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Augmented Reality Immersive Experience: A Study on The Effects of Individuals' Big Five Personality Traits

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Abstract:

The use of immersive technologies such as augmented reality (AR) on social media platforms has drastically increased in the past few years. As AR technologies focus on providing individual experiences, it becomes critical to understand how individual differences affect AR immersive experiences. In this study, we draw on the Big-Five model to examine the impact of personality traits on AR immersive experiences. Through a survey involving 331 participants from Amazon MTurk, we explore the varied effects of personality traits on AR immersive experiences. To ensure the robustness of the results, we utilized both variance-based SEM and co-variance-based SEM. Results show that agreeableness and openness positively affect the AR immersive experience, while conscientiousness partially influences the AR immersive experience. Theoretically, our findings elucidate the influence of personality traits on AR immersion. In addition, our study offers important practical implications for social media and brand managers. These implications provide important design considerations that can enhance user experiences in AR environments.

Keywords: Augmented Reality, Immersion, Immersive Technology, Personality Traits, AR Filters.

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1 Introduction

Advancements in digital technologies have improved the accessibility and affordability of immersive technologies such as Augmented Reality (AR), thereby increasing their deployment across various domains (ProvenReality, 2023). The global demand for immersive technology is burgeoning, with potential revenues projected at $38.6 billion in 2024 and user numbers expected to reach 3674 million by 2028 (Statista, 2024b). Organizations benefit from immersive technology as it enhances productivity and fosters collaboration between members within the organization (Dincelli & Yayla, 2022; Marabelli & Newell, 2023). Immersive technology also offers businesses and consumers various benefits. Utilizing immersive technology enables businesses to demonstrate the ideal presentations of products (Kinzinger et al., 2022). The tourism industry has leveraged immersive technology to spark curiosity and enhance users' interactivity, which positively influences users' intentions to visit (Lee et al., 2020; Trunfio et al., 2022). Finally, immersive technology can be beneficial for users as it affords a try-before-you-buy experience (French et al., 2020) and promotes performance (John et al., 2022).

The increasing use of immersive technologies, such as AR on social media, provides exciting opportunities for both professionals and researchers. Immersive technologies play a crucial role in social media and offer benefits for brands, influencers, and users on social media platforms. One popular application of AR is augmented reality filters (AR filters hereafter) (Kumar & Agarwal, 2023). These filters have significantly increased digital advertising revenues for social media platforms by enhancing user engagement. Approximately 600 million people regularly use AR filters on Instagram and Facebook (Bhatt, 2020), and the global AR market is expected to reach $198 billion by 2025 (Statista, 2018). It is projected that the AR advertising market will generate $5.2 billion in revenues in 2024 (Statista, 2024a). Product and service brands also benefit from AR filters on social media platforms as they enhance user experiences and positively influence brand image and purchase behaviors (Plotkina et al., 2022; Sung, 2021). Additionally, AR filters help influencers increase their followers on social media platforms and can have a positive impact on user experiences and emotions (Javornik et al., 2022). Users engaging with AR filters are more likely to experience increased enjoyment (Massa & Ladhari, 2023; Sung, 2021). Social media platforms have recognized the importance of AR filters in enhancing user engagement and have begun developing specific AR filters for various occasions, such as festivals, to improve users' AR immersive experience. For example, Instagram introduced an AR filter specifically for the Indian festival of Durga Puja (Times, 2022). Furthermore, many social media influencers have provided guidelines to create and search for AR filters to streamline the use of AR on platforms like Instagram (Influencer Marketing Hub, 2024; Lifewire, 2024). The widespread use of AR filters underscores their growing significance, emphasizing the need to explore the factors contributing to these immersive experiences.

Scholars have noticed and started examining the factors that influence AR immersion (Liberatore & Wagner, 2021; Massa & Ladhari, 2023). A significant feature of AR immersive experiences is their capability to deliver personalized experiences (Alimamy & Gnoth, 2022; Hilken et al., 2017; McKone et al., 2016). For example, AR can provide unique experiences for individuals to try on makeup, sunglasses, furniture, and clothing to visualize these products on themselves (Hsu et al., 2021). This personalized approach to AR content delivery enables users to engage with digital experiences that are relevant and meaningful to them on a personal level. Prior scholarly work has examined the impact of AR immersive technologies on user product attitudes and purchase intentions (Kinzinger et al., 2022; Steffen et al., 2019). However, to fully realize the potential of personalized AR immersive experiences, it's crucial to recognize individual differences among users. An integral part of individual differences can be attributed to their personality traits (McAdams, 1995). It becomes more relevant as personality traits are generally stable over the course of an individual's life. A recent longitudinal study conducted by Damian et al. (2019) over a 50-year period, using the Big Five measures of John and Srivastava (1999), demonstrated that personality traits remain stable and malleable from the age of 16 to 66 years. The critical role of personality traits has been well-established in information systems literature (Dennis et al., 2022; Devaraj et al., 2008; Yang et al., 2023). For instance, prior literature has demonstrated that personality traits impact user's perception of technology (Devaraj et al., 2008). Similarly, prior empirical analysis has demonstrated that personality traits significantly affect user behaviors and information processing (Adamopoulos et al., 2018; Liu et al., 2021). Scholars have called for more research to achieve a more holistic understanding of user immersion with AR applications (Ibáñez‐Sánchez et al., 2022; Srivastava et al., 2021). In response to these calls for undertaking further investigation of users' AR immersive experience, some empirical studies have examined user immersion primarily through two perspectives:

system-oriented and user-oriented (Daassi & Debbabi, 2021). However, within the user-centric studies, very few studies have explored how individual characteristics such as personality traits affect user immersive experience (Smink et al., 2020; Srivastava et al., 2021). Building on this motivation, this study aims to explore how user personality traits influence AR immersive experiences. Recognizing and understanding the influence of personality traits is essential, especially considering that AR immersive experiences deeply resonate with users. This understanding ensures that personalized AR applications effectively cater to the needs and preferences of diverse individuals. Given this, we focus on examining the following research question:

RQ: How do different personality traits impact users' AR immersive experience?

We examine the above research question by conducting a survey with 331 participants on Amazon Mechanical Turk (MTurk). We tested the hypotheses using both co-variance-based SEM and variance-based (PLS)-SEM to ensure the robustness of the results. The findings of this study have important implications for both scholars and practitioners. First, we contribute to the theory by understanding the predicting factors of AR immersive experience. Second, our results show how personality traits have different impacts on users' AR immersion experience. Third, our study also contributes to practice by providing important design considerations for social media and brand managers.

The rest of this paper is structured in the following manner: the next section will give an overview of the existing literature on immersive technology, augmented reality, immersive experience, and personality traits. Section 3 focuses on developing the hypotheses. The methodology is presented in Section 4. Section 5 exhibits the results of the analysis. Finally, we discuss the results and their theoretical contribution, practical implications, limitations, and potential avenues for future research in section 6.

2 Literature Review

2.1 Immersive Technology

Immersive technologies merge the boundaries between real and virtual worlds (Cavusoglu et al., 2019; Suh & Prophet, 2018). They are designed to provide enduring and interactive environments to increase the subjective feeling of being immersed (Liberatore & Wagner, 2021). Understanding the importance of recent advancements in immersive technologies, organizations have started the deployment of immersive technologies across various sectors, such as retail (French et al., 2020), online gaming (Shin, 2022), and e-commerce (Yang & Xiong, 2019).

Scholarly research on immersive technologies is also experiencing rapid growth as several streams of literature are being developed to explore the different aspects of immersive technologies (see Appendix A Table A1 for a summary of prior literature). First, among the emerging streams, a body of literature is dedicated to examining the impact of embedded characteristics in immersive technologies on the experience (Hamari et al., 2016; Kinzinger et al., 2022). The findings from this literature reveal that immersive technology characteristics, such as the vividness of the virtual environment, significantly influence users' immersive experience (Kinzinger et al., 2022; Steffen et al., 2019). A second stream of literature examines the antecedents of user immersion (Shin, 2022; Zuo & Shen, 2024). For example, studies have investigated how perceived presence and interactivities foster immersive experiences (Shin, 2022). The third stream of literature delves into the different types of immersive technologies and points to the core difference between these types through a reality-virtuality continuum ranging from a completely real environment to a completely virtual environment (Farshid et al., 2018; Flavián et al., 2019). Next, we describe augmented reality, which is one of the most commonly used immersive technologies.

2.2 Augmented Reality

Augmented reality (AR) is an immersive technology that superimposes computer-generated virtual elements onto real objects (e.g., images, videos) and is one of the most frequently used immersive technologies on digital platforms (Hilken et al., 2017; Ibáñez‐Sánchez et al., 2022; Javornik et al., 2022). The use of AR is pervasive across domains, such as education (Salar et al., 2020), marketing (Rauschnabel et al., 2019), and advertising (de Ruyter et al., 2020).

Taking notice of the pervasiveness of AR, scholars have started to examine the factors that are important to AR (see Appendix A Table A2 for a summary of prior literature). A decent portion of the literature is currently focused on AR technology (Massa & Ladhari, 2023). This stream of research highlights that AR features and characteristics such as display types, responsiveness, and augmentation quality play an important role in the user's immersive experience (Butt et al., 2021; Li & Fang, 2020). The second stream of literature explores the importance of contexts in AR immersive experiences (Ali, 2022; Lee et al., 2020; Sung, 2021). Studies highlight the main contexts (hedonic and utilitarian) and several other sub-contexts (e.g., advertising, tourism) in which AR immersion has been examined (Ali, 2022; Sung, 2021). Finally, the third stream of literature focuses on user perceptions and reactions (Kowalczuk et al., 2021; Yim & Park, 2019). This stream of literature is still emerging, and thus far, scholars have examined the situational or state-level variables such as curiosity and attention (Ibáñez‐Sánchez et al., 2022; Jäger & Weber, 2020; Yang et al., 2020).

2.3 Immersive Experience

Immersive experience is a broad concept that explains the extent to which an individual is involved in an activity (Merhi, 2016; Nilsson et al., 2016; Witmer & Singer, 1998). For example, an individual is said to be immersed when he/she is so deeply involved in reading a novel that they lose track of time. Although the concept of immersive experience is not novel, it has gained popularity because of the proliferation of immersive technologies such as AR in recent years (Lee et al., 2020; Sung, 2021). In this study, we utilize the Experience Economy framework, developed by Pine and Gilmore (1998), as the theoretical basis for exploring the immersive experience offered by AR. The immersive experience is generally defined using the dimensions of entertainment, education, esthetics, and escapism (*Figure 1*) (Oh et al., 2007; Pine & Gilmore, 1998). The Experience Economy framework is particularly suitable for capturing the immersive experience provided by AR because it allows for a comprehensive understanding of how different dimensions of an experience (i.e., entertainment, education, esthetics, and escapism) contribute to an immersive experience. These dimensions help to break down and analyze the various layers of immersion that AR offers, providing a comprehensive understanding of the depth and complexity of immersion. Prior literature posits that the dimensions of the user’s experiences can be aligned around two core axes: the user’s active-passive participation axis and the absorption-immersion axis (Oh et al., 2007). Active participation involves direct engagement in activities, influencing the outcome of their experience, while passive participation entails observing without directly affecting the performance of the experience. Absorption is defined as “occupying a person’s attention by bringing the experience into the mind,” while immersion is “becoming physically (or virtually) a part of the experience itself” (Pine & Gilmore, 1999, p. 31). The participation axis regards entertainment and esthetics as passive dimensions and regards education and escapism dimensions as active engagement that shapes users’ immersive experiences (Oh et al., 2007; Pine & Gilmore, 1998). In terms of the absorption-immersion axis, the absorption axis consists of entertainment and education. The immersion axis focuses on esthetics and escapism experiences (Oh et al., 2007; Pine & Gilmore, 1998).

