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NFT luxury brand marketing in the metaverse: Leveraging blockchain-certified NFTs to drive consumer behavior

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Abstract

Industry 4.0 technology enables luxury fashion brands in the virtual market to quantify the value of digital items in the metaverse; thus, brands can maintain their reputations, ensure consistent and integrated luxury brand marketing, and attract new consumers in the virtual market. Understanding consumer behavior toward buying digital assets (i.e., nonfungible tokens [NFTs]) is important. By using blockchain-based NFTs as a way to verify the authenticity of digital assets in the virtual market, luxury brands can maintain their reputations and help consumers protect their digital assets. Thus, developing global marketing strategies supported by this technology is important for the success of luxury fashion brands in the metaverse. We conducted analyses to explore consumer behavior in the metaverse with regard to blockchain-based luxury NFTs. The findings reveal the psychological evaluation process as a mechanism that drives consumer behavior toward NFT luxury brand fashion items in global virtual markets. The empirical findings also extend the application of game theory and prospect theory by revealing the psychological evaluation of risks associated with (not) buying luxury fashion NFTs as another mechanism driving consumer behavior in the metaverse.

KEYWORDS

blockchain, game theory, industry 4.0 technologies, luxury fashion brand, metaverse, NFT, nonfungible token, self-image congruence

1 | INTRODUCTION

Advanced technologies such as augmented reality (AR), virtual reality (VR), extended reality, and artificial intelligence are driving the fourth industrial revolution. At the same time, many face-to-face activities in the consumer market have shifted to the virtual environment in the wake of the COVID-19 pandemic. This shift to the virtual environment as a disease prevention behavior has driven a dramatic digital transition of the global consumer market since 2020. As an extension of reality-enhancing technologies (e.g., AR, VR), the metaverse provides an immersive virtual environment offering social, economic, and cultural functions as well as other activities that help consumers maintain virtual lives via representative avatars (i.e., digital entities with anthropomorphic appearances). With the development of computer technology, avatars in the form of virtual characters have proliferated (Miao et al., 2022).

According to the Software Policy and Research Institute (Software Policy and Research Institute, 2021), the metaverse platform offers (a) a convenient virtual space for interaction, (b) a reality-enhancing world that reduces the gap between VR and actual reality

via advanced technologies, and (c) a new economic market. The Software Policy and Research Institute (2021) predicts that, with the proliferation of social communities in the new blended reality accelerated by the fourth industrial revolution, the metaverse will continue to encompass more economic activities and be driven by the use of metaverse devices, digital human development, brand alliances, and nonfungible tokens (NFTs) based on blockchain technology. NFTs designate pieces of digital media as tradeable assets with economic value that adheres to the principles of liquidity.

Specifically, an increasing number of activities are shifting to the metaverse, a completely virtual environment with reality-enhancing technologies. Several metaverse platforms have become popular globally, such as Fortnite, Roblox, Horizon, and ZEPETO. For example, the ZEPETO platform currently has more than 300 million users. Reality-enhancing technologies that provide the foundation for metaverse platforms have been used effectively in the consumer market as part of digital technology marketing and consumer engagement strategies (Chylinski et al., 2020; Flavián et al., 2021; Hilken et al., 2018, 2022; Ibáñez-Sánchez et al., 2022; Rauschnabel, 2021; Sung et al., 2022).

With the advent of metaverse platforms with social, cultural, and economic functions, brands are finding it difficult to identify which aspects have the most potential. To what extent do luxury brands need to integrate marketing across channels (traditional offline, online, and the emerging reality-enhancing metaverse) to maintain their reputations? Do they need to think outside the box and create new marketing strategies to expose a new generation of consumers to their brands in anticipation of their emergence as the next group to target? To answer these questions, we investigate current metaverse users' perceptions of the value of digital NFT items of luxury fashion brands and their evaluations of the risk of (not) buying such items (Frost & Gross, 1993; McKinnon et al., 1985), leading to final behavioral outcomes.

