# Seeing is believing, owning is engaging: how augmented reality enhances psychological ownership and brand connection.

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# Seeing is Believing, Owning is Engaging: How Augmented Reality Enhances Psychological Ownership and Brand Connection

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## Abstract

Augmented reality (AR) is an emerging technology with the potential to influence consumer behavior in retail. Despite growing attention, the psychological mechanisms underlying AR's impact on brand engagement remain underexplored in both academic research and practical applications. This study aims to address this gap by adopting the Stimulus-Organism-Response (S-O-R) theory. It identifies two key pathways -sensory stimulation and mental imagery - that foster brand psychological ownership (BPO) and brand engagement, while comparing the effects of AR and non-AR experiences. Data were collected from 313 Gucci consumers in Turkey who interacted with the Gucci AR or non-AR app. Findings indicate that AR is associated with significantly higher levels of mental imagery and BPO than non-AR apps. In contrast, perceived sensory stimulation does not differ significantly between the two conditions. AR-driven mental imagery plays a crucial role in enhancing BPO and consumer engagement. The findings further highlight the role of "inspired by" and "inspired to" as boundary conditions, strengthening the effects of mental imagery and sensory stimulation on BPO. These findings contribute to the theoretical framework of AR marketing by highlighting the psychological processes through which AR drives brand engagement. Furthermore, it offers practical guidance for brands effectively

applying AR technologies, particularly by leveraging mental imagery and inspiration to enhance brand engagement.

**Keywords:** Augmented Reality Marketing, Sensory Stimulation, Mental Imagery, Brand Psychological Ownership, Behavioral Engagement

## 1. Introduction

Prior research underscores the pivotal role of augmented reality in shaping consumer behavior (Rauschanbel et al., 2024a). By integrating virtual content within real-world environments and leveraging unique features such as contextualization, assortment, and portability (Kumar et al., 2024). AR offers interactive and engaging experiences for customers in retail settings (Hilken et al., 2022; Yim et al., 2017). According to Fortune Business Insights (2023), the global AR market is projected to grow rapidly, reaching $ 1,109.71 billion by 2030. Leading brands like Louis Vuitton, Amazon, Nike, Gucci, Snapchat, and IKEA have introduced AR-branded applications to create more immersive and engaging consumer experiences.

The rapid growth of the AR market, as evidenced by its projected financial expansion, paves the way for a deeper exploration of its theoretical benefits in marketing. Current literature on AR demonstrates its advantages over traditional media in several key areas, including higher interactivity (Yim et al., 2017) and greater engagement (Nikhashemi et al., 2021), while also providing rich experiential contexts in which consumers may experience varying levels of inspiration (Arghashi, 2022). Moreover, AR experiences foster elevated states of flow (Javornik et al., 2016), heightened spatial presence (Heller et al., 2019), and deeper immersion (Song et al., 2020). These factors contribute to tangible outcomes, such as increased sales (Tan et al., 2022), impulse purchases (Kumar & Srivastava, 2022), favorable brand attitudes (Arghashi & Yuksel, 2022), and improved decision-making (Song et al., 2020).

Despite recent advances, significant gaps persist in understanding the influence of AR on consumer–brand relationships. Most AR research has concentrated on consumer-specific outcomes, such as purchase intentions and attitudinal changes (Arghashi & Yuksel, 2022). In contrast, brand-related outcomes have received comparatively less scholarly attention (Rauschnabel et al., 2024a). This focus limits the ability to elucidate how AR contributes to the development of enduring consumer–brand relationships. While some studies have begun to investigate AR's impact on branding outcomes, including brand advocacy (Kumar et al., 2024), consumer engagement (Rauschnabel et al., 2024b), brand personality (Plotkina et al., 2022), and brand love (Huang & Liu, 2021), the psychological mechanisms underlying AR-driven brand engagement remain largely unexamined. In the absence of a clear understanding of these mechanisms, it is challenging to explain how AR experiences promote meaningful brand relationships. Next, while the concept of inspiration has been widely studied in AR marketing research (Arghashi & Yuksel, 2022; Kumar et al., 2024; Rauschnabel et al., 2019), its role as a boundary condition remains underexplored. In particular, limited research has examined how distinct dimensions of inspiration (i.e., "inspired by" and "inspired to") moderate the relationship between AR-based experiences (e.g., sensory stimulation and mental imagery) and subsequent outcomes, including brand psychological ownership. This gap restricts current understanding of the contexts and target audiences for which AR experiences most effectively influence brand-related responses. Furthermore, although BPO is well established in marketing literature (Morewedge et al., 2021; Pierce et al., 2001), its explanatory role in the context of AR-driven brand outcomes remains underexplored (Carrozzi et al., 2019; Yuan et al., 2021). Without incorporating psychological ownership into AR research, it is difficult to clarify how interactive and immersive experiences cultivate deeper consumer–brand relationships.

To address these gaps, this study adopts the Stimulus–Organism–Response framework (Jacoby, 2002; Kim & Lennon, 2013). Specifically, AR and non-AR applications are conceptualized as stimuli that influence internal consumer processes, including sensory stimulation and mental imagery, which in turn shape BPO and brand engagement. In addition, inspiration is introduced as a conditional factor that moderates these relationships. This framework provides a coherent theoretical structure for examining how AR-driven experiences translate into brand-related outcomes. By integrating these elements, this study develops a comprehensive model to answer the following research questions: $R_{Q1}$**:** How do AR vs non-AR experiences influence brand engagement through sensory stimulation, mental imagery, and BPO? $R_{Q2}$**:** How does consumer inspiration moderate the relationships between sensory stimulation, mental imagery, and BPO?

Findings indicate that AR is associated with higher levels of mental imagery and BPO compared to non-AR apps, which in turn enhance consumers' conscious attention, affection, social connection, and enthusiastic participation with the brand. From a theoretical perspective, this study provides insights into how sensory cues and mental imagery contribute to the development of psychological ownership towards the brand. From a practical standpoint, the findings provide useful insights for brand managers and AR/metaverse designers to integrate AR more effectively into branding and marketing.

The following sections review the literature on AR marketing, develop the theoretical background and hypotheses, describe the methodology and findings, and conclude with a discussion of the study's implications and limitations.

# 2. Literature Review

## *2.1. Augmented Reality Marketing*

Augmented reality marketing is a specialized area within marketing that aligns with a company's overarching strategy. It aims to create value not only for the company and brand but also for stakeholders and society at large (Rauschnabel et al., 2019). By enhancing the online customer experience, AR marketing leverages technologies such as AR mirrors, branded apps, and smart glasses, either autonomously or integrated with websites and social media platforms (Hinsch et al., 2020). This approach supports the organization's strategic objectives by focusing on complementary roles of AR technologies throughout the consumer's online shopping journey (Rauschnabel et al., 2022).

AR is an innovative technology that overlays digital content—such as images, sounds, and information—onto the physical world in real time (Rauschnabel et al., 2022). This fundamentally differs from Virtual Reality (VR), which immerses users in fully artificial environments (Azuma, 1997). In this study, AR is conceptualized as a dynamic tool that enables engaging brand experiences integrated into users' real-world contexts. This capability highlights AR's potential to shape consumers' experiential and cognitive responses during brand interactions. AR provides interactive visual and informational cues—such as text, graphics, audio, and video—by digitally augmenting the physical environment (Carmigniani et al., 2011; Sung, 2021). Compared with non-AR experiences, AR enables consumers to visualize and interact with digital representations of products within their physical surroundings (Yim et al., 2017).

The current literature demonstrates that AR can influence consumer behavior in multiple ways, including enhancing brand engagement (Arghashi and Yuksel, 2022) and supporting the development of sensory stimulation (Hoyer et al., 2020), mental imagery (Sun et al., 2022b), BPO

(Yuan et al., 2021), and inspiration (Hinsch et al., 2020). These capabilities highlight AR's potential to create value for both companies and consumers (Jiang et al., 2021). However, existing findings remain fragmented, as most studies examine these psychological processes in isolation rather than as part of an integrated mechanism. In addition, prior research has reported mixed findings regarding the effectiveness of AR in shaping consumer responses (Gatter et al., 2022; Hilken et al., 2017; Javornik, 2016). Therefore, there is a need for a more comprehensive framework that integrates sensory stimulation, mental imagery, inspiration, and BPO to explain how AR-driven experiences translate into brand engagement.

### *2.2. Sensory Marketing and AR*

Sensory marketing emphasizes the five human senses — visual, gustatory, tactile, olfactory, and auditory—to understand how customers perceive and process emotions through sensory experiences (Laukkanen et al., 2022). Sensory marketing highlights how sensory experiences affect consumers' perceptions, cognition, emotions, judgment, and behavior in marketing (Krishna, 2012). Early research in sensory marketing primarily focused on consumers' sensory responses within physical environments, such as brick-and-mortar stores, hotels, and restaurants (Erenkol & Merve, 2015; Hultén, 2011; Nghiêm-Phú, 2017). However, with the rapid advancement of digital and emerging technologies, sensory marketing has emerged as a crucial concept for understanding consumer experiences in online environments.

One prominent technology that enables sensory marketing in digital contexts is AR, which integrates digital elements, such as visuals, audio, and graphical overlays, into real-world environments (Rauschnabel, 2018). AR offers consumers new opportunities to interact with virtual objects, facilitating enhanced perceptual and interactive experiences (Barhorst et al., 2021). While visual and auditory elements predominate in AR due to technological constraints, these sensory

cues can be experienced in alternative and interactive ways (Labrecque, 2020). AR applications on mobile devices enable users to interact with 3D images in real-time and access integrated visual and informational content. These features enable consumers to engage with brands and products in more interactive ways (Javornik, 2016). Thus, consumers can visualize virtual products in real-world contexts—such as their homes or on their bodies—supporting more vivid mental representations of the product (Scholz & Smith, 2016).

These technologies can deliver vivid visual representations and descriptive cues (Yim et al., 2017), which aid consumers in forming mental imagery related to taste or olfactory experiences (Krishna et al., 2014). AR can provide sensory-related cues that support experiential and cognitive processing (Hoyer et al., 2020; Hsu et al., 2021), as well as the development of mental imagery (Heller et al., 2019; Sun et al., 2022b). Enhanced mental imagery has been shown to facilitate consumer engagement in digital retail environments (Jessen et al., 2020) and to influence emotional and behavioral responses in online shopping (Lao, 2013). Chen et al. (2024) indicated that AR-based interactions can increase purchase intentions by reducing product uncertainty and information overload through underlying psychological processes. Prior research suggests that AR can support more engaging and immersive experiences by facilitating sensory-related and cognitive processing (Dacko, 2017). Collectively, these findings underscore the potential of AR to shape consumers' sensory experiences during decision-making processes.

However, despite these promising findings, not all studies report consistent results regarding the role of sensory stimulation in AR. For example, Gatter et al. (2022) show that while AR can partially satisfy consumers' need for touch, it does not fully compensate for the absence of physical interaction, and its effectiveness depends on individual and contextual factors. This suggests that sensory stimulation alone may not be sufficient to drive deeper psychological responses.