Among the dimensions of immersive experiences, entertainment experience is defined as the pleasure and joy the individual obtains through passive interactions with elements of immersive technology (Benny, 2015; Pine & Gilmore, 1998). The dimension of education experience is associated with the knowledge and skills gained by an individual through the use of immersive technology (Moorhouse & Jung, 2017; tom Dieck, Jung, & tom Dieck, 2018). Esthetic experiences are defined as pleasant immersive experiences derived from sensory immersive technology content (tom Dieck, Jung, & Rauschnabel, 2018). Finally, the escapism experience is related to the act of breaking out from the mundane and routine moments of daily life, which enables users to fully submerge themselves into an immersive technology environment (Song et al., 2015). Scholars have utilized the four dimensions of entertainment, education, esthetics, and escapism to understand user immersion experiences. For example, Lee et al. (2020) examined user immersive experiences in the context of virtual museums. Sung (2021) examined how users' immersive experiences influence satisfaction with AR technology and consequent behavioral outcomes, such as purchase intentions.

We focus on the immersive experience for three reasons (see Appendix A Table A3 for a summary of the prior literature). First, prior literature highlights that the most prominent feature of immersive technologies is their ability to immerse users (Steffen et al., 2019). Given the context of our study, which is AR filters on social media, focusing on immersive experiences enables us to extend the literature that examines factors that impact AR immersion. Second, prior studies highlight a need to examine how users make sense of their corresponding immersive technology experiences (Haj-Bolouri, 2023). This study responds to this call by investigating how different personality traits affect immersive experiences. Third, immersive experiences have largely exhibited promising effects across various business domains (Lee et al., 2020;

Suh & Prophet, 2018; Sung, 2021). Therefore, examining how personality traits affect AR immersion enables us to offer implications for social media platforms that can deploy AR filters strategically for users.

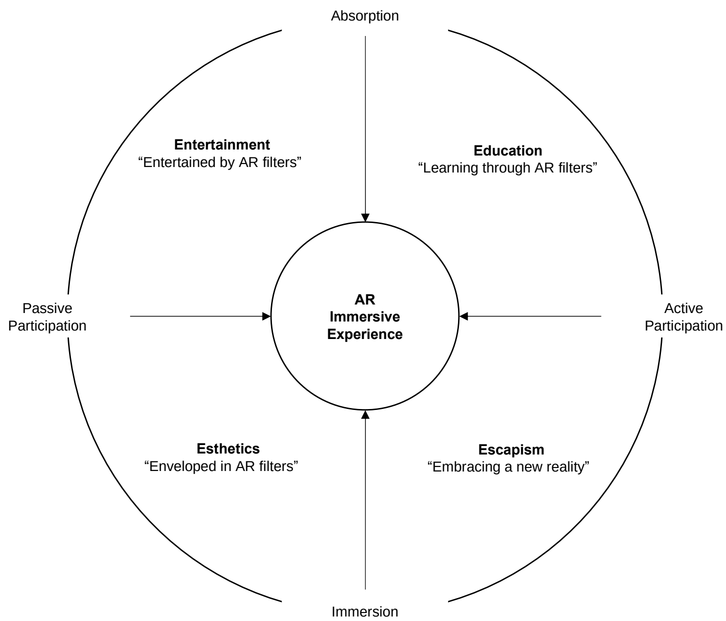

Figure 1. Immersive Experience Dimensions (Adapted from Oh et al., 2007)

2.4 Personality Traits

Personality is defined as "the dynamic organization within the individual of those psychological systems that determine his characteristics behavior and thought" (Allport, 1961, p. 28). Personality has been a focus of academic researchers across many disciplines, including business (see Appendix A Table A4 for a summary of prior literature). Although there are various personality traits taxonomies, the Big Five model has been dominantly used to study personality (Tupes & Christal, 1992). The Big Five model includes agreeableness, conscientiousness, extraversion, openness, and neuroticism (Costa & McCrae, 1992; Goldberg, 1992). Agreeableness involves individuals' tendency to be trusting, likable, cooperative, compassionate, and empathetic (Barrick & Mount, 1991; McCrae & Costa, 1985). Agreeable individuals exhibit kindness and are genuinely concerned with the well-being of others. They are also more successful in their relationships with others (Costa Jr et al., 1991; Judge et al., 2002). Conscientiousness is about one's inclination toward being responsible, diligent, organized, dependable, and risk-averse (Goldberg, 1992; John et al., 2008). Conscientious individuals pay close attention to detail and show precision in their tasks (Barrick & Mount, 1991; McCrae & Costa, 1987). Extraversion describes individuals who are characterized as being sociable, talkative, friendly, and active (Costa & McCrae, 1992). Extraverts behave assertively, seek excitement, and show positive emotions (McCrae & Costa, 2003). Openness to experience trait explains one's tendency to experience original experiences (McCrae & Costa, 1987; Simha & Parboteeah, 2020). Individuals who are open are characterized as being intelligent, creative, broad-minded, and curious (Barrick & Mount, 1991). Neuroticism is often linked to an inclination toward anxiety, depression, anger, pessimism, and worry (Judge et al., 1999; Scheier et al., 1994). Neurotic people show negative cognitions when facing new situations and exhibit reduced emotional stability (McCrae & Costa Jr, 1997b).

The Big Five model is the most popular framework that has been utilized in the information systems literature (Bansal et al., 2016; Hess et al., 2009; Srivastava et al., 2015; Venkatesh et al., 2014; Venkatesh & Windeler, 2012; Wang et al., 2023). For instance, Barnett et al. (2015) examined the role of personality traits in the context of a web-based classroom technological system and showed that conscientiousness and neuroticism predicted the perceived and actual use of technology. Examining the effect of personality traits on virtual team performance, Dennis et al. (2022) revealed that team performance was negatively related to extraversion and neuroticism. Liao et al. (2021) examined the effect of conscientiousness on the defensive and offensive functions of online gamers. The results showed that three facets of conscientiousness are associated with defensive functions, while two other facets of conscientiousness are linked to offensive functions. As shown, personality traits have been used to explain various behavioral outcomes within the information system literature. In the next section, we present the research model and develop our hypotheses in order to examine the relationship between personality traits and AR immersive experiences.

The following table provides an overview of all the key constructs used throughout this study.

Table 1. Key Constructs and Their Definitions

Construct	Definition	Source
Immersive Experience	Immersive experience is the extent to which an individual is involved in an activity and is generally defined using the dimensions of entertainment, education, esthetics, and escapism.	(Nilsson et al., 2016; Oh et al., 2007; Witmer & Singer, 1998)
Entertainment Experience	The entertainment experience is defined as the pleasure and joy the individual obtains through passive interactions with elements of immersive technology.	(Benny, 2015; Pine & Gilmore, 1998)
Education Experience	The dimension of education experience is associated with the knowledge and skills gained by an individual through the use of immersive technology.	(Moorhouse & Jung, 2017; tom Dieck, Jung, & tom Dieck, 2018)
Esthetic Experience	Esthetic experiences are defined as pleasant immersive experiences derived from sensory immersive technology content.	(tom Dieck, Jung, & Rauschnabel, 2018)
Escapism Experience	The escapism experience is related to the act of breaking out from the mundane and routine moments of daily life, which enables users to fully submerge themselves into an immersive technology environment.	(Song et al., 2015)
Agreeableness	Agreeableness involves individuals' tendency to be trusting, likable, cooperative, compassionate, and empathetic.	(Barrick & Mount, 1991; McCrae & Costa, 1985)
Conscientiousness	Conscientiousness is about one's inclination toward being responsible, diligent, organized, dependable, and risk-averse.	(Goldberg, 1992; John et al., 2008)
Extraversion	Extraversion describes individuals who are characterized as being sociable, talkative, friendly, and active.	(Costa & McCrae, 1992)
Openness	Openness to experience trait explains one's tendency to experience original experiences.	(McCrae & Costa, 1987; Simha & Parboteeah, 2020).
Neuroticism	Neuroticism is often linked to an inclination toward anxiety, depression, anger, pessimism, and worry.	(Judge et al., 1999; Scheier et al., 1994).

3 Research Model and Hypotheses Development

3.1 Research model

This study explores the relationship between personality traits and AR immersive experiences using the Big Five personality framework and the dimensions of the Experience Economy (*Figure 2*). The Big Five personality traits—Agreeableness, Conscientiousness, Extraversion, Openness, and Neuroticism—provide a robust model for understanding individual differences, particularly because they remain stable over a lifetime (Damian et al., 2019). Since AR immersive experiences are a relatively new area of study, exploring the effects of one of the most fundamental aspects of human nature, personality, serves as an ideal point. Personality is commonly understood as a collection of traits that shape our thoughts, emotions, and behaviors across time and situations (Hinds & Joinson, 2024). By focusing on the Big Five personality traits, this model allows for a foundational exploration of how these inherent characteristics shape users' AR immersive experiences.

