Box plots are used as descriptive statistics giving an overall summary of means, medians, spread and the outliers of dataset, and if the assumption of normality stays true, the plot would be symmetrical with no outliers. If the underlying distribution of differences are continuous, unimodal, and symmetric, the violation of normality is considered not as serious. (Rietveld and van Hout, 2017) We used R studio for conducting the statistical analysis where the R programming syntax is generated using ChatGPT (refer to Appendix E).

4.8.2.2 Linear mixed effects model

To further explore how emotional engagement can vary across individual participants with time and preferences, a critical factor in understanding AR's effectiveness in luxury retail, we use a linear mixed effects model. LMM have become a well-used data analysis method in psychological sciences. LMM is used when the data collected has a repeated measures design which likely has correlation between the same participants under the conditions of an experiment. When participants are subjected to stimuli, the experience results in repeated measures. The random effects are related to the unexplained differences between the participants. Fewer sampling will result in less reliable effects estimate and hence it is advised to have as many sampling data as possible. For psychological research 30-50 participants and 30-50 items or trials for each participant are recommended1. In order to conduct a LMM certain assumptions have to be met for the sampling data. We assume that residual errors and random effects deviation are normally distributed. (Meteyard and Davies, 2020)

LMM makes use of all the available data rather than relying on an aggregate of data done prior. The LMM model allows researchers to explore the variability between participants in their reaction towards a stimulus or subject and the variability within these items design. LMM poses another advantage in terms of dealing with missing data. Mixed effects models include fixed and random effects. Fixed effects are the variables in the model that are of interest as predictors of an outcome. The random effects are included to account for any potential variance in the outcome variable. We include random intercepts for participants and items in the model which allows the mean of dependent variables to vary across distinct levels of a grouping variable. (Muradoglu, Cimpian and Cimpian, 2023)

This method provides a more well-rounded insights as compared to aggregate techniques which enables the exploration of emotional variance in response to specific AR stimuli. LMM test is implemented to directly answer RQ1 and lays the foundation for RQ2, helping to identify AR try-on that are most emotionally engaging and therefore potentially help in strategizing marketing strategies. As stated by Muradoglu, Cimpian and Cimpian (2023), LMM helps to model both the average effect across participants and individual level variation which is apt for an exploratory psychological and consumer behaviour research. The R programming syntax used is given in Appendix E.

4.9 Research Quality

Establishing the trustworthiness of qualitative research requires systematic reflection on the research's credibility, transferability, dependability, and confirmability. To support this, the present study draws on the “trustworthiness verification framework” proposed by Singh et al. (2021), developed within the context of international marketing research. Its relevance extends to this research for two key reasons. First, the second research question driving this thesis explicitly investigates how AR try-on experiences can be optimised as a marketing tool in the luxury sector, thereby aligning conceptually with methodological concerns typical of marketing research. Second, the sample was composed of participants from diverse national backgrounds, reflecting an international dimension in both consumer experience and interpretation. Accordingly, adopting this framework offers a suitable and rigorous lens through which to assess the quality of qualitative research in a digitally mediated, cross-cultural marketing context.

4.9.1 Credibility

This research employed several strategies to reinforce credibility, particularly through the use of multiple data types and methods aligned with the study's aims. Short and structured interviews, participant observations during AR try-on sessions, and physiological data from

GSR sensors provided a multidimensional view of emotional engagement. Familiarisation with the data occurred through iterative readings and detailed coding, enabling the identification of recurring patterns and emergent themes. This process ensured that the analysis remained grounded in the data and allowed for a robust thematic structure to develop. To further strengthen credibility, member checking was conducted by sharing the results with participants, allowing them to review and validate the interpretations of their responses. This process ensured that the findings accurately reflected the participants' views, reducing the risk of misrepresentation and supporting a more participant-informed analysis.

Triangulation of interview, observational, and physiological data contributed significantly to the overall credibility of the results. Observational data, collected during the AR try-on sessions, were cross-checked with physiological responses measured via GSR sensors. This cross-referencing helped deepen our understanding of whether specific behaviours or verbal responses aligned with measurable emotional responses. By integrating these multiple data sources, the research ensured that interpretations were corroborated by different forms of evidence, providing a more robust foundation for analysis. They reinforced the credibility of the thematic interpretations and supported more nuanced conclusions. For example, heightened GSR readings were linked to high emotional arousal, regardless of whether the emotions were positive or negative, which further strengthened the analysis of emotional engagement.

4.9.2 Transferability

This approach contributes to the transferability of findings by offering context-rich insights into participant behaviours and emotional responses. Rather than providing a comprehensive thick description of the setting, the researcher prioritised observations to obtain accounts of participant interactions, expressions, and affective cues during the AR try-on process. The findings are thus transferable to similar settings involving experiential retail technologies. Nonetheless, the transferability of insights remains bounded by the specificity of the setting and participant cohort and should be evaluated accordingly. (Lim, 2025)

4.9.3 Dependability

To reinforce dependability, the research process is traceable and allows others to assess the consistency of the analytical procedures. Consistent with Halpren (1983 cited in Nowell et al., 2017), keeping comprehensive records facilitates the cross-referencing of data and supports clear reporting, ultimately strengthening the coherence and trustworthiness of the analysis. Data familiarisation occurred through multiple iterative readings and detailed coding, allowing the identification and refinement of themes over time. This iterative approach ensured that the analytical process remained grounded in the data and responsive to emerging insights, contributing to a consistent and coherent thematic structure.

4.9.4 Confirmability

To strengthen confirmability, the researcher committed to reflexivity, whereby the researcher regularly questioned their own assumptions and interpretive stance to mitigate bias and strengthen analytical rigour (Lim, 2025), particularly when analysing emotionally charged data or ambiguous non-verbal cues. As theme identification does not produce a single valid outcome but involves researcher judgement (Ryan and Bernard, 2003), efforts were made to ensure transparency in coding and theme development. To minimise subjective influence, only behaviours that were clearly interpretable or paired with verbal commentary were included in the analysis. Additionally, a transparent audit trail was maintained to document analytical decisions, enabling others to trace the interpretive process and assess the neutrality of the findings.

4.10 Ethical Considerations

The use of quantitative and qualitative methods in behavioural research methods give rise to additional ethical issues that may arise during the research. With the requirement of collecting identification information from participants and maybe contacting them in later points, this puts the participants in a higher burden position. Hence the wellbeing of the participants, their time, and information must be taken into serious consideration. (Stadnick et al. 2021)

This research conducted experiments with participants interacting with AR technology and their physiological data and interview data were recorded and stored. Given the sensitivity of physiological data, ethical adherence was a critical part of the research. All procedures were carefully designed and conducted to ensure participant safety, informed consent, confidentiality, and minimal burden.

4.10.1 Informed consent

The participants have to be ensured with ethical adherence to well informed consent procedures. With simple communication and proper training to ensure that the participants are thoroughly informed of the procedures involved in the research experiment (Stadnick et al. 2021). The researchers ensured to present the experimental procedure with a self-introduction, followed with the explanation of the project. The information was made simple for the participants to comprehend the processes involved, the type of data collected, its storage of data and under the administrative bodies under which the research is being conducted. The information was conveyed verbally followed with a written consent form approval which the participants read through and proceeded with their signature to seal the consent for the experiment. All participants provide their informed consent by signing the consent form. It is ensured that the information in the consent form is clear and easy to understand for the participants, ensuring that participants are informed about what measurements are being recorded, the purpose of the experiment and how their data will be handled. Participants can withdraw from the experiment at any time without giving a reason.

4.10.2 Confidentiality and Data Management

Similar to informed consent, most respondents mentioned standard practices to guarantee ethical adherence to participant anonymity, include limiting access to data by the research team, utilising participant IDs, and deleting identifiable information (Stadnick et al. 2021). The participant data is stored under participant IDs and all access to any other sources of identification is made untraceable by ensuring deletion of names, age and participant background which can be traced back to them. The collected data is handled by the researchers of this thesis, and no outside party has any access to the same. We have ensured that there is no risk of sensitive information being disclosed. If the equipment contains stored data that participants may accidentally access, an assessment will be made regarding any potential negative consequences for the participants. Clear guidelines are established regarding how data is stored, where it is stored, and how it is deleted after the experiment.

4.10.3 Safety

Strategies to ensure the ethical adherence to the participant's wellbeing and safety has to be implemented. It includes procedures and protocols which are properly defined and comprehendible to assess safety, which addresses potential risk concerns, and the participant is well informed before the experiment by the researcher (Stadnick et al., 2021). The research uses only commercially approved and publicly available equipment (Shimmer3 GSR+). The experiments do not involve any physiological risks or cause mental distress or trauma. While conducting the experiments we reflected upon potential risks, such as: Whether a participant may receive a result that could cause concern (e.g., an unexpected deviation in a physiological test) and how such situations should be managed if they occur.

4.10.4 Burden

Procedures to lessen the burden on participants are implemented which involves conducting user testing or pilot studies before or after the data collection. With the purpose to make changes to the research design to make the process efficient in order to reduce the burden (Stadnick et al., 2021). The research conducted a pilot study for 11 participants. The experiment design was further then modified to reduce time and create an efficient procedure for the participants to follow during the experiment and afterwards for the interview. The questions were streamlined after the pilot test. This was to ensure that the final experiment would face less technical issues, efficient procedures so as to ensure the quality of the experiments are uniform and is managed in a timely fashion.

The participants have to be offered appropriate compensation to complete the given experiment or research activity (Stadnick et al., 2021). The participants were offered a restaurant discount offer as compensation for their contribution to the experiment. Another way to lessen the burden is to allow flexible scheduling of time for the purpose of data collection, while clearly informing the participants of the time taken for the overall data collection process (Stadnick et al., 2021). The participants were given information regarding the scheduling of the experiment via a google excel sheet link where they could enter their selection under the date and time slot of their preference, the sheet was managed by the researchers of this thesis. This allowed the participant to be available for the experiment in their own convenience. The participants were informed of the time taken for the experiments, the details of the experiment and the compensation through emails, LinkedIn posts, word of mouth and posters which were supplemented throughout.

5 Results

This chapter presents the findings from both the qualitative and quantitative analyses of the research. It begins by exploring key themes and sub themes from participant interviews and observational notes. This is followed by the statistical analysis of GSR data to assess physiological arousal during the AR try-on experience through two different statistical tests. The results are then interpreted through a comparative analysis to examine the alignment between self-reported engagement and biometric responses, offering a comprehensive analysis of consumer interaction with AR in luxury fashion retail.

5.1 Qualitative Analysis

5.1.1 Emotional Arousal

This chapter investigates the theme of Emotional Arousal within AR fashion try-on experiences in luxury retail. Two sub-themes structure the analysis: Emotional Responses, which explores how participants (P) experienced and articulated affective states such as fun, curiosity, excitement, and discomfort, and Emotional Associations, which considers how visual features of virtual garments triggered memories, identity connections, and symbolic meanings. Together, these sub-themes reveal how AR interfaces elicit both immediate affective reactions and deeper psychological resonances, demonstrating that emotional arousal in digital fashion is mediated not only by technological novelty, but also by personal relevance, cultural familiarity, and embodied self-perception.

5.1.1.1 Emotional Responses

Fun and playfulness emerged as the most frequently cited emotional reactions. Participants consistently described the experience as “fun,” often accompanied by visible expressions of joy such as smiling or laughter. These moments highlight the role of modality interactivity in encouraging playful, low-stakes exploration. The virtual environment enabled experimentation without the material, social, or financial constraints often associated with physical fashion try-ons. As one participant explained:

I was essentially just interested in the colour for playing around. (P22)

Curiosity and excitement were also featured prominently, particularly in response to the unpredictability of garment presentation. Participants often expressed anticipation and a sense of discovery, viewing the experience as an opportunity to explore without pressure. These reactions proposes that curiosity may act as a motivational driver, prompting self-directed engagement even in the absence of purchasing intent. One participant remarked:

It is a new thing to try out, and you know all these thoughts are going through my head like, you know, it is the future of trying out clothes. (P6)

Happiness, satisfaction, and a sense of self-expression also emerged as central emotional responses. Several participants described feeling a sense of joy when they found a design that matched their personal taste or digital self-concept. These responses point that emotional engagement is enhanced when consumer perceive alignment between the virtual garments and their self-concept. One participant reflected this by stating:

When I found the right one, I felt happy. (P32)

However, consistent with the TIME framework's recognition of psychological variability, not all emotional reactions were positive. Some participants reported discomfort or insecurity, particularly when the virtual garments clashed with their personal style or when the digital rendering appeared visually awkward. In several cases, participants noted that garments seemed distorted, clipped, or poorly fitted to their body proportions. For instance, one participant admitted:

I did not feel that excited with a lot of them because it was so far from my style. (P3)

Despite these issues, frustration was relatively rare. While participants acknowledged technical limitations, such as occasional glitches or fit inaccuracies, these were generally perceived as minor and did not significantly disrupt the experience. As one participant noted:

Some of them clearly struggle with fitting to my body shape, and some of them clipped. (P20)

While some participants reported initial nervousness, it often faded with continued interaction, implying a process of acclimatisation. Importantly, such adaptation indicates a generally high level of tolerance, even when the experience was unfamiliar or visually imperfect.

The emotional landscape articulated by participants during the virtual try-on experience reveals a nuanced and multi-layered affective engagement. Overall, participants reported a predominantly positive emotional valence, with recurring references to fun, curiosity, excitement, and interest serving as core affective anchors. These affective states align with previous work indicating that increased interaction features can foster enjoyment and trust, thereby enhancing consumer's connection with both the media interface and the branded content (Sundar, Bellur, Oh, Xu and Jia, 2014; Javornik, 2016b).

5.1.1.2 Emotional Associations

Participants often formed affective associations triggered by visual elements of the designs, such as colours, textures, and silhouettes, that evoked personal memories, cultural ties, or identity markers. For instance, some responses referenced familial or cultural familiarity: *"*I feel like my sister, she is Chinese*"* (P2), *"*I think my sister would like this one*"* (P28), and *"*My father is an artist and wears these types of prints*"* (P44). Others engaged with symbolic meanings. Filter 10 (F10), for example, was frequently compared to bridalwear: *"*This is cute, looks like I am getting married*"* (P17), *"*My princess moment*"* (P6). Similarly, P15 described *"*my Elton John moment*,"* P20 referenced *The Fifth Element*, and P22 likened a look to the *DJ Marshmello*, demonstrating how virtual garments invited interpretation through popular cultural frameworks.