Moreover, there remains a paucity of research examining how sensory stimulation interacts with other psychological processes, particularly mental imagery and BPO. Consequently, the pathways through which AR-driven experiences translate into consumer–brand relationships remain insufficiently understood.

### *2.3. Stimulus-Organism-Response Framework*

The theory is widely applied to explain consumer responses that arise from the interaction between external environmental elements (i.e., stimuli) and individuals' internal cognitive, affective, or psychological states (i.e., the organism) (Jacoby, 2002; Mehrabian & Russell, 1974). Compared with models, such as the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and Elaboration Likelihood Model (ELM), which primarily emphasize technology acceptance, behavioral intention, or attitude formation (Ajzen, 1991; Davis, 1989; Petty & Cacioppo, 1986), S-O-R is better suited to examining multi-stage psychological mechanisms underlying consumer responses. This framework helps researchers examine cognitive and affective processes in consumer-brand relationships in immersive environments such as AR (Lee et al., 2023; Nikhashemi et al., 2021), making it an appropriate theoretical lens for this study.

Drawing on the S-O-R framework, this study investigates how AR and non-AR apps serve as stimuli (S) that influence internal consumer processes, specifically sensory stimulation and mental imagery (O). These organismic responses subsequently shape BPO as a proximal psychological outcome (R1), which then drives brand engagement as the behavioral response (R2). The proposed model further incorporates inspiration as a moderating variable that influences the strength of the relationships between organismic responses and BPO (see Fig. 1). While organismic states are frequently modeled as mediators within S-O-R, recent extensions acknowledge that certain

psychological variables may function as boundary conditions, affecting the strength of stimulus–organism or organism–response relationships (Jacoby, 2002; Vieira, 2013). Similarly, consumer inspiration has been conceptualized as a state-like orientation that modulates sensitivity to marketing stimuli and amplifies downstream psychological effects, rather than as a direct response to a single exposure (Böttger et al., 2017; Izogo & Mpinganjira, 2020; Thrash & Elliot, 2003). Thus, individuals with higher levels of inspiration are more likely to translate internal experiences, such as sensory stimulation and mental imagery, into stronger perceptions of BPO. As a result, inspiration is positioned as a boundary condition that moderates the effect of organismic responses on BPO.

This research advances the S-O-R framework by introducing inspiration (i.e., "inspired by" and "inspired to") as a moderating mechanism and positioning BPO as a proximal psychological response connected to internal AR-driven experiences and brand engagement. Specifically, the model conceptualizes the organism as a multi-stage process in which sensory stimulation influences mental imagery, which in turn contributes to the development of BPO. Engagement is then treated as a higher-order response encompassing cognitive, emotional, social, and behavioral dimensions. The proposed framework moves beyond a linear S-O-R structure, providing a more nuanced understanding of how AR-driven experiences are translated into consumer–brand relationships by integrating these elements.

## 3. Hypothetical Development

### *3.1. Perceived Sensory Stimulation*

Sensory stimulation refers to consumers' involuntary sensory responses or the degree to which marketing activities — such as advertising, branding, and promotions — engage their senses (Wei et al., 2022). Prior research on sensory-driven marketing has primarily examined two types of

sensory stimulation: single-sensory (Sun et al., 2022a) and multi-sensory (Petit et al., 2019). Multi-sensory marketing initiatives are generally more effective than those that focus solely on a single sensory stimulus (Elder & Krishna, 2012). AR can generate immersive virtual experiences that allow users to perceive product details and related functional information through multiple sensory cues, including visual, auditory, and tactile or interaction-based cues (Chylinski et al., 2020; Heller, 2019; Rauschnabel et al., 2019), which leads to users' positive intention and behavior (Chen et al., 2024; Kim et al., 2023; Wei et al., 2022).

Sensory stimulation fosters a sense of presence in the digital environment, enabling consumers to interpret virtual objects as physical ones (Cao et al., 2021). Enhancing the number of simultaneously presented sensory elements in AR (sensory breadth) and the impact, performance, and quality of the sensory information (sensory depth) increases consumers' immersive experience in retail (Perannagari & Chakrabarti, 2019). Lyu and Huang (2024) demonstrated that sensory-related visual cues can activate internal product representations and strengthen mental imagery, even in the absence of direct sensory experience. Kim et al. (2023) highlighted that AR features (i.e., vividness and interactivity) positively contribute to users' sensory brand experiences, attitudes, and behavioral intentions in digital shopping. While these findings highlight the experiential capabilities of AR, its impact on sensory stimulation may not always be pronounced. In modern digital environments, non-AR apps such as brand e-commerce websites increasingly incorporate advanced visual and interactive features (e.g., high-resolution images and 360-degree views), which may reduce the perceived difference in sensory stimulation between AR and non-AR apps (Fiore et al., 2005; Kim et al., 2020). In addition, AR apps are often predominantly visual and may provide limited multisensory input (Batool & Mou, 2024; Gatter et al., 2022).

AR enables consumers to interact with virtual objects in real-world settings and to simulate product use through visual and interactive cues (Hilken et al., 2017). Users can virtually try on a piece of clothing, test a pair of glasses on their faces, or visualize furniture placement on a table in the corner of the home, which helps them perceive the virtual product as "real". Such interactive experiences may also support psychological ownership by allowing consumers to feel greater control over and connection with virtual products (Brengman et al., 2018). Song et al. (2020) further noted that environmental embedding and physical control in AR stimulate immersion and a sense of ownership of a virtual product. Similarly, Brasel and Gips (2014) demonstrated that visualizing and haptically interacting with a digital product via a touchscreen leads to BPO and increases consumer intention to pay for it. As a result, these studies suggest that AR can provide enhanced interactive and sensory-related cues, which may influence consumers' perceptual experiences. Therefore, this study assumes:

***$H_1$:*** *In contrast to non-AR apps, AR is associated with (a) higher sensory stimulation, which (b) positively affects consumers' mental imagery, and (c) BPO.*

### *3.2. Mental Imagery*

Mental imagery refers to the visualization of nonverbal information stored in memory, the creation of mental pictures, and the simulation of perceptual experiences without external sensory input (Kosslyn et al., 1979; Paivio, 1969). Previous research indicates that external stimuli can evoke mental imagery (Yoo & Kim, 2014). This process enables consumers to construct quasi-perceptual experiences that simulate sensory information and facilitate subsequent behaviors (Heller et al., 2019; Lyu & Huang, 2024). As a cognitive process, mental imagery influences users' attitudes, emotions, intentions, and behaviors in marketing contexts (Heller et al., 2019; Kamleitner & Feuchtl, 2015). In AR environments, consumers increasingly rely on mental imagery to evaluate

products through technology-based features when direct product interaction is unavailable (Hilken et al., 2022; Park & Yoo, 2020). In this study, mental imagery refers to the cognitive process through which users mentally simulate product-related experiences while using an AR application, potentially leading to psychological and behavioral responses toward the brand.

Mental imagery can induce a sense of ownership over an object (Peck et al., 2013). Liu (2023) found that touch-enabled interfaces, compared to non-touch interfaces, elicit stronger mental imagery, leading to greater psychological ownership and more favorable product evaluations. Interacting with virtual products using touchscreens, such as tablets, can enhance both the sense of touch and psychological ownership (Ştir & Zaiţ, 2024). These findings indicate that tablets generate higher brand psychological ownership than smartphones, suggesting that tablets facilitate a more immersive experience. Mental imagery can influence individuals' attitudes, desires, and decisions regarding an object, even in the absence of direct interaction (Kamleitner & Feuchtl, 2015).

AR technological features, such as perceived control (Park & Yoo, 2020), visual representations of objects in users' real environments (Heller et al., 2019), and perceived augmentation (Wu et al., 2024), facilitate consumers' comprehension of mental imagery. Hilken et al. (2022) argued that AR is more effective than VR in facilitating purchase intention because it enables users to create fluid, vivid, and product-based mental imagery. Park and Yoo (2020) demonstrated that the interactive nature of AR significantly influences users' mental imagery through increased involvement. Consequently, visual stimuli in AR environments strengthen mental imagery (Heller et al., 2019), and these mental images can evoke a sense of ownership of virtual products (Feuchtl & Kamleitner, 2009). Therefore, this study assumes:

***$H_2$:*** *In contrast to non-AR apps, AR is associated with (a) higher mental imagery, which (b) positively affects BPO.*

Prior research suggests that AR can create interactive and sensory-related experiences (e.g., interaction with real-world objects, touch, sound, and sight) through direct product interaction as well as through advertising and brand-related contexts (Barhorst et al., 2021; Rauschnabel, 2018). These experiences can trigger mental imagery, defined as the ability to create or recall sensory impressions in the absence of direct stimulation (Kim et al., 2021). For example, interacting with a virtual product integrated into one's body or physical environment can evoke vivid mental images associated with the brand, strengthening consumers' emotional connection (Ha et al., 2019; Krishna, 2012). Reimann et al. (2018) found that stronger emotional connections to a brand can lead to the development of psychological ownership. Accordingly, mental imagery can act as a mediator by translating sensory experiences into internal representations of the brand, which in turn enhance emotional attachment and foster psychological ownership. Therefore, this study proposes:

***$H_{2c}$:*** *Mental imagery mediates the relationship between sensory stimulation and BPO.*

### *3.3. Brand Psychological Ownership*

Psychological ownership is a mental state in which individuals perceive a target of ownership, or a portion of it, as personally owned (Pierce et al., 2001). Consumers can assert psychological ownership of non-possessed items (e.g., products or brands), known as brand psychological ownership (BPO). It refers to the psychological experience in which a person perceives ownership of the brand, sees it as an extension of their self (Kumar, 2021), and feels a sense of possession or control over the product (Chang et al., 2015). BPO may be activated by several factors, including

mental imagery (Liu, 2023), environmental embedding (Song et al., 2020), and sensory stimulation (e.g., the digital touch of products in online shopping via touch interface devices) (Brasel and Gips, 2014; Ştir & Zaiț., 2024).