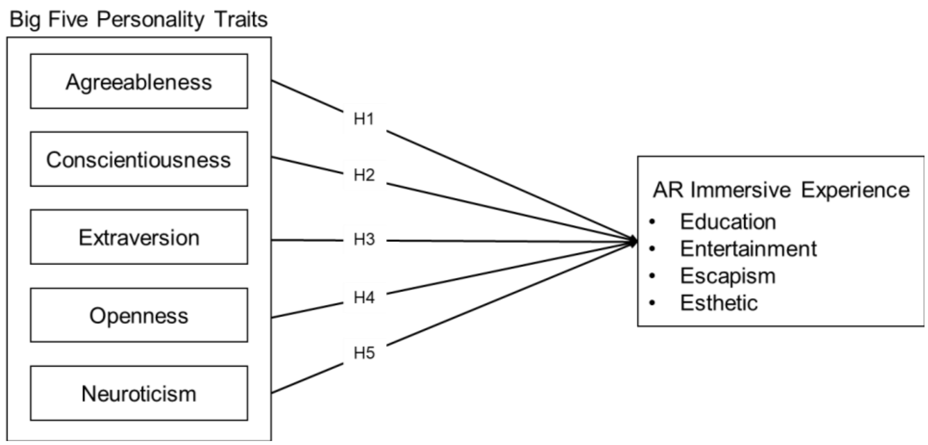

Figure 2. Research Model

3.2 Agreeableness and AR Immersive Experience

Agreeable individuals are characterized by higher levels of trust, forgivingness, kindness, cooperation, and considerateness (McCrae & Costa, 2003). Highly agreeable individuals show a preference for harmony in their relationships and avoid conflict in their interactions (McCrae & Costa Jr, 1991). Research has shown that agreeable individuals tend to show agreeable behaviors in virtual environments (McCreery et al., 2012). For example, Tabacchi et al. (2017) show that early adopters of AR-based online games tend to be highly agreeable. Similarly, individuals who pursue hobbies for immersive experiences tend to show high levels of agreeableness (Lukka, 2014). Higher levels of agreeableness are also associated with experiencing enjoyment (Li & Wang, 2021), and the link between AR technologies and enjoyment is also well-documented (Holdack et al., 2022; Marto et al., 2020). Prior literature also shows that users interpret their immersive virtual experience through emotional connection and feelings of empathy (Haj-Bolouri, 2023). Thus, agreeableness may strengthen user immersion as agreeable individuals tend to care of others. Grounding on these foundations, we argue that a high level of agreeableness enhances the immersive experience in AR technologies. Hence, we propose the following hypothesis:

H1: Agreeableness positively impacts AR immersive experience.

3.3 Conscientiousness and AR Immersive Experience

Conscientiousness is an individual's tendency to exhibit higher levels of self-control, persistence, order, and need for achievement (Digman, 1990). Conscientious individuals are structured, reliable, meticulous, and more likely to plan ahead (Barrick et al., 2001). Individuals high in conscientiousness tend to delay instant gratification to fulfill responsibilities for the sake of achieving their long-term goals (Liu et al., 2021).

AR filters are generally classified as hedonic in nature because they provide instant gratifications to their users (Ibáñez - Sánchez et al., 2022). Since conscientious individuals are generally utilitarian in nature, they are less likely to engage with hedonic AR filters. Further, prior literature shows that individuals with higher conscientiousness are less inclined to engage in social networks (Frauenstein et al., 2023). It is well established that conscientiousness is positively associated with the deliberate use of technology (Devaraj et al., 2008; McElroy et al., 2007). Prior studies also indicate that AR face filters may impose negative impacts on user well-being by enlarging irrational body image expectations and social comparison (Chae, 2017; Javornik et al., 2022; Yim & Park, 2019). Given people with high conscientiousness desire self-control and consistency (Costa & McCrae, 1992), they may recognize these risks to their self-concept and refrain from being immersed in such potentially negative experiences. Based on these arguments, it is plausible to suggest that conscientious individuals might experience diminished immersion when interacting with AR environments. Therefore, we hypothesize:

H2: Conscientiousness negatively impacts AR immersive experience.

3.4 Extraversion and AR Immersive Experience

Extraversion is a trait that explains individuals' inclinations toward being energetic, exuberant, outgoing, cordial, and assertive (Watson & Clark, 1997). Extroverts generally have higher levels of interest in learning (Major et al., 2006) and social interactions (Goldberg, 2013). Extroverts are also more likely to engage in online environments and make use of technology (Choi et al., 2015; Zmud, 1979). Additionally, extroverts tend to exhibit excitement and novelty-seeking behaviors (Eysenck & Eysenck, 1984; Li & Tsai, 2013; Zuckerman, 1994).

Prior literature provides evidence for the role of immersive technologies in sparking user curiosity and learning performance through immersive experiences across various contexts (Lee et al., 2020; Rauschnabel et al., 2019; Salar et al., 2020). For example, research shows virtual environments that motivate user knowledge absorption increase immersion (Lee et al., 2020). Moreover, an existing study demonstrates the effectiveness of AR applications in obtaining student attention and fostering immersive learning experiences (Salar et al., 2020). Given people high in extraversion tend to be motivated to learn and engage (Costa & McCrae, 1992), the exploratory features of AR applications can amplify user immersion (Rauschnabel et al., 2019; Yang et al., 2020).

Research demonstrates that people who are characterized by seeking adventurous and exciting behaviors are more likely to show positive experiences in using AR technologies (Park & Stangl, 2020). Further, prior research in social media shows that social engagement, perceived enjoyment, and perceived interactivities are the primary drivers of AR face filter usage (Ibáñez‐Sánchez et al., 2022; Javornik et al., 2022). Extraversion may positively influence user immersion through its positive association with the AR filter's sociable and interactive natures. Therefore, we expect that a high level of extraversion contributes positively to immersive experience:

H3: Extraversion positively impacts AR immersive experience.

3.5 Openness and AR Immersive Experience

Open individuals are described as being explorative, imaginative, artistic, and divergent (Judge et al., 2002; McCrae & Costa Jr, 1991). The primary trait of these individuals is their willingness to have new and diverse experiences (McCrae & Costa Jr, 1997a). Also, people scoring high in openness exhibit a higher propensity to learn (Major et al., 2006). Thus, open individuals tend to engage with novel and diverse experiences and activities that pertain to knowledge acquisition (Liu et al., 2021; McCrae & Costa, 2003).

Prior studies have established a positive association between openness and technology usage (Devaraj et al., 2008; McElroy et al., 2007; Venkatesh & Windeler, 2012). In the context of immersive technology, previous research indicates that individuals with higher levels of openness tend to show interest in using AR (Rauschnabel et al., 2015). Moreover, prior literature has extensively documented the strong influence of immersive technologies on creating novel experiences for users (Hilken et al., 2017; Rauschnabel et al., 2019; Trunfio et al., 2022). For example, prior research shows that AR advertising can provide users with novel experiences (Sung, 2021). Within the social media context, prior literature highlights the effectiveness of innovative content creation in enhancing user exploratory usage of AR face filters (Javornik et al., 2022). The natural inclination of open individuals to seek out and adapt to novel and artistic experiences aligns well with immersion experience in AR.

Scholarly research also indicates that the quality and content of AR applications have a strong influence on user propensity for knowledge acquisition (Rauschnabel et al., 2019). For instance, research demonstrates that in comparison with traditional advertisements, AR advertisements are more effective in fortifying consumer curiosity and capturing attention (Yang et al., 2020). Besides, prior literature illustrates that high sensory virtual product representation is positively associated with the user's perceived diagnosticity (Kinzinger et al., 2022). Hence, openness may positively impact user immersion through its exploratory nature as well as its strong influence in promoting user curiosity. Combining these arguments, we propose the following hypothesis:

H4: Openness positively impacts AR immersive experience.

3.6 Neuroticism and AR Immersive Experience

Neuroticism describes the extent to which an individual exhibits nervousness, helplessness, insecurity, and emotional instability (Goldberg, 2013). Neurotic individuals often perceive novel technologies as threatening and have negative thoughts about them (Devaraj et al., 2008). In the same vein, research shows that neuroticism is positively associated with technostress (Maier et al., 2019; Srivastava et al., 2015). Within the context of immersive technology, Rauschnabel et al. (2015) assert that neurotic individuals are less likely to adopt AR glasses. Hence, we argue that individuals with higher neuroticism will become less engaged with AR applications.

Scholars have found that virtual environments with a high level of immersion can induce more anxiety (Kwon et al., 2013). Moreover, prior research shows that the use of AR technology may induce negative emotions (Soon et al., 2023). Besides the potential negative emotions associated with AR immersive experience, prior research also demonstrates that AR applications might elicit a sense of intrusiveness among users (Smink et al., 2020). Furthermore, research has revealed the potential negative impact of AR face filters on user well-being and self-concepts (Dijkslag et al., 2024). Similarly, prior studies show that AR filters can induce negative influences on self-acceptance (Javornik et al., 2022) and overall AR usage (Yim & Park, 2019). As neurotic individuals avoid anxiety (Tamir, 2005), they may be less inclined to engage deeply with AR immersive experiences that could potentially heighten their stress levels. Therefore, we hypothesize:

H5: Neuroticism negatively impacts AR immersive experience.

4 Methods

We used the survey method to collect data for evaluating our presented hypotheses. We recruited participants via Amazon MTurk and offered them financial compensation for their participation in our study. We chose it due to its accessibility and efficiency in reaching diverse participant pools. MTurk allows researchers to quickly gather data from a wide range of demographics, facilitating the recruitment of participants who might be otherwise difficult to reach. We only targeted master workers who had already been pre-screened by MTurk and had "Master Qualification" status. These workers have consistently demonstrated a high degree of success and Amazon has made it difficult to get to this status. Participants were offered $1.50 for their participation in our study. MTurk has been widely used by scholars from various disciplines and has been shown to be a reliable platform for data collection (Ghafoori et al., 2024; Gupta et al., 2023; Parra et al., 2022).

We collected data in two separate phases. First, we collected data and conducted a pilot test to assess the face validity, content validity, and reliability of the measures. For this test, we collected 39 responses. The results showed that our measures are valid and reliable. Then, we collected data for our primary analysis. We included several attention-check questions to ensure the correctness of the collected data (Sharpe Wessling et al., 2017).

We collected a total of 400 responses but encountered some missing data and straight-lining. For the missing data, we used a pairwise deletion approach. This allowed us to retain as much data as possible without introducing bias. Straight-lining occurs when participants select the same response option across multiple items, indicating a lack of engagement. To identify instances of straight-lining, we examined response patterns and excluded those responses where consecutive items received identical ratings. After cleaning the data, we ended up with 331 responses collected from 229 males and 102 females. The data collected from this second phase were used to test our hypotheses. The majority of our respondents have a 4-year college degree and are between 31 and 40 years old. They also have different levels of income and experience. More details about the participants are presented in Table 2.

Table 2. Participants' Demographic Information

Demography	Frequency	% in Sample
Gender		
Male	229	69.18%
Female	102	30.82%
Education		
Some college	34	10.27%
4-year degree	193	58.31%
Professional Degree	98	29.61%
Doctorate	6	1.81%
Income		
Less than $50,000	42	12.69%
$50,000 to $75,000	136	41.09%
$75,000 to $100,000	120	36.25%
More than $100,000	33	9.97%
Age		
20-30	91	29.00%
31-40	215	64.95%
41-50	9	2.72%
More than 50	11	3.32%
Experience		
Less than 1 year	4	1.21%
1-2 years	27	8.16%
3-5 years	190	57.40%
6-9 years	76	22.96%
10-12 years	24	7.25%
More than 12 years	10	3.02%

4.1 Measures

We utilized measures from previous studies to ensure the validity and reliability of our findings. We used a seven-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". We adopted the measures of the Big Five personality traits from Goldberg (1992) and his IPIP. We adopted the same measures as Goldberg (1992), but we are not sharing them in this study because the instrument is copyrighted. We adapted measures of immersive experience from Oh et al. (2007). Participants were asked the following: "Please carefully read the following statements with respect to yourself and answer based on the extent to which you disagree or agree with the following statements:" Table 3 includes all the items we used in this study.