With the advent of Industry 4.0 technology and the emerging generation of new consumers, major brands, including luxury brands (e.g., Gucci, Christian Dior, Louis Vuitton), have begun to partner with metaverse social platforms. Gucci and Burberry have even launched NFT luxury fashion items for game characters in the metaverse. As fashion brands continue to enter the virtual market in the wake of the global upheaval caused by the COVID-19 pandemic, brand marketers are trying to understand consumer behavior and implement marketing strategies on virtual platforms; these include quantifying the value of digital fashion items, maintaining their reputations, ensuring consistent and integrated luxury fashion brand marketing, and attracting new consumers (e.g., Gen Z users, who will eventually become their primary target group in the real world). Our research contributes to the new NFT consumer behavior literature by assessing blockchain-based NFTs as a way to verify the authenticity of digital assets in the virtual market to help luxury brands maintain their reputations and to help consumers protect their digital assets. Developing global NFT marketing strategies supported by Industry 4.0 technology is critical to luxury fashion brands' success in the metaverse.

In this study, we investigate the psychological risk evaluation process that shapes consumer behavior toward blockchain-based NFT luxury fashion items across individualist (United States) and collectivist (South Korea) cultures. Drawing on game theory and prospect theory, we investigate the antecedents and consequences of consumers' assessments of the anticipated gains and losses associated with (not) buying NFTs. Figure 1 depicts our structural

