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## Article

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# Impact of Brand Concept and AI Agent Gender on Brand Experiences in Virtual Spaces

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## ABSTRACT

**Purpose:** This study investigates the anticipated differences between consumers' interactions with AI agents and brand experiences in virtual brand spaces, based on brand concepts and the agent's gender.

**Design/methodology/approach:** To test the proposed hypotheses, a 2 (Brand Concept: Functional Brand vs. Experiential Brand) × 2 (AI agent's gender: male vs. female) experimental design was used.

**Findings:** Consumers may expect continuous dialogue, and entertainment or search experiences, while receiving guidance on functional brand Concepts from a male AI agent, because of higher confidence and trust. However, when guided by a female AI agent on experiential brand concepts, continuous dialogue could be anticipated because of greater sensory and emotional experiences.

**Research limitations/implications:** The analysis yields two key academic implications. First, the role of brand concept in achieving a continuous grounding between consumers and AI agents was identified. Second, the role of the AI agent's gender in enhancing brand experience in virtual spaces was identified.

**Originality/value:** This study investigates how consumers encountering AI agents in virtual brand spaces evaluate grounding and brand experiences differently based on the agent's gender. It was anticipated that grounding with AI agents would vary according to the brand concept emphasized in virtual spaces, and that the intensity of brand experience in interaction with the AI agent would also differ.

*Keywords: AI Agent, Gender, Brand Concept, Grounding, Experience*

## I. Introduction

Samsung Electronics recently introduced the Galaxy S24, which features an artificial intelligence (AI) agent developed by Google called Gemini. Gemini is designed to recognize both voice and text, enabling it to respond to a diverse range of user commands. Apple has similarly revealed intentions

to improve the functionalities of Siri and introduce generative AI, starting with the iPhone 16. In a personal blog, Bill Gates declared that AI agents signify the most significant computing revolution since Windows. As AI technology advances, the marketing academic community is witnessing a growing interest in AI agents that assist consumers' decision-making processes. AI agents handle diverse roles, such as providing product information, manuals and personalized recommendations, and handling complaints. Various research efforts are underway to improve the service quality of AI agents. This

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trend is accentuated by the development of XR (extended reality) technology, which allows consumers to experience branded products in virtual spaces, making the role of AI agents in assisting consumers in virtual brand stores even more crucial.

Continuous interactions between consumers and AI agents are crucial in providing consumers with appropriate services in virtual spaces. The AI agent should be capable of delivering suitable responses to various consumer queries. They should also be able to initiate, lead, and facilitate conversations and interactions when necessary. Grounding, which is defined as the level at which the AI agent comprehends the structure, meaning, grammar, and context of the consumer language, thereby guiding the conversation accordingly, (Bergner et al., 2023) between the AI agent and the consumer is essential. Consumers visiting virtual brand stores should participate in continuous grounding with AI agents to explore various brands.

To facilitate grounding between consumers and AI agents, developers must anthropomorphize the AI agent by incorporating attributes such as name, gender, and personality (Epley et al., 2007; Jin and Bolebruch, 2009; Zhao, 2003). This process enhances the humanization of the AI agent, thereby fostering continuous grounding between the consumer and the AI agent. This study focuses specifically on the gender attributes of AI agents. Expectations of consumer interactions may differ based on the perception of whether the AI agent is male or female. owing to gender stereotypes (Ahn et al. 2022; Sun, 2022). Furthermore, AI agent gender stereotypes may influence interaction intensity and brand experience with the virtual brand, depending on the concept emphasized within the virtual space (Jeon 2023a).

This study anticipates that interactions with AI agents and brand experiences will differ for users encountering AI agents in virtual brand spaces, based on brand concepts and the AI agent's gender. Specifically, consumers may expect continuous dialogue and entertainment or search experiences when receiving guidance on functional brand concepts from a male AI agent because of higher trust and

confidence. However, when guided by a female AI agent on experiential brand concepts, consumers may anticipate continuous dialogue, along with entertainment or search experiences, due to greater expected sensory and emotional experiences (Jin and Lee 2010; Jeon 2023b).