Table 3. Measures and Descriptive Statistics

Code	Mean Measure	Average	Std. Deviation
Entertainment			
Enter_1	Using AR filters on Instagram is amusing.	5.31	1.37
Enter_2	Using AR filters on Instagram is captivating.	5.55	1.33
Enter_3	I really enjoy using AR filters on Instagram.	5.48	1.35
Enter_4	Using AR filters on Instagram is fun.	5.56	1.32
Enter_5	Using AR filters on Instagram is very entertaining.	5.46	1.24
Enter_6	Using AR filters on Instagram is very exciting.	5.61	1.33

Escapism			
Escap_1	I feel I am playing a different character when I am using AR filters on Instagram.	5.38	1.24
Escap_2	I feel like I am living in a different time or place when I am using AR filters on Instagram.	5.47	1.34
Escap_3	Using AR filters on Instagram lets me imagine being someone else.	5.48	1.28
Escap_4	I completely escape from reality when I am using AR filters on Instagram.	5.46	1.32
Escap_5	I totally forget about my daily routine when I am using AR filters on Instagram.	5.27	1.44
Escap_6	I feel I am in a different world when I am using AR filters on Instagram.	5.44	1.39
Esthetics			
Esth_1	I feel a real sense of harmony when I am using AR filters on Instagram.	5.33	1.30
Esth_2	Using AR filters on Instagram is very pleasant.	5.62	1.23
Esth_3	The environment feels lively when I use AR filters on Instagram.	6.36	1.35
Esth_4	AR filters on Instagram are very attractive.	5.46	1.31
Esth_5	AR filters on Instagram really pay close attention to detail.	5.46	1.33
Esth_6	Using AR filters on Instagram provides pleasure to my senses.	5.56	1.29
Education			
Edu_1	Using AR filters on Instagram makes me more knowledgeable.	5.48	1.22
Edu_2	I learn a lot when I use AR filters on Instagram.	5.47	1.31
Edu_3	Using AR filters on Instagram stimulates my curiosity to learn new things.	5.43	1.33
Edu_4	Using AR filters on Instagram is a real learning experience.	5.51	1.38
Edu_5	Using AR filters on Instagram is highly educational to me.	5.40	1.30
Edu_6	Using AR filters on Instagram really enhances my skills.	5.59	1.33

5 Analysis and Results

5.1 Statistical Analysis

We used partial least squares SEM, specifically Smart PLS 4 software, to assess the research hypotheses. We also tested our hypotheses using covariance-based SEM to ensure the robustness of the results. We reported the results of both methods. PLS has both strong advocates and strong critics (Venable, 2023). In a recent debate published in the Communications of the Association for Information Systems, Evermann and Rönkkö (Evermann & Rönkkö, 2023a) provided 14 recommendations for how and when PLS may be appropriately used. The recommendations aim to improve the validity of research in IS (Evermann & Rönkkö, 2023b). Researchers responded to the recommendations by either supporting, criticizing, or offering further suggestions (Russo & Stol, 2022; Sharma et al., 2023). Their main point from the debate is that if researchers choose to use PLS, they need to make sure that they follow best practices to decrease the likelihood of obtaining inaccurate results. We made sure to follow the guidelines published in the debate.

First, we examined the convergent and discriminant validities of the measurement model. We found that values of the Cronbach's alpha and reliability are above the threshold of 0.7, indicating robust composite reliabilities (Hair Jr et al., 2021). We also found that all Average Variance Extracted (AVE) values are above the threshold of 0.50, indicating that all constructs in the study are convergent. Table 4 includes the details.

Table 4. Measurement Quality Indicators

	Loadings	t statistics	Cronbach's alpha	Composite reliability	AVE
Ag_1	0.77	23.50	0.81	0.88	0.64
Ag_2	0.83	34.07			
Ag_3	0.81	32.54			
Ag_4	0.79	20.10			
Co_1	0.88	49.77	0.88	0.92	0.74
Co_2	0.82	31.39			
Co_3	0.86	35.20			
Co_4	0.89	48.46			
Open_1	0.85	51.32	0.86	0.91	0.71
Open _2	0.74	16.77			
Open_3	0.77	18.31			
Ne_1	0.87	45.97	0.93	0.94	0.77
Ne_2	0.87	38.41			
Ne_3	0.89	65.50			
Ne_4	0.89	54.81			
Ne_5	0.87	52.03			
Enter_1	0.77	29.06	0.90	0.92	0.67
Enter_2	0.82	33.50			
Enter_3	0.82	35.02			
Enter_4	0.87	58.85			
Enter_5	0.82	33.75			
Enter_6	0.81	29.52			
Escap_1	0.83	38.14	0.91	0.93	0.68
Escap_2	0.82	32.87			
Escap_3	0.81	33.89			
Escap_4	0.81	23.84			
Escap_5	0.82	37.79			
Escap_6	0.87	56.46			
Esth_1	0.78	27.25	0.90	0.92	0.67
Esth_2	0.81	25.16			
Esth_3	0.82	36.68			
Esth_4	0.84	44.14			
Esth_5	0.78	23.15			
Esth_6	0.86	45.45			
Edu_1	0.81	32.36	0.92	0.94	0.71
Edu_2	0.83	37.16			
Edu_3	0.86	45.61			

Edu_4	0.84	35.03			
Edu_5	0.87	50.36			
Edu_6	0.84	42.16			

We then tested the discriminant validity using different methods. We used the Fornell and Larcker (1981) criterion test and compared the square root of the AVE of each construct with the correlation of a pair of constructs. We found that all the values of the square root of the AVEs are larger than their correlation with any other constructs, implying adequate discriminant validity (Fornell & Larcker, 1981). The results are presented in Table 5. We also evaluated the items' cross-loadings and found that the measures load highly on the respective constructs. Table 6 presents the results of the cross-loadings. Lastly, we utilized the Heterotrait-Monotrait Ratio (HTMT) matrix developed by Henseler et al. (2015) to examine the discriminant validity. The results show that all HTMT matrix values fell below the recommended threshold (0.90) by Hair et al. (2019) and Henseler et al. (2015).

Table 5. Correlations Fornell-Larcker criterion

	Ag	Co	Education	Ex	Int	Ne
Ag	**0.800**					
Co	-0.431	**0.862**				
Education	0.681	-0.450	**0.841**			
Ex	-0.462	0.719	-0.438	**0.841**		
Int	0.681	-0.505	0.684	-0.510	**0.788**	
Ne	0.335	-0.601	0.345	-0.736	0.465	**0.878**
	Ag	Co	Entertainment	Ex	Int	Ne
Ag	**0.800**					
Co	-0.431	**0.862**				
Entertainment	0.699	-0.405	**0.816**			
Ex	-0.460	0.718	-0.415	**0.842**		
Int	0.679	-0.509	0.633	-0.512	**0.789**	
Ne	0.334	-0.600	0.357	-0.737	0.466	**0.878**
	Ag	Co	Escap	Ex	Int	Ne
Ag	**0.800**					
Co	-0.427	**0.863**				
Escap	0.664	-0.564	**0.827**			
Ex	-0.461	0.717	-0.517	**0.842**		
Int	0.675	-0.520	0.698	-0.513	**0.790**	
Ne	0.334	-0.602	0.446	-0.738	0.469	**0.878**
	Ag	Co	Esth	Ex	Int	Ne
Ag	**0.800**					
Co	-0.432	**0.862**				
Esth	0.683	-0.401	**0.816**			
Ex	-0.462	0.719	-0.406	**0.841**		
Int	0.681	-0.506	0.633	-0.510	**0.788**	
Ne	0.336	-0.599	0.311	-0.735	0.466	**0.878**
Note: The diagonal bold values are the square roots of AVE.						

Table 6. Cross-loadings

	Ag	Co	Education	Ex	Int	Ne
Ag_2	**0.767**	-0.370	0.533	-0.374	0.492	0.294
Ag_3	**0.833**	-0.319	0.572	-0.311	0.561	0.184
Ag_5	**0.814**	-0.345	0.547	-0.353	0.532	0.245
Ag_6	**0.785**	-0.346	0.525	-0.446	0.595	0.357
Co_10_R	-0.311	**0.881**	-0.398	0.613	-0.457	-0.536
Co_7_R	-0.422	**0.821**	-0.407	0.612	-0.432	-0.466
Co_8_R	-0.379	**0.859**	-0.364	0.603	-0.399	-0.511
Co_9_R	-0.371	**0.887**	-0.378	0.649	-0.450	-0.560
Edu_1	0.495	-0.353	**0.811**	-0.295	0.555	0.252
Edu_2	0.580	-0.363	**0.832**	-0.366	0.529	0.259
Edu_3	0.596	-0.390	**0.857**	-0.372	0.613	0.317
Edu_4	0.609	-0.395	**0.837**	-0.420	0.561	0.324
Edu_5	0.579	-0.377	**0.866**	-0.386	0.600	0.312
Edu_6	0.571	-0.391	**0.843**	-0.365	0.590	0.270
Ex_6_R	-0.384	0.581	-0.382	**0.851**	-0.442	-0.615
Ex_7_R	-0.369	0.593	-0.355	**0.826**	-0.421	-0.615
Ex_8_R	-0.427	0.642	-0.426	**0.860**	-0.418	-0.611
Ex_9_R	-0.363	0.602	-0.285	**0.826**	-0.443	-0.647
Int_1	0.580	-0.414	0.642	-0.373	**0.849**	0.327
Int_5	0.468	-0.516	0.402	-0.401	**0.740**	0.422
Int_7	0.550	-0.299	0.530	-0.449	**0.770**	0.380
Ne_1	0.286	-0.487	0.338	-0.575	0.399	**0.868**
Ne_2	0.320	-0.522	0.271	-0.680	0.380	**0.870**
Ne_3	0.262	-0.536	0.262	-0.634	0.380	**0.892**
Ne_4	0.271	-0.554	0.298	-0.671	0.390	**0.887**
Ne_5	0.326	-0.542	0.329	-0.676	0.479	**0.873**

	Ag	Co	Entertainment	Ex	Int	Ne
Ag_2	**0.768**	-0.371	0.550	-0.373	0.492	0.295
Ag_3	**0.834**	-0.321	0.590	-0.310	0.558	0.184
Ag_5	**0.813**	-0.345	0.560	-0.353	0.531	0.243
Ag_6	**0.784**	-0.346	0.535	-0.445	0.595	0.357
Co_10_R	-0.311	**0.878**	-0.342	0.613	-0.462	-0.535
Co_7_R	-0.422	**0.818**	-0.358	0.610	-0.434	-0.466
Co_8_R	-0.380	**0.868**	-0.363	0.603	-0.404	-0.511
Co_9_R	-0.371	**0.885**	-0.334	0.650	-0.456	-0.560
Enter_1	0.523	-0.278	**0.770**	-0.316	0.542	0.312
Enter_2	0.620	-0.355	**0.815**	-0.383	0.541	0.352
Enter_3	0.549	-0.301	**0.819**	-0.282	0.485	0.239
Enter_4	0.626	-0.393	**0.865**	-0.404	0.545	0.318
Enter_5	0.561	-0.324	**0.816**	-0.308	0.512	0.257
Enter_6	0.533	-0.326	**0.810**	-0.327	0.472	0.260