Emotional resonance was further shaped by alignment with personal interests or values. P6's strong reaction to F8, described as a *"*snake jacket*,"* stemmed from a passion for reptiles, while P11 expressed appreciation for a design associated with a brand they had worked with, highlighting the role of brand familiarity and personal history. Interestingly, two male participants independently expressed a preference for the same black jacket, both referring to it as a "leather" jacket. One of them remarked, *"*That is the one I felt most familiar with,*"* emphasising how familiarity and perceived material aesthetics, even in virtual form, can influence emotional attachment and preference. This may be attributed to leather as a textile material whose cultural associations are linked with durability, masculinity, and classic fashion tropes.

Nostalgic responses also surfaced. P11 remarked, *"I liked this one because it made me think of The Sims,"* while P6 referred to a childhood lava lamp. These examples illustrate how virtual designs functioned not only as aesthetic stimuli, but also as mnemonic triggers tied to memory, aspiration, or belonging. These responses indicate that emotional engagement extended beyond surface-level enjoyment and was often anchored in deeper psychological connections related to identity, memory, and symbolic meaning. In line with the TIME framework, such responses were shaped not only by interface novelty but also by consumer's internal psychological structures and life experiences, reinforcing the contextual richness of AR interaction.

AR try-ons also revealed their social dimension. Two participants expressed a desire to photograph themselves in the filters, linking the experience to pre-existing digital sharing habits. Another participant noted: "This was my first time with clothes. I like usually being around on Snapchat and send the filters to friends." These reactions underscore score how AR fashion is often integrated into performative and communicative behaviours, particularly on social media. As highlighted in Snap Inc. and IPG MAGNA (2022), peer-based sharing plays a critical role in consumer influence, offering luxury brands opportunities to embed themselves within emotionally resonant contexts.

5.1.2 Consumer Engagement

This chapter explores the theme of consumer engagement within the context of AR fashion try-on experiences in luxury retail. The analysis is structured around two sub-themes: novelty, immersion, and engagement, which examines how participants responded to the technological affordances and interactivity of AR, and personal styling and preferences across genders, which investigates how individual aesthetic preferences and gender identity shaped engagement with the virtual garments. Together, these sub-themes illuminate how AR interfaces mediate both playful exploration and self-representation in digital fashion environments.

5.1.2.1 Novelty, Immersion and Engagement

Participant responses revealed a dynamic interplay between novelty, immersion, and engagement in relation to the AR try-on experience. While several participants had prior experience with AR face filters on platforms such as Snapchat, the transition to full-body garment visualisation was described overall as *"new," "innovative"* (P32), and *"thrilling"* (P44). Despite this initial excitement, some participants expressed uncertainty about the meaning of the term "immersion," and experiences of immersion varied considerably across the sample. One participant described:

> *It felt more real because I could move around and see it change*. (P21)

Responses to the visual features of the AR filters, such as animated backgrounds, were mixed. While certain participants felt that they enhanced the immersive experience, others described them as "distracting." This divide raises the possibility that although rich media elements can increase engagement, excessive visual stimuli may challenge users' ability to focus on product details. These divergent views underline the importance of content balance, particularly in luxury fashion, where material detail and visual clarity are often central to consumer evaluation.

Few participants described the experience as "fun," "engaging," or "interesting" enough to prompt additional actions, such as taking photos or sharing with friends. This behaviour illustrates a level of personal investment that extends beyond passive observation. Additionally, although some reported prior to the experiment having time constraints, they did not realise how much time had passed once they began interacting with the filters. These observations that the AR try-on experience held sufficient immersive quality to impact participants' subjective perception of time.

Participants frequently engaged kinaesthetically with the AR try-on features, using body movements to interact with the filters. This behaviour reflects modality interactivity, a concept described by Sundar et al. (2015), where consumers may actively manipulate media content, contributing to immersion. Our findings appear to align with the TIME framework's proposition that richer, more interactive AR experiences heighten consumer involvement. However, there may be a critical boundary whereby rich media features, while capable of amplifying engagement and emotional arousal, risk overwhelming cognitive processing and diminishing the persuasive impact of the content.

5.1.2.2 Personal Styling and Preferences Across Genders

Participants' responses highlighted that personal style and gender expression played a central role in shaping engagement with the AR garments. Many participants described certain clothing items as *"*not my style*"* (P3, P20, P39), *"*not something I would wear*"* (P4, P6, P7), *"*I do not wear a lot of luxury brands" (P20, P35), or *"*too casual*"* (P5, P26). These responses indicate a noticeable gap between their personal aesthetics and the curated digital wardrobe offered by the AR experience. However, several participants noted that even garments they would not typically wear in real life were *"*fun to try-on*,"* reflecting a playful openness to experimentation within the AR environment.

Participant preferences revealed a wide spectrum of responses to gender-coded virtual garments, often shaped by personal identity, comfort, and self-perception. Some participants consciously avoided clothing they associated with another gender; for example, a male-identifying participant expressed discomfort with feminine-coded filters, while a female participant stated, "I was preferring the women's dresses mostly and I skipped the men's dresses. So, I least preferred the men's dresses" (P44). In contrast, most of the male participants experimented openly with traditionally feminine garments such as dresses, implying that AR try-ons may enable gender-fluid exploration within a low-risk, virtual space. This sentiment was echoed by two of them who commented:

If I were a girl, I would love this one. (P19)

If I was a woman, I would not wear it. (P28)

Other responses demonstrated the nuanced and subjective interpretations of gendered cues. Two female participants characterised a women's filter as "masculine," while P11 reflected on how different styles, "cute" versus "sexy", affected their self-concept in the filter. These reactions underscore how AR can both affirm and challenge consumer gendered self-concepts, with garments functioning not just as fashion items but as reflective surfaces for exploring and expressing identity. This aligns with modality interactivity theory, which suggests that high agency in virtual environments enables self-exploration and identity play (Sundar et al., 2015).

5.1.3 Purchase Intention

This chapter examines purchase intention in the context of AR fashion try-on experiences in luxury retail. It is structured around two sub-themes: AR as a decision-making tool and perceived value, which considers how participants viewed AR as a supportive mechanism for evaluating luxury items, and realism and comparison with real-life shopping, which explores how the perceived fidelity of AR influenced emotional engagement and behavioural intent. The findings highlight that while AR increases product discovery and convenience, its persuasive power remains limited, particularly for high-involvement purchases.

5.1.3.1 AR as a Decision-Making Tool and Perceived Value

Participants widely recognised AR as a useful aid in decision-making when considering luxury fashion purchases. While few participants felt AR directly triggered purchases, many acknowledged its role in sparking interest, enhancing recall, and informing future shopping decisions. This view was evident in the spontaneous use of the word "help" by nine participants, who emphasised AR's facilitative role in navigating luxury shopping. Participants described using the filters to explore different styles, reduce uncertainty around appearance or fit, and assist with pre-selecting items before visiting physical stores. For some, this practical utility extended to reducing product returns and managing financial risk, particularly in the context of high-value purchases. Convenience emerged as a key benefit. Several participants noted that AR made the process feel quicker and less effortful than in-person shopping, especially when used to narrow down options in advance. One participant summarised this perspective:

We have to invest on time for travelling and shopping and everything. And this one was really comfortable and at the same time, it was so convenient for everyone, I guess. (P33)

Despite this overall positive framing, participants also identified key limitations, especially within the specific context of luxury consumption. The symbolic and financial weight of luxury items often prompted greater deliberation, making it unlikely that virtual try-ons alone would lead to spontaneous purchases. This sense of caution was particularly apparent for items requiring exact fit, such as eyewear, where several participants expressed the need for physical trials before committing to a purchase. However, footwear was perceived as more suitable for virtual evaluation, especially when consumer was already familiar with the brand's sizing. As one participant put it:

It sparks this idea of, oh, maybe I would like to have something like this but not directly like in the moment I am going to buy this now. (P3)

However, the practical value of AR was occasionally undermined by perceptions of the garments themselves. Some participants felt that the items showcased through AR filters were more suited to social media or performance than to everyday wear. For these consumers, AR functioned less as a bridge to ownership and more as a playful or aspirational interaction. This reflects a broader tension in luxury fashion between fantasy and functionality, suggesting that while AR can increase visibility and desire, it does not always lead to tangible consumption, particularly when items are perceived as impractical. Nevertheless, for some, AR served as a low-risk and engaging entry point into high-end retail, particularly for those less familiar with, or hesitant about, luxury consumption. Although not a decisive tool in converting interest to impulse purchases, AR was widely seen as enriching the decision-making process.

5.1.3.2 Realism and Comparison with Real-Life Shopping

Consumer engagement with AR filters in fashion was strongly shaped by perceived realism and personal preferences during interaction. Several participants questioned whether the garments were real or purely digital, suggesting a shift from traditional luxury cues to visual and interactive features, engagement over brand recognition. Visual details such as colour, shape, and texture were influential. One participant reflected positively, stating:

This one fits me perfectly, the best, I can feel it. (P38)

In contrast, some participants rejected filters based on unflattering silhouettes or colour palettes. These affective responses reinforce that personalisation and stylistic alignment play a key role in consumer engagement, consistent with the interactivity effects model's emphasis on how modality interactivity can foster positive attitudes when content resonates with the individual. For example, two participants shared:

The waist was very small. So that did not really, it was not my thing. (P40)

I do not like them, a bit weird colours. (P26)

Participants also drew spontaneous comparisons to real-life changing rooms, citing AR's hygiene benefits and convenience. P38 noted that AR eliminates concerns like stains or shared garments in physical stores. This implies that AR interfaces can remove traditional shopping barriers, potentially increasing engagement, and intent to purchase. Although such concerns may be less relevant in luxury fashion, where garments are typically exclusive, and handled with care, they remain notable for participants reflecting on general shopping norms. Moreover, subtle embodied behaviours, like participants pulling their hair back, hinted at an instinctive alignment with real-life try-on habits, enhancing the sense of presence.

Despite this, the digital-physical division remained clear. Many still preferred to try garments physically before purchasing. Technical limitations also undermined the immersive potential for some. Issues like glitches, clipping, unrealistic tracking, and the inability to view garments from all angles interrupted the user experience. Such disruptions reflect low modality fidelity, which, as Sundar et al. (2015) argue, can limit emotional resonance by reducing perceived control and flow. As one participant noted:

It was a bit hard to feel something because I think there is one feeling that you have when you try a digital filter, but the feeling would be different if you tried it in real life, because then you feel like the fabric on your body and you get, you get like a bigger experience of each kind of clothing. (P26)

These findings highlight the need for further technological refinement in AR fashion applications to meet both experiential and functional expectations in luxury contexts.

5.2 Statistical Analysis

The research conducted statistical analysis on a sample of data from 42 out of 45 participants, which includes 18 female, 23 male, and 1 non-binary participant. Three data sets were excluded from the analysis due to the technical issue which arose during the experimentation process which led to highly insignificant data points corresponding to the participants. However, they have been included in the qualitative data analysis as the observational notes and interview data was not affected by the irregular data logging of GSR during the experiment. The data resulted in an overall average interaction duration of 7 minutes and 33 seconds. Average number of filters interacted with was 20 and the average interaction duration per filter was 23 seconds where a baseline value was recorded for 1 minute for each participant.

To analyse the participant's engagement and emotional arousal throughout the experiment where the participants interacted with AR filters, we first conducted a paired T-test comparing baseline SCL with average SCL recorded during the interaction with the filters. This is followed by a second paired T-test comparing baseline SCL with the SCL recorded during the final AR filter interaction. This is done in order to analyse the potential cumulative effect or the emotional peak which arise from the interaction.

The research then conducted a linear mixed effects model to analyse the effect of different AR filters on SCL while also accounting for the individual variation across the participants such as the unequal number of filters interaction, unequal duration, and random order of interacted filters. This model includes both fixed effects (i.e. Filters and baseline values) and random effects (i.e. participant specific variability) in its application, which provides a more accurate and generalised understanding of how experimental conditions can influence physiological responses. By using this model, the research is able to estimate the impact of filters while considering the individual variabilities and repeated measurements throughout the experimentation process.

To conduct statistical tests on the data acquired we have devised the following hypothesis to answer RQ1 and RQ2.

H1 → The AR try-on experience leads to a statistically significant increase in physiological arousal

With the corresponding null hypothesis,

$H0_1$ → *There is no statistically significant difference in physiological arousal after the AR try-on experience.*

H2 → Different AR filter types significantly influence physiological arousal

With the corresponding null hypothesis,

$H0_2$ → *There is no statistically significant effect of AR filter type on physiological arousal*

5.2.1 Paired T-test

5.2.1.1 Baseline SCL vs. Average SCL

This analysis aims to determine whether the AR try-on experience shows increased physiological engagement, which is measured through the SCL, compared to participants resting baseline. The analysis assumes that the specific filter or the order in which filters were viewed does not significantly affect the results. While the data also needs to consider the possibility of masking high or low peaks of participant engagement. Participants showed a statistically significant increase in SCL while interacting with AR try-on filters, indicating heightened physiological engagement compared to their baseline. With a data sample of 42 participants which resulted in different orders and durations in terms of the AR filter interaction experiment resulting in varying filter experiences, the average SCL approach is fairer, more stable, and less biased by the filter that participants interacted with last. The null hypothesis $H0_1$ is tested here.

A paired T-test is conducted between

- The baseline SCL, and
- The mean SCL across all filters the participant interacted with.