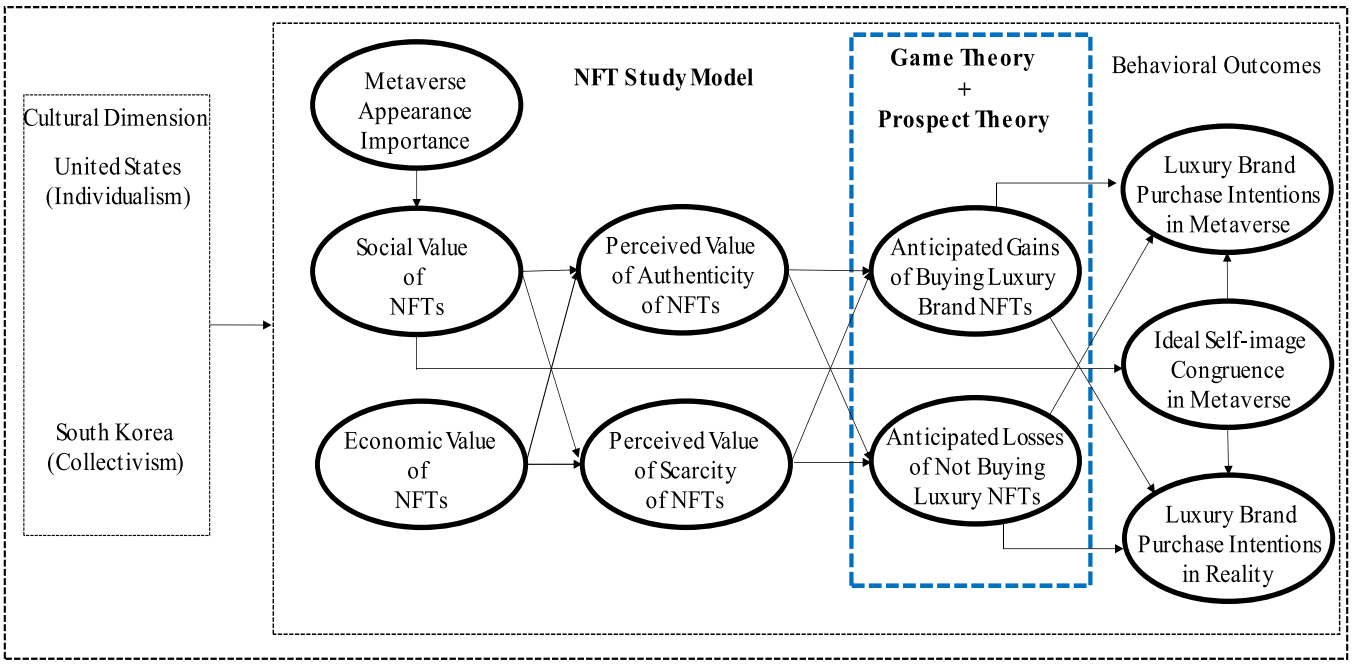


FIGURE 1 Theoretical model. NFT, nonfungible tokens.

model. In the psychological evaluation process, the two main antecedents are the perceived economic value (i.e., potential to be resold without depreciation) and social value of NFT luxury fashion items. Importantly, economic and social value influence consumers' consideration of the authenticity and scarcity status of NFT luxury fashion items as digital assets. In the metaverse, NFT authenticity can be verified by blockchain technology, and NFT scarcity can be controlled by marketers. Taking all of these factors into account, we test consumer purchase intentions in the metaverse and in the real world. We also assess ideal self-image congruence via appearance and the social value of luxury brands in the virtual market. Finally, because Hofstede's cultural dimensions (individualism vs. collectivism) might have different influences on the economic and social value of NFT luxury fashion items as digital assets, we compare each path of the consumer psychological process using samples of consumers from the United States and South Korea.

Our findings make several theoretical contributions. Notably, our findings confirm our proposed structural model of the psychological consumer decision-making process leading to the purchase of luxury brand NFT items in the metaverse (see Figure 1). We identify two antecedents of NFT purchasing decisions—i.e., perceived economic (resale) value and social value—which drive consumers' attention toward NFTs that are scarce and authentic. Drawing on game (Shubik, 1981) and prospect (Byun & Sternquist, 2012; Kahneman & Tversky, 1979) theories, we explain how consumers assess potential gains and losses associated with (not) buying blockchain-certified NFT luxury brand fashion items relative to competitors (other consumers). Importantly, the psychological process whereby metaverse users value digital assets in the virtual environment differs from that for traditional offline assets in those preconceived notions of potential economic value and social value shape consumers' attention to scarcity and authenticity, rather than the other way around. Furthermore, we draw on ideal self-image congruence theory (Chebat et al., 2006) to show that perceived social value drives NFT item purchases in the virtual community. To our knowledge, this study is the first to provide empirical evidence of how global consumers evaluate the economic and social value of digital NFT assets when making purchase decisions in the metaverse. Thus, our contribution lies in the development and further application of prior theoretical concepts within our proposed structural model. Importantly, our findings may help marketers leverage new opportunities in the metaverse to engage with both current and potential consumers (Dwivedi et al., 2023), particularly members of Gen Z. Our findings have important practical implications, because marketing within the metaverse is currently in a highly experimental phase (Hazan et al., 2022), and Industry 4.0 technologies are enabling marketers to reach consumers in new ways in the technology-enhanced virtual world (Belk, 2023).

Our empirical study also has important implications for practitioners. Our findings show that luxury brands that are developing digital technology marketing strategies for the virtual world may want to focus on promoting authentic branded items that are verified by NFTs, as our findings show that blockchain's capacity to verify authenticity is an important driver of the desire to purchase and own NFT luxury fashion items in the metaverse. Furthermore, the number of digital assets also needs to be controlled, much like traditional luxury brand items, as consumers pay attention to scarce NFTs. These findings are interesting, as scarcity works differently for digital luxury fashion items than for fast fashion items, which sell out quickly because consumers are concerned that items will not be available if they do not purchase them immediately. In case of digital assets, consumers might think that opportunities to buy NFT items in the metaverse are rare, leading them to buy when they encounter opportunities to do so. Moreover, our findings show that the psychological process depicted in our model plays a key role in the global luxury fashion industry across cultures, with important managerial implications to help brands implement strategies, particularly in the United States and South Korea.