Ex_6_R	-0.384	0.582	-0.365	**0.852**	-0.442	-0.615
Ex_7_R	-0.369	0.591	-0.334	**0.825**	-0.422	-0.614
Ex_8_R	-0.427	0.641	-0.383	**0.852**	-0.417	-0.611
Ex_9_R	-0.363	0.601	-0.305	**0.837**	-0.446	-0.647
Int_1	0.580	-0.412	0.585	-0.373	**0.843**	0.325
Int_5	0.467	-0.515	0.409	-0.405	**0.756**	0.421
Int_7	0.550	-0.298	0.482	-0.448	**0.764**	0.379
Ne_1	0.286	-0.487	0.354	-0.576	0.400	**0.868**
Ne_2	0.320	-0.522	0.303	-0.681	0.383	**0.875**
Ne_3	0.262	-0.536	0.263	-0.636	0.383	**0.891**
Ne_4	0.271	-0.553	0.317	-0.672	0.393	**0.890**
Ne_5	0.326	-0.541	0.313	-0.677	0.481	**0.866**

	Ag	Co	Escapism	Ex	Int	Ne
Ag_2	**0.767**	-0.366	0.520	-0.372	0.491	0.294
Ag_3	**0.831**	-0.317	0.551	-0.309	0.550	0.182
Ag_5	**0.812**	-0.344	0.526	-0.352	0.527	0.242
Ag_6	**0.789**	-0.342	0.526	-0.444	0.593	0.356
Co_10_R	-0.311	**0.887**	-0.517	0.613	-0.474	-0.537
Co_7_R	-0.423	**0.805**	-0.451	0.610	-0.437	-0.465
Co_8_R	-0.379	**0.864**	-0.476	0.602	-0.414	-0.511
Co_9_R	-0.372	**0.892**	-0.499	0.651	-0.466	-0.560
Escap_1	0.559	-0.409	**0.828**	-0.402	0.609	0.336
Escap_2	0.539	-0.485	**0.820**	-0.438	0.566	0.391
Escap_3	0.599	-0.459	**0.812**	-0.460	0.589	0.373
Escap_4	0.541	-0.473	**0.807**	-0.443	0.552	0.376
Escap_5	0.482	-0.472	**0.820**	-0.401	0.567	0.357
Escap_6	0.564	-0.497	**0.871**	-0.420	0.576	0.378
Ex_6_R	-0.385	0.582	-0.439	**0.848**	-0.442	-0.616
Ex_7_R	-0.370	0.589	-0.418	**0.825**	-0.423	-0.613
Ex_8_R	-0.428	0.640	-0.466	**0.848**	-0.414	-0.611
Ex_9_R	-0.364	0.602	-0.416	**0.846**	-0.452	-0.647
Int_1	0.580	-0.412	0.610	-0.373	**0.829**	0.323
Int_5	0.468	-0.518	0.536	-0.407	**0.791**	0.420
Int_7	0.551	-0.298	0.502	-0.447	**0.748**	0.378
Ne_1	0.287	-0.488	0.421	-0.577	0.402	**0.864**
Ne_2	0.321	-0.522	0.369	-0.682	0.388	**0.875**
Ne_3	0.264	-0.538	0.371	-0.637	0.389	**0.897**
Ne_4	0.272	-0.555	0.418	-0.673	0.398	**0.893**
Ne_5	0.327	-0.542	0.372	-0.678	0.485	**0.863**

	Ag	Co	Esthetic	Ex	Int	Ne
Ag_2	**0.763**	-0.373	0.522	-0.374	0.492	0.295
Ag_3	**0.834**	-0.321	0.579	-0.310	0.560	0.186

Ag_5	**0.814**	-0.346	0.547	-0.353	0.532	0.245
Ag_6	**0.788**	-0.348	0.538	-0.446	0.595	0.358
Co_10_R	-0.311	**0.875**	-0.331	0.613	-0.459	-0.534
Co_7_R	-0.422	**0.824**	-0.371	0.614	-0.433	-0.466
Co_8_R	-0.379	**0.862**	-0.339	0.602	-0.401	-0.510
Co_9_R	-0.371	**0.886**	-0.338	0.649	-0.452	-0.559
Esth_1	0.541	-0.339	**0.779**	-0.331	0.534	0.331
Esth_2	0.541	-0.338	**0.807**	-0.354	0.493	0.244
Esth_3	0.541	-0.279	**0.824**	-0.318	0.486	0.252
Esth_4	0.580	-0.321	**0.843**	-0.316	0.549	0.214
Esth_5	0.560	-0.319	**0.782**	-0.301	0.485	0.210
Esth_6	0.578	-0.364	**0.855**	-0.367	0.548	0.269
Ex_6_R	-0.384	0.581	-0.337	**0.844**	-0.442	-0.612
Ex_7_R	-0.370	0.593	-0.351	**0.835**	-0.422	-0.615
Ex_8_R	-0.427	0.642	-0.395	**0.861**	-0.418	-0.611
Ex_9_R	-0.363	0.602	-0.256	**0.823**	-0.444	-0.645
Int_1	0.580	-0.413	0.591	-0.372	**0.847**	0.328
Int_5	0.468	-0.514	0.385	-0.401	**0.745**	0.421
Int_7	0.552	-0.300	0.489	-0.449	**0.769**	0.381
Ne_1	0.286	-0.486	0.329	-0.576	0.399	**0.875**
Ne_2	0.319	-0.522	0.252	-0.680	0.381	**0.871**
Ne_3	0.262	-0.534	0.207	-0.634	0.381	**0.887**
Ne_4	0.271	-0.553	0.252	-0.670	0.391	**0.884**
Ne_5	0.327	-0.542	0.290	-0.677	0.480	**0.871**

5.2 Results

After examining the measurement model, we used SmartPLS and a bootstrapping procedure to assess the hypotheses (Hair et al., 2019). Previous studies have found the four dimensions of immersive experience to be highly correlated (Lee et al., 2020; Sung, 2021). We also found high correlations between these four constructs. For this reason, we ran four separate models. To ensure the robustness of the results, we tested the hypotheses using both variance-based SEM and co-variance-based SEM. We found that both tests gave the same results in terms of significant relationships indicating that the results are robust. We also assessed the predictive power and found that the models have good power. The results of the variance-based (PLS) are displayed in Table 7 and the results of the covariance-based SEM are displayed in Table B.1 in Appendix B. The data suggest that three of the five personality traits significantly impact AR immersive experiences. The results show that agreeableness has a positive impact on all four dimensions of AR immersive experiences, supporting hypothesis H1 ($\beta_{education}$ = .38; p < .001; $\beta_{entertainment}$ = .50; p < .001; $\beta_{escapism}$ = .32; p < .001; $\beta_{esthetic}$ = .46; p < .001). The results indicate that conscientiousness has a negative significant impact on education (β= -.11; p < .001) and on escapism (β= -.22; p < .001), partially supporting hypothesis H2. We also find that openness significantly influences all four dimensions of immersive experiences, supporting hypothesis H4 ($\beta_{education}$ = .36; p < .001; $\beta_{entertainment}$ = .24; p < .001; $\beta_{escapism}$ = .34; p < .001; $\beta_{esthetic}$ = .27; p < .001). The data did not support our hypotheses for the impact of extraversion (H3) and neuroticism (H5) on AR immersive experiences. The results also indicate that age only has an impact on esthetics, while internet usage has a significant impact on entertainment and esthetics.

Table 7. Results of Hypotheses Testing

	Education		Entertainment		Escapism		Esthetic
Agreeableness	$0.383^{\mathbf{(0.000)}}$		$0.502^{\mathbf{(0.000)}}$		$0.321^{\mathbf{(0.000)}}$		$0.460^{\mathbf{(0.000)}}$
Conscientiousness	$-0.114^{\mathbf{(0.036)}}$		$-0.052^{(0.443)}$		$-0.221^{\mathbf{(0.001)}}$		$-0.077^{(0.117)}$
Extraversion	$-0.010^{(0.458)}$		$0.035^{(0.681)}$		$-0.002^{(0.493)}$		$-0.010^{(0.454)}$
Openness	$0.360^{\mathbf{(0.000)}}$		$0.238^{\mathbf{(0.001)}}$		$0.344^{\mathbf{(0.000)}}$		$0.266^{\mathbf{(0.000)}}$
Neuroticism	$-0.032^{(0.351)}$		$0.069^{(0.368)}$		$0.043^{(0.315)}$		$-0.029^{(0.342)}$
Age	$0.054^{(0.130)}$		$-0.007^{(0.855)}$		$-0.002^{(0.479)}$		$0.072^{\mathbf{(0.025)}}$
Internet usage	$0.060^{(0.094)}$		$0.114^{\mathbf{(0.013)}}$		$0.015^{(0.349)}$		$0.110^{\mathbf{(0.007)}}$
R-square	0.568		0.552		0.599		0.541
Note: Values in parentheses are p-values.							

5.3 Common Methods Bias

When the same survey and response method are used to collect data for both the dependent and independent variables, there is a concern about common method bias (CMB) (Podsakoff et al., 2003). To address social desirability bias, we assured participants that their responses would be kept anonymous, following the guidance of Podsakoff et al. (2003). After collecting data, we conducted multiple independent tests to investigate the impact of common methods bias. Harman's single factor test (SFT) was performed, revealing that a single factor accounted for 36.53% of the variance, which is below the 50% threshold, indicating no CMB issue. According to Kock (2015), a VIF exceeding 3.3 may indicate pathological collinearity and the presence of common method bias. The VIFs in our study range from 1.29 to 2.74, which is less than 3.3, indicating no common method bias in the model. We also examined whether any pair of variables had a correlation coefficient above 0.90 (Pavlou & Fygenson, 2006). This is because methodological bias can artificially inflate observed correlations between measures due to spurious covariance (Campbell & Fiske, 1959). Upon reviewing Table 5, we observed that no strong correlations exceeded the threshold. Therefore, these tests suggest that CMB did not influence our results.

6 Discussion

Augmented Reality technology has gained popularity in recent years (Javornik, 2016). The number of AR users increased by over 300% from 2021 to 2023, with projections indicating a rise from 23.47 million in 2023 to 126.55 million by 2028 (Statista, 2024c). Therefore, a more nuanced understanding of how users interact with AR technologies is needed. This research investigates the role of personality traits in AR immersive experiences. In the next section, the findings of this study are discussed.