The results are as follows:

Table 3 Paired T-test Baseline Vs Average SCL

Statistic	Value
Test type	Paired T-test
Sample size (n)	42
t-value	5.7208
Degrees of freedom (df)	41
p-value	1.079×10^{-6}
Mean difference	0.822
95% Confidence Interval	[0.532, 1.112]
Alternative hypothesis	True mean difference ≠ 0

The p-value is extremely small (< 0.001), which means the difference between baseline SCL and average SCL is statistically significant. The positive mean difference (≈ 0.82) suggests that, on average, SCL increased during interaction with AR filters compared to baseline. The confidence interval [0.53, 1.11] tells us that we are 95% confident the true mean increase in SCL lies within this range which indicates that it is not due to random chance. There was a statistically significant increase in SCL (mean Δ = 0.82 μS), t (41) = 5.72, p < .001, with a 95% Confidence interval [0.53, 1.11], indicating increased emotional or Physiological arousal during AR interaction. Hence, as the p-value is < 0.05, we reject the null hypothesis $H0_1$ and accept the alternative hypothesis H1: -

H1→ The AR try-on experience leads to a statistically significant increase in physiological arousal

This indicates that, on average, participants' physiological arousal rose across the set of filters they tried. The experiment shows strong evidence that interacting with AR fashion filters increased emotional arousal, as measured by skin conductance levels. This supports the argument that AR experiences can stimulate emotional engagement in consumers. This analysis supports the research objective as to assess whether AR experiences can impact the emotional arousal and engagement of consumers in real time, contributing to the research question **RQ1→ How does AR for luxury clothing try-on experiences influence emotional arousal, consumer engagement, and purchase intention?** The statistical findings from the paired T-test shows that the AR try-on experience increased the emotional arousal across participants. This further supports the TIME framework's argument that modality interactivity through the ability to interact with media through touch, gesture and manipulation can result in higher levels of consumer engagement and immersion (Sundar et al., 2015). Within luxury fashion retail, this finding implies that AR technology may serve as a functional tool as well as be an emotional engaging user experience that can potentially impact purchase behaviour.

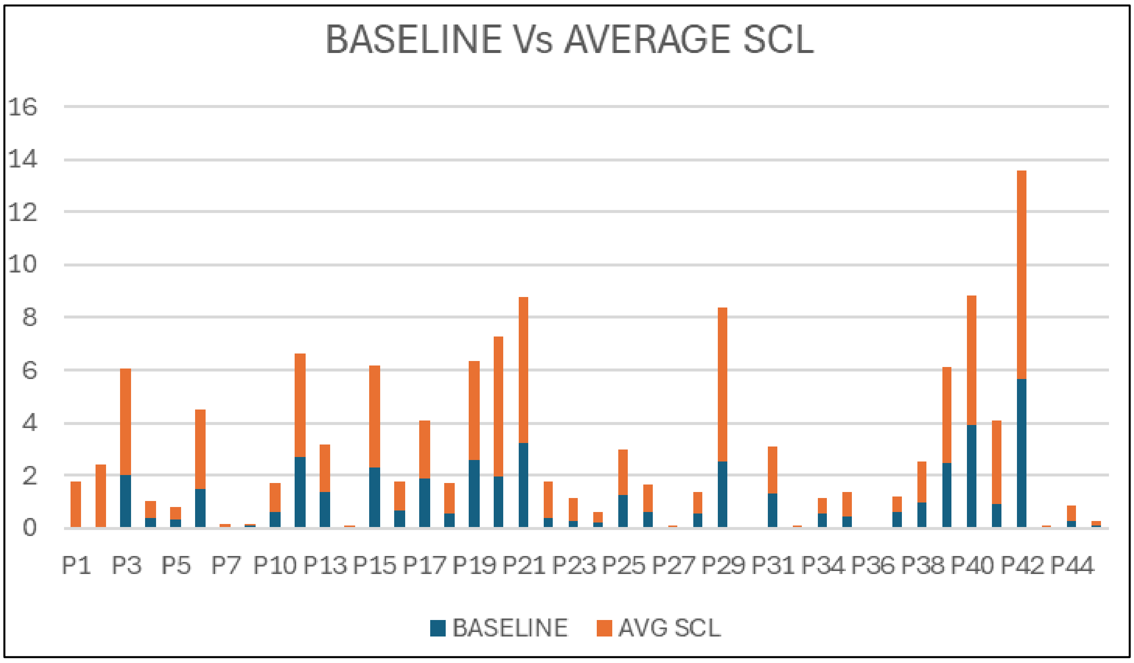

Figure 12 Stacked column chart - Baseline Vs Average SCL

5.2.1.2 Baseline SCL vs. Final Filter SCL

This analysis aims to understand whether the participants experienced a peak or cumulative emotional response with their final AR try-on interaction, compared to their baseline SCL. Participants showed a statistically significant increase in SCL, indicating heightened physiological engagement compared to their baseline, implying that interacting with AR filters resulted in a sustained or growing emotional engagement. While considering that the last filter may not be the same across participants, the result may reflect individual filter differences rather than interaction duration**.** The null hypothesis $H0_1$ is tested here.

A paired T-test conducted between:

- The participant's baseline SCL, and
- Their SCL from the final AR filter they interacted with

The results are as follows:

Table 4 Paired T-test Baseline Vs Final SCL

Statistic	Value
Test type	Paired T-test
Sample size (n)	42
t-value	5.8982
Degrees of freedom (df)	41
p-value	6.039×10^{-7}
Mean difference	1.321
95% Confidence Interval	[0.869, 1.774]
Alternative hypothesis	True mean difference $\neq 0$

The results of the paired T-test indicate a statistically significant difference between the participants' baseline SCL and their SCL after interacting with the final AR filter. The p-value is extremely small ($p < 0.001$), providing strong evidence against the null hypothesis. The mean difference $\Delta = 1.32$ µS shows a considerable increase in physiological arousal from baseline to the final AR filter. The 95% confidence interval [0.869, 1.774] does not include 0, reinforcing the result's significance. The second paired T-test revealed an even larger increase from baseline to the final AR filter SCL, Participants exhibited significantly higher skin conductance levels after the final AR filter interaction compared to their baseline. This supports the argument that cumulative or concluding AR experiences may lead to heightened physiological responses. Hence, as the p-value is < 0.05, we reject the null hypothesis $H0_1$ and accept the alternative hypothesis H1: -

H1 → The AR try-on experience leads to a statistically significant increase in physiological arousal

This analysis supports the research objective to analyse whether AR experiences can instil real time emotional or cognitive engagement which directly contributes to **RQ1.** The findings add on the previous results by showing that emotional impact may intensify over time, especially towards the end of the AR experience. This is in alignment with the TIME framework specifically modality interactivity which states that user control and manipulation of digital objects leads to increased engagement and emotional arousal (Sundar et al., 2015). The higher SCL at final interaction stage could imply that prolonged interaction in immersive AR environments may drive stronger consumer engagement, a crucial factor that could aid luxury brands that are looking for ways to improve purchase journey through digital experiences.

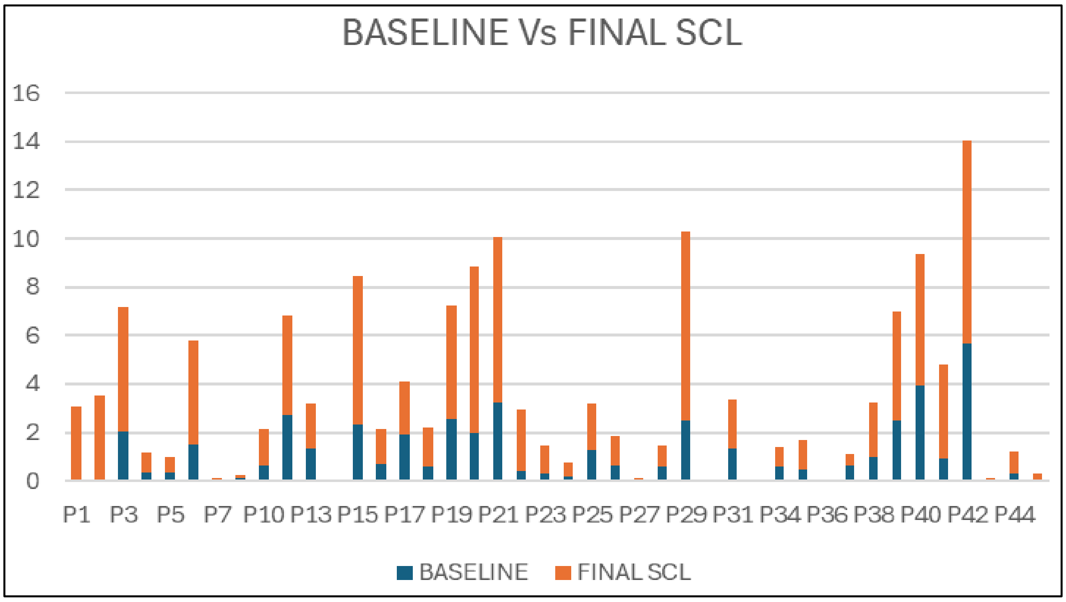

Figure 13 Stacked column chart- Baseline SCL Vs Final SCL

5.2.1.3 Validity of Paired T-test

In order to strengthen the validity of the T-test the following tests are subsequently conducted with the results as follows.

Table 5 Validity tests

Test	Baseline vs. Average SCL	Final SCL vs. Baseline SCL
Shapiro-Wilk Test	W = 0.82509, p-value = 1.588e-05	W = 0.84421, p-value = 4.5e-05
Wilcoxon Signed Rank Test	V = 873, p-value = 9.254e-10	V = 888, p-value = 6.23e-11
Alternative Hypothesis	True location shift ≠ 0	True location shift ≠ 0

The results from the Shapiro Wilk normality test for both Average SCL vs Baseline and Final SCL Vs Baseline show p value less than 0.001, indicating that the parameter of normal distribution is not true in the data. Hence, the assumption of normality needed to perform the T-test is not followed. However, given that the data is not normally distributed we further proceeded to conduct a Wilcoxon signed rank test, the non-parametric alternative to paired T-test. For both the comparison of baseline with average SCL and Final SCL the p values are less than 0.001, which indicates that differences in values between Baseline Vs Average SCL and Baseline Vs final SCL are statistically significant. With the alternative hypothesis showing that true location shift ≠ 0, the results support the alternative hypothesis H1. Hence, the findings from the paired T-test are still valid and supported by the findings.

5.2.2 Linear Mixed-Effects Model

The LMM is conducted with both Filter as a fixed effect so as to test how different AR filters affect physiological arousal, Baseline SCL as a covariate to control for individual physiological differences. The model predicting SCL during AR filter interaction includes the type of filter each participant interacted with, their baseline SCL before the experiment, and random intercepts for each participant to account for repeated measures. The null hypothesis $H0_2$ is tested here.

Modelling **SCL** as a function of:

- **Filter** (fixed effect) - what AR filter the participant interacted with
- **Baseline** - each participant's physiological arousal before the AR session
- **Participant** (random effect) - to account for repeated measures per person

The results are as follows:

Table 6 Linear Mixed Effects Model results

Predictor	Estimate	Std. Error	df	t value	p-value	Significance
(Intercept)	0.02755	0.20473	102.44	0.135	0.893210	
F10	0.28600	0.14999	722.86	1.907	0.056950	.
F11	0.33685	0.15156	722.63	2.223	0.026555	*

F12	0.33232	0.14751	722.76	2.253	0.024566	*
F13	0.44524	0.15084	722.90	2.952	0.003261	**
F14	0.39748	0.15153	722.96	2.623	0.008898	**
F15	0.51667	0.15156	722.94	3.409	0.000688	***
F16	0.48321	0.14802	722.75	3.265	0.001148	**
F17	0.57400	0.15085	722.91	3.805	0.000154	***
F18	0.58769	0.15349	722.77	3.829	0.000140	***
F19	0.59910	0.15455	722.85	3.876	0.000116	***
F2	-0.20667	0.15073	722.93	-1.371	0.170762	
F20	0.65608	0.15434	722.77	4.251	2.41e-05	***
F21	0.65919	0.15129	722.81	4.357	1.51e-05	***
F22	0.74730	0.14983	722.79	4.988	7.66e-07	***
F23	0.74111	0.15147	722.93	4.893	1.23e-06	***
F24	0.84342	0.15063	722.81	5.599	3.06e-08	***
F3	-0.07636	0.14909	723.03	-0.512	0.608686	
F4	-0.11185	0.14760	722.84	-0.758	0.448818	
F5	-0.08047	0.14709	722.82	-0.547	0.584513	
F6	0.07436	0.15068	722.92	0.493	0.621817	
F7	0.03488	0.14770	722.84	0.236	0.813362	
F8	0.20824	0.14876	722.90	1.400	0.161994	
F9	0.24100	0.14966	722.71	1.610	0.107773	
Baseline	**1.41583**	**0.09770**	**40.08**	**14.492**	**< 2e-16**	***

Random Effects:

Table 7 Random effects results

Group	Effect	Variance	Std. Dev.	Results
Participant	(Intercept)	0.6008	0.7751	Moderate variance across participants
Residual	-	0.2173	0.4662	Within-participant variation not explained by model

Participants differ in their base responses and including Participant as a random effect is justified and confirms that individual differences significantly impact arousal responses.

Fixed Effects:

Table 8 Fixed effects results

Variable	Estimate	Results
Intercept	0.02755	SCL when Filter = baseline and Baseline = 0 - not meaningful by itself

Baseline	1.41583	Strong positive effect: higher resting arousal = higher SCL during AR interaction
F10-F24	~0.28 to 0.84	Significant positive influence on SCL
F2-F9	Small or negative	No substantial effect (not significantly different from baseline filter)

Filters that significantly increased physiological arousal (SCL):

Table 9 Filters that significantly increased physiological arousal

Filter	Estimate	p-value	Results
F11-F24	~0.33-0.84	< 0.05 to < 0.001	Significantly increased SCL compared to Baseline
F13-F19	~0.45-0.60	< 0.05	Consistent arousal elevation
F20-F24	~0.65 to 0.84	< 0.05	Strongest impact on arousal - particularly F24
F24	0.84342	3.06e-08	The most arousing filter
F2-F10	NS	> 0.05	No significant effect

The key findings of the LMM shows that AR filter type significantly influenced physiological arousal. Filters F11 through F24 significantly increase physiological arousal, even after accounting for baseline. F1-F10 show no significant effect. Baseline SCL is a strong predictor of response, and it is crucial to include this covariate in this statistical analysis. F11-F24 significantly increase emotional arousal as compared to the baseline. F1-F10 and F2-F10 do not cause significantly different arousal. F24 ($p < 0.001$) causes the strongest physiological response among all filters. The LMM revealed a significant effect of AR filter type on physiological arousal through SCL, even after accounting for individual variabilities in baseline arousal. In summary, F11-F24 significantly improved SCL (estimates 0.33-0.84 µS, all $p <.05$), and when baseline was included as a covariate and the participant was regarded as a random intercept, F24 showed the highest arousal ($p <.001$).