## II. Literature Review

### A. AI Agent and Gender

The term Artificial Intelligence (AI), also known as AI, encompasses computer programs, algorithms, or systems developed to mimic human intelligence and behavior (Huang and Rust 2018; Shankar 2018; Syam and Sharma 2018). The advancement of this technology has also resulted in the development of AI agents, also known as social bots, which control and make decisions autonomously through generative programs (Choi, Miracle, and Biocca 2001; Jeon 2023a). AI agents could take various forms, including animations, interactive 3D avatars (Jin and Lee 2010), and anthropomorphized human appearances (Verhagen et al. 2014). With advances in deep and machine learning, AI agents learn and generate knowledge during interactions with humans, continuously improving overall service quality.

AI agents fundamentally play a role in assisting humans, and their approach can vary depending on whether they are considered "assistants" or "companions." From an assistant's perspective, AI technology is regarded as a technically useful proxy for resolving human tasks (Chattarman et al. 2019), focusing on task-oriented objectives. In contrast, from the companion perspective, AI technology is considered capable of interacting in everyday conversations for emotional support, utilizing sophisticated natural language processing to cater to human emotional needs (Bickmore and Picard 2005; Guzman 2019). In the fields of marketing, advertising, and communication, AI agents primarily act as assistants, focusing on the functions of customer satisfaction, relationship

building, and recommendation (Holzwarth et al. 2006).

In human-computer interaction (HCI), AI agents need identifiable names, gender, personality, and attributes, such as speech or voice to be anthropomorphic enough for effective interaction with humans (Nass and Moon 2000). AI agents must surpass a certain level of anthropomorphism, resembling virtual humans, to achieve effective interactions (Fong et al. 2003; Holzwarth et al. 2006). Among the various attributes of anthropomorphized AI agents, gender has gained attention as a concept that enhances social presence (Nass and Yen 2010). Gender stereotypes of AI agents can influence their interactions with humans, similar to human gender stereotypes. For example, Nass et al. (1997) found that people feel somewhat more dominant, but also develop higher trust, when hearing a male, rather than female, voice from a computer. Additionally, a study investigating the gender of robots based on appearance reported that male-looking robots were evaluated positively when performing adventurous and strength-demanding tasks, whereas female-looking robots were evaluated positively when performing delicate and meticulous tasks (Eyssel and Hegel 2012). Simultaneously, the gender selection of AI agents guiding consumers in virtual brand stores has become crucial for shaping brand image. According to previous studies, consumers expect competence from male AI agents and warmth from female AI agents (Ashton-James et al. 2019; Fiske et al. 2007; Heilman 2012; Huddy and Terkildsen 1993).

## B. Brand Concept in Virtual Spaces

Even in the virtual world, consumers can experience emotional and practical benefits similar to those in the real world when encountering brands (Barnes et al. 2015). This virtual brand experience not only leads to increased immersion (flow) and positive brand attitudes, but also provides enjoyment to the brand (Shen et al. 2021). Therefore, in virtual spaces, brands must consider how to emphasize specific benefits to consumers and create differentiated concepts.

Consumers perceive subjective rewards or anticipated benefits from brand purchases or experiences (Hamid, et al., 2023; Jeon, 2017). Consumers expect various benefits to be fulfilled through a brand, which can be broadly categorized into functional and experiential benefits (Holbrook and Hirschman 1982). Functional benefits highlight how various brand attributes can fulfill consumers' utilitarian needs. Through cognitive evaluation, consumers who prioritize functional benefits evaluate a brand based on how well it satisfies practical needs. On the other hand, experiential benefits emphasize that a brand can fulfill consumers' sensory and aesthetic desires through brand experiences. Consumers who prioritize experiential benefits evaluate a brand based on the emotional and aesthetic fulfillment experienced during affective evaluation processes (Jeon 2017; Park et al. 2013).

Depending on the emphasized benefits, brand concepts can be categorized as functional or experiential (Park et al. 2013). Functional brand concepts emphasize the functional and utilitarian benefits of a product, whereas experiential brand concepts highlight the sensory and aesthetic benefits gained through brand experiences. Consumer evaluation processes differ depending on the brand concept. Consumers who purchase functional brands focus on cognitive evaluation and assess brands based on physical performance. In contrast, those who consume experiential brand concepts focus on affective evaluation and assess brands based on sensory experiences (Jeon 2017).