6.1 Interpretation of the Results

We now describe the findings of this research in detail. First, our results indicate that agreeableness is significantly associated with AR immersive experience. Agreeableness is positively associated with education, entertainment, escapism, and esthetic dimensions of AR immersive experience, indicating that hypothesis H1 is supported. Prior works demonstrate the relationship between agreeableness and education by promoting collaborative engagement (an inherent characteristic of agreeable individuals) in learning activities (De Raad & Schouwenburg, 1996; Vermetten et al., 2001). As individuals with agreeableness traits show agreeable behaviors in virtual environments (McCreery et al., 2012), the finding that agreeableness is positively associated with educational outcomes in an AR immersive experience is expected. Individuals with high levels of agreeableness are known to have more fun (Karl et al., 2007; Tews et al., 2014). Given that AR technologies have the capability of providing hedonic experiences (Hilken et al., 2017; Weingarten & Goodman, 2021), it is understandable that agreeable individuals would find AR immersive experiences more entertaining. Research has shown that a high level of agreeableness is associated with escapism (Park et al., 2011). Considering the effectiveness of AR technologies in facilitating escapism (Preece & Skandalis, 2024), it is reasonable to anticipate a positive association between agreeableness and escapism in AR immersive experiences. An important aspect of using AR technology is its capability to enhance the esthetic of the environment (Vieira et al., 2022). Individuals with high levels of agreeableness tend to exhibit a positive inclination toward esthetics (e.g., arts and nature) (Chacón et al., 2024). Consequently, a positive association between high agreeableness and enhanced aesthetic engagement in AR immersive experiences is expected.

Second, our results on conscientiousness and AR immersive experience provide partial support for hypothesis H2. Our findings indicate that conscientiousness has a meaningful relationship with education and escapism. Although conscientious individuals tend to demonstrate higher levels of motivation to learn (Colquitt et al., 2000), we found a negative association between conscientiousness and the education dimension, implying that conscientious individuals may not perceive AR as a beneficial educational tool. A plausible reason for this result is that conscientious individuals prefer work-oriented applications over hedonic experiences provided by AR filters (Ibáñez‐Sánchez et al., 2022). We did not find a significant relationship between conscientiousness and entertainment. A possible explanation is that conscientious individuals often prioritize productivity and goal-oriented activities (Yeo & Neal, 2004). Consequently, they are less likely to derive enjoyment from activities perceived as purely recreational or lacking in clear purpose. For example, in the context of gaming (as a form of entertainment), conscientious individuals show lower immersion motives (Graham & Gosling, 2013). Our results show a negative relationship between conscientiousness and escapism. This is understandable as conscientious individuals are known to plan their daily tasks and fulfill their responsibilities (Barrick et al., 2001). Given these characteristics, conscientious individuals may view escapism—activities designed to distract oneself from the realities of daily life—as unproductive or a deviation from their goals and duties. As a result, they are less likely to engage in activities aimed at escapism. Finally, we did not find a significant association between conscientiousness and esthetic. Conscientious individuals mainly focus on goal achievement in their activities (Costa Jr et al., 1991). Esthetic experiences (such as art experiences), which are often non-utilitarian, might not align closely with their goal-oriented priorities (Furnham & Chamorro-Premuzic, 2004). Upon expanding our perspective, it becomes evident that both the dimensions of education and escapism are situated along the active participation axis of immersion experiences. This observation aligns with the conscientiousness personality trait, wherein conscientious individuals tend to engage actively in various tasks, responsibilities, and endeavors (Chiaburu et al., 2011; Simmering et al., 2003; Young et al., 2018). Therefore, it is understandable that conscientious individuals pay more attention to the active participation axis dimension, namely education and escapism.

Third, we did not find significant associations between extraversion and AR immersive experience, indicating that hypothesis H3 was not supported. Previous studies show that extraversion does not always have a significant impact on the immersion experience (Kober & Neuper, 2013; Yu et al., 2020). A possible explanation could be that the immersive experience provided by AR might not be sufficiently engaging for extroverts. Moreover, this result becomes more plausible when we acknowledge the current limitations of AR technologies (Yim et al., 2017).

Fourth, we found that openness has a positive association with AR immersion experience, showing support for hypothesis H4. Increased openness could lead to greater intentions to buy and use AR devices (Rauschnabel et al., 2015). In the context of video games, openness to experience has been considered a primary predictor of immersion (Lukka, 2014; Worth & Book, 2014). Openness has been positively associated with the active pursuit of learning and elevated learning motivation (McCrae, 1996; Poropat, 2009). Considering the potential of AR technologies to enhance learning and education (Yuen et al., 2011), it is reasonable to expect a positive impact of openness on the education dimension of AR immersive experience. Openness has also been linked to excitement-seeking behaviors (Aluja et al., 2003). AR technologies also offer exciting, entertaining, and fun experiences (Jang & Liu, 2020; Javornik et al., 2022; Zanger et al., 2022). Following these, it is sensible to believe that individuals with high openness are likely to have positive entertaining experiences. Our results show that a high level of openness is positively associated with the escapism dimension of AR immersive experience. This finding diverges from the established literature, where in the context of online gaming, de Hesselle et al. (2021) argue that openness to experience is negatively associated with escapism motives. This discrepancy can be attributed to the unique characteristics of augmented reality technology, which offers a higher level of immersion, allowing individuals to truly escape from the real world (Preece & Skandalis, 2024). This enhanced escapism might appeal differently to those with high openness, compared to the escapism observed in online gaming contexts. Open individuals are characterized by artistic and esthetic inclinations (Silvia et al., 2015; Wang & Wanberg, 2017). With AR's capability in enhancing esthetics, it is logical that open individuals who already have an interest in enhancing artistic and aesthetic experiences would experience enhanced AR immersion, as it offers innovative and immersive ways to engage with art.

Finally, hypothesis H5 was not supported as we did not find evidence to support the relationship between neuroticism and AR immersive experience. Existing literature presents similar results regarding the effects of neuroticism in AR contexts. For instance, in the context of AR advertising, Uribe et al. (2022) found that neuroticism does not moderate advertisement exposure and entertainment aspect of the advertisement. In the context of AR games, Khalis and Mikami (2018) found no significant relationship between neuroticism and AR game behaviors. Consequently, it is not surprising that neuroticism did not significantly affect the AR immersive experience.

6.2 Theoretical Contributions

This study makes two key theoretical contributions to the literature. First, we contribute to theory by providing a better understanding of AR technology. We explain how different personality traits impact AR immersive experiences. The Big-Five personality model is utilized to investigate the effect of different personalities on four dimensions of the AR immersive experience. Existing literature predominantly explores the effects of AR technology on various outcomes, such as attitude and reuse intention (Daassi & Debbabi, 2021), purchase intention (Rauschnabel et al., 2018), satisfaction (Jessen et al., 2020), and consumer engagement and perception (Pamuru et al., 2021). In addition to investigating the consequences of AR technology usage, several studies delve into how constructs from the experience economy framework serve as antecedents of other dimensions of user experience (Sung, 2021; tom Dieck, Jung, & Rauschnabel, 2018) or user immersion (Lee et al., 2020). This study offers a unique perspective by shifting the focus to the predictors of AR immersive experiences beyond the lens of the experience economy framework. Building on previous research, our study extends the immersive experience framework by showing its application in the context of AR technology. Moreover, this study extends the AR immersive experience model by showing how different personality traits influence each dimension of the user's AR immersive experience. By focusing on the intricacies between users' dispositional factors and AR immersive experiences, we bridge the existing gap in the literature by understanding how psychological factors shape users' perceptions. Understanding these factors is crucial because they precede and shape users' attitudes and behaviors in AR contexts.

Second, this study contributes to personality literature by showing how personality traits manifest and operate in an AR environment. Existing literature has shown the critical role of personality traits in various contexts, such as software development (Balijepally et al., 2006), word-of-mouth (Adamopoulos et al., 2018), remote work (Parra et al., 2022), and social media engagement behaviors (Miller et al., 2024). Our findings reveal that specific personality traits exert differential impacts on various dimensions of AR immersive experiences. For example, agreeableness and openness positively influence all four dimensions of the AR immersive experiences. However, conscientiousness negatively impacts education and escapism dimensions, showing a significant effect on the active participation axis of the AR immersive experience. To the best of our knowledge, this study is among the first to study the effect of personality traits on AR immersive experience, highlighting the complexity of human interactions with AR technology.

6.3 Practical Implications

The findings from this study also provide important implications for practitioners. First, our findings can help social media platform managers target individuals based on personality types to increase user engagement on social media platforms. Social media managers can use text mining tools to infer personality traits from social media users' public posts to suggest appropriate AR filters (Adamopoulos et al., 2018). For instance, we know from the results that agreeableness and openness are positively associated with AR immersive experiences. This suggests that social media platform managers can leverage these traits to enhance user engagement by recommending AR filters specifically designed for the dimensions of education, entertainment, escapism, and esthetics to cater to individuals with high levels of agreeableness and openness.

Second, brand managers on social media platforms can target individuals with specific personality traits to promote their services or products on social media using AR filters. For example, brand managers can utilize established machine learning methods to extract personality traits from social media posts as described above (Adamopoulos et al., 2018). Once user personality traits have been identified, brand managers can promote their products using AR filters for individuals who have higher levels of trait agreeableness and openness. These AR filters could be developed to provide educational information about the product, and entertaining and fun experiences that might be expected from the use of the product.

Third, using insights from this study, social media managers and AR developers might develop specific AR filters for these different personality types. Despite the common practice of developing AR filters for particular events and tasks (e.g., AR filters for festivals) (Times, 2022), we emphasize the importance of designing AR filters tailored to different personality types. We think that the development of personality-dependent AR filters might receive more traction and engagement on social media platforms. As a starting point, social media managers and AR developers might ask individuals with different personality types to provide suggestions for newer and more personalized AR filters. Similarly, brand managers can develop specific AR filters that could appeal to individuals with specific personality traits to improve brand image and purchase behaviors. For example, the findings show that individuals with high levels of agreeableness and openness experience higher immersive experiences in terms of entertainment dimension. Filters that incorporate fun, interactive elements or visually rich environments may resonate particularly well with these individuals. Social media managers and AR developers can use this insight to design AR filters that are more entertaining and engaging for these personality types. In addition, brand managers should also consider the specific characteristics of their organizations when creating such filters. Research indicates that organizational cultures differ significantly (Gupta et al., 2022), and these differences may influence the kinds of AR filters that will be most effective and appealing within a given context.

Fourth, social media managers might vary the amount of AR filter recommendations to users based on personality traits. Our findings indicate that users who have higher levels of agreeableness and openness are more likely to have positive immersive experiences. Therefore, social media managers might recommend more AR filters to these users. In contrast, users who have higher levels of conscientiousness are more likely to have negative immersive experiences, particularly in dimensions like education and escapism. Therefore, social media managers might adopt a more conservative approach when recommending AR filters to conscientious users.