2 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

NFTs are likely to become a driving force in the metaverse market because they can be optimized as tools to certify the authenticity of consumers' digital assets (Seong et al., 2021). The utilization of functional NFTs has been investigated by researchers (Dowling, 2022). In general, NFTs can provide assurances for copyright and ownership of digital items, verify transaction transparency, and authenticate digital art using blockchain technology. Consequently, NFTs have become distinctive, verifiable, and easily tradable digital assets (Dowling, 2022). Furthermore, purchasers have the ability to resell NFTs through trading contracts on the blockchain, ensuring trustworthy trading and liquidity (Chohan & Paschen, 2023).

Digital luxury fashion brands in particular have considerable potential to leverage NFTs. Having a way to verify the authenticity of luxury items is a major concern for luxury brands, especially in the virtual world, and blockchain-based NFTs have flourished in virtual markets for this purpose. Blockchain technology is a digital ledger of transactions in the network of computer systems and a system of recording information (data) that people cannot change or hack, thereby inhibiting cheaters (Euromoney, 2022). Blockchain is a type of digital database—that is, a secure peer-to-peer network that ensures transaction safety (Kaushik, 2021)—and NFTs are digital records on a blockchain associated with digital (intangible) or physical (tangible) assets; ownership is recorded in the blockchain when a digital asset is sold and traded (The, Economist, 2021). We contribute to this recent stream of NFT studies, summarized in Table 1.

2.1 | Economic value of NFT luxury fashion items

Since the advent of the reality-enhancing metaverse platform, the economic value of NFT luxury fashion items has been unclear and difficult to measure. Collecting digital assets has become a widespread practice in virtual communities, spanning cultures and genders and appealing to people of all ages (Mardon & Belk, 2018). The characteristics of digital

TABLE 1 Summary of recent NFT studies.

Reference	Research aim	Context	Sample and methods	Findings and contributions
Nevi (2022)	To understand behavioral intentions toward NFTs based on items extracted from an integrated TAM	U.S.-based workers sampled via Amazon's Mechanical Turk (MTurk) platform	487 respondents; descriptive statistics, SEM analysis	Significant positive effects of perceived ease of use, and perceived usefulness, and insignificant effect of risk on use
Kiliçaslan and Ekizler (2022)	To examine the effects of perceived value (including its antecedents, i.e., scarcity, ownership, and uniqueness) and trust in blockchain technology on NFT purchase intentions	Individuals who use crypto wallets	306 respondents in NFT-related online communities and Discord community channels; descriptive statistics, SEM analysis	Significant positive effects of perceived value and trust in blockchain technology; perceived scarcity and perceived ownership are positively associated with perceived value, whereas perceived uniqueness is not
Lee et al. (2023)	To examine how brand NFT attributes can generate positive brand outcomes	Participants on brands' digital communication forums (blogs, communities on NFT, brand NFT)	Text mining from 257 sources	Significant positive effects of scarcity, financial value, prestige, uniqueness, originality, and communication consistency on brand NFT attitude
Khelladi et al. (2021)	To investigate motivational factors driving purchases of NFT virtual clothes	Digital clothes	173 respondents in the Prolific academic participant pool; descriptive statistics, SEM analysis	Autonomy, praise and communication act as motivators influencing purchase intentions for digital clothes, while attention-seeking and reputation act as inhibitors
Albayati et al. (2023)	To perform a multifactor analysis that includes the NFT/metaverse engagement decision and user behavior	NFT/metaverse	459 respondents: NFT creators, traders, and enthusiasts with experience searching, buying, creating or dealing with NFTs and crypto wallets	Social, technical, regulatory, market, and trust factors have a strong impact on NFT/metaverse engagement decisions
Wongkitrungrueng and Suprawan (2023)	To investigate the influence of metaverse experiential value on consumers' brand perceptions and behavioral responses in the virtual and real worlds	NFT/metaverse (branded virtual environment)	702 respondents in Thailand who use Asia's largest metaverse platform	Metaverse experiential (hedonic, utilitarian and symbolic) value indirectly affects consumer-brand engagement (CBE) through brand image and virtual purchase intentions