Psychological ownership is a critical factor in consumer brand engagement (Kumar, 2021; Kumar & Nayak, 2019). BPO enhances consumers' positive attitudes toward brands (Chang et al., 2012) and increases involvement in brand interactions (Kirmani et al., 1999). Natarajan and Ramanan (2023) found that consumer psychological ownership is significantly associated with brand engagement behavior in multi-channel shopping contexts. BPO can also strengthen brand loyalty through social media content marketing (Xie & Lou, 2024). It facilitates consumer engagement on digital collective intelligence platforms and significantly influences the dynamics of brand-user relationships (Shi et al., 2022). BPO also plays a pivotal role in consumers' information-sharing behavior in digital brand communities (Jiang et al., 2022), thereby increasing consumers' attention to brand-related information compared with brands they do not directly interact with. This finding confirms that psychological ownership can increase attention to the brand. When consumers develop a sense of BPO, they form emotional connections with the brand and adopt more positive attitudes toward it (Thürridl et al., 2020). Both brand engagement and brand community participation are significantly influenced by BPO and psychological ownership of the brand community (Kumar, 2021), resulting in enthusiastic participation. Psychological ownership also increases social connection within brand communities, as consumers are more likely to connect with others who share similar sentiments toward the brand (Wang & Yang, 2024). Based on these findings, the following hypotheses are proposed:

*$H_3$: In contrast to non-AR apps, AR is associated with (a) higher BPO, which in turn positively influences the dimensions of brand engagement behavior: (b) conscious attention, (c) affection, (d) enthusiastic participation, and (e) social connection.*

### *3.4. Inspiration*

Inspiration is a transient motivational state activated by external stimuli (Thrash et al., 2014), which enables a shift from a marketing-driven idea to a core motivation for a novel idea linked to use or consumption objectives (Böttger et al., 2017). Prior research conceptualizes inspiration not merely as a reaction, but as a facilitating psychological condition that amplifies consumers' internal processing of marketing stimuli and strengthens downstream cognitive and emotional outcomes (Böttger et al., 2017; Thrash & Elliot, 2003). Inspiration represents a motivational state of heightened receptivity and goal-directed readiness that may not be entirely stimulus-driven (Böttger et al., 2017; Izogo & Mpinganjira, 2020). The current literature indicates that AR multi-sensory environments enhance consumers' experiential engagement and interactive processing (Hinsch et al., 2020; Nikhashemi et al., 2021). Prior scholarship has demonstrated that both components of inspiration, consisting of "inspired by" (i.e., being inspired by a stimulus) and "inspired to" (i.e., being inspired to take action), are essential to generate a "full episode of inspiration" (Caboni et al., 2024; Shiota et al., 2007). Hinsch et al. (2020) distinguish between the cognitive (*inspired by*) and motivational (*inspired to*) components of inspiration, highlighting their different roles in shaping consumer responses in AR contexts. Therefore, the current study will examine both types of inspiration (i.e., "inspired by" and "inspired to") in the consumer engagement behavior process in AR.

### *3.4.1. Psychological Inspiration (Inspired By)*

Psychological inspiration is a cognitive state in which individuals become receptive to new ideas and perceive greater intrinsic value in external stimuli, such as products, applications, or marketing experiences (Thrash et al., 2014). Izogo and Mpinganjira (2020) describe psychological inspiration as a boundary condition that moderates the effectiveness of stimuli. Findings showed that psychological inspiration should not be regarded as a direct or immediate response to a single stimulus. Böttger et al. (2017) argued that psychological inspiration constitutes a state-like readiness that shapes how consumers interpret, elaborate on, and internalize marketing-related experiences. In this regard, the present study proposes that the condition of being "Inspired by" functions as a contextual psychological state that modulates the effectiveness of underlying cognitive processes (Shiota et al., 2017).

Previous research indicates that exposure to novel ideas broadens individuals' mental horizons and stimulates imagination (Sheng et al., 2020), enabling consumers to form vivid and personally meaningful connections with brands, which in turn improve psychological ownership (Zhao & Xia, 2021). In AR contexts, these processes are further enhanced by improved visualization and interactivity, enabling consumers to construct detailed, immersive mental representations of products (Nikhashemi et al., 2021). However, the degree to which mental imagery leads to brand psychological ownership varies among individuals. Consumers with higher levels of inspiration are more likely to engage in deeper cognitive elaboration (Böttger et al., 2017), to integrate their mental representations into their self-concept (Escalas, 2004), and to attribute personal meaning to the marketing experience (Belk, 1988). These mechanisms facilitate a stronger transformation of mental imagery into psychological ownership of the brand. Within the S-O-R framework, this suggests that psychological inspiration serves as a conditional factor that determines how

effectively organismic responses (i.e., mental imagery) are translated into downstream outcomes, such as BPO. The following hypothesis is therefore proposed:

*$H_4$: Psychological inspiration moderates the relationship between mental imagery and BPO, such that this relationship is stronger at higher levels of psychological inspiration.*

### *3.4.2. Behavioral Inspiration (Inspired To)*

Behavioral inspiration refers to a motivational state characterized by a readiness to actualize, pursue, or extend ideas evoked by an inspiring object or experience (Thrash et al., 2014). Distinct from actual behavior, it represents a motivational orientation toward action rather than the enactment of action itself (Böttger et al., 2017; Thrash & Elliot, 2003). In this regard, inspiration does not directly translate into behavior; however, it facilitates a state of readiness for action. Liang et al. (2016) demonstrated that inspiration evokes a motivational urge to act on ideas conveyed by inspirational stimuli, leading to engagement behaviors. In AR, this motivational readiness is associated with higher levels of consumer engagement and continued usage intentions (Hinsch et al., 2020; Nikhashemi et al., 2021).

In sensory-rich consumption environments, sensory stimulation enhances consumers' brand engagement (Krishna, 2012). Prior research further suggests that sensory experiences can boost BPO by strengthening consumers' emotional connection and engagement with the brand (Shahid et al., 2022). However, the extent to which such sensory stimulation translates into BPO varies across individuals. Specifically, consumers with higher levels of behavioral inspiration exhibit a greater motivational readiness to act upon sensory experiences (Böttger et al., 2017). This action-oriented tendency facilitates the internalization of sensory experiences and their translation into stronger perceptions of BPO (Peck et al., 2013). In contrast, when inspiration is low, sensory

stimulation may remain an enjoyable but relatively superficial experience, with weaker implications for BPO.

Within the S-O-R framework, these motivational states that reflect action readiness may operate as boundary conditions that shape the strength of relationships between organismic responses (i.e., sensory stimulation) and downstream outcomes (i.e., BPO), rather than functioning as mediators directly elicited by stimuli (Jacoby, 2002; Vieira, 2013). Thus, this study considers behavioral inspiration as a moderating variable that determines the extent to which sensory stimulation translates into brand psychological ownership. Therefore, the following hypothesis is proposed:

*$H_5$: Behavioral inspiration moderates the relationship between sensory stimulation and BPO, such that the relationship is stronger at higher levels of behavioral inspiration.*

### *3.5. Brand Engagement*

Early conceptualizations of brand engagement often treated it as a unidimensional construct, despite its established multidimensional nature in the literature. According to Hollebeek et al. (2014), brand engagement is a psychological state that measures the intensity of a customer's cognitive, affective, and behavioral connections to a brand. It refers to the interchanges between brands and consumers as partners in a dual relationship (Dwivedi, 2015). This study employed a multidimensional construct of the brand engagement concept to describe "consumers' conscious attention, affection, social connection, and enthusiastic participation with the brand" (Paruthi & Kaur, 2017). The cognitive dimension, conceptualized as conscious attention, captures the degree to which consumers direct their attention toward a brand (Vivek et al., 2012). The behavioral dimension (i.e., enthusiastic participation) captures the level of active involvement and participation in brand-related activities (Paruthi & Kaur, 2017). The emotional dimension reflects

consumers' affective responses, including hedonic experiences such as passion toward the brand (Gambetti et al., 2012; Hollebeek, 2011). Finally, the social dimension (i.e., social connection) represents interactions with others that enhance engagement with the brand (Vivek et al., 2012).

This refinement ensures conceptual alignment between the study's theoretical assumptions and empirical modeling, allowing for a more accurate interpretation of AR's effects across different dimensions of brand engagement. Prior studies suggest that AR applications can facilitate consumer engagement in retail settings (Khan & Fatma, 2024; McLean & Wilson, 2019; Nikhashemi et al., 2021). Kumar (2021) further provides empirical evidence that psychological brand ownership enhances consumer engagement. In addition, prior work shows that AR experiences can improve well-being by satisfying core psychological needs (Sun & Yuan, 2025), suggesting that AR's interactive qualities may also foster deeper consumer–brand connections. Accordingly, this study proposes that AR-branded apps enhance consumers' brand engagement through brand psychological ownership, which is shaped by sensory stimulation and mental imagery.

# 4. Research Method

## *4.1. Data Gathering Process*

A two-step procedure was used for participant recruitment and assignment. First, purposive sampling was used during the recruitment stage to ensure that participants had sufficient familiarity with both AR technology and the Gucci brand. An online questionnaire was carefully designed to target individuals residing in Istanbul aged 18 or older. The survey included the following filtering questions: (1) Are you familiar with AR technologies? (2) Have you used any AR-enabled platforms (e.g., Gucci app, Amazon, IKEA Place, Wanna Kicks, Shopify AR, Google Lens,...) in the past six months? If yes, please specify. (3) Have you purchased any Gucci-branded products

in the last six months? Accordingly, this study focused on participants who responded affirmatively to the screening questions. As a non-probability sampling approach, purposive sampling facilitates the deliberate selection of participants with relevant knowledge or skills in a given area (Palinkas et al., 2015). This screening was necessary to enable meaningful interaction with the experimental stimuli and to avoid confounding effects arising from a lack of basic technological or brand knowledge. Data were collected from October to December 2024 with the assistance of a reputable research company.

After meeting the screening criteria, eligible participants were randomly assigned to either the AR or non-AR condition. Random assignment was used to strengthen internal validity and minimize systematic differences between the experimental groups. Participants in both conditions interacted with the assigned application for approximately 5 to 10 minutes. Both groups completed equivalent tasks, including product exploration, customization of available options, and review of product information. A pre-test confirmed that these tasks were clear, feasible, and comparable across the two conditions. To ensure consistency, interaction time and task completion were systematically monitored throughout the study.

Participants in the AR condition used the Gucci mobile application and engaged with the "Try On" feature, which allows users to virtually try products, explore different styles, and interact with product features. Participants in the non-AR condition used the Gucci website, which does not include AR functionality but provides comparable opportunities for product exploration, access to detailed information, and evaluation of available options. This design ensured comparable task complexity and interaction duration across both conditions. Gucci was selected as the focal brand due to its global recognition as a luxury brand, reputation for innovation, and pioneering role in

integrating digital technologies, particularly mobile applications, into the fashion industry (Cockney, 2022).

Data were collected by a team of four trained interviewers using an Apple iPad Pro device. After completing the assigned tasks, participants were directed to an online survey via a provided link to record their responses. A preliminary sample of 350 responses was gathered during this phase. After excluding incomplete questionnaires, 313 valid responses were retained for hypothesis testing, with 166 participants in the AR group and 147 in the non-AR group. Table 1 shows detailed participant demographics, online shopping habits, and AR usage patterns. The sample was predominantly female (56.2%), with the majority falling within the 18-35 age range (77.7%). Nearly half of the participants (48.9%) were pursuing a bachelor's degree, and 37.5% reported occasionally using AR for online shopping. Furthermore, 64% of respondents had at least 3 years of experience with digital shopping.