6.4 Limitations and Future Research

This study has some limitations that can provide avenues for future research. First, in this study, we leverage survey methodology to examine how personality traits impact AR immersion. Survey methodology is widely adopted (Gupta et al., 2019; Hammer & Shadbad, 2022; Merhi & Meisami, 2024; Parthiban & Adil, 2024) and serves as a good starting point for examining our research question. Future studies should consider incorporating qualitative methods, such as interviews or focus groups, to gain deeper insights into how and why different personality traits influence AR immersive experiences. Additionally, experimental designs that allow participants to interact with AR technologies under controlled conditions could offer more robust evidence of causality and clarify the specific mechanisms through which personality traits shape AR immersive experiences. These approaches would complement the quantitative data, providing a fuller understanding of the factors driving individual differences in AR interactions. Second, we utilized the Big-Five model to examine the effect of personality traits on AR immersive experiences. The Big Five model is one of the most popular models for examining personality traits (Adamopoulos et al., 2018; Liu et al., 2021). However, other models, such as HEXACO (Lee & Ashton, 2004), can be used to provide a more comprehensive understanding of the effect of personality on AR immersive experience. Third, all participants of this study are from the United States. However, we know that there are significant differences across different cultures and countries (Gupta & Gupta, 2019). Therefore, we encourage future research to include participants from a broader range of regions and demographic groups to better capture the diversity of AR immersive experiences across different populations. Fourth, we used Amazon MTurk to collect data. MTurk is widely recognized for its broad usage and is considered reliable (Esmaeilzadeh, 2019; Plachkinova, 2023; Zaza et al., 2023). However, using Amazon MTurk for data collection has been associated with specific biases, such as self-selection, non-independence, and participants' ability to perform the survey (Jia et al., 2017). Although we ensured robust data quality through attention checks, pilot tests, reliability and validity assessments, and tests for common method bias, we encourage future research to utilize different sources to validate our findings. Fifth, we used cross-sectional data to measure the hypotheses presented. Future research can use a mixed-method approach to assess the model and its hypotheses (Maier et al., 2023). For instance, longitudinal studies could be utilized to explore how AR immersive experiences impact users over time, particularly as AR technology continues to evolve. Sixth, while our study focuses on AR, exploring whether similar associations exist in other extended reality (XR) technologies, such as Virtual Reality (VR), could provide a more comprehensive understanding of immersive experiences provided by these technologies. Seventh, our study focused on examining the association between different personality traits and AR immersive experiences. Our study provides important insights. However, there are several ethical and privacy considerations regarding personality types and the use of AR on social media that can be examined in future research. On the ethical side, future research can examine how AR filters designed to change or enhance facial features might harm individuals with higher levels of specific personality traits (e.g., neuroticism) (Fastoso et al., 2021; Moore & Craciun, 2021). On the privacy side, future research can examine the association between different personality traits and AR immersive experiences that might be moderated by individuals' privacy concerns because individuals share biometric facial data when using AR filters on social media (Cowan et al., 2021; Merhi & Ahluwalia, 2024). We also encourage future research to explore the relationship between the AR immersive experience and challenges created by other novel technologies, such as AI hallucination (defined as "when generative AI produces nonsensical or inaccurate output" (Diaz Campo et al., 2024)). Finally, future research could explore potential biases related to participants' varying familiarity with AR by assessing their proficiency. This would help ensure more accurate insights into how different individuals experience AR technologies.

7 Conclusion

AR immersive technologies play an important role in engaging social media users. Since users generally have different preferences, it is important to understand how personality traits influence AR immersive experiences. The study utilizes the Experience Economy framework and models the relationship between Big-Five personality traits and AR immersive experiences. Our findings indicate that openness and agreeableness positively impact all four dimensions of the AR immersive experience. In contrast, conscientiousness negatively impacts the escapism and education dimensions of the AR immersive experience. Through this research, we highlight the important role of personality in understanding AR immersion experience on social media and provide important implications for theory and practice.

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Appendix A: Summary of Studies Included in the Literature Review

Table A1. Immersive Technology

Title	Method	Independent variables	Dependent Variables	Findings
Suh and Prophet (2018)	Review Paper	NA	NA	The authors thoroughly review academic work regarding immersive technology using the stimulus-organism-response (S-O-R) framework.
Liberatore and Wagner (2021)	Review Paper	NA	NA	The paper synthesizes literature investigating the application of immersive technology across various contexts.
French et al. (2020)	Review Paper	NA	NA	The paper highlights the role of immersive technologies in disrupting society and business.
Yang and Xiong (2019)	Quantitative Experiments	Study 1&2 IVs: Personalized and Non-personalized Virtual fitting room, Promotion, Historical sales, Historical rating Study 3 IVs: Perceived enjoyment, Perceived risk, apparel	Study 1&2 DVs: Sales volume, Customer satisfaction, Return rate Study 3 DVs: Likelihood of Purchase	Both personalized and non-personalized virtual fitting room (VFR) increase sales. Personalized VFRs provide greater enhanced perceived enjoyment and reduced perceived risk, which in turn enhance customer satisfaction, and reduced return rates.

Shin (2022)	Mixed Methods Ethnography Survey	Study2: IVs: Instrumental affordance (Immersion, presence), Affective affordance (Empathy, Embodiment)	DV: Playability	The paper demonstrates the crucial role of immersion and presence in shaping user attitudes and behaviors. User's emotional connection and embodiment are positively connected to user engagement in an immersive environment, with the effect being context-dependent.
Kinzinger et al. (2022)	Quantitative Experiments	IVs: High and low sensory product presentation modes Attitude towards the product, perceived diagnosticity	DVs: Attitude towards the product, intention to purchase	The study highlights the positive impact of higher immersive virtual product presentation mode on consumers' attitudes and purchase intention.
Steffen et al. (2019)	Mixed-Methods Survey Interview	Study 1&2 IVs: Affordances of immersive technologies	Study 1&2 DV: User's perception of the affordances of immersive technologies	The paper examines the user adoption of immersive technologies through the affordance framework. The findings show that immersive technologies can mitigate the negative user perceptions of the physical world while enlarging the positive aspects.
Zuo and Shen (2024)	Qualitative Interviews	NA	NA	The study demonstrates that the functionalities of immersive technology's hardware and software and its content are crucial in shaping user experience and engagement.

Farshid et al. (2018)	Discussion Paper	NA	NA	The paper elaborates on the concepts of the reality-virtuality continuum and discusses the potential business applications.
Flavián et al. (2019)	Conceptual Paper	NA	NA	The paper conceptualizes the boundaries of different immersive technologies and highlights the promising potential of immersive technologies in fortifying consumer engagement and positive attitudes across different purchase stages.

Table A2. Augmented Reality

Title	Method	Independent variables	Dependent Variables	Findings
Hilken et al. (2017)	Quantitative Experiment	IVs: AR simulated physical control, AR environmental embedding, Spatial presence	DV: Purchase intention	AR-based service enhancements are positively associated with consumer experience and purchase intention, with spatial presence mediating such effect.
Ibáñez‐Sánchez et al. (2022)	Mixed Methods Survey Focus Group Studies	IVs: Perceived entertainment, Perceived convenience, Perceived interactivity	DV: User satisfaction with AR filter experiences	User satisfaction is largely influenced by the perceived entertainment of AR filters.
Javornik et al. (2022)	Mixed Methods Interview Survey	IVs: Motivations related to AR face filter usage	DVs: User well-being, AR face filter usage	The study highlights the positive impact of AR filters impact on user self-acceptance. However, ideal-self motivations can induce a negative influence on self-acceptance.

Salar et al. (2020)	Quantitative Experiments	IVs: Emotional investment, focus of attention	DVs: Flow	The study demonstrates the positive effect of AR applications in enhancing students' attention and performance.
Rauschnabel et al. (2019)	Quantitative Survey	IVs: Perceived augmentation quality, hedonic benefits, utilitarian benefits	DV: Attitude towards brand	The study highlights that the quality of AR content is positively associated with consumers' attitudes toward brands, with AR inspiration mediating the effect.
de Ruyter et al. (2020)	Discussion Paper	NA	NA	The paper proposes a conceptual framework to explore the utilization of AR applications in advertising and marketing.
Liberatore and Wagner (2021)	Literature Review	NA	NA	The paper highlights the positive effects of utilizing AR, such as mental rehabilitation.
Massa and Ladhari (2023)	Literature Review	NA	NA	The paper proposes a conceptual framework that aims to understand how AR characteristics and experience impact marketing outcomes such as brand attitudes and purchase intentions.
Butt et al. (2021)	Quantitative Survey	IVs: AR quality, perceived ease of use, AR satisfaction, perceived enjoyment, perceived interactivity, perceived customization	DV: Continuous intention to use AR apps	The study demonstrates that AR apps' content and augmentation quality are positively associated with consumer satisfaction.

Li and Fang (2020)	Quantitative Survey	IVs: Mobile AR features, nostalgia, playfulness, game-challenge reactions	DV: User experience	The authors indicate that mobile AR application features, including controllability, perceived spatial mobility, and perceived interactivity, are positively connected with user experience.
Ali (2022)	Quantitative Survey	IVs: Utilitarian, hedonic, social factors	DV: AR-experience	The author proposes a three-dimensional framework of utilitarian, hedonic, and social interactions to predict user AR-immersive experience.
Lee et al. (2020)	Quantitative Survey	IVs: Absorptive experience (entertainment, education), Immersion experience (esthetic, escapism)	DVs: Overall museum experience, intention to visit	The findings highlight the importance of immersive virtual experiences on users' perceived authenticity and intention to visit museums.
Sung (2021)	Quantitative Survey	IVs: Entertainment, Esthetics, education, escapism	DVs: AR advertising satisfaction, purchase intention	The findings reveal the role of the aesthetics of AR experience in promoting consumers' positive immersive advertising experiences.
Kowalczuk et al. (2021)	Quantitative Survey	IVs: AR characteristics	DVs: Affective responses, cognitive responses, behavioral responses	The paper demonstrates that the system characteristics of AR significantly enhance user immersion and enjoyment, whereas the congruence of product presentation exhibits no significant impact on user immersive experience and purchase intention.

Yim and Park (2019)	Quantitative Survey	IVs: AR and web-based product presentation	DVs: Media usefulness, media enjoyment, attitude toward technology, adoption intention	The study suggests that individuals with unfavorable body image are more inclined to adopt AR presentations for fashion products.
Jäger and Weber (2020)	Quantitative Experiment	IVs: Different methods of advertising display, local or organic products	DVs: Sales of advertised products	The study highlights that AR applications are more effective in attracting consumer attention than traditional digital displays.
Yang et al. (2020)	Quantitative Experiment	IVs: AR ads, Traditional ads, Curiosity, familiarity with AR ad technology	DV: Attention and attitude toward advertisements	The findings indicate that AR advertisements are more effective in fortifying consumers' positive attitudes toward the ads.