Abbreviation: NFT, nonfungible tokens.

consumption objects vary greatly in terms of consumer motivation behavior (Mardon & Belk, 2018). We define the economic value of luxury NFTs as their potential to be resold as digital assets in the metaverse consumer market. Some NFTs have become valuable as potential investments, such as digital artwork (e.g., Beeple's "POLITICS IS BULLSHIT") and digital NFT fashion items (e.g., Gucci's digital handbag, Nike's digital sneaker), as shown in Figure 2. Perceived economic value influences the willingness of consumers to pay for luxury fashion brands (Li et al., 2012); the same concept can be applied to the economic value of luxury NFTs. For example, in the fluctuating stock market, consumers make psychological decisions to (not) purchase shares from other consumers who perceive them as having a different economic value.

According to Mark Cuban, an American billionaire entrepreneur who evaluates and invests in start-ups on the American television show *Shark Tank*, brand loyalty from the resale of NFTs is revolutionary and can be leveraged for many purposes. This presents an opportunity for luxury fashion brand marketers to create digital fashion items with great potential to generate economic and social value in the digital world. Traditional luxury brand consumers may focus on the social value of luxury items, but with the advent of the fourth industrial revolution, digital luxury brand consumers may focus on both the social (e.g., status, prestige) and economic (e.g., NFT investment, resale) value of digital assets. With blockchain and NFT technology, customer-to-customer transactions can take place outside the central transaction system via social tokens such as NFTs (Seong et al., 2021).

Furthermore, NFT game items stored in the blockchain can be controlled by users who own them and can be used across platforms (Seong et al., 2021). For example, luxury fashion brand Louis Vuitton launched *Louis the Game* with NFT game characters, and Burberry also launched NFT game characters as novel luxury fashion marketing strategies (see Figure 3).

Game items (e.g., equipment, tools/accessories, characters/avatars) account for $50 million of the $150 million digital gaming industry (Seong et al., 2021). By changing their characters' identities, users can increase their status in the gaming community and progress to more difficult levels in games. Luxury fashion brands such as Louis Vuitton and Burberry have entered the game character business to leverage its economic market potential in the metaverse. Consumers who own NFT game items are able to use them across various platforms via Open Ecosystem and sell them to other consumers (Seong et al., 2021).

2.2 | Social value of luxury brands

Although some consumers desire luxury brands because they represent product superiority, exclusivity, uniqueness, elitism, glamor, status, and exclusive channel distribution (Kapferer & Valette-Florence, 2016), they especially desire luxury brands for their capacity to address social motives, such as self-expression (value expressive function) and self-presentation (social adjustive function) (Shavitt, 1989; Wilcox et al., 2009). Consuming luxury brands can be

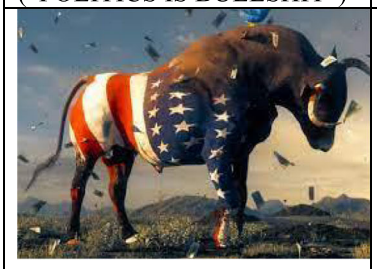
Beeple's digital artwork ("POLITICS IS BULLSHIT")	Gucci's digital luxury handbag	Nike's digital luxury sneaker
		
$66,666 for 100 copies (Seong et al., 2021)	$4,115 more than its physical version (https://luxus-plus.com/en/a-virtual-gucci-bag-sold-for-more-than-its-physical-version/)	Sold for $134,000 (https://www.nytimes.com/2022/05/26/style/nike-nft-sneaker.html)
		
e.g., Avatar wearing a Gucci backpack (from a google image)	e.g., Avatar wearing a Nike sneaker (from a google image)	e.g., Avatars wearing Ralph Lauren (from a google image)

FIGURE 2 Digital NFTs of art and fashion items. NFT, nonfungible tokens.