**----- Insert Fig 1 ------**

### *4.2. Measurement*

A survey questionnaire was designed to evaluate various aspects of the study, employing a seven-point Likert scale (1 = “strongly disagree” to 7 = “strongly agree”) for measurement. The survey was structured into four parts. The first section presented the research objectives and included three screening questions. Respondents were required to answer “Yes” to all three questions to proceed to the main questionnaire. The second part inquired about respondents’ experiences with AR usage and their familiarity with the Gucci brand. The third part focused on the research model variables, with sensory stimulation adapted from Chang and Chieng (2006) and Mental imagery from Yoo and Kim (2014). The scales for “inspired to” and “inspired by” were adopted from Böttger et al. (2017), while psychological ownership was measured using four items derived from

Kuchmaner et al. (2019). Brand engagement is measured by using four dimensions, including "conscious attention, affection, social connection, and enthusiastic participation," adapted from Paruthi and Kaur (2017). Prior to formal data collection, a pilot test was conducted with a group of students (n = 50) to ensure respondents correctly understood the measurement items and to confirm the measurement's reliability and validity. The final section of the questionnaire collected demographic information, including age, gender, educational attainment, and household income.

### *4.3. Analysis*

The hypotheses were tested using partial least squares–based structural equation modeling (PLS-SEM) implemented in SmartPLS 4.1.9. This approach is methodologically sound for complex models involving multiple types of relationships (direct, indirect, mediating, and moderating), particularly when working with small or medium-sized datasets (Willaby et al., 2015). The analysis adhered to a five-step methodological framework comprising: (1) confirmatory composite analysis to assess the measurement model's reliability and validity; (2) structural model assessment to evaluate path coefficients and model fit using a bootstrapping procedure (case = 313, sample = 5000) via the PLS algorithm (Hair et al., 2020); (3) hypothesis testing, which entailed permutation testing alongside the examination of both direct and indirect relationships; (4) multigroup analysis (MGA) to compare control means and explore significant distinctions across AR and non-AR conditions in the research model; and (5) the inclusion of control variables (i.e., brand familiarity and AR familiarity) to account for extraneous influences on the model outcomes.

# 5. Results

## *5.1. Confirmatory Composite Analysis*

Confirmatory Composite Analysis (CCA) is a systematic research approach for validating measurement models in PLS-SEM by evaluating factor loadings and significance levels, measurement reliability, construct-level reliability, average variance extracted (AVE), and HTMT-based assessment of discriminant validity (Hair et al., 2020). First, the factor loadings of the indicators were examined. All factor loadings were statistically significant and exceeded the recommended threshold of 0.70, indicating that the indicators reliably measured their respective constructs (Sarstedt et al., 2021). Second, composite reliability (CR) was estimated to assess the construct's internal consistency (Hair et al., 2020). CR values exceeded the 0.70 threshold, confirming internal consistency (see Table 2).

Next, discriminant validity was assessed using cross-loadings, the Fornell–Larcker criterion, and the Heterotrait–Monotrait Ratio (HTMT). As shown in Table 3, each item loaded highest on its respective construct compared with all other constructs, and no item showed substantial cross-loading on unintended constructs. In addition, the square roots of the AVEs for each construct exceeded their correlations with other constructs, and all HTMT values were below the conservative threshold of 0.85 (Henseler et al., 2015), confirming that the constructs were distinct and not excessively correlated.

To assess common method bias (CMB), Harman's one-factor test (Podsakoff et al., 2003) and the marker-variable technique (Lindell & Whitney, 2001) were applied. Harman's test showed that the first factor accounted for less than 39% of the total variance, suggesting that single-source bias was not a serious concern. Furthermore, the theoretically unrelated marker variable showed no

significant correlation with the main constructs, further indicating that CMB was unlikely to affect the results.

**----- Insert Table 1 ------**

Convergent validity was assessed using the Average Variance Extracted (AVE). The AVE values ranged from 0.71 to 0.84, exceeding the recommended threshold of 0.50 (McDonald and Ho, 2002), indicating that the constructs explained more than half of the variance in their respective indicators. Finally, multicollinearity was assessed using variance inflation factors (VIFs). The VIF values ranged from 1.49 to 3.50, satisfying the recommended threshold of VIF < 5 (O'Brien, 2007). Findings indicate that the measurement model demonstrates adequate reliability, convergent validity, discriminant validity, and absence of serious multicollinearity concerns (see Table 4).

The overall model fit was evaluated by comparing the observed and model-implied correlation matrices using the standardized root mean square residual (SRMR), geodesic distance (d_G), and Euclidean squared distance (d_ULS) to assess model misspecification. The results showed that the saturated model provided a good fit, with an SRMR of 0.054, which was below the threshold of 0.08 (Hu & Bentler, 1999). The geodesic distance (d_G) was 0.78, and the Euclidean squared distance (d_ULS) was 1.436, indicating a good model fit (Henseler et al., 2016).

### *5.2. Structural Model Assessment*

The structural model was assessed using a systematic approach. First, predictor collinearity was examined, and the results indicated that collinearity was not a concern in estimating the structural paths (see Table 4). Subsequently, bootstrapping procedures with 5,000 resamples were employed to assess the significance and magnitude of the path coefficients (see Table 6). Second, the R-squared values for the endogenous constructs were examined to assess the model's explanatory

power. The $R^2$ values ranged from 0.229 to 0.542, exceeding the 0.02 threshold, confirming the strong predictive validity of the structural model (Hair et al., 2020). Third, the structural model's predictive relevance was assessed using the $Q^2$ statistic, thereby confirming the model's predictive capability for the endogenous variables. All values are more than zero, indicating satisfactory predictive relevance (Cohen, 1988). Finally, the $f^2$ effect size was calculated to control the substantive relevance of each predictor's contribution to the dependent variable, confirming that excluding a specific exogenous variable does not result in a significant change in $R^2$ (Hair et al., 2020). The findings supported the structural model's validity, explanatory power, and predictive accuracy.

**----- Insert Table 2 ------**

## *5.3. Hypotheses Test Results*

### *5.3.1. Permutation Testing*

Permutation testing within the MICOM framework was conducted in SmartPLS to establish measurement invariance before comparing the AR and non-AR conditions. This approach is a non-parametric resampling method that does not rely on distributional assumptions (Good, 2013) and is suitable for small samples when data may deviate from normality (Holt & Sullivan, 2023). MICOM provides a rigorous method for examining measurement model invariance in PLS-SEM, ensuring that constructs are interpreted consistently across groups. The analysis followed three sequential steps: (a) assessing configural invariance, (b) evaluating compositional invariance, and (c) testing the equality of composite means and variances across groups. The configural invariance test ensures that the constructs are estimated equally across the two groups (Henseler et al., 2016). The results showed that all permutation p-values ranged from 0.109 to 0.999, above the 0.05 threshold, indicating that configural invariance holds across groups. This supports the invariance

of the measurement model across groups, allowing for valid mean comparisons in the next step. Next, compositional invariance was tested to determine whether the latent construct means were comparable across groups. Compositional invariance holds when composite scores across groups are perfectly correlated (Henseler et al., 2016). The results show that AR leads to stronger mental imagery and greater brand psychological ownership compared to non-AR, supporting $H_{2a}$ and $H_{3a}$. Therefore, AR helps users imagine the brand more vividly and feel a stronger sense of ownership than traditional non-AR apps.

Findings also showed no significant difference in sensory stimulation between the AR and non-AR apps; therefore, $H_{1a}$ was not supported (see Table 5). This finding is theoretically meaningful in light of current digital retailing practices. Many contemporary non-AR websites already provide rich visual experiences—such as high-resolution images, product videos, and 360-degree product views —that support vivid mental imagery, thereby reducing the additional sensory advantage typically expected from basic AR features (Fiore et al., 2005; Kim et al., 2020). Moreover, the AR virtual try-on used in this study primarily enhances visual perception and imagination but offers limited multisensory input, particularly tactile or haptic cues (e.g., texture, weight, or physical fit) that are central to stronger sensory stimulation. In line with prior research, this result suggests that AR-based experiences often remain predominantly visual and lack richer multisensory engagement, thereby limiting their impact on overall sensory stimulation compared with well-optimized non-AR interfaces (Batool & Mou, 2024; Gatter et al., 2022).

**----- Insert Fig 2 -----**

**----- Insert Table 3 ------**

### *5.3.2. Analysis of Direct Relationships*

Partial Least Squares (PLS) regression was used to estimate the structural model for all groups (full sample, AR, and non-AR), employing a bootstrapping procedure (n = 5000). The results showed that sensory stimulation has various roles in the model; while it positively affects mental imagery ($\beta = 0.414$, $P < 0.001$), it has no significant impact on BPO ($\beta = 0.009$, $P > 0.05$). Therefore, $H_{1b}$ is supported, whereas $H_{1c}$ is not (see Fig. 2). Mental imagery leads to BPO ($\beta = 0.179$, $P < 0.005$), which in turn increases the four dimensions of engagement, including conscious attention ($\beta = 0.754$, $P < 0.001$), affection ($\beta = 0.622$, $P < 0.001$), enthusiastic participation ($\beta = 0.751$, $P < 0.001$), and social connection ($\beta = 0.643$, $P < 0.001$), providing support for $H_{2b}$ and $H_{3b,c,d,e}$ (see Table 6).

### *5.3.3. Analysis of Indirect Relationships*

After examining the direct relationships, a subsequent PLS analysis was conducted to assess the moderating effects (i.e., "inspired by" and "inspired to") and the mediating path (i.e., mental imagery ) using a bootstrapping procedure (n = 5000). The enhanced bootstrapping procedure was applied to evaluate the statistical significance of path coefficients and indirect effects, thereby enabling rigorous analysis of complex models involving multiple mediators and moderators (Streukens & Leroi-Werelds, 2016). The results indicated that the indirect path from sensory stimulation to BPO through mental imagery is significant, confirming that sensory stimulation influences BPO primarily through its impact on mental imagery, supporting $H_{2c}$ ($\beta = 0.056$, $P = 0.029$) (see Table 7). It highlights the mediating role of mental imagery in translating sensory stimulation into consumers' BPO. The results of the moderating test showed that the interaction between "inspired by" and mental imagery affects BPO ($\beta = 0.099$, $P = 0.021$), supporting $H_4$.

This confirms that the combination of emotional involvement (inspiration) and cognitive involvement (mental imagery) strengthens personal connection and perceived control over the brand, ultimately leading to a greater sense of ownership (see Fig. 3). In addition, the interaction between "inspired to" and sensory stimulation significantly affects BPO ($\beta = 0.088$, $p = 0.039$), supporting $H_5$. This suggests that sensory cues (e.g., visual or virtual stimuli) can enhance the effectiveness of inspiration in strengthening the relationship between internal experiences and psychological ownership. In particular, when sensory stimulation is higher, inspiration amplifies the extent to which mental imagery translates into a stronger sense of connectedness and ownership toward the brand (see Fig. 4).