Therefore, functional and experiential benefits are expected to lead to different evaluation processes for each brand concept, depending on the desires and motivations that consumers seek from a brand.

## C. Grounding between Brand Concept and AI Agent

As discussed earlier, from an HCI perspective, consumers and AI agents form symbiotic relationships, necessitating continuous interaction. This interaction requires grounding, which is defined as constant

dialogue and communication between two parties through language or nonverbal signals (Richardson and Dale 2005). Although grounding occurs naturally between humans, achieving it between humans and AI agents (computer programs) is challenging.

Because consumers perceive AI agents in virtual spaces as assistants, expecting a transactional trust relationship and effective grounding is essential. Consumers view AI agents not as sales representatives selling products in physical stores, but as virtual representatives (Clark et al. 2019; Madhavan and Wiegmann 2007). To establish grounding, consumers focus on whether an AI agent can adequately explain brand benefits (Kontogiorgos et al. 2021). Consequently, if grounding is established, consumers intend to collect various types of information from the AI agent.

This study posits that the impact of an AI agent's gender traits on assessing AI agent grounding will vary depending on brand concepts (functional vs. experiential). Functional brands underscore practical purposes, whereas experiential brands concentrate on sensory experiences (Park et al., 1986; Park et al., 2013). In the context of functional concepts, the competence of an AI agent (reflecting the brand's competence) is pivotal to purchase decisions. Conversely, in the evaluation of experiential brands, consumer judgments are based on sensory experiences and affective responses, in which the warmth exhibited by the AI agent plays a more significant role in influencing emotional decisions and brand sales (Bennett and Hill, 2012).

In summary, functional brands emphasize product functionality and attributes, leading consumers to expect detailed product information when the AI agent is male. By contrast, experiential brands emphasize sensory experiences, causing consumers to anticipate various experiential attributes when the AI agent is female. Based on this discussion, we propose the following hypothesis:

**Hypothesis 1:** Grounding differs according to brand concept and the AI agent's gender.

**Hypothesis 1-1:** For functional brands, grounding will be higher when the AI agent is male than when it is female.

**Hypothesis 1-2:** For experiential brands, grounding will be higher when the AI agent is female than when it is male.

#### D. Brand Experience between Brand Concept and AI Agent

According to previous research, consumer experiences with brands in virtual spaces can be categorized into four types (Brakus et al. 2009; Jeon 2023b; Kim et al. 2012; Moriuchi et al. 2021): search, entertainment, interaction, and assembly. This study focuses on the exploration and entertainment experiences associated with the proposed brand concepts. Examining each brand's specific experience, it is observed that:

First, the search experience in a virtual brand store allows consumers to understand the brand's features and attributes (Jeon 2023c; Park and Lee 2012). Upon entering the virtual brand experience space, consumers are provided information related to the brand's functions, quality, and attributes. For example, Zepeto's Hyundai Motor Experience Space offers information on various car models produced by Hyundai. Second, the entertainment experience in a virtual brand store includes playful activities for the consumer (Lee and Choi 2017; Mohd et al. 2017). With advancements in extended reality (XR) technology, avatars have a higher degree of freedom, enabling diverse entertainment experiences. For instance, Zepeto's Baskin-Robbins 31 World provides an experience wherein avatars can create and enjoy various ice cream flavors.

In this study, we anticipate that consumer experiences with brands will vary depending on the brand concept and the AI agent's gender. Functional brands emphasize practical benefits, whereas experiential brands highlight sensory experiences (Holbrook and Hirschman 1982). Additionally, consumers perceive AI agents in virtual spaces differently, based on gender, perceiving male agents as dominant and competent, and female agents as warm and sensory (Ashton-James et al. 2019; Fiske

et al. 2007; Huddy and Terkildsen 1993). This suggests that even with the same brand concept, consumer expectations of experiences may differ depending on the AI agent's gender.