According to the LMM, participants' physiological arousal was significantly influenced by the type of AR filter. F11 through F24 increased SCL with F24 having the biggest effect (+0.84 µS) as compared to the baseline filter. Participants with higher pre-experiment arousal (baseline) performed better overall, as evidenced by the fact that baseline arousal was a significant predictor of SCL responses (Estimate = 1.42). Lower levels of emotional engagement are implied by the lack of significant effects from F2-F9. These findings support the argument that AR try-on filters can significantly impact emotional arousal. The LMM confirm that the filter type significantly affects the emotional arousal with F11-F24 ($p <0.05$) being more effective in stimulating consumer engagement. These findings support H2, and we reject the null hypothesis H02. We accept the alternate hypothesis-

H2 → Different AR filter types significantly influence physiological arousal.

These results strengthen the TIME framework which based on modality interactivity states that gestures and immersive features enhance emotional engagement (Sundar et al., 2015). The variations in responses across filters, intimate that design features and interactivity elements are also key to enhancing physiological and emotional engagement in AR experiences.

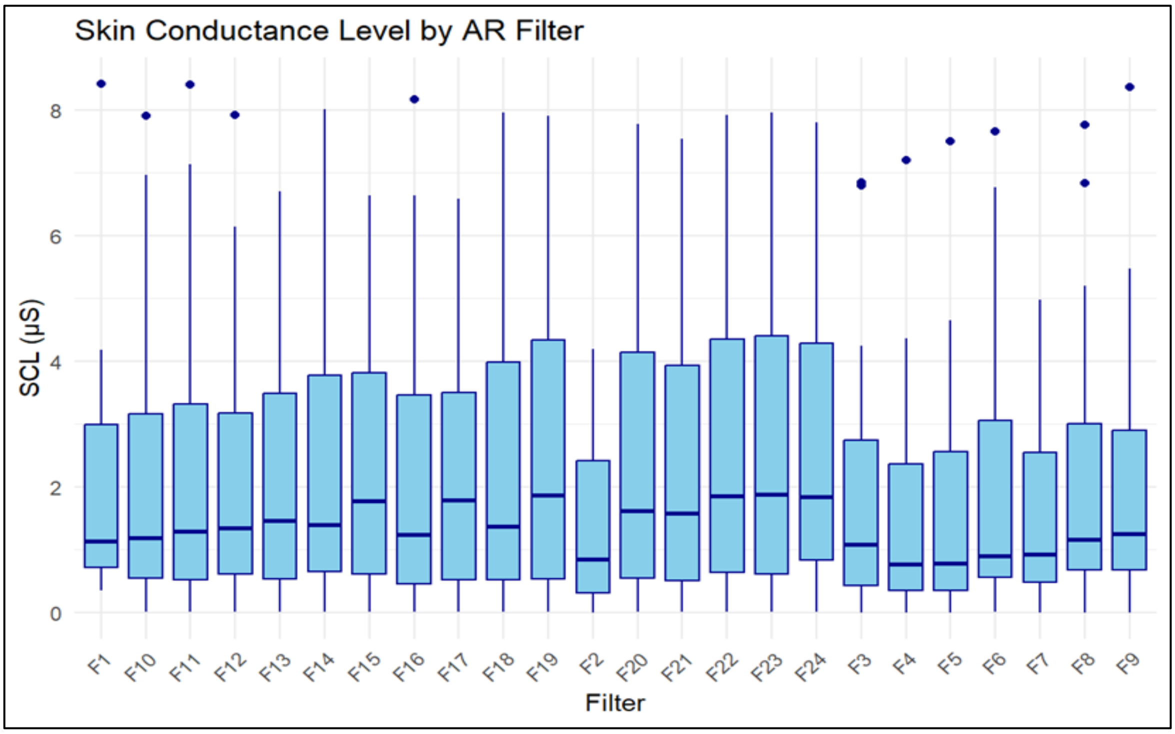

Figure 14 Skin Conductance Level by AR Filter Boxplot

Table 10 Boxplot parameters

X-axis: AR Filters (F1 to F24)
Y-axis: Skin Conductance Level (SCL) in micro-Siemens (µS)
Each Box: Distribution of SCL responses across all participants for a specific filter
Middle line (median): Central tendency of the SCL per filter
Box size (IQR): Spread of the middle 50% of values
Whiskers: Range within 1.5× IQR
Dots: Outliers (extremely high arousal responses)

Filters that show higher emotional arousal:

Table 11 Boxplot interpretation

Filter(s)	Visual Cues	Results
F20-F24	High medians, wider IQRs, upper-range outliers	Strong physiological response, most emotionally arousing filters
F17-F19	Median and spread relatively high	Also emotionally engaging, but not as much as F24
F13-F16	Slightly higher medians than earlier filters	Moderate arousal

Several filters (F1, F10, F11, F20, F21, etc.) have upper outliers above 8 µS. These represent strong individual emotional peaks, suggesting that certain participants were highly engaged by some filters, even if the overall average was not extreme. The box plot supports the conclusion that certain AR filters (notably F20–F24) consistently triggered higher emotional arousal, as reflected in elevated skin conductance levels. F2-F9 do not appear to stimulate much arousal, remaining close to baseline. This supports the statistical findings from the LMM showing significant fixed effects for the more engaging filters.

5.2.3 Methodological Learnings

Throughout the experiment design and data analysis phases of this research, key methodological learnings emerged, particularly concerning the handling of data variability and the selection of appropriate statistical techniques. Due to the high sampling rate of 100 Hz in the GSR recordings, the raw data required preprocessing. To make the data manageable and analytically meaningful, the mean value of every 100 data points was computed to generate one averaged SCL value per second for each participant. This transformation allowed for a consistent time-based structure across all datasets. One of the main challenges rose from the randomisation of the order of AR filters interacted with and the unequal number of AR filters interacted by the participants. This resulted in a dataset with participant and item variability. This limited the statistical methods like ANOVA, which requires a balanced dataset. The research analysis is done through a linear mixed effects model to account for these variabilities. A cross evaluation of GSR and participant observational data post experiment indicated certain discrepancies of data in terms of the filter interactions of the participant. As certain filters lacked engagement or due to accidental clicks and rapid skips some were unaccounted for in GSR observational data. Due to this discrepancy such filters were excluded from the dataset and calculations. This filtering was to ensure consistency in data quality, as it helped to exclude the filters that failed to produce significant observational data both in terms of GSR data and observational notes.

5.3 Comparative Analysis

In this chapter we further analyse the qualitative and quantitative data through comparative study. The comparative analysis is categorised into themes of the research– emotional arousal, consumer engagement and purchase intention. The findings are cross analysed and linked back to the theoretical framework for stronger comprehension.

Table 12 Summary of interaction durations

Category	***Details***
Experiment Session Duration	Average: 7:33 minutes Range: 2:29 – 25:28 minutes
Interaction per Filter	Average: 23 seconds (excluding baseline duration)
Participant Engagement	42 out of 45 participants Interacted with 20 out of 24 filters on average
Interview Session Duration	Average: 7:33 minutes Range: 1:28 – 11:07 minutes

5.3.1 Emotional Arousal

Table 13 Comparative Analysis - Emotional Arousal

Qualitative Findings	Quantitative Findings
Participants commonly described the AR experience as fun, exciting, and playful.	Paired T-tests showed a statistically significant increase in SCL from baseline to average and final filter exposure.
Some participants reported discomfort or insecurity, often linked to visual distortions in body representation.	SCL increase indicates heightened emotional arousal during AR interaction.
Emotional connections were often tied to visual elements (e.g., colour, texture), triggering memories or personal meaning.	Example: P18 showed a drop in arousal at F12 and a peak at F17, suggesting varied engagement.
Participants took photos wearing filters, indicating social and emotional investment.	P44 showed a steady SCL increase across filters, reflecting consistent emotional build-up.
Alignment: emotional valence (QUAL) supported by SCL rise indicating emotional arousal (QUAL)	

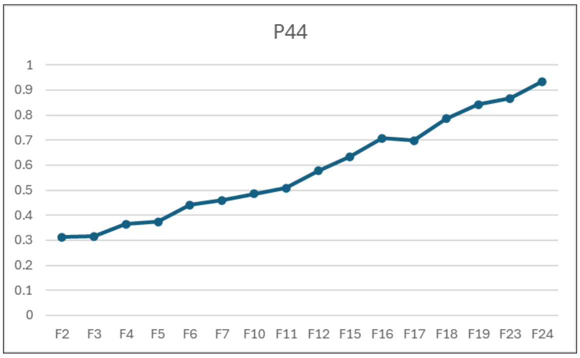

Figure 15 Participant P44 Filter Vs SCL

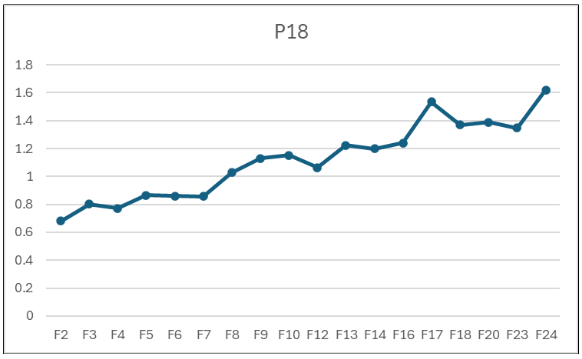

Figure 16 Participant P18 Filter VS SCL

Participants expressed positive emotional reactions consistently during the AR try-on experiment. These valence and high arousal emotional descriptors show affective states as explained by Russell's (1980) circumplex model of affect which indicates heightened pleasure and psychological engagement. Drawing upon the TIME, this sub-theme examines how consumers' emotional responses are shaped by real-time interaction with AR technology in the context of luxury fashion retail. TIME framework points that media interactivity can significantly influence psychological states, including emotional arousal (Sundar et al., 2015). The findings of this research support these theoretical claims. From a quantitative perspective, paired T-tests confirmed a statistically significant increase in SCL during the AR interaction compared to baseline. P18 showed a temporary dip in SCL around F12, followed by a sharp increase at F17 (refer to Figure 15) implying emotional variability across the experience. Similarly, P44 displayed a steady rise in SCL from F2 to F24, which shows growing emotional arousal over interaction time (refer to Figure 14). These findings are consistent with Sundar et al.'s (2015) TIME framework. Participant's ability to control and interact with the AR filters by moving, swiping, or selecting the try-on filter increased their sense of emotional immersion supporting the core theme of the TIME framework used in this research.

5.3.2 Consumer Engagement

Table 14 Comparative Analysis - Consumer engagement

Qualitative Findings	Quantitative Findings
Participants described the AR try-on experience as “immersive,” “engaging,” and “new.”	Sustained average SCL levels indicate consistent engagement throughout the AR experience.
Some participants reported losing track of time, suggesting deep cognitive and emotional involvement.	Mixed effects model shows F11–F24 significantly increased SCL, while F2–F10 had no significant effect.
Interaction with unexpected or gender-incongruent garments led to exploration beyond norms especially for male participants.	Participant P8 showed fluctuating SCL, indicating variable engagement; P14 had steady low SCL, implying stable but lower involvement.
Animated effects were divisive. Some found them engaging and others distracting.	SCL data supports that participant engagement varies across filters, confirming the influence of content and design.
Alignment: Engagement themes in interviews (QUAL) are supported by sustained physiological responses (QUAN), confirming that AR filter interaction-maintained consumer engagement.	

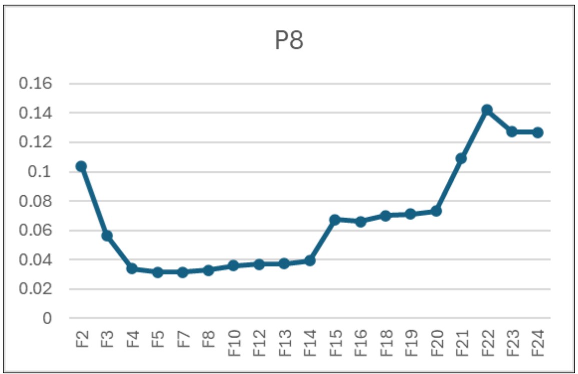

Figure 17 Participant P8 Filter Vs SCL

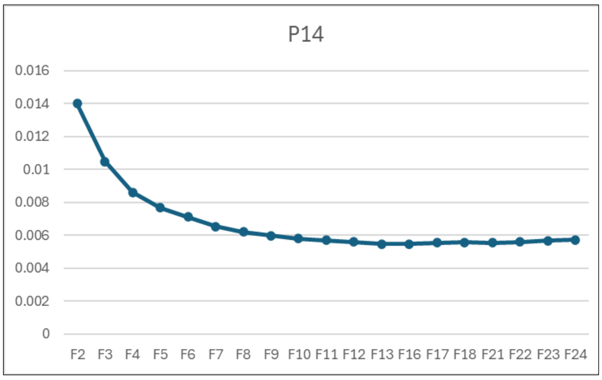

Figure 18 Participant P14 Filter Vs SCL

Participants described their AR experiences with movement and interaction, by manipulating the AR try-on filters of clothing, creating a heightened sense of engagement. These elements align with the TIME, particularly the modality Interactivity, which emphasises the role of users’ ability to manipulate media content, feeling immersed, as a key determinant of emotional engagement and behavioural responses (Sundar et al., 2015). During their AR experience some participants reported losing track of time, which is indicative of a flow state that is linked to high consumer satisfaction and engagement in interactive environments. Participants experimented with clothing that deviated from their usual preferences- male participants explored AR try-on clothing of the opposing sex. This showed the willingness to experimentation and playful potential of AR interfaces. Quantitative analysis through the linear mixed effects model further supports these findings. F11-F24 showed significantly increased skin conductance which shows a sustained physiological engagement. While other filters did not respond accordingly, indicating that not all designs or interactivity content are equally engaging. Participant P14 (refer Figure 17) showed a relatively stable SCL after an initial drop in value, while P8 (refer Figure 16) showed fluctuating SCL's, implies a possibility of variable engagement throughout the interaction. These findings align with Sundar et al.'s (2015) claim that media content and design quality can regulate the effectiveness of interactive engagement. These findings also reflect the observations by Javornik(2016b), who highlights that AR experiences can transport consumers into states of enhanced attentiveness and flow, with realistic and personalised interactive content.