**----- Insert Table 4 ------**

### *5.4. Multi-group Assessment*

A multi-group analysis (MGA) with 5,000 consistent bootstrap subsamples was conducted to examine whether the structural relationships differed significantly between the AR and non-AR conditions. This method helped us to detect group-specific differences in the structural model. The results show clear differences between the AR and non-AR groups in several key relationships. Specifically, the effects of mental imagery on brand psychological ownership (MI → BPO), brand psychological ownership on conscious attention (BPO → CA), and brand psychological ownership on the affection dimension of brand engagement (BPO → AF) were all significantly stronger in the AR group than in the non-AR group (all $p < 0.05$). In practical terms, this means that using AR enhances consumers' mental imagery, which in turn leads to a stronger sense of brand ownership and greater cognitive and emotional engagement. The relationship between brand psychological ownership and social connection (BPO → SC) approached statistical significance ($p = 0.053$),

suggesting a possible trend in which AR may also strengthen this link, though the evidence is not conclusive.

In contrast, no significant differences were found between the AR and non-AR groups for the paths from sensory stimulation to mental imagery (SS → MI), sensory stimulation to brand psychological ownership (SS → BPO), or brand psychological ownership to enthusiastic participation (BPO → EP) (all $p > 0.10$). These findings suggest that the structural relationships among these constructs are consistent across conditions. However, the mean differences indicate that AR leads to higher levels of mental imagery and brand psychological ownership. This shows that AR mainly enhances these psychological processes rather than changing the underlying structural relationships (see Table 8).

**----- Insert Table 5 ------**

**----- Insert Table 6 ------**

**----- Insert Fig 3 ------**

**----- Insert Fig 4 ------**

### *5.5. Control Variables*

This study considered brand familiarity as a control variable to enhance brand engagement and psychological ownership (Acharya, 2021). The results indicate that brand familiarity has no significant effects on brand engagement dimensions, including affection ($\beta = 0.075$, $p > 0.05$), enthusiastic participation ($\beta = 0.054$, $p > 0.05$), social connection ($\beta = 0.059$, $p = 0.27$), and conscious attention ($\beta = 0.067$, $p > 0.05$), nor on brand psychological ownership (BPO; $\beta = 0.058$, $p > 0.05$). These findings suggest that consumers' engagement with the brand and feelings of ownership are not contingent upon prior brand knowledge, indicating that AR-based brand experiences can elicit engagement even among consumers with low brand familiarity. Technology familiarity was included as an additional control variable, as prior experience with immersive

technologies can reduce cognitive barriers and facilitate a state of flow (Csikszentmihalyi, 2013; Novak et al., 2000). Previous research suggests that AR familiarity can strengthen consumers' cognitive and emotional reactions to AR marketing efforts (Rauschnabel et al., 2019). Similarly, the effectiveness of AR in generating enjoyment and inspiration may depend on users' prior experience with AR technologies (Zanger et al., 2022). Accordingly, more familiar users were expected to experience stronger sensory stimulation, inspiration, and mental imagery. However, the results show that AR familiarity significantly influences only mental imagery ($\beta = 0.067$, $p = 0.010$), while having no significant effects on inspired by ($\beta = 0.084$, $p > 0.05$), inspired to ($\beta = 0.077$, $p > 0.05$), or sensory stimulation ($\beta = 0.073$, $p > 0.05$). This pattern suggests that while AR familiarity enhances imagery-related cognitive processing, AR's inspirational and sensory effects are accessible even to users with limited AR experience, highlighting the inclusiveness and broad applicability of AR-based brand experiences.

**----- Insert Table 7 ------**

**----- Insert Table 8 ------**

## 6. Discussion

Findings highlighted the superiority of AR over traditional media, primarily because it creates stronger mental imagery and psychological ownership. Current literature confirms that AR has the potential to trigger mental imagery (Park & Yoo, 2020) and psychological ownership (Song et al., 2020). The results revealed distinct roles for sensory stimulation in driving cognitive processes (i.e., mental imagery) and its nonsignificant effect on BPO. Thus, although sensory cues can enhance the brand experience (Zha et al., 2024), additional psychological processes—such as mental imagery—are necessary to foster a deeper sense of ownership toward the brand.

Findings further indicate that no significant difference in the effect of sensory stimulation on mental imagery between the AR and non-AR conditions. In AR-based experiences, consumers can visually inspect products on themselves (Hilken et al., 2017); however, they generally cannot assess tactile or physical fit to the same extent as with physical product try-on methods. Gatter et al. (2022) show that while AR can partially satisfy consumers' need for touch, it does not fully compensate for the absence of physical interaction, and its effectiveness depends on individual and contextual factors. This suggests that sensory stimulation alone may not be sufficient to drive deeper psychological responses. Consistent with this view, prior research indicates that AR shopping experiences are constrained by the lack of realistic haptic feedback, as virtual objects remain physically untouchable, thereby limiting perceived sensory richness (Batool & Mou, 2024). Consequently, AR is associated with enhanced mental imagery but does not necessarily increase overall sensory stimulation beyond what a well-designed mobile website can provide.

The study highlighted that mental imagery plays a key role in users' psychological ownership mechanism. This process can enhance psychological ownership of the brand and subsequently foster brand engagement behaviors. However, mental imagery is a significant mediating construct and act a bridge between sensory stimulation and BPO. The findings support the idea that sensory stimulation can enhance the creation of vivid brand-related mental images that eventually contribute to a stronger sense of brand ownership. This is consistent with the existing literature suggesting that mental imagery affects consumer behavior and emotional responses (Bone & Ellen, 1992; Lao, 2013)—users with high mental imagery ability can develop stronger emotional connections with a brand, even in the absence of direct or tangible interactions.

Finally, the study revealed a significant moderating role for inspiration ("inspired by" and "inspired to") in triggering psychological ownership through the interaction between mental

imagery and sensory stimulation. The first moderated effect suggests a significant interaction between being "inspired by" a technology and mental imagery, ultimately affecting psychological ownership. Therefore, when consumers feel "inspired by" AR, they create vivid mental images of brands that increase their attachment and sense of ownership. This result is consistent with existing literature highlighting the emotional and cognitive dimensions of inspiration, which shape how consumers form attachments to experiences or possessions (Böttger et al., 2017).

The second moderated effect showed a significant interaction between feeling "inspired to" a technology and sensory stimulation, which eventually increases psychological ownership. Thus, when consumers perceive "inspired to" AR (e.g., by technology features, ideas, or innovations) and simultaneously experience sensory stimulation (e.g., visual, auditory, or tactile cues), they experience a stronger sense of psychological ownership. This finding aligns with theories of psychological ownership, which suggest that feelings of attachment arise when consumers mentally internalize a brand (Park et al., 2010). However, the results indicate that sensory stimulation alone is not sufficient to enhance brand psychological ownership. Rather, sensory stimulation contributes to BPO only when consumers experience higher levels of inspired-to motivation. This suggests that sensory cues become psychologically meaningful when they are accompanied by a motivational state that encourages consumers to imagine, internalize, and feel connected to the brand.

### *6.1. Implications for Theory*

The current study makes significant theoretical contributions to the marketing and consumer behavior literature. It extends the application of the S-O-R framework in AR marketing by conceptualizing AR and non-AR applications as distinct forms of external stimuli. Prior studies have examined specific AR features, such as interactivity, immersion, and vividness; however,

limited research has directly compared AR-based and non-AR applications as alternative technological stimuli (Lee et al., 2023; Nikhashemi et al., 2021). This comparison provides a clearer understanding of how different digital environments shape consumers' psychological and behavioral responses within the S-O-R framework.

The study further extends the S-O-R framework by conceptualizing the organism as a multi-stage psychological process. Specifically, sensory stimulation and mental imagery are examined as internal experiential processes that contribute to BPO, which subsequently enhance brand engagement behaviors. This approach moves beyond a simple stimulus–response explanation by showing how technological stimuli are translated into deeper consumer–brand relationships through internal psychological mechanisms. The findings also refine the role of technological stimuli by showing that AR does not necessarily directly enhance sensory stimulation. Rather, its effect appears to operate primarily through cognitive and experiential processes, particularly mental imagery.

This study also advances the emerging literature on AR marketing by integrating previously fragmented findings on how AR influences consumer psychological and behavioral responses. Existing studies have examined constructs such as inspiration (Rauschnabel et al., 2019), mental imagery (Heller et al., 2019), psychological ownership (Carrozzi et al., 2019), and brand management outcomes (Javornik et al., 2021), but these mechanisms have largely been investigated in isolation. Building on this work, the present study integrates these constructs into a comprehensive framework and examines their interrelationships to explain consumer engagement in AR contexts. The findings indicate that AR enhances BPO through mental imagery, thereby fostering brand engagement. This effect becomes stronger when consumers experience higher levels of inspiration.

The study further contributes by positioning inspiration as a moderating boundary condition in AR-based consumer experiences. Rather than functioning only as an affective response, inspiration represents a cognitive and motivational state, reflected in being "inspired by" AR experiences and "inspired to" take subsequent action. Specifically, inspiration strengthens the extent to which sensory stimulation and mental imagery are converted into BPO, indicating that these internal processes become more effective when consumers experience higher levels of inspiration.

Notably, the dual pathways of sensory stimulation and mental imagery leading to BPO add depth to the AR marketing literature. This perspective bridges embodiment, imagination, and AR-induced interactivity. Previous studies have confirmed the role of AR in enhancing mental imagery (Sun et al., 2022b; Yoo et al., 2023). However, the present study extends these findings by examining how AR influences brand engagement through multiple psychological mechanisms, including sensory stimulation, mental imagery, and BPO, while also considering inspiration as a conditional factor that shapes the strength of these relationships. This provides new insight into the cognitive and emotional pathways through which AR-driven experiences can strengthen consumer–brand relationships.

Overall, this study provides a more nuanced understanding of AR's role in branding. While AR research has predominantly focused on broader domains such as retail (Kumar et al., 2024), services (Hilken et al., 2017), and advertising (Pozharliev et al., 2022), empirical evidence on its role in shaping branding outcomes remains limited (Javornik et al., 2021). By linking AR-facilitated mental imagery and sensory stimulation with BPO and brand engagement, this study offers an integrated framework for understanding the transformative potential of AR in marketing.

### *6.2. Implications for Practice*

This research provides practical guidance for companies seeking to leverage AR effectively. From a managerial perspective, the effectiveness of AR depends on the specific usage context. The results show that AR generates higher mental imagery than non-AR, which significantly influences BPO. In virtual try-on applications, managers should focus on enhancing visual realism and incorporating usage cues that facilitate mental imagery and foster a sense of ownership. For example, they can create more first-person AR experiences that allow users to view and manipulate products in their own environment.