In summary, functional brands emphasize solving practical issues, leading consumers to expect more brand experiences when the AI agent is male, rather than female (Parulekar and Raheja 2006). Conversely, experiential brands emphasize aesthetic and sensory experiences, leading consumers to anticipate more brand experiences when the AI agent is female rather than male (Bennett and Hill 2012). Furthermore, grounding with AI agents is expected to enhance the virtual brand experience within the virtual space. Based on these discussions, the following hypotheses are proposed:

**Hypothesis 2:** Search experiences differ based on the brand concept and the gender of the AI agent.

**Hypothesis 2-1:** For functional brands, the search experience is higher when the AI agent is male than when it is female.

**Hypothesis 2-2:** For experiential brands, search experience is better when the AI agent is female than when it is male.

**Hypothesis 3:** Entertainment experience differs based on the brand concept and the gender of the AI agent.

**Hypothesis 3-1:** For functional brands, entertainment experience is better when the AI agent is male than when it is female.

**Hypothesis 3-2:** For experiential brands, entertainment experience is better when the AI agent is female than when it is male.

**Hypothesis 4:** Grounding with AI agents will positively affect the virtual brand experience.

### III. Method

#### A. Research Design

To test the proposed hypotheses, a 2 (Brand Concept:

Functional Brand vs. Experiential Brand)  $\times$  2 (AI agent's gender: male vs. female) experimental design was used. The dependent variables selected for the evaluation were grounding, search experience, and entertainment experience. Brand attitude and respondents' gender were considered control variables. The brand concept and AI agent's gender were manipulated by exposing the participants to stimuli for evaluation.

#### B. Stimuli and Scale

First, we created stimuli for brand concepts. We selected the automotive industry, which has a high level of engagement with product information in virtual spaces. For the functional brand, we chose Hyundai's Grandeur and for the experiential brand, we selected MINI. Next, we intended to create stimuli for the AI agents. Both, the male and female AI agents were developed using Naver Z's Zepeto platform. The measured variables were as follows: For the functional brand concept, the statements 'Functionally excellent,' 'Practical,' and 'Good quality' were selected, while for the experiential brand concept, 'Aesthetically designed,' 'Visually appealing,' and 'Expect an enjoyable riding experience' were chosen (Jeon 2017; Park et al. 1986). The AI agent's gender was measured using a single item: 'masculine' and 'feminine.' Grounding was assessed using three statements: 'Seems to solve my curiosity well,' 'Seems to match what I want well,' and 'Seems to reflect my requirements well' (Bergner et al. 2023). Search experience included the statements, 'Seems to obtain useful information,' 'Seems to understand functionality,' and 'Seems to grasp practical performance' (Jeon 2023b). Entertainment experience was measured with 'Seems to feel enjoyment,' 'Seems interesting,' and 'Seems to have a good mood.' Lastly, the control variable, brand attitude, included three statements: 'Good,' 'Favorable,' and 'Positive' (Jeon 2017). All items were measured on a 7-point Likert scale.

### C. Procedure

The experiment was conducted online with participants from panels registered with a domestic marketing research company. The participants were briefed on the research purpose and procedures, and their willingness to participate was confirmed. Those expressing interest were instructed to connect online, evaluate AI agents in virtual brand stores, and respond to the survey. The experimental procedure involved participants responding to the control variable of brand attitude before exposure to stimuli. Subsequently, they were randomly exposed to one of four stimuli. The participants were instructed to respond to items related to brand concepts after viewing the AI agent in the virtual brand store, search and entertainment experiences, and grounding. The entire experiment lasted for approximately 10 min. A total of 190 participants participated in this experiment, with a gender distribution of 96 males (50.5%) and 94 females (49.5%), and an average age of 30.7 years.

## IV. Results

### A. Manipulation Check

The reliability of the measurement items was assessed before testing the proposed hypotheses. The reliability of each item was confirmed to meet the measurement criterion of Cronbach's  $\alpha$ . The reliability for functional brand concept was .891, experiential brand concept, .828, brand attitude, .940, grounding, .910, search experience, .891, and for entertainment experience was .932.