5.3.3 Purchase Intention

Table 15 Comparative Analysis - Purchase Intention

Qualitative Findings	Quantitative Findings
AR was seen as a support tool for decision-making (e.g., fit, style), not a direct purchase trigger.	Elevated SCL values observed on final filters may indicate cumulative engagement.
Participants used the word "help" frequently, showing AR's utility in pre-purchase exploration.	For P6, high SCL on F24 aligned with stated purchase interest.
Some expressed caution with buying expensive items without physical try-on.	For P19, moderate SCL elevation on F13 and F17 matched declared purchase intention.
AR was sometimes seen as playful or performative rather than transactional.	SCL patterns support emotional arousal, but intent to purchase remains influenced by other factors.
Alignment: Purchase intention (QUAL) is nuanced by emotional arousal (QUAN), suggesting AR influences consideration but not necessarily direct conversion.	

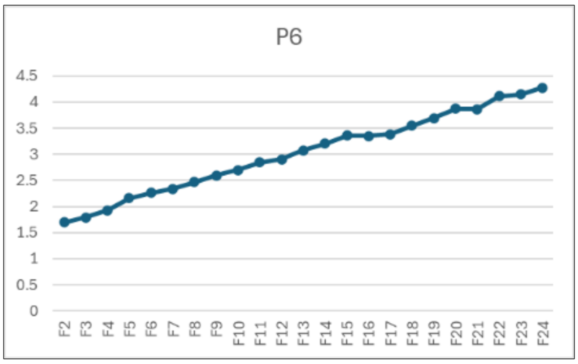

Figure 19 Participant P6 Filter Vs SCL

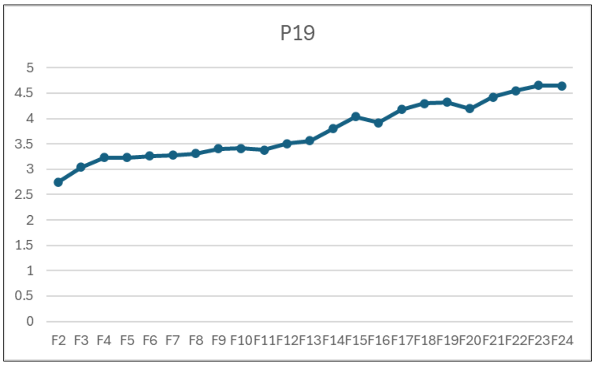

Figure 20 Participant P19 Filter Vs SCL

Participants described the AR try-on as a functional and supportive tool in luxury fashion retail in the purchasing process, rather than a direct driver of purchase in terms of style exploration, fitting and product exploration. This aligns with Sundar et al.'s (2015) argument that while modality interactivity elevates digital experiences, it may not fully replicate the depth of sensory engagement available in physical shopping. This practical and explorative approach towards AR aligns with findings by Scholz and Duffy (2018), who highlights that AR technology can help with the decision making in pre-purchasing process while it does not necessarily convert into impulse purchases. Poushneh and Vasquez-Parraga (2017) emphasise on the role of AR in enhancing decision making especially in high involvement product ranges like fashion. From a quantitative perspective, while the findings show a cumulative emotional engagement across the experience, purchase intent, however, cannot be directly measured through physiological data. While this may be the case, our research pointed to cases where there is a notable correlation between participant’s self-reported purchase intention and peaks in SCL, which is seen in the case of participants P6 (refer Figure 18) and P19 (refer Figure 19). For these two cases, the peaks in SCL during specific filters, F24 and F17, align with the expressions of purchase intent, providing an indirect physiological support for consumer purchase intention.

5.3.4 Overview of Comparative analysis

Table 16 Comparative analysis overview

Theme	Qualitative Insight	Quantitative Support	Interpretation
Emotional Arousal	Participants described excitement, fun, and curiosity. Negative affect tied to body distortions and fit issues.	Statistically significant SCL increase from baseline to AR interaction.	Positive valence and high arousal confirm deep emotional engagement.
Consumer Engagement	Perceived as immersive and novel. Participants explored filters beyond social norms.	Sustained SCL across F11–F24.	Engagement varies by filter realism and alignment with consumer identity.
Purchase Intention	Viewed as a helpful tool rather than a trigger for purchase, used for pre-selection and exploration.	Elevated SCL at final filters (F24, F17).	AR serves more as a bridge to consideration than a direct driver of purchase in luxury contexts.

The comparative analysis of qualitative findings and quantitative findings reveals that AR try-on experience in luxury fashion retail showed significant levels of emotional and cognitive engagement, while being supported by the framework TIME (Sundar et al., 2015). The framework helps to navigate through and interpret the dual perspectives of subjective and physiological responses observed in the research. However, studies showed that self-reported arousal did not correlate significantly with its physiological counterpart, a finding that has been consistently reported in previous research (Ciuk et al., 2015), which is consistent with our findings, as it does not point to a strong correlation in some cases of the study. This division implies that while consumers may perceive emotional engagement, the physiological responses may follow prominent patterns, which reinforces the need for multimodal measures when evaluating interactive media. In conclusion, the findings support the TIME framework and reveals that AR based modality interactivity enhances emotional arousal and engagement, even when participants do not report it consciously.

6 Discussion

The discussion chapter interprets the research findings in the context of existing literature and the theoretical framework. It highlights how AR try-on experiences influence emotional arousal, consumer engagement, and potential purchase behaviour. Drawing on the TIME framework, the chapter critically reflects on the role of modality interactivity in shaping consumer responses and situates the findings within broader debates on digital innovation in luxury fashion.

The research studied the effects of AR try-on filters in luxury fashion retail by combining physiological data, observational notes, and participant interviews. The results showed a consistent increase in emotional arousal indicated by SCL data, high consumer engagement and mixed expressions of purchase intentions revealed by thematic analysis of interviews. These findings are interpreted through the framework of TIME, specifically modality interactivity (Sundar et al., 2015), and provided an in-depth analysis into how consumers emotionally and cognitively engage with interactive technologies in the context of luxury fashion retail. While the AR experience was primarily positively received, however, occasional feelings of discomfort were also observed. Even so, the participants were engaged which showed that AR's novelty and interactivity was able to prolong consumer attention despite minor setbacks.

6.1 Emotional Arousal

The findings suggest that emotional arousal during AR try-on experiences is shaped by both immediate affective reactions and deeper psychological associations. Participants engaged playfully with the technology, highlighting the low-stakes environment AR creates, one that enables self-expression and experimentation without the social or financial pressures of physical retail. Positive emotions were frequently triggered by alignment between virtual garments and personal aesthetic preferences, implying that emotional resonance stems not only from technological novelty, but also from content relevance and user identification. Instead, garment design, interface clarity, and personal relevance emerged as more decisive factors.

Some participants also reported negative or ambivalent emotions, such as discomfort, insecurity, or boredom. These were largely associated with technical limitations (e.g. poor garment fit, visual clipping) or mismatched expectations, particularly when the interface felt overly familiar or insufficiently immersive. These emotional reactions can be further interpreted through Russell's (1980) circumplex model of affect, which maps emotions across dimensions of arousal and valence. The fun, curiosity, and excitement reported by participants reflect high-arousal, positive-valence states, suggesting that AR try-ons can produce energised, psychologically engaging experiences. Conversely, feelings of discomfort or insecurity point to lower-valence states, often tied to moments of misalignment between consumer expectations and visual output. Notably, these negative responses were frequently rooted in self-perception, indicating the psychological sensitivity of embodied digital interaction.

The statistical findings revealed significant increases in SCL from baseline to both average and final filter interactions, which confirms an increase in physiological arousal. The level of change particularly in the stronger increase in the final filter criteria, suggests that cumulative interaction with AR may heightens the emotional arousal over time. This finding is also consistent with Scholz and Duffy (2018), who argue that AR experiences are emotionally resonant due to their mix of novelty and personalised content. Emotional reactions are also reflected by deeper psychological and symbolic meanings, in our research specific filters triggered memories or cultural associations. Responses of participants P18 and P44 showed these instances. These patterns are also convened through Vecchiato et al. (2010), who showed that sudden changes in GSR often reflect cognitive and emotional processing of personally significant stimuli. The research by Negm (2024) highlights AR's realism and interactivity contribute to both hedonic and utilitarian values which in turn affect consumer behaviour, The physiological data from our study support this, showing that AR try-on experience not only captures the attention of consumers but is also able to evoke emotional responses that can be meaningful and personal.

6.2 Consumer Engagement

The findings show that consumer engagement during AR try-on experiences is shaped by the interplay between consumer's ability to interact with the filters, their sense of personal agency, and the contextual relevance of the experience. Participants engaged playfully and kinaesthetically with the filters, often moving their bodies to view garments in motion. Contrary to prior claims that first-time users must "understand" the technology before it becomes meaningful (Söderström et al., 2023), our research found little disorientation among those unfamiliar with full-body AR. Furthermore, our participant sample reported not being new to the AR technology, outside the context of fashion, challenging the notion that novelty alone drives engagement (Yim, Chu and Sauer, 2017).

Notably, a few participants mentioned feeling rushed before starting the experiment, with only 20 to 25 minutes allocated for the task. Despite this, many reported losing track of time while interacting with the AR filters. This phenomenon implies that the immersive and emotionally engaging nature of the AR experience altered their perception of time passing, making it feel slower. This observation aligns with Angrilli et al. (1997), who argued that emotionally arousing stimuli can lead to a slowed perception of time because the arousal can override cognitive mechanisms involved in time perception, leading to distortions in how time is subjectively experienced. The interactive aspects of AR thus appear to encourage deeper engagement than participants initially anticipated, highlighting a key experiential dimension of consumer involvement.

Engagement, however, was not uniform. While some filters enhanced immersion, others were described as visually noisy or distracting. Nawres et al. (2024) claim that affective engagement is linked to interface smoothness and content quality is supported here. Nonetheless, participants who experienced discomfort or disappointment often still expressed interest in using the filters again or believed they could motivate a future purchase. This aligns with Soon, Lim and Gaur (2023), who found that negative emotional responses do not necessarily reduce willingness to engage with AR applications. In addition to these emotional responses, personal identity also shaped how participants interacted with the filters. One male-identifying participant, for example, explicitly avoided interacting with designs he associated with femininity. Such moments echo Lau et al.'s (2023) argument that self-identity and social identity are critical to shaping attitudes and brand appeal, especially in luxury fashion and through social media channels.

GSR measurements also showed sustained engagement throughout the AR experience. The mixed effects model showed significant increases in SCL for F11-F24, which implies that certain AR content features like visualisation and the design animation could play a role in capturing the consumer attention and maintaining the engagement. This observation is consistent with the study by Nikhashemi et al. (2021), whose findings reported that interactivity in AR applications significantly influence consumer attitudes and behavioural intentions. This was further highlighted by McLean and Wilson (2019) that AR's immersive qualities could improve the flow and experience which leads to stronger and deeper consumer engagement. The TIME framework further supports these findings that interactivity in digital media can build a sense of immersion and instancy which are important components of user engagement in interactive media.

6.3 Purchase Intention

The findings show that AR try-ons support purchase intention in luxury fashion not through direct persuasion, but by enhancing product discovery and facilitating decision-making. Although research by Sohn et al. (2015) implies that both high positive and negative arousal can lead to increased impulsive decisions in purchasing, linked to reduced activity in cognitive control regions, such effects were not strongly evident in this research. Participants often described AR as "helpful" rather than persuasive, indicating that its value lies in reducing uncertainty, aiding pre-selection, and lowering the cognitive load of luxury shopping. This aligns with Söderström et al. (2024) which states that first-time users often engage with AR tools for utilitarian reasons, rather than entertainment. Some categories like footwear, in which sizing familiarity matters, were considered more suitable for virtual evaluation, while high-involvement products such as eyewear still demanded physical interaction. Unlike our participants, Batat (2024) reports that virtual try-on technology, especially for eyewear and watches, is valued as a persuasive aid in decision-making within the metaverse. This discrepancy may reflect differences in consumer populations, technology maturity, or product categories, and highlights the need for further research to clarify the conditions under which AR technologies can shift from being primarily supportive tools to more directly persuasive influences in luxury retail contexts.

These insights highlight that digital convenience alone is often insufficient to drive commitment, particularly considering the symbolic and financial stakes of luxury consumption. As Nawres et al. (2024) argue, seamless AR experiences heighten emotional and cognitive engagement, laying the groundwork for future behavioural outcomes, even in the absence of impulse purchases. Notably, initial hesitation or discomfort often subsided with increased exposure, suggesting that interface acclimatisation can temper affective resistance over time. In such cases, product informativeness plays a crucial role in enhancing consumers' decision confidence and perceived usefulness (Söderström et al., 2024). While most participants described the experience as intuitive, these insights underscore the importance of interface clarity and pacing to minimise cognitive friction and support sustained engagement.

Our results showed that purchase intention was ambiguous than emotional arousal or consumer engagement. AR was characterised by the participants as a useful tool that may help them during their shopping process. The study by Poushneh and Vasquez-Parraga (2017) supports this, arguing that although AR raises perceived utility and enjoyment, it does not always result in impulse purchase. Quantitatively, elevated SCL's during certain filters (F17, F24) was observed and participants expressed purchase intent (P6, P19) shows that emotional arousal may correlate with purchase intent. However, direct measurement of purchase intention through physiological data is challenging as no causal link can be formed. Sozer's (2021) research indicates that AR applications improve decision-making and reduce perceived risk, which in turn influences purchasing intentions. Negm (2024) also highlights how both hedonic and utilitarian values derived from AR experiences impact brand engagement and purchase intentions. In line with the research by Leonnard, Paramita and Maulidiani (2019), the virtual presence in AR experiences have a significant impact on perceived enjoyment and utility, which can influence purchase intentions. Our findings support previous studies by showing that AR experiences have the potential to close the gap between consumer interest and purchase intention.