Because mental imagery also mediates the effect of sensory stimulation on BPO, managers should design AR experiences that translate rich sensory stimulation into vivid imagination. For instance, marketing managers can achieve this by pairing immersive visual elements with usage-oriented prompts that help consumers imagine themselves owning or using the product. In home visualisation contexts, AR should enable seamless integration of products into consumers' personal environments to strengthen psychological attachment. For interactive product displays, AR designers should emphasise exploratory features that encourage active engagement and stimulate inspiration, thereby enhancing the translation of internal experiences into brand-related outcomes.

Managers can leverage AR-enabled apps to generate higher BPO than non-AR apps, as AR features strengthen consumers' conscious attention, affection, enthusiastic participation, and social connection. They can deploy AR as an engagement tool, for example, by offering interactive and more immersive AR experiences that encourage exploration, emotional connection, and sharing with others to incrase consumer brand engagement behaviour. In addition, the study showed that AR apps lead to stronger brand engagement than traditional (non-AR) apps and identified the

psychological mechanism underlying this effect. Based on the findings, companies should actively integrate AR into marketing campaigns, product launches, and customer experience strategies. Features like interactive 3D advertisements, virtual store tours, and gamified product trials can make brand interactions more engaging and memorable.

The research highlights two pathways of inspiration—"inspired to" (action-oriented motivation) and "inspired by" (cognitive–affective appreciation). Brands can design storytelling-driven AR content that encourages consumers to engage more deeply with their products. AR-driven brand narratives can help foster stronger emotional connections and influence purchase intentions. In this context, higher levels of "inspired by" strengthen the effect of mental imagery on BPO. Therefore, managers should design AR experiences that enhance vivid visualisation and meaningful consumption contexts. For instance, AR designers can combine augmented reality visualisation with idealised cues (e.g., ideal use scenarios or creative suggestions) to strengthen the impact of consumers' mental imagery on BPO. Conversely, higher levels of "inspired to" strengthen the effect of sensory stimulation on BPO. Managers should design AR experiences that facilitate user actions. They can integrate virtual try-ons, home placement previews, and personalised interactions, or link rich sensory AR features with clear next-step options (e.g., try, customise, or save) to translate sensory stimulation into BPO more effectively.

Although prior research suggests that AR may provide stronger sensory stimulation than traditional web interfaces (Huang & Chung, 2024), the present study found no significant difference in perceived sensory stimulation between the AR and non-AR conditions. However, the findings indicate that AR is associated with higher levels of mental imagery and brand psychological ownership. This suggests that the primary value of AR may not lie in increased sensory stimulation, but rather in its capacity to stimulate cognitive and affective processes through

immersive visualisation. From a practical perspective, this highlights the importance of leveraging AR to enhance mental imagery rather than focusing solely on its sensory features. AR marketers should incorporate integrative elements that prioritise narrative depth and imaginative interaction to maximise the AR impacts.

### *6.3. Limitations and Future Research*

This study offers valuable insights into AR marketing; however, several limitations should be considered when interpreting the generalizability of the findings. First, because the study relied on purposive sampling, the findings may not be fully generalizable beyond the research sample (Palinkas et al., 2015). In this study, participants were screened for prior familiarity with AR technology and the Gucci brand to ensure meaningful interaction with the stimuli. However, this purposive screening may have resulted in a relatively homogeneous sample, potentially reducing variability and attenuating perceptual differences between the AR and non-AR conditions. Future research should examine more diverse consumer groups across different levels of technological familiarity and cultural contexts to assess how these factors shape responses to AR experiences. They could use probability sampling techniques to enhance the generalizability of the results. Second, this study examined individual consumer experiences; however, social factors (e.g., social norms and peer recommendations) may influence consumer behavior (Cialdini & Goldstein, 2004). Other researchers could explore the impact of social aspects on the mechanism. Third, this study focused on a well-known luxury fashion brand with which participants already exhibited high brand familiarity. Given that brand familiarity plays varying roles across engagement dimensions, future research could examine unfamiliar or emerging brands to assess whether AR exerts similar effects on brand engagement in lower-familiarity contexts. Fourth, the study was conducted in Turkey, a developing economy, which may limit the generalizability of the findings

to other cultural settings. Given that cultural differences can shape consumer engagement and technology adoption (Roy et al., 2018), future cross-cultural studies are encouraged to validate and extend the present findings. Fifth, the study does not consider practical constraints such as AR implementation costs or user privacy concerns, which may limit the applicability and actionability of its recommendations. Future research should incorporate these factors to evaluate the feasibility and scalability of AR-based marketing strategies. Finally, future research should incorporate a broader set of control variables, such as brand preference and purchase frequency, to further validate the robustness of these findings.

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**Author contributions / CRediT:** Vahideh Arghashi: Conceptualization, Methodology, Investigation, Project administration, Writing – original draft, Writing – review & editing; Harish Kumar: Writing – original draft, Writing – review & editing; Kayhan Tajeddini: Writing – review & editing, Validation.

**Data availability statement:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

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**Table 1.** Participant Demographics and Usage Details

| | No. | Percentage | | No. | Percentage |
|---|---|---|---|---|---|
| **AR Usage Frequency in Online Shopping** | | | **Frequency of Online Shopping** | | |
| Every time | 116 | 37.3 | Every day | 30 | 9.6 |
| Sometimes | 118 | 37.5 | Every week | 36 | 11.5 |
| Rarely | 62 | 19.8 | Every month | 140 | 44.7 |
| Not at all | 17 | 5.4 | Several times a year | 89 | 28.5 |
| **Familiar AR apps** | | | Rarely | 18 | 5.7 |
| IKEA Place | 114 | 36.4 | **Average age** | | |
| Gucci app | 103 | 32.9 | 18-25 years old | 139 | 44.5 |
| Wanna Kicks | 61 | 19.4 | 26-35 years old | 104 | 33.2 |
| Shopify AR | 56 | 17.9 | 36-45 years old | 57 | 18.2 |
| Google Lens | 41 | 13 | Above 46 years old | 13 | 4.1 |
| Snapchat | 38 | 12.1 | **Education** | | |
| Houzz | 14 | 4.5 | High school | 48 | 15.3 |
| YouCam Makeup | 14 | 4.5 | Bachelor | 153 | 48.9 |
| **Gucci brand use** | | | Master | 105 | 33.6 |
| More than 3 years | 213 | 68 | Ph.D | 7 | 2.2 |
| Less than 3 years | 100 | 32 | **Professional Status** | | |
| **Online shopping experience** | | | Private sector | 74 | 23.7 |
| Less than 1 year | 32 | 10.2 | Public sector | 12 | 3.8 |
| 1 to 2 years | 38 | 12.1 | Self-Employed | 73 | 23.3 |
| 2 to 3 years | 43 | 13.7 | Student | 133 | 42.5 |
| More than 3 years | 200 | 64 | Unemployed | 21 | 6.7 |
| **Gender** | | | **Monthly household income (Turkish lira)** | | |
| Male | 137 | 43.7 | ≤ 23.000 TL | 94 | 30.1 |
| Female | 176 | 56.2 | > 23.000 TL | 219 | 69.9 |

**Table 2.** Reliability and convergence of construct measures

| Construct Items | Sample (n=313) EFA | AR (n=166) EFA | Non-AR (n=147) EFA | Sample (n=313) VIF |
|---|---|---|---|---|
| **"Inspired to"** (Böttger et al., 2017) | | | | |
| **INT1:** The app inspired me to think about the brand. | 0.827 | 0.844 | 0.815 | 1.81 |
| **INT2:** The app sparked a desire to purchase products from the brand again. | 0.921 | 0.933 | 0.868 | 2.91 |
| **INT3:** I feel motivated to buy products from the brand again after using the app. | 0.902 | 0.906 | 0.892 | 2.54 |
| **"Inspired by"** (Böttger et al., 2017) | | | | |
| **INB1:** Using this app was inspiring. | 0.772 | 0.758 | 0.726 | 1.68 |
| **INB2:** Using this app stimulated my imagination. | 0.886 | 0.894 | 0.861 | 3.01 |
| **INB3:** Using this app spontaneously gave me new ideas. | 0.852 | 0.854 | 0.868 | 2.85 |
| **INB4:** Using this app spontaneously gave me unexpected ideas. | 0.836 | 0.836 | 0.888 | 2.07 |
| **Sensory stimulation** (Chang & Chieng, 2006) | | | | |
| **SS1:** Using this app excited my senses. | 0.923 | 0.923 | 0.955 | 3.04 |
| **SS2:** Using this app pleasantly stimulated my senses. | 0.918 | 0.936 | 0.946 | 2.98 |
| **SS3:** This app engaged my senses. | 0.919 | 0.913 | 0.955 | 3.05 |
| **Mental Imagery** (Yoo & Kim, 2014) | | | | |
| **MI1:** I felt like I was actually trying the real products while using this app. | 0.885 | 0.86 | 0.914 | 2.41 |
| **MI2:** It was easy for me to imagine actually trying the products while using this app. | 0.916 | 0.918 | 0.921 | 2.97 |
| **MI3:** I found myself fantasizing about trying the products while using this app. | 0.874 | 0.878 | 0.862 | 2.05 |
| **Brand Psychological Ownership** (Kuchmaner et al., 2019) | | | | |
| **BPO1:** I consider the brand where I belong. | 0.833 | 0.857 | 0.781 | 2.15 |
| **BPO2:** I think the brand is a brand that belongs to me. | 0.853 | 0.871 | 0.822 | 2.30 |
| **BPO3:** The brand is a part of my life. | 0.875 | 0.856 | 0.89 | 2.66 |
| **BPO4:** I feel like I own a part of the brand. | 0.855 | 0.864 | 0.832 | 2.47 |
| **Brand engagement** (Paruthi & Kaur, 2017) | | | | |
| ***Conscious Attention*** | | | | |
| **CA1:** I like to know more about the brand. | 0.838 | 0.837 | 0.827 | 2.34 |
| **CA2:** I like events that are related to the brand. | 0.845 | 0.873 | 0.800 | 2.47 |
| **CA3:** I like to learn more about the brand. | 0.864 | 0.862 | 0.859 | 2.59 |
| **CA4:** I pay a lot of attention to anything about the brand. | 0.858 | 0.88 | 0.816 | 2.63 |
| **CA5:** I keep up with things related to the brand. | 0.863 | 0.852 | 0.867 | 2.65 |
| ***Affection*** | | | | |
| **AF1:** Engaging with the brand makes me feel happy. (R) | - | - | - | - |
| **AF2:** I feel the experience of the brand to be pleasurable. | 0.892 | 0.898 | 0.852 | 2.37 |
| **AF3:** Browsing the brand's online platforms satisfies me. | 0.787 | 0.777 | 0.79 | 1.56 |
| ***Social connection*** | | | | |
| **SS1:** I love accessing the brand with my friends. | 0.903 | 0.911 | 0.891 | 2.58 |
| **SS2:** I enjoy using the brand more when I am with others. | 0.931 | 0.942 | 0.916 | 3.31 |

| | | | | |
|---|---|---|---|---|
| **SS3:** Brand is more fun when other people around me also access it. | 0.882 | 0.906 | 0.842 | 2.40 |
| ***Enthusiastic participation*** | | | | |
| **EP1:** I spend a lot of my free time on the brand. | 0.871 | 0.902 | 0.828 | 2.65 |
| **EP2:** I am heavily into the brand. | 0.919 | 0.941 | 0.878 | 3.50 |
| **EP3:** I am passionate about the brand. | 0.857 | 0.892 | 0.791 | 2.48 |
| **EP4:** I try to fit accessing the brand into my schedule. | 0.895 | 0.911 | 0.866 | 2.90 |