To ensure the appropriateness of the experimental stimuli manipulation, a manipulation check was conducted. First, for the Grandeur, functional benefits ( $M=4.98$ ) were rated higher than experiential benefits ( $M=4.01$ ) ( $p<.01$ ), while for the MINI, experiential benefits ( $M=4.81$ ) were rated higher than functional benefits ( $M=4.06$ ) ( $p<.01$ ). Furthermore, regarding gender, for the male AI agent, the perception of

masculinity ( $M=4.84$ ) was rated higher than that of femininity ( $M=3.21$ ), and for the female AI agent, the perception of femininity ( $M=5.77$ ) was rated higher than that of masculinity ( $M=2.07$ ). Based on these results, the manipulation for the empirical analysis was deemed successful.

### B. Interaction between Brand Concept and AI Agent Gender on Grounding

An analysis of variance (ANOVA) was conducted to test the hypotheses proposed in this study (See Table 1). The results of the interaction between the brand concept and the gender of the AI agent on grounding are as follows (See Figure 1): First, the control variable brand attitude ( $F=.822$ ,  $p=.366$ ), did not have a significant impact. However, the respondent's gender ( $F=7.838$ ,  $p<.05$ ) was found to have a significant influence on grounding. The main effects revealed that the brand concept ( $F=.165$ ,  $p=.685$ ) and gender of the AI agent ( $F=.536$ ,  $p=.465$ ) did not significantly affect grounding. The interaction effect showed that the interaction between the brand concept and the gender of the AI agent was significant ( $F=7.144$ ,  $p<.05$ ).

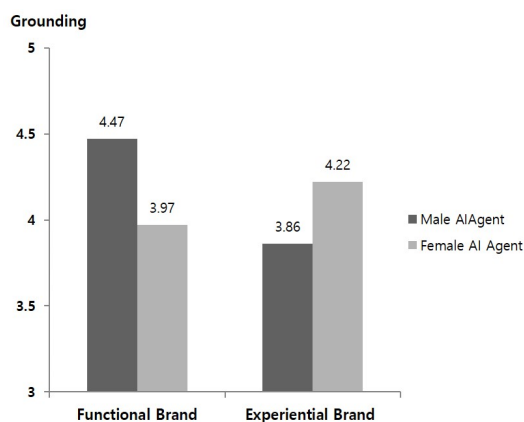
Specifically, for functional brands, grounding was higher when exposed to a male ( $M = 4.47$ ) rather than a female AI agent ( $M=3.97$ ) ( $F=4.676$ ,  $p<.05$ ). In contrast, for experiential brands, grounding was higher when exposed to a female ( $M = 4.22$ ) rather than a male AI agent ( $M=3.86$ ) ( $F=7.286$ ,  $p<.05$ ).

### C. Interaction between Brand Concept and AI Agent Gender on Experience

An ANOVA was conducted to test the hypotheses proposed in this study (See Table 2). First, the interaction results of brand concept and AI agent gender on the search experience are as follows: Initially, the control variable of brand attitude ( $F=7.736$ ,  $p<.01$ ) demonstrated a significant impact, whereas the respondent's gender ( $F=.140$ ,  $p=.709$ )

**Table 1.** Interaction effect on grounding

	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	19.782 <sup>a</sup>	5	3.956	3.414	.006
Intercept	91.691	1	91.691	79.128	.000
Brand Attitude	.953	1	.953	.822	.366
Gender	9.082	1	9.082	7.838	.006
Brand Concept(A)	.191	1	.191	.165	.685
AI Agent Gender(B)	.621	1	.621	.536	.465
A * B	8.278	1	8.278	7.144	.008
Error	213.212	184	1.159		
Total	3470.778	190			
Corrected Total	232.995	189			

**Figure 1.** Results of grounding

did not influence the search experience significantly. The main effects indicated that the brand concept ( $F=.721$ ,  $p=.397$ ) and the gender of the AI agent ( $F=.137$ ,  $p=.711$ ) did not individually affect the search experience. The interaction between the brand concept and the gender of the AI agent was found to be significant ( $F=4.613$ ,  $p<.05$ ). Specifically, for functional brands, there was no significant difference between exposure to a male AI ( $M=4.61$ ) or female AI agent ( $M=4.36$ ) ( $F=1.075$ ,  $p=.301$ ). However, for experiential brands, exposure to a female AI agent ( $M=4.46$ ) resulted in a higher search experience than that to a male AI agent ( $M=4.00$ ) ( $F=6.916$ ,  $p<.01$ ). These findings suggest that, in functional brands, there may not be a substantial difference in search

experiences based on the gender of the AI agent. However, for experiential brands, a female AI agent could potentially enhance the entertainment experience to a greater extent than that of a male agent.