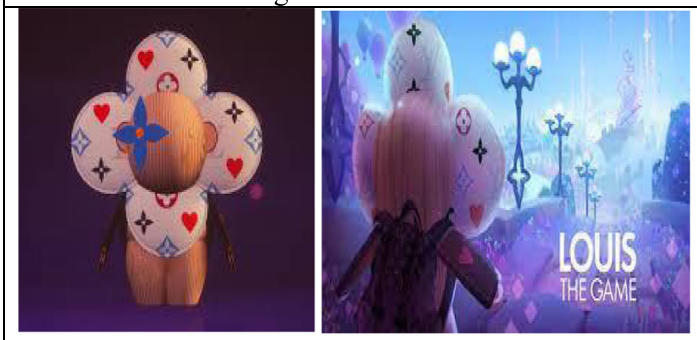
Louis Vuitton's NFT game character	Burberry's NFT game character
	
(https://www.engadget.com/louis-vuitton-mobile-game-nft-105507072.html)	(https://www.inverse.com/input/style/burberry-miny-b-nft-mythical-games-blankos-block-party)

FIGURE 3 Digital NFT art and fashionable game character items. NFT, nonfungible tokens.

a way to maintain self-esteem as an ego-defense function (Shavitt, 1989) and to enable self-expression as a social function for consumers. Thus, the social value of luxury brands can derive from their symbolic association with social status, exclusivity, and unique identity (Kwon et al., 2016).

During an interview for *Vogue*, Lady Gaga, an American pop star and fashion icon, highlighted the social value of fashion: "I like that fashion can both be a form of *expression* and a form of *hiding*" (https://www.vogue.com/video/watch/73-questions-with-lady-gaga?c=series). In the metaverse, users' avatars may be interpreted the same way, in that users can create ideal versions of themselves through their avatars and NFT fashion items. Avatar fashion, therefore, can be both a form of "expression" that enables users to be seen in a specific way and a form of "hiding" (ideal self-image congruence) in the social community, leading to consumption behavior toward NFT luxury brand items. When the COVID-19 pandemic forced people to isolate themselves from others, many found new virtual platforms that enabled them to express or hide aspects of themselves through avatar fashion. Thus, one aspect that we investigate in this empirical study is whether the social value derived from expressing one's ideal self via virtual characters drives consumer purchases of NFT luxury fashion items.

When interacting with avatars in the virtual environment, the social value of luxury brands could be important in the metaverse community, as it is on social media platforms. Dwivedi et al. (2022) classified interactions within the metaverse into social networking, collaboration, and personal dialog. Applying the social value of luxury brands to our study context—digital luxury fashion brands—the social value of an NFT luxury fashion item also can help maintain one's social status as an ego-defensive function by conveying exclusivity and a unique identity in the metaverse community. As luxury brands are more salient to social (value-expressive and social-adjustive) value than general brands, the social value of NFT luxury fashion brands is higher than that of NFT general brands in the metaverse community. As such, the social value of NFT luxury brand items or game characters could be tied to their potential to enhance a user's status in the metaverse.

2.3 | NFT authenticity and scarcity of luxury fashion brands

2.3.1 | Authenticity

Luxury brand consumption is associated with perceptions of escapism, exclusivity, and inaccessibility (Brioschi, 2006). Thus, the conveyed symbolism of luxury brands associated with superiority, exclusivity, uniqueness, elitism, glamour fashion, status, and inaccessibility (Brioschi, 2006; Kapferer & Valette-Florence, 2016) leads to high social value of luxury brand items over non-luxury brand items. Applying this notion to our study context, NFTs convey the