**Note:** Item marked (R) was removed from the measurement model to improve discriminant validity. Exploratory Factor Analysis (EFA); Variance Inflation Factor (VIF)

**Table 3.** Cross-Loadings of Measurement Items on Latent Constructs

| | AF | CA | EP | INB | INT | MI | BPO | SS | SC |
|---|---|---|---|---|---|---|---|---|---|
| **AF2** | **0.896** | 0.685 | 0.497 | 0.325 | 0.390 | 0.271 | 0.459 | 0.321 | 0.537 |
| **AF3** | **0.879** | 0.491 | 0.428 | 0.259 | 0.301 | 0.379 | 0.427 | 0.189 | 0.414 |
| **CA1** | 0.591 | **0.837** | 0.570 | 0.364 | 0.432 | 0.249 | 0.548 | 0.347 | 0.611 |
| **CA2** | 0.610 | **0.845** | 0.626 | 0.378 | 0.407 | 0.333 | 0.568 | 0.356 | 0.629 |
| **CA3** | 0.534 | **0.864** | 0.585 | 0.423 | 0.419 | 0.339 | 0.593 | 0.405 | 0.605 |
| **CA4** | 0.555 | **0.859** | 0.667 | 0.354 | 0.413 | 0.255 | 0.610 | 0.338 | 0.669 |
| **CA5** | 0.559 | **0.863** | 0.676 | 0.376 | 0.423 | 0.242 | 0.587 | 0.362 | 0.670 |
| **EP1** | 0.470 | 0.652 | **0.871** | 0.381 | 0.333 | 0.237 | 0.639 | 0.256 | 0.670 |
| **EP2** | 0.447 | 0.648 | **0.919** | 0.377 | 0.396 | 0.278 | 0.686 | 0.263 | 0.659 |
| **EP3** | 0.482 | 0.611 | **0.857** | 0.303 | 0.359 | 0.284 | 0.622 | 0.216 | 0.675 |
| **EP4** | 0.456 | 0.686 | **0.896** | 0.328 | 0.357 | 0.232 | 0.658 | 0.289 | 0.767 |
| **INB1** | 0.366 | 0.345 | 0.264 | **0.743** | 0.476 | 0.527 | 0.290 | 0.486 | 0.243 |
| **INB2** | 0.274 | 0.352 | 0.306 | **0.872** | 0.406 | 0.451 | 0.246 | 0.588 | 0.286 |
| **INB3** | 0.271 | 0.341 | 0.322 | **0.860** | 0.401 | 0.413 | 0.284 | 0.600 | 0.353 |
| **INB4** | 0.215 | 0.424 | 0.394 | **0.865** | 0.424 | 0.454 | 0.391 | 0.607 | 0.372 |
| **INT1** | 0.317 | 0.374 | 0.311 | 0.496 | **0.826** | 0.395 | 0.387 | 0.370 | 0.312 |
| **INT2** | 0.361 | 0.449 | 0.364 | 0.422 | **0.918** | 0.322 | 0.442 | 0.382 | 0.358 |
| **INT3** | 0.357 | 0.470 | 0.402 | 0.449 | **0.906** | 0.353 | 0.490 | 0.438 | 0.371 |
| **MI1** | 0.288 | 0.240 | 0.195 | 0.501 | 0.318 | **0.886** | 0.235 | 0.458 | 0.159 |
| **MI2** | 0.296 | 0.281 | 0.250 | 0.467 | 0.337 | **0.918** | 0.257 | 0.443 | 0.185 |
| **MI3** | 0.388 | 0.364 | 0.329 | 0.507 | 0.414 | **0.872** | 0.328 | 0.422 | 0.316 |
| **BPO1** | 0.458 | 0.552 | 0.601 | 0.288 | 0.460 | 0.340 | **0.837** | 0.296 | 0.481 |
| **BPO2** | 0.507 | 0.552 | 0.591 | 0.346 | 0.458 | 0.336 | **0.856** | 0.197 | 0.505 |
| **BPO3** | 0.370 | 0.617 | 0.684 | 0.336 | 0.419 | 0.204 | **0.872** | 0.246 | 0.569 |
| **BPO4** | 0.371 | 0.609 | 0.637 | 0.306 | 0.370 | 0.169 | **0.851** | 0.284 | 0.535 |
| **SS1** | 0.268 | 0.394 | 0.255 | 0.650 | 0.423 | 0.466 | 0.286 | **0.923** | 0.270 |
| **SS2** | 0.257 | 0.375 | 0.287 | 0.601 | 0.397 | 0.451 | 0.271 | **0.918** | 0.307 |
| **SS3** | 0.274 | 0.400 | 0.258 | 0.639 | 0.423 | 0.446 | 0.269 | **0.919** | 0.320 |
| **SC1** | 0.460 | 0.689 | 0.749 | 0.375 | 0.354 | 0.268 | 0.582 | 0.318 | **0.904** |
| **SC2** | 0.498 | 0.684 | 0.733 | 0.334 | 0.373 | 0.234 | 0.565 | 0.284 | **0.931** |
| **SC3** | 0.506 | 0.653 | 0.635 | 0.327 | 0.342 | 0.167 | 0.512 | 0.278 | **0.881** |

**Note:** Sensory Stimulation (SS); Mental Imagery (MI); Brand Psychological Ownership (BPO); "Inspired by" (INB); "Inspired to" (INT); Conscious Attention (CA); Affection (AF); Social connection (SC); Enthusiastic participation (EP)

**Table 4.** Discriminant validity

| Construct | AF | CA | EP | INB | INT | MI | BPO | SS | SC | CR | AVE | Alpha |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AF** | **.862** | | | | | | | | | .854 | .743 | .827 |
| **CA** | [.815] | **.853** | | | | | | | | .907 | .729 | .907 |
| **EP** | [.692] | [.807] | **.884** | | | | | | | .910 | .785 | .908 |
| **INB** | [.452] | [.495] | [.435] | **.837** | | | | | | .858 | .711 | .857 |
| **INT** | [.513] | [.552] | [.458] | [.597] | **.884** | | | | | .872 | .782 | .861 |
| **MI** | [.442] | [.373] | [.326] | [.637] | [.465] | **.891** | | | | .872 | .795 | .871 |
| **BPO** | [.667] | [.764] | [.804] | [.417] | [.572] | [.351] | **.854** | | | .877 | .730 | .876 |
| **SS** | [.400] | [.466] | [.318] | [.772] | [.507] | [.555] | [.336] | **.919** | | .910 | .846 | .909 |
| **SC** | [.723] | [.803] | [.807] | [.030] | [.448] | [.278] | [.691] | [.361] | **.905** | .894 | .820 | .890 |

**Note:** HTMT values display in the blanket; The square root of AVE is indicated in bold numbers, Composite Reliability (CR); Average Variance Extracted (AVE)

**Table 5.** Mean Differences between AR and Non-AR with Permutation Testing

| Construct | Original difference | Permutation mean difference | 5% | 95% | Permutation p value |
|---|---|---|---|---|---|
| **$H_{1a}$:** Sensory stimulation | -0.105 | 0.004 | -0.190 | 0.188 | 0.158 |
| **$H_{2a}$:** Mental Imagery | -0.426 | 0.002 | -0.176 | 0.190 | 0.000 |
| **$H_{3a}$:** Psychological ownership | -0.407 | 0.003 | -0.191 | 0.202 | 0.000 |

**Table 6.** Results of the direct relationships

| | Path | Groups | Mean (M) | Std. deviation | t-value | p-value | Result |
|---|---|---|---|---|---|---|---|
| $H_{1b}$ | SS ⇒ MI | Sample | .479 | .053 | 8.964 | 0.000 | **Supported** |
| | | AR | .414 | .079 | 5.183 | 0.000 | **Supported** |
| | | Non-AR | .555 | .066 | 8.42 | 0.000 | **Supported** |
| $H_{1c}$ | SS ⇒ BPO | Sample | .059 | .083 | 0.684 | 0.247 | **No** |
| | | AR | .009 | .089 | 0.097 | 0.923 | **No** |
| | | Non-AR | .001 | .130 | 0.009 | 0.993 | **No** |
| $H_{2b}$ | MI ⇒ BPO | Sample | .118 | .064 | 1.981 | 0.020 | **Supported** |
| | | AR | .179 | .079 | 2.270 | 0.023 | **Supported** |
| | | Non-AR | -.067 | .108 | 0.623 | 0.536 | **No** |
| $H_{3b}$ | BPO ⇒ CA | Sample | .684 | .039 | 17.66 | 0.000 | **Supported** |
| | | AR | .754 | .042 | 17.91 | 0.000 | **Supported** |
| | | Non-AR | .558 | .068 | 8.18 | 0.000 | **Supported** |
| $H_{3c}$ | BPO ⇒ AF | Sample | .578 | .045 | 12.82 | 0.000 | **Supported** |
| | | AR | .622 | .056 | 11.14 | 0.000 | **Supported** |
| | | Non-AR | .476 | .072 | 6.64 | 0.000 | **Supported** |
| $H_{3d}$ | BPO ⇒ EP | Sample | .737 | .028 | 26.37 | 0.000 | **Supported** |
| | | AR | .751 | .036 | 21.11 | 0.000 | **Supported** |
| | | Non-AR | .696 | .049 | 14.22 | 0.000 | **Supported** |
| $H_{3e}$ | BPO ⇒ SC | Sample | .613 | .040 | 15.34 | 0.000 | **Supported** |
| | | AR | .643 | .054 | 11.86 | 0.000 | **Supported** |
| | | Non-AR | .543 | .064 | 8.42 | 0.000 | **Supported** |

**Note:** Normed Fit Index (NFI); Standardized Root Mean Square Residual (SRMR)

**Chi-square** = 1495.450; **NFI** = .890; **SRMR** = .054

**Table 7.** Indirect effects results

| Path | Mean (M) | Std. deviation | t-value | p-value | Result |
|---|---|---|---|---|---|
| SS ⇒ MI ⇒ BPO ($H_{2c}$) | .056 | .031 | 1.893 | 0.029 | **Supported** |
| INB x MI ⇒ BPO ( $H_4$) | .099 | .050 | 2.434 | 0.021 | **Supported** |
| INT x SS ⇒ BPO ( $H_5$) | .088 | .050 | 1.733 | 0.053 | **Supported** |