Next, the interaction results of brand concept and AI Agent Gender on entertainment experience are as follows: The control variable, brand attitude ( $F=6.407$ ,  $p<.01$ ), showed a significant impact, whereas the respondent's gender ( $F=.137$ ,  $p=.712$ ) did not influence the entertainment experience significantly. The main effects indicated that the brand concept ( $F=.044$ ,  $p=.834$ ) and the gender of the AI agent ( $F=.733$ ,  $p=.393$ ) did not individually affect the entertainment experience. Specifically, for functional brands, male AI agent ( $M=4.44$ ) resulted in a greater entertainment experience than a female AI agent ( $M=3.90$ ) ( $F=3.903$ ,  $p<.05$ ). In contrast, for experiential brands, a female AI agent ( $M=4.24$ ) resulted in a higher entertainment experience than a male AI agent ( $M=3.93$ ) ( $F=3.659$ ,  $p<.05$ ). These results suggest that, in functional brands, the presence of a male AI agent may contribute to a higher level of brand experience. However, for experiential brands, the presence of a female AI agent can lead to better brand experience (See Figure 2).

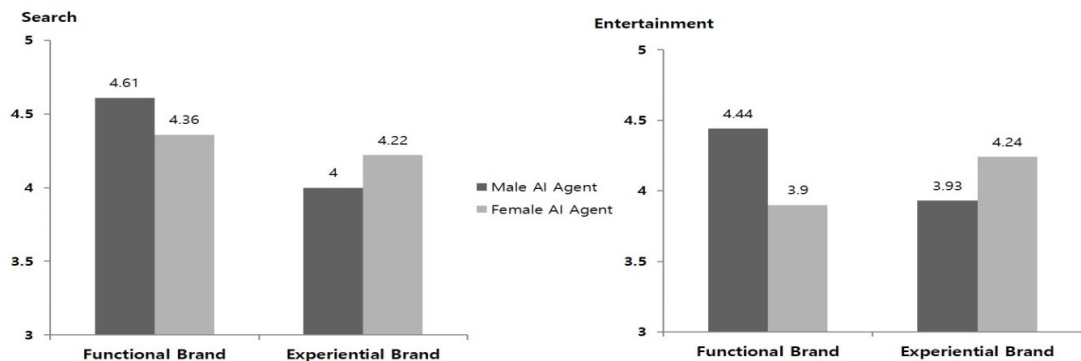
#### D. The Effect of Grounding with AI Agent

Although not proposed as a hypothesis in this study,



**Table 2.** Interaction effect on search and entertainment

		Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Search	19.422a	5	3.884	3.219	.008
	Entertainment	19.931b	5	3.986	2.418	.038
Intercept	Search	87.069	1	87.069	72.149	.000
	Entertainment	82.240	1	82.240	49.894	.000
Brand Attitude	Search	9.336	1	9.336	7.736	.006
	Entertainment	10.561	1	10.561	6.407	.012
Gender	Search	.169	1	.169	.140	.709
	Entertainment	.225	1	.225	.137	.712
Brand Concept(A)	Search	.870	1	.870	.721	.397
	Entertainment	.073	1	.073	.044	.834
AI Agent Gender(B)	Search	.166	1	.166	.137	.711
	Entertainment	1.208	1	1.208	.733	.393
A * B	Search	5.566	1	5.566	4.613	.033
	Entertainment	8.334	1	8.334	5.056	.026
Error	Search	222.049	184	1.207		
	Entertainment	303.286	184	1.648		
Total	Search	3844.000	190			
	Entertainment	3561.000	190			
Corrected Total	Search	241.471	189			
	Entertainment	323.217	189			

**Figure 2.** Results of experience

it was hypothesized that grounding with AI agents would positively affect the virtual brand experience, especially in terms of its effects on the search and entertainment experiences. The verification results indicated that grounding significantly influences search experience ( $\beta=.683$ ,  $p<.001$ ,  $R^2=.463$ ).