7 Conclusion

The final chapter summarises the main findings and contributions of the thesis. It revisits the research questions, outlines the theoretical and managerial implications, and highlights how AR can enhance luxury fashion retail experiences through emotional and interactive engagement for consumers. The chapter also reflects on the research's limitations and offers suggestions for future research, particularly in extending the use of physiological metrics in immersive retail environments.

This thesis set out to explore how AR try-on technology in luxury fashion retail influences consumer engagement, emotional arousal, and purchase intention. By adopting the TIME framework, with a particular emphasis on modality interactivity, the research examined how immersive AR environments can shape both emotional and behavioural responses within the context of luxury fashion retail. The research was explorative and used a convergent parallel design, by combining physiological measures like GSR with qualitative observations and short structured interviews. This methodological approach helped us to understand the real-time consumer reactions to AR interactions by integrating the physiological data with subjective experience from observational notes and interviews.

Two research questions guided the study:

RQ1→ How does AR for luxury clothing try-on experiences influence emotional arousal, consumer engagement, and purchase intention?

RQ2→ How can luxury brands optimise AR try-on experiences as a marketing tool to enhance the overall consumer experience?

Findings showed that AR try-on experiences show measurable physiological responses associated with emotional arousal. However, as physiological measures such as GSR are limited to detecting the intensity of arousal without indicating emotional valence, they cannot determine whether a response is positive or negative. To address this limitation, qualitative data was collected through observation notes and short structured interviews, which offered insights into participants' subjective interpretations and affective experiences. They reported heightened immersion, curiosity, and satisfaction, responses that were closely linked to perceived realism, the aesthetic appeal of the digital garments, and the novelty of the AR experience, all elements particularly notable in the context of luxury branding.

By addressing a clear gap in the literature, the limited empirical focus on AR in luxury retail and the overreliance on self-reported data, the research contributes to a more well-rounded understanding of digital consumer engagement. In doing so, this research highlights the potential of AR not merely as a functional retail tool but as a tool capable of reshaping emotional perception and deepening brand interaction. As luxury brands continue to navigate digital transformation, understanding the psychological and experiential dimensions of AR will be essential for maintaining relevance and emotional resonance in an increasingly digitalised consumer landscape.

7.1 Theoretical Implications

This thesis deepens the understanding of digital technology and how it affects emotional and cognitive functioning. Within the framework of TIME theory, the research focuses on the model of interactive modality in the context of AR experiences and luxury fashion retail. The research findings support the TIME framework focused on the theory that increased interactivity leads to increased emotional and cognitive engagement. The research contributes to the alignment of modality interactivity of the TIME framework through both qualitative and quantitative results. The paired T-test, Linear mixed effects model revealed a statistically significant increase in SCL during the AR try-on experience confirming through the theory that gestures, touch and visual manipulation which resulted in higher emotional arousal.

The findings are also in alignment with Sundar et al. (2015), who states that modality interactivity which is induced by touch, gesture and object manipulation in turn increases the media engagement by increasing the perceptual bandwidth. More significantly, this research extends Sundar et al.'s (2015) theory by showing that modality interactivity is not only a subjective or self-reported measure, but also measurable through objective physiological data. Previous studies by Vecchiato et al. (2010) have shown the relevance of GSR in emotional marketing contexts, but only a few studies have directly tied it to interactivity theory in AR retail spaces. This study shows physiological data validation to the TIME framework in the domain of fashion marketing. GSR data provides insight into these physiological shifts, which TIME positions as central to user engagement. Thus, rather than emotions merely producing bodily effects, this framework supports a model in which the body's automatic responses constitute the emotional experience itself, especially within immersive contexts.

The research contributes to a more significant understanding of interactivity effects based on the content design of AR. As the linear mixed effects model revealed certain filters that showed significant increases in SCL while some did not, this shows that design quality, visual realism and immersion of the AR content or experience affect the emotional arousal and participant engagement where different forms of modality interactivity have varied effects. The finding adds to the theory by focusing on the qualitative differences in interactivity modality, also implying that future models of interactive media effects should consider the design quality and content of the media as some parameters. In the study by Javornik (2016b) states that realism in AR can significantly impact the flow a behavioural response, while research done by Yim, Chu and Sauer (2017) highlights that realism and interactivity must work hand in hand to increase the consumer engagement. Our findings align with these, showing that interactivity must be both technically immersive and designed to suit personalised preferences to achieve a stronger consumer engagement in luxury AR fashion retail.

The research is able to expand the focus of the theory on traditional screen based or gaming contexts to consumer marketing and e-commerce. The findings validate the need of the theory in highly interactive and sensory enhanced settings suggesting its use in order to understand consumer to media interactions in AR experiences. The thesis contributes to the expansion of TIME applicability into consumer marketing and luxury retail. Based on the study by Ko, Costello and Taylor (2019) the luxury segment is categorised by exclusivity, sensory elements and emotional branding which aligns with the findings that AR technology is able to recreate elements of emotional branding through immersive interactive experiences. The research contributes to consumer behaviour studies by integrating the physiological responses with thematic analysis, combining psychological theory and marketing. Studies have called for using biometric measures like physiological metrics to explore real time emotional engagement data (Pozharliev De Angelis and Rossi, 2022).

7.2 Managerial Implications

The research provides insights for the field of marketing, digital technology, and luxury fashion brands who wish to use AR as a tool to improve consumer engagement and increase their purchase intention. According to the results of the linear mixed effects model, some filters had little to no impact on emotional arousal, while others had a significant impact. This methodological approach provides a vigorous and significant understanding of how various AR features can influence emotional arousal. This goes to show that AR experiences are quite varied in their effectiveness and are dependent on how they are designed and visually appealing. Filters with higher visual realism and interactivity tend to promote stronger emotional responses.

In luxury fashion where personalised experiences become key to brand loyalty, AR could offer recommendations and provide the unique opportunity for virtual fitting, styling, and personal shopping. As the research findings point to an overall positive reinforcement with the significant increase in emotional arousal from the interactive AR experience, luxury brands and retailers can utilise AR as a strategic engagement tool in marketing. With the increase in digital technology marketing through which AR try-ons narrows the gap between online and in-store experiences, AR can enhance consumer shopping journey. By integrating AR experiences in e-commerce platforms and physical retail stores, brands can significantly improve their brand engagement.

When considering the applicability of this technology to luxury brands, the ease of access and low barriers to entry certainly work in its favour. However, a more nuanced consideration arises when applying AR filters to emerging or smaller fashion brands. Our own experience of creating custom filters revealed the technical expertise required for their development. While luxury brands may have the resources and expertise to design sophisticated AR filters, smaller or emerging designers may face challenges in terms of both the technical knowledge and financial investment required to create and implement such technology. Therefore, while AR has the potential to democratise fashion experiences, it may simultaneously reinforce the divide between larger, established brands and newer, smaller players in the market.

7.3 Limitations

Several limitations of this research should be considered. Due to the small sample size and the lack of diversity in terms of age, technological knowledge and luxury consumer profiles, the findings cannot be generalised. The physical laboratory setup of the research environment may also have influenced participants’ experiences. The lighting was suboptimal, potentially affecting the visibility and realism of the virtual garments. Furthermore, the phone set up capturing the try-ons was not adjusted for participants' individual heights, which may have impacted the accuracy of the AR tracking and how the garments appeared on different body types.

There were occasional deviations due to technical issues due to the GSR equipment which may have interfered with the participant's overall experience. Another limitation of the research relates to the type of clothing participants wore during the experiment. While participants were advised to wear tight-fitting clothes to ensure optimal tracking of the AR filters, not all followed this recommendation. Some participants expressed uncertainty about whether the fit of their clothing impacted their experience with the AR try-ons. This issue may have contributed to frustration and negative self-perception, as the virtual garments did not fit as expected. These factors could have affected participants' engagement with the technology and their emotional responses, influencing purchase intentions.

Another limitation lies in the conceptualisation of luxury and immersion. The term “engaging” was occasionally used interchangeably with “immersive” throughout the interviews. Given that each participant had a different baseline of understanding, “engaging” was used by the researcher in instances where participants were unclear about “immersion”. While these concepts are related, they are not identical, and this interchangeability may have introduced inconsistency in the thematic coding process.

The findings are influenced by the subjective nature of participants' narratives. Participants’ responses may have been shaped by memory limitations, social desirability, or the specific context in which the interviews took place. It is possible that some participants forgot to mention certain aspects or would have expressed different views at another time. Participants who were known to the researcher were likely more comfortable and therefore provided more verbal commentary, whereas those less familiar with the researcher were less expressive. This difference may have affected the richness and accuracy of the data collected. In line with the interpretive nature of qualitative research, these biases were addressed through a transparent coding process and reflexive engagement with the data.

While GSR is able to provide real-time physiological data, it is susceptible to external interference. Technical malfunctions, inconsistent sensor placement, or skin conductivity issues may have introduced noise into the data. The experiment’s filter presentation order was randomised, and participants interacted with varying numbers of filters for differing durations. This created an unbalanced dataset that limited the use of more traditional statistical tests like ANOVA. To account for this variability, a LMM was employed. However, this model, while statistically appropriate, still assumes that certain distributions and may not fully capture the complex interactions between filter design and emotional response.

7.4 Future Research

Future studies would benefit from engaging a broader and more diverse participant pool, including individuals with prior experience in digital fashion and AR filters. Comparing responses between novice and experienced users could offer a more nuanced understanding of user engagement with AR technology. Additionally, future research should explore the optimal number of AR filters for luxury brands, balancing exclusivity with consumer desire for variety, especially given the speed and ease of AR try-ons. Investigating this trade-off will provide valuable insights into how AR filter offerings influence consumer behaviour in the luxury fashion context. The current research limits the physiological data to SCL, however future research could explore and benefit by including more measurement parametric such as heart rate, temperature and other physiological metrics that could contribute to a more nuanced understanding through for psychological behavioural research.

Another research direction will be sampling in shopping malls which could provide more ecologically valid data. This could enhance participant's experience through a real-world shopping setting. Since the current research focuses on clothing, future studies could explore additional product categories to produce more generalisable findings. Research into different media supports offering AR, such as smart screens in retail settings, could also be an interesting avenue for AR marketing scholars. Moreover, future studies could examine cross-cultural engagement with AR fashion technologies, exploring how cultural backgrounds influence garment preferences, emotional responses, and interaction styles. Observations from this study suggest participants from diverse cultural contexts may respond differently to garment colours, styles, and filter engagement levels. Given the current international market, a more systematic investigation of these differences could uncover valuable insights for brands aiming to tailor AR experiences to diverse consumer groups. While this study captures immediate emotional and behavioural responses to AR try-on experiences, it does not address their long-term effects on consumer attitudes, brand loyalty, or repeat purchase behaviour. Future research could explore how emotional engagement evolves over time and whether initial arousal translates into sustained brand connection. A study involving post-experiment sessions conducted several days or weeks later could provide insights into memory retention, changes in purchase intention, and long-term consumer perception of AR interactions.

8 Appendix

8.1 Appendix A: AR try-on filter

Ciszere's marketing campaign as part of the Digital Marketing and Communication course at the University of Borås.

Figure 21 Ciszere's AR try-on filter (Created by Fyona Robert, 2024)

8.2 Appendix B: Descriptive documentation of the trials

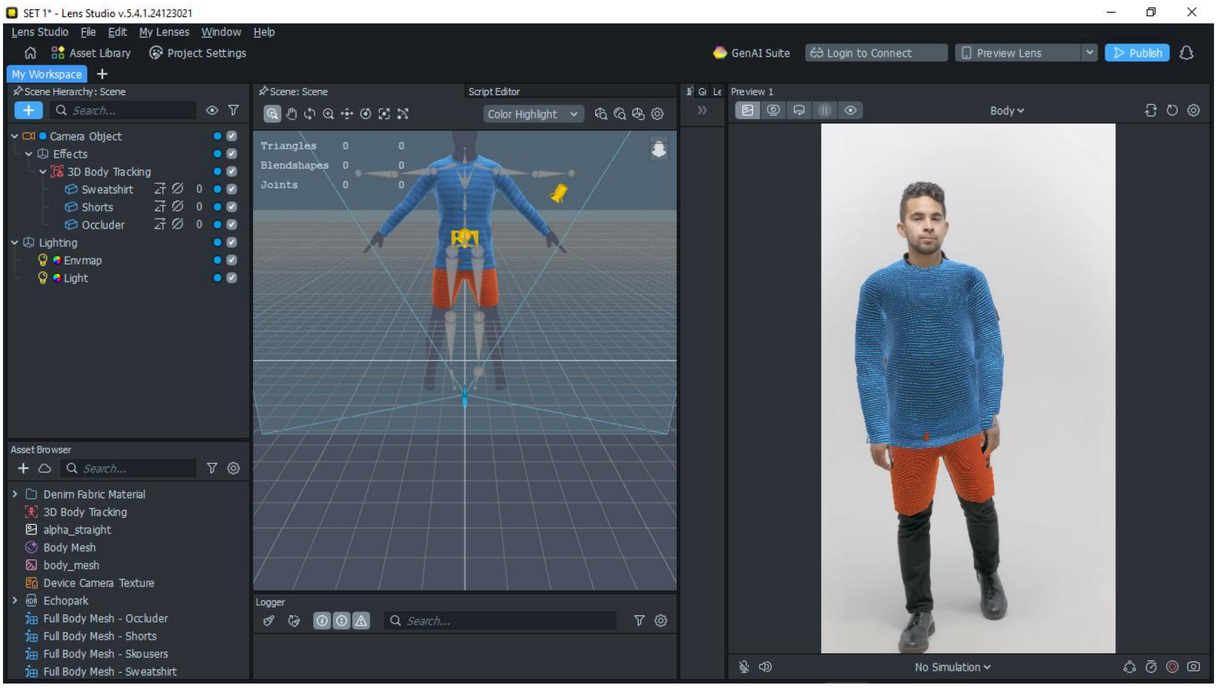

Figure 22 3D full-body tracking in Lens Studio

A tech pack was obtained from the software's library, which provided a starting point for garment implementation. To ensure a broader and more relevant range of garments for our project, we turned to WGSN 3D CAD's library. However, even with this resource, the options remained limited, as the library featured only generic models rather than recognised luxury brands, which we assume is due to its open-source nature. While it meant no concerns regarding copyright, it raised the question of whether participants would perceive the garments as luxury without the presence of branding.

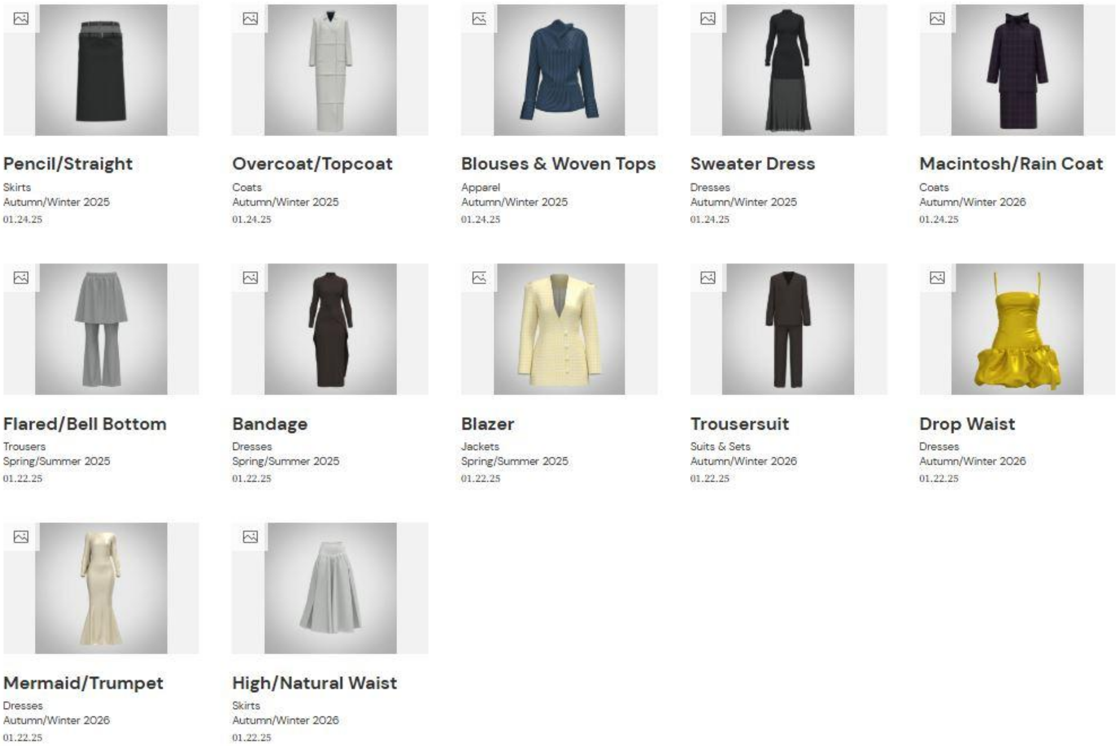

Figure 23 3D CADs from WGSN

The first trial involved the Flared/Bell Bottom trousers. We took into consideration Lens Studio's technical constraints of a maximum file size of 8 MB and a limit of 60,000 triangles per mesh, including joints or skinning (Snap for Developers, n.d.). Upon import, the garment significantly exceeded these constraints, with a face count of 578,004 triangles. Furthermore, the garment was found to be significantly larger than Lens Studio's body mesh. Hence, it required adjustments in Blender before reintegration into Lens Studio.

To address this, we consulted ChatGPT, prompting: "How can we reduce the number of polygons in a garment?" The response suggested using Blender's Decimate Modifier, with the following instructions: "With your model selected, go to the Modifier Properties tab and add the Decimate Modifier. Adjust the Ratio slider to reduce polygons while maintaining quality." Following this guidance, we set the ratio to 0.10, reducing the polygon count to 57,799 and scaled the .obj file down to appropriate dimensions. However, despite these modifications we believed the fit and overall appearance remained unsatisfactory, raising concerns regarding the feasibility of adapting pre-existing garments within these constraints.

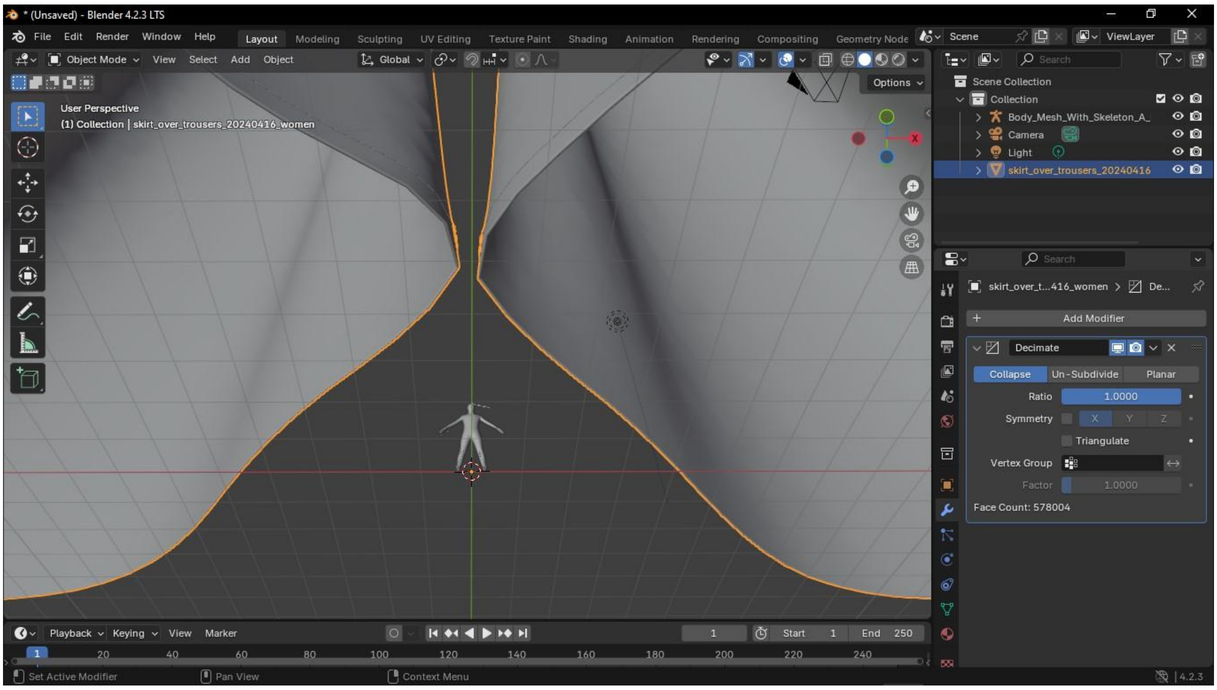

Figure 24 Flared/Bell Bottom trousers adjustments in Blender

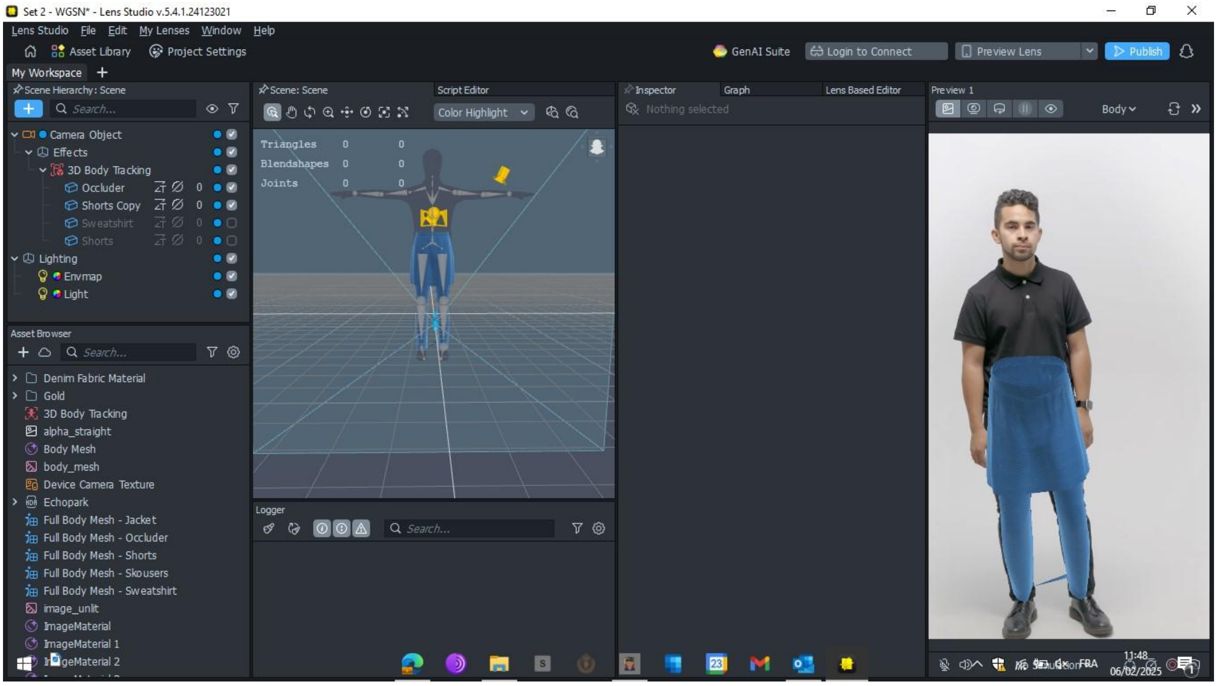

Figure 25 Flared/Bell Bottom trousers adjustments in Lens Studio

In response to these limitations, the project shifted towards creating garments in Clo3D, which we assumed would allow us for greater control over design and fit. Although we had no prior experience with Clo3D, the learning curve was approximately one week, during which the primary objective was to develop garments that would be perceived as luxurious by consumers. A key challenge was recognising that AR might restricts an accurate reproduction and that, for many individuals unfamiliar with materials and couture construction techniques, garments would only be recognised as luxury through logos. Hence, we planned to focus on designs that were more elaborate and visually striking.

The initial trial aimed to ensure a proper fit with Lens Studio's body mesh using a Macintosh/Raincoat from WGSN. To achieve this, the Snapchat-provided body mesh in a T-pose was converted into an avatar within Clo3D, using Clo Skin Style to improve the accuracy of the garment's fit. This method seemed to demonstrate a notable enhancement in the realism and adaptability of the garment, suggesting that a Clo3D-based workflow could provide a viable solution for creating customised, high-quality digital fashion in AR environments.

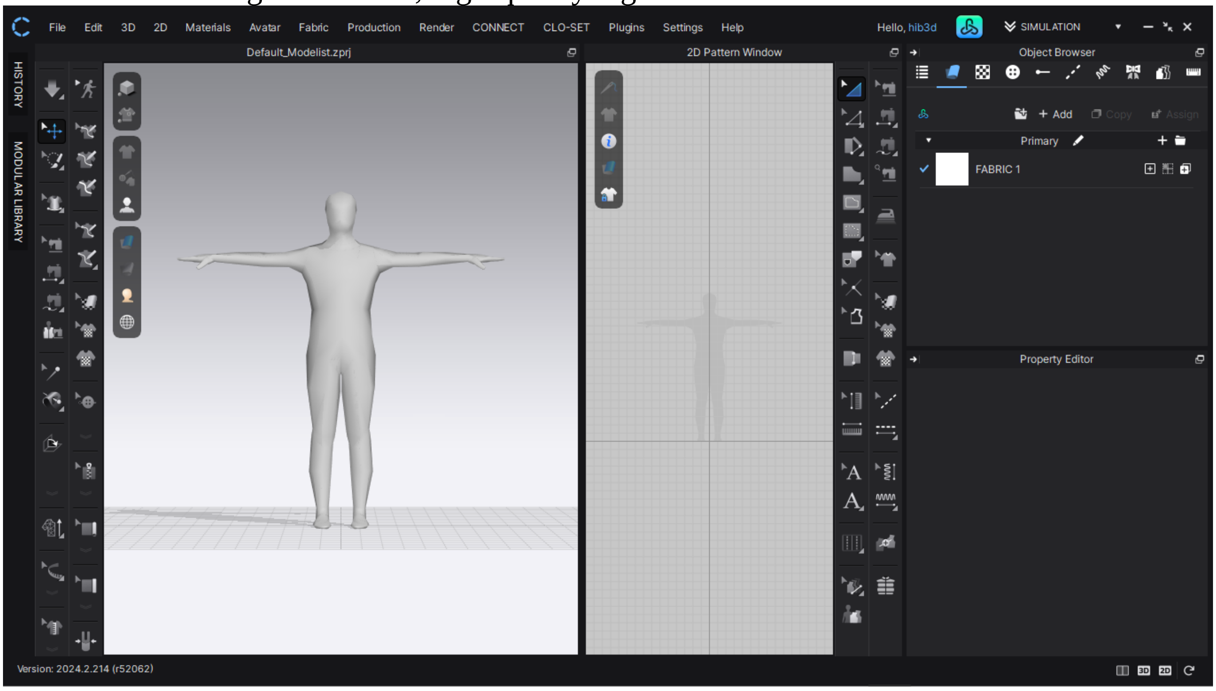

Figure 26 Snapchat-provided body mesh in a T-pose in Clo3D

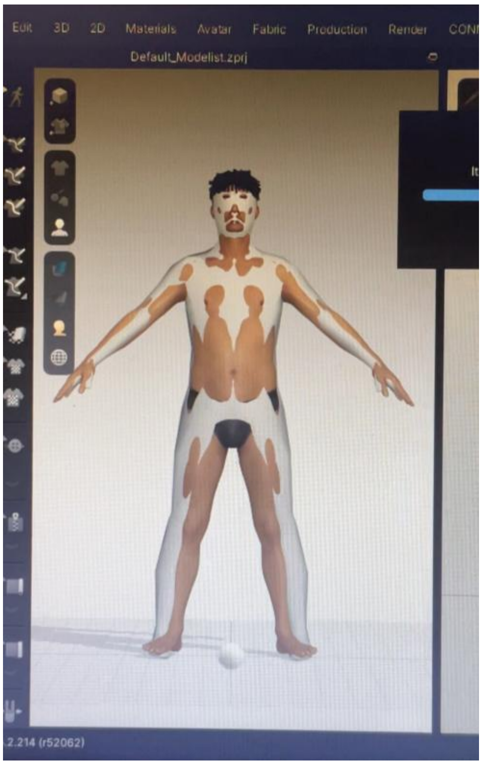

Figure 27 Male avatar conversion

Figure 28 Male converted avatar wearing a Macintosh/Raincoat from WGSN

To enhance garment fit and mitigate distortions in the body mesh, the avatar was converted a second time. Due to the complexity of working with sleeves, an alternative garment, a Leather Vest pattern, was selected. Additionally, various poses available in Connect Assets were explored to assess their impact on the garment's fit when applied to the newly converted avatar.

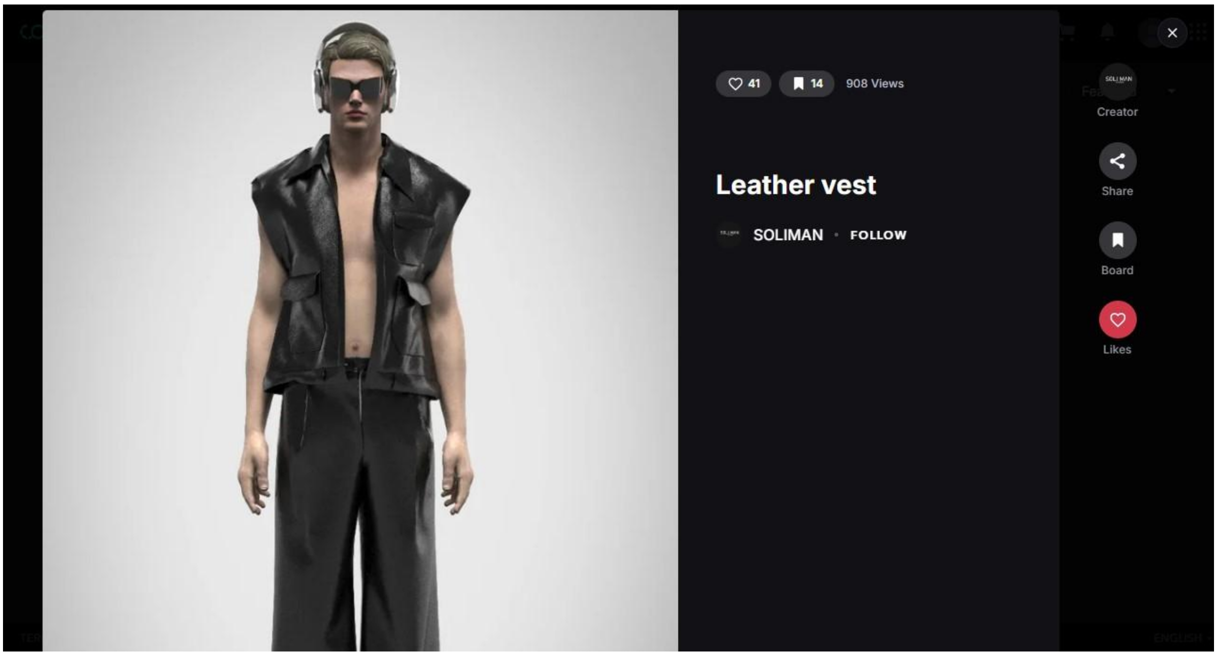

Figure 29 Leather vest (SOLIMAN, 2024)

Figure 30 New avatar converted wearing a leather vest

Before pursuing with the design process, we wanted to ensure that it would successfully be imported into Lens Studio, through EveryWear, “a feature package that optimizes garments made in CLO and Marvelous Designer for digital spaces like gaming, metaverse, and entertainment” (CONNECT CLO-SET, n.d.). The process of exporting garments from Clo3D through EveryWear required to pack the UVs as bake the Normal Map, which we initially carried out manually, referring to a YouTube tutorial (My Dress Patterns, 2021); however, it took two days to find out that this step could be automated within Clo3D thanks to another tutorial from Clo itself (CLO, 2024).

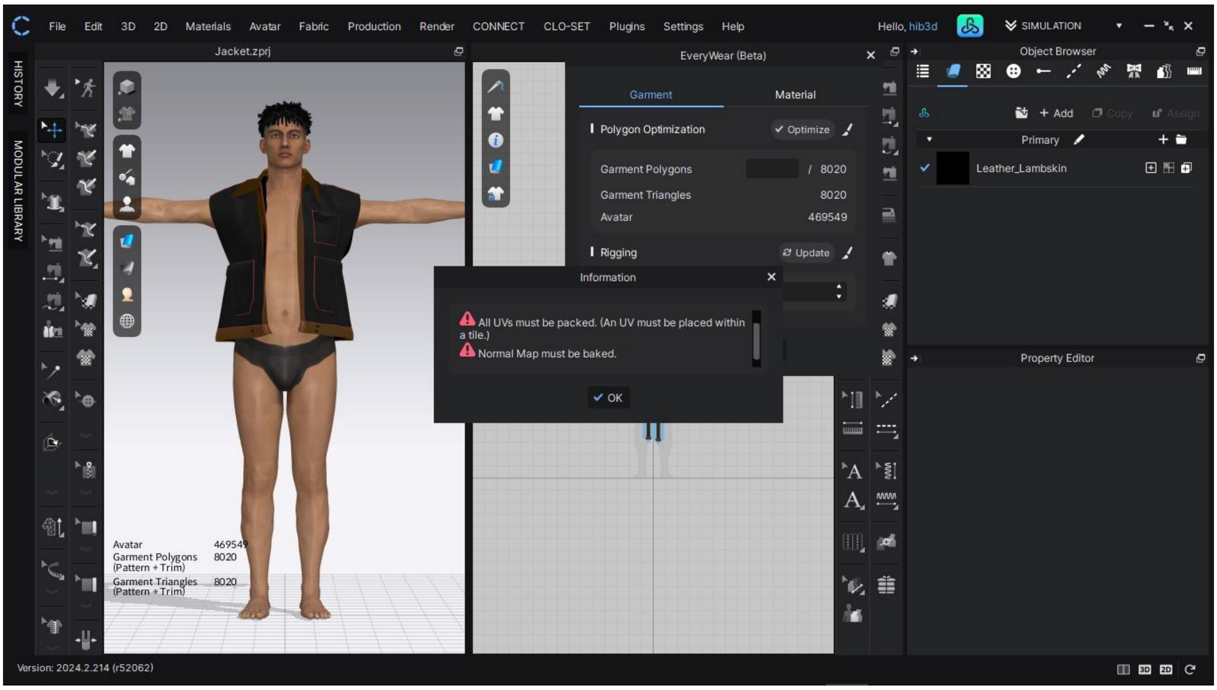

Figure 31 Exporting the leather vest from Clo3D through EveryWear


Figure 32 Exported garments through EveryWear

Although the import of the .fbx file into Lens Studio was successful, several technical issues arose, notably with the parka hood, which failed to render as double-sided even though the setting was applied to the materials in Clo3D.

Figure 33 Parka simulation in Lens Studio

Despite these challenges, we continued refining the process, focusing on optimising garment fit and enhancing their perceived luxury, notably through the fabrics. We referred to another tutorial from My Dress Pattern (2022) to learn how to find and apply the fabrics to our garments, and sourced them from CONNECT ASSETS:



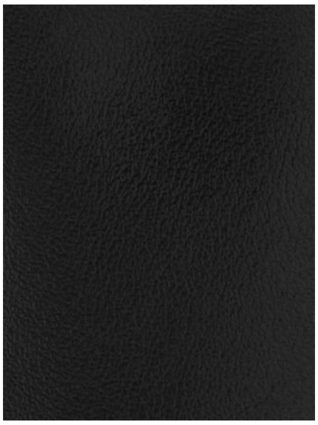

Figure 34 Leather 69 (Clothing Axis, 2024a) Figure 35 Leather Weave 68 (Clothing Axis, 2024b) Figure 36 recycled leather venezia (ULTIMA ITALIA, 2021)

While the rendering quality was satisfactory, significant distortions persisted in areas such as the armpits and abdomen. We assumed these issues were likely attributed to the avatar conversion process, which may have influenced the garment deformation.

Figure 37 Leather jacket simulation in Lens Studio

The initial objective was to develop two to four outfits for both menswear and womenswear. However, due to unidentified reasons, it was not possible to convert an additional avatar on Clo3D. Consequently, the project proceeded using a default Clo3D library female avatar, thereby shifting the primary focus from achieving precise avatar fitting to refining garment designs.

Figure 38 Default Clo3D library female avatar wearing our third design

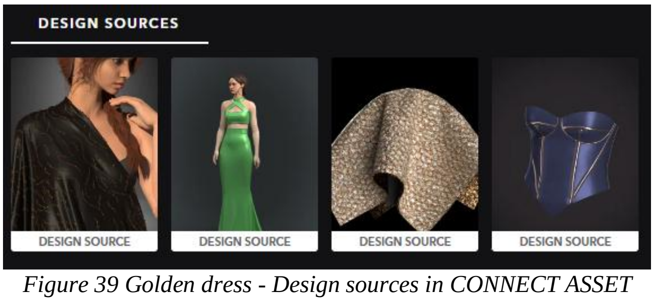

Figure 39 Golden dress - Design sources in CONNECT ASSET

The main issue encountered was the size of the .fbx file, which was approximately 20 MB, more than double the size that Lens Studio can handle without crashing. Initially, we used the "Decimate" modifier in Blender, but later discovered the process could be done in Property Editor, thanks to another YouTube tutorial from CLO (2022), by changing the mesh type from “Triangle” to “Quad,” which reduced the "Face Count" and "Vertex Count". Additionally, we increased the particle distance to further reduce the polygon count, optimising the mesh for real-time rendering. Unfortunately, the file size remained over 10 MB. To address this, we considered splitting the outfit into two parts, but the skirt remained at 17 MB. The corset ended up not fitting properly. We decided to move on to another design, as the female avatar by default was not compatible with Lens Studio’s body mesh. When we tried fitting a dress on the Luka avatar, it initially worked but was distorted (especially around the belly area) when tested in Lens Studio.

Figure 40 Converted Luka avatar wearing our fourth design

After finally being able to convert a female avatar, fitting the dress remained a challenge, and the test was unsuccessful. As a result, we shifted our focus to menswear due to these technical issues.

Figure 41 Female avatar conversion

Figure 42 Converted Luka avatar wearing our fifth design

Figure 43 Denim jacket simulation in Lens Studio

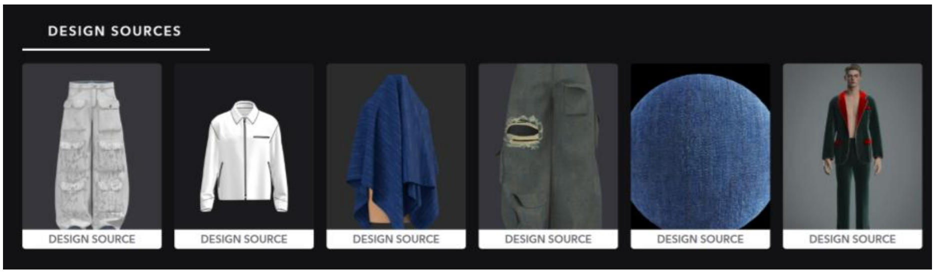

Figure 44 Denim jacket - Design sources in CONNECT ASSET

We tried to reduce the file size further by starting with the jacket. Despite removing trims and simplifying the design – an optimised file size, deformation issues persisted. A final attempt with a houndstooth jacket resulted in similar body distortions, suggesting the problem might lay in the converted avatars, not Lens Studio itself.

Figure 45 Converted Luka avatar wearing our eighth design

Figure 46 Houndstooth jacket simulation in Lens Studio

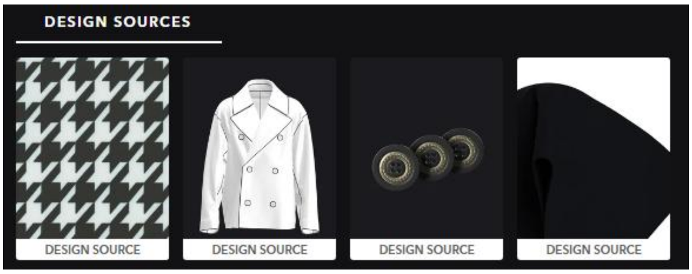

Figure 47 Houndstooth jacket simulation - Design sources in CONNECT ASSET

8.3 Appendix C: Flyer

8.4 Appendix D: Interview Guide

Demographic questions – Age, Gender, Education, and Income
Do you happen to make luxury purchase?

- Have you used AR try-on filters before, or was it your first time?
- Could you describe your overall experience?
- What emotions did you feel throughout the process (e.g., excitement, frustration, curiosity)?
- Among those filters, was there one you preferred or disliked?
- According to you, was the experience immersive?
- Would AR try-on filters motivate you to make a purchase when it comes to luxury fashion?

8.5 Appendix E: R programming code Syntax

1. For data sorting

```
library(dplyr)
library(readr)
library(lubridate)

data <- read_csv("data.csv") # Replace with your actual file name
data <- data %>% mutate( Timestamp = parse_time(Timestamp, format = "%H:%M:%OS"),
Time_Second = floor_date(Timestamp, unit = "second") # Round to nearest second )

averaged_data <- data %>% group_by(Time_Second) %>% summarise( Avg_SCL =
mean(SCL, na.rm = TRUE), Avg_PPG = mean(PPG, na.rm = TRUE), Avg_Temp =
mean(Temperature, na.rm = TRUE) )

print(averaged_data)
write_csv(averaged_data, "averaged_data.csv")
```

2. Paired T-test

```
t_test_result <- t.test(data$avg_scl, data$baseline_scl, paired = TRUE)
print(t_test_result)
```

3. Shapiro Wilk test

```
library(dplyr)

ttest2 <- ttest2 %>%
mutate(diff_avg = `AVG SCL` - BASELINE)

shapiro.test(ttest2$diff_avg)
```

4. Wilcox Signed rank test

```
wilcox.test(ttest2[["AVG SCL"]], ttest2$BASELINE, paired = TRUE)
```

5. Linear Mixed Effects Model

```
install.packages("lme4")
library(lme4)

model <- lmer(SCL ~ Filter + Gender + (1 | Participant), data = your_data)

summary(model)
```

8.6 Appendix F: Video of the Experiment Setup

Experiment.mp4

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