**Table 8.** PLS-MGA analysis results

| Path | AR | Non-AR | Original difference | 5.0% | 95.0% | Permutation p value | Result |
|---|---|---|---|---|---|---|---|
| **SS ⇒ MI** | 0.447 | 0.553 | -0.105 | -0.138 | 0.143 | 0.160 | **No** |
| **SS ⇒ BPO** | 0.032 | -0.018 | 0.049 | -0.196 | 0.201 | 0.380 | **No** |
| **MI ⇒ BPO** | 0.180 | -0.068 | 0.250 | -0.212 | 0.231 | **0.032** | **Supported** |
| **BPO ⇒ CA** | 0.753 | 0.556 | -0.197 | -0.125 | 0.131 | **0.034** | **Supported** |
| **BPO ⇒ AF** | 0.619 | 0.479 | -0.140 | -0.139 | 0.152 | **0.006** | **Supported** |
| **BPO ⇒ EP** | 0.750 | 0.689 | -0.061 | -0.086 | 0.090 | 0.125 | **No** |
| **BPO ⇒ SC** | 0.643 | 0.539 | -0.105 | -0.128 | 0.131 | **0.053** | **Supported** |

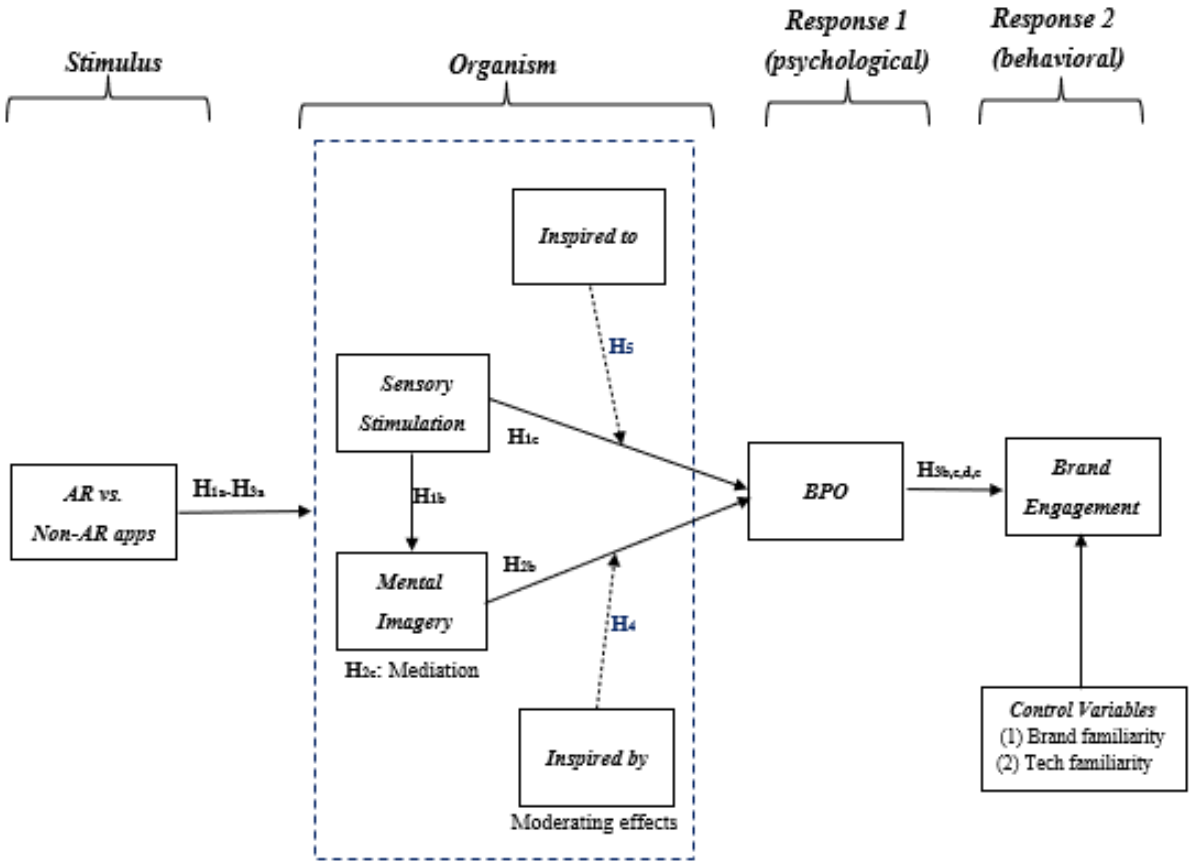


**Fig 1. AR Sensory Marketing: Proposed Model**

**Source:** Figure created by author

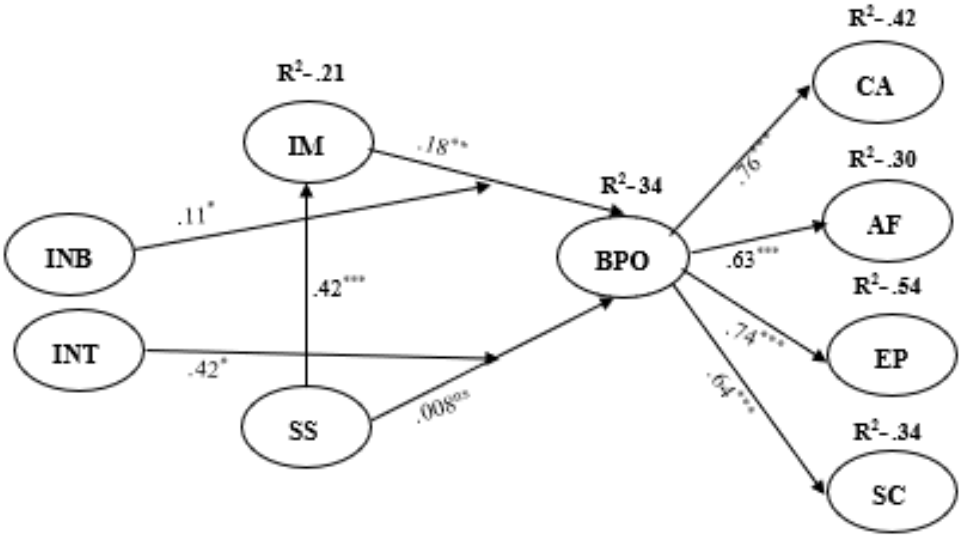


**Fig 2.** Results of PLS-SEM analysis, Authors' Elaboration

***p≤ 0.001, **p≤ 0.01, *p≤ 0.05, ns=No significant

**Source:** Figure created by author

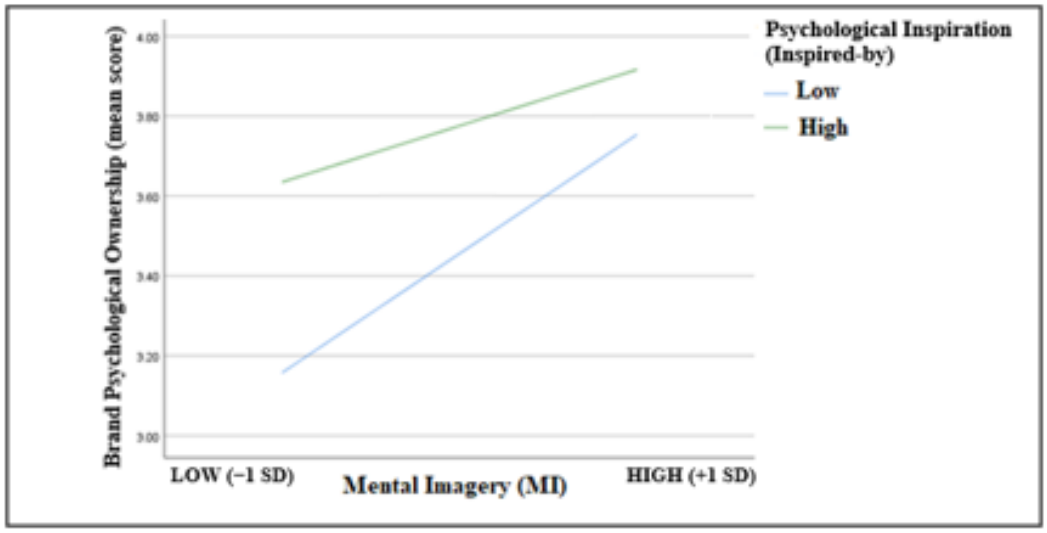


**Fig 3.** Moderation effect of "inspired by" on the relationship between mental imagery and BPO, Mental imagery and inspired-by are plotted at −1 SD (low) and +1 SD (high), Values represent "Predicted mean scores" derived from the moderation model, Statistical significance of the moderation effects is reported in Table 7

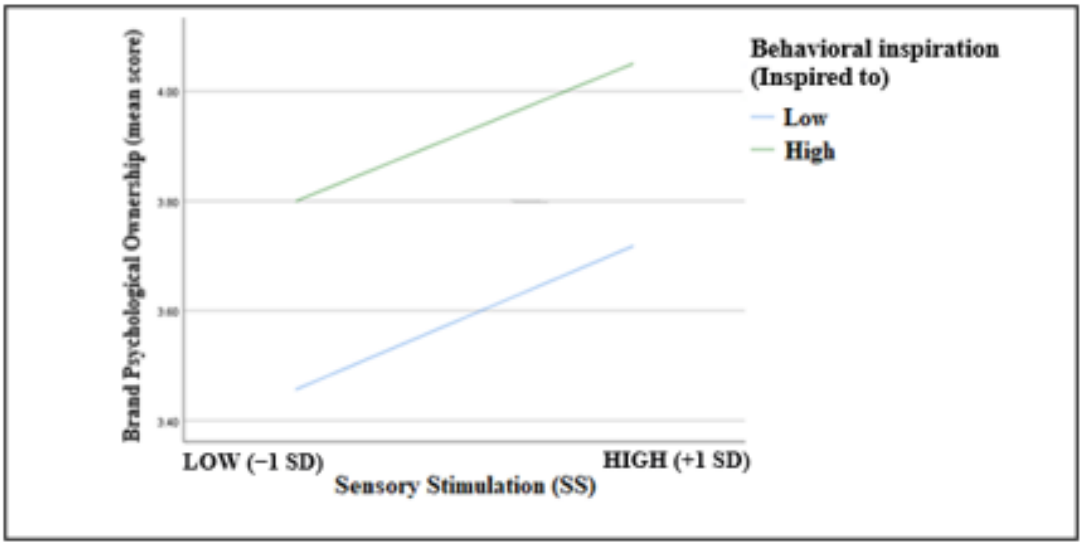


**Fig 4.** Moderation effect of "inspired to" on the relationship between sensory simulation and BPO, Sensory stimulation and inspired-to are plotted at −1 SD (low) and +1 SD (high), Values represent "Predicted mean scores" derived from the moderation model, Statistical significance of the moderation effects is reported in Table 7