Furthermore, grounding was found to have a significant impact on entertainment experience as well ( $\beta=.638$ ,  $p<.001$ ,  $R^2=.404$ ).

## V. Discussion

With the recent surge in interest in AI agents, numerous studies are underway to improve the interaction between consumers and AI agents within virtual brand stores. Although research on the effectiveness of gender in anthropomorphizing AI agents to humanize them has been conducted, studies that verify their interaction with brand concepts are scarce. This study investigates how consumers encountering AI agents in virtual brand spaces evaluate grounding and brand experiences differently based on the agent's gender. It was anticipated that grounding with AI agents would vary according to the brand concept emphasized in virtual spaces, and that the intensity of brand experience in interaction with the AI agent would also differ. The results were as follows:

First, for functional brands, grounding was higher with a male AI agent, whereas for experiential brands, it was higher with a female agent. Consumers in virtual spaces are expected to focus on whether an agent appropriately conveys brand-related information. For functional brands that emphasize product features, attributes, and quality, consumers expect to gather relevant information from male AI agents, which leads to grounding. Similarly, for experiential brands, greater sensory and entertaining experiences are anticipated from female AI agents, resulting in grounding.

Second, brand experience in virtual brand stores varies based on the alignment of brand concepts and the gender of the AI agent. Consumers anticipate diverse brand experiences, even within virtual brand spaces. The expected brand experiences, guided by the gender of the AI agent, were hypothesized to differ. The validation results indicated that for functional and experiential brands, a male and female AI agent, respectively, led to higher perceptions of exploration and entertainment experiences.

The analysis yields two key academic implications. First, the role of brand concept in achieving a continuous grounding between consumers and AI

agents was identified. Grounding represents an ongoing state of communication between parties through linguistic and nonlinguistic tools. As AI agents are not human, expecting continuous grounding is challenging from a consumer's perspective. However, from a corporate perspective, collecting consumer data through grounding is crucial for improving the quality of AI agents and realizing customized services. It was discovered that for such grounding to occur, the alignment between brand concepts and the gender of the AI agent must be considered.

Second, the role of the AI agent's gender in enhancing brand experience in virtual spaces was identified. With the advancement of the XR platform technology, the number of companies operating brand stores in virtual spaces has been increasing. It is crucial to offer consumers more than just a visit to virtual brand stores to provide various experiences. This study emphasizes the brand's emphasized image and AI agent gender to explore diverse information related to the brand and provide an enjoyable entertainment experience for consumers, thereby validating the roles of brand concepts and AI agent gender in enhancing the virtual brand experience.

This study has practical implications for developers who select the AI agent's gender during anthropomorphization. It was observed that the alignment of the brand's emphasized image and concept with the AI agent's gender was crucial for maintaining the agent's service quality, and enhancing consumer satisfaction. Therefore, understanding a brand's identity and concepts before anthropomorphizing an AI agent is expected to enhance consumer satisfaction.

Although this study offers several insights, it has some limitations. The product category selected in the experimental process was automobiles. Because automobiles are considered high-involvement products, prior consumer knowledge may significantly influence the results. Although the attitude toward the experimental brand was analyzed as a control variable, prior knowledge of the automobile product category was not considered. Therefore, future research analyzing low-involvement product categories is expected to be meaningful. Secondly, the degree of

anthropomorphism of the AI agent was not considered. As reported in the literature, AI agents can anthropomorphize animation forms that closely resemble real individuals. Further, an AI agent should closely resemble a real person to achieve higher grounding. However, this study did not consider the degree of anthropomorphism of AI agents. Therefore, future research validating the differences in the anthropomorphism of AI agents from animated to real individuals is expected to be meaningful.

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