Table A3. Experience Economy

Nilsson et al. (2016)	Review Paper	NA	NA	The paper thoroughly reviews the literature regarding immersive technology and highlights that the functionalities, contents, and interactions provided by immersive systems are the key to fostering user immersion.
Witmer and Singer (1998)	Quantitative Survey	IVs: Control factors, sensory factors, distraction factors, and realism factors.	DVs: Presence in virtual environments	The empirical results illustrate that perceived controllability is crucial in amplifying perceived presence in immersive environments, with the extent of the vividness of the content also affecting the immersion experience.

Lee et al. (2020)	Quantitative Survey	IVs: Absorptive experience (Entertainment, Education), Immersion experience (esthetic, escapism)	DVs: Overall museum experience, intention to visit	The findings highlight the importance of immersive experience on frosting visitor’s perceived authenticity and visit intention of museums.
Sung (2021)	Quantitative Survey	IVs: Entertainment, Esthetics, Education, Escapism	DVs: AR advertising satisfaction, purchase intention	The findings reveal the crucial role of the aesthetics of AR experience in promoting consumers' positive immersive advertising experiences.
Oh et al. (2007)	Mixed Methods Interview Survey	IVs: Entertainment, Esthetics, Education, Escapism	DVs: Customer satisfaction, perceived quality	The result highlights that the aesthetics dimension is the most influential factor in promoting consumer satisfaction within the context of hospitality.
Pine and Gilmore (1998)	Conceptual Paper	NA	NA	The study proposes the concept of the four realms of an experience consisting of entertainment, educational, escapist, and esthetic. Moreover, the study submits that there are two dimensions of user participation that affect consumer participation: active and passive, which affect consumer experience. Active participation significantly shapes consumer experience, while passive participations have no influence.

Moorhouse and Jung (2017)	Qualitative Focus Group	NA	NA	The findings demonstrate that AR technologies enable persistent knowledge absorption by users and increase the intention to re-visit the museum.
Benny (2015)	Discussion Paper	NA	NA	The paper discusses the importance of entertainment across various domains, highlighting the emerging potential of entertainment in user engagement.
tom Dieck, Jung and tom Dieck (2018)	Qualitative Interview	NA	NA	The findings demonstrate that AR applications can enhance overall user learning performance.
tom Dieck, Jung and Rauschnabel (2018)	Quantitative Survey	IVs: Esthetics, education, entertainment, escapism	DVs: Satisfaction, visitor engagement	The results demonstrate that within the context of science festivals, the esthetic dimension is the main driver of the three elements of the experience economy framework, collectively enhancing consumer engagement and satisfaction.
Song et al. (2015)	Quantitative Survey	IVs: Esthetics, education, entertainment, escapism	DVs: Values, satisfaction	The study highlights that escapist and entertainment experiences affect both utilitarian perceptions and sentiment, with educational experience only affecting utilitarian perceptions and esthetic experience only influencing consumer sentiment.

Haj-Bolouri (2023)	Qualitative Interview	NA	NA	The study shows that users' perceived value of escapism experiences is shaped by four feelings: satisfaction, acquaintance, sentiment, and empathy.
Suh and Prophet (2018)	Review Paper	NA	NA	The paper highlights that user immersive experiences are largely affected by the content and interactions provided by immersive technology and are context-dependent.

Table A4. Personality Traits

Title	**Method**	**Independent variables**	**Dependent Variables**	**Findings**
Balijepally et al. (2006)	Review Paper	NA	NA	The paper compares the MBTI and FFM framework for measuring personalities, highlighting the impact of each dimension of personality traits on software development team performance.
Bansal et al. (2016)	Quantitative Lab experiment	IVs: Personality traits, internet privacy concerns, trust	DV: Intention to disclose information	The findings show that individuals with personality traits that favor social interactions, such as extroverts and agreeable individuals, are more trusting, emphasizing the effect, and are context-sensitive.
Maier et al. (2019)	Quantitative Survey	IVs: Personality traits, IS conditions	DV: Techno-strain	The study highlights the effect of neuroticism on technostress, with the remaining traits exhibiting no significant effect.

Parra et al. (2022)	Quantitative Survey	IVs: Personality traits	DV: Remote work exhaustion	Neuroticism is positively associated with remote work fatigue, while agreeableness and conscientiousness are negatively associated with remote work exhaustion.
Yang et al. (2023)	Quantitative Design science	NA	NA	The results demonstrated that the proposed artifact outperformed existing NLP-based methods for personality prediction, highlighting the effectiveness of utilizing personality traits for downstream prediction tasks.
Tupes and Christal (1992)	Quantitative Board-interview	NA	NA	The study submits that the five-factor personality traits are surgency, agreeableness, dependability, emotional stability, and culture.
Costa and McCrae (1992)	Quantitative Survey	NA	NA	The results demonstrate that the NEO framework is consistent within clinical and normal contexts, highlighting its potential to support clinical decisions.
Goldberg (1992)	Quantitative Survey	NA	NA	The study shows that the proposed measurements are valid and aligned with the NEO framework.

Barrick and Mount (1991)	Review Paper	NA	NA	The study highlights the potential of conscientiousness in predicting job performance across different job types, as it showed consistency among all the occupations included in the study. Moreover, extraversion is consistent within jobs involving high social interactions, and openness is positively linked to learning activities.
McCrae and Costa (1985)	Quantitative Survey	IVs: Personality traits items	DVs: Personality traits	The findings highlight that an appropriate framework of personality traits should be extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience.
Costa Jr et al. (1991)	Quantitative Survey	NA	NA	The results validate the new NEO personality framework by adding items for agreeableness and conscientiousness.
Judge et al. (2002)	Review Paper	NA	NA	Neuroticism is negatively associated with job satisfaction, while conscientiousness and extraversion are positively associated with job satisfaction.
McCrae and Costa (1987)	Quantitative Survey	NA	NA	The study incorporates spouse ratings, peer ratings, and self-report data to validate the proposed measurements for Big Five personality traits.

Simha and Parboteeah (2020)	Quantitative Survey	IVs: Conscientiousness, agreeableness, openness to experience, national culture variables	DV: Willingness to justify ethically suspect behaviors	The findings indicate that conscientiousness and agreeableness are negatively correlated with unethical behaviors.
Judge et al. (1999)	Quantitative Survey	IVs: Personality traits, mental ability	DVs: Intrinsic career success, extrinsic career success	The results demonstrate conscientiousness is positively associated with both external and internal career achievements, while neuroticism only negatively correlates with external career achievements.
Scheier et al. (1994)	Quantitative Survey	IVs: Neuroticism, optimism, self-esteem, trait anxiety	DVs: Life orientation test variables	The findings show that neuroticism and optimism are distinct concepts.
McCrae and Costa Jr (1997b)	Quantitative Survey	NA	NA	The consistency of personality across different cultures emerged, suggesting the Five Factor Model is universal among various cultures.
Hess et al. (2009)	Quantitative Lab experiment	IVs: RA extraversion, RA vividness, computer playfulness.	DVs: Social presence, Trusting beliefs.	The study demonstrates that RA extroversion positively enhances user's perception of social presence and trust.
Srivastava et al. (2015)	Quantitative Survey	IVs: Personality traits, Technostress creators.	DVs: Job burnout, job engagement	Openness to experience enhances the relationship between technostress and job involvement, while neuroticism negatively moderates the relationship.

Venkatesh and Windeler (2012)	Quantitative Field study	IVs: Personality traits, IT-specific disposition	DVs: Team technology use, team performance	The analysis demonstrates that agreeableness, conscientiousness, extraversion, and openness are positively associated with team technology adoption and continued usage.
Wang et al. (2023)	Quantitative Survey	IVs: Micro-level factors, Macro-level factors, Meso-level factors	DV: Information security policy violation intentions	The paper submits that conscientiousness of employees' immediate work group significantly reduces security policy violation intentions.
Barnett et al. (2015a)	Quantitative Survey	IVs: Personality traits, UTAUT's main constructs	DVs: Perceived system use, actual usage	The findings demonstrate that conscientiousness positively affects the actual and intended usage of technology, while neuroticism has a negative impact. Surprisingly, extraversion is negatively associated with actual usage.
Dennis et al. (2022)	Quantitative Lab experiment	Vs: Team mean intelligence, team mean personality traits	DV: Team decision quality	The findings show that team average neuroticism is negatively associated with team performance, with extraversion exhibiting an even larger negative effect.
Liao et al. (2021)	Quantitative Survey	IVs: Facets of conscientiousness, defensive and offensive functions	DVs: Online gamer loyalty	The findings reveal that conscientiousness is a key factor in promoting team-based gaming engagement, and users will adapt to a team function that aligns with their personality.

Venkatesh et al. (2014)	Quantitative Survey	IVs: Personality traits, demographic information	DV: E-Government portal usage	Examined e-government portal usage in a rural area of India, the results show that conscientiousness, extraversion and openness to experience are positively associated with portal usage.

Appendix B: Results of CB-SEM

Table B1. Results of Hypotheses Testing (CB-SEM)

	Education		Entertainment		Escapism		Esthetic
Agreeableness	$0.522^{\mathbf{(0.000)}}$		$0.702^{\mathbf{(0.000)}}$		$0.469^{\mathbf{(0.000)}}$		$0.633^{\mathbf{(0.000)}}$
Conscientiousness	$-0.136^{\mathbf{(0.025)}}$		$-0.036^{(0.372)}$		$-0.168^{\mathbf{(0.000)}}$		$-0.049^{(0.223)}$
Extraversion	$-0.010^{(0.941)}$		$0.015^{(0.780)}$		$-0.000^{(0.994)}$		$-0.016^{(0.764)}$
Openness	$0.541^{\mathbf{(0.000)}}$		$0.280^{\mathbf{(0.000)}}$		$0.429^{\mathbf{(0.000)}}$		$0.320^{\mathbf{(0.000)}}$
Neuroticism	$-0.029^{(0.856)}$		$0.048^{(0.263)}$		$0.037^{(0.337)}$		$-0.028^{(0.508)}$
Age	$0.073^{(0.239)}$		$-0.000^{(0.984)}$		$-0.000^{(0.981)}$		$0.012^{\mathbf{(0.045)}}$
Internet usage	$0.070^{(0.213)}$		$0.112^{\mathbf{(0.004)}}$		$0.012^{(0.745)}$		$0.100^{\mathbf{(0.010)}}$
R-square	0.594		0.594		0.597		0.566
Note: Values in parentheses are p-values.							
Fit Indices							
RMSEA	0.048		0.048		0.049		0.051
GFI	0.865		0.876		0.866		0.909
NFI	0.886		0.900		0.887		0.918
TLI	0.928		0.936		0.926		0.928
CFI	0.936		0.944		0.934		0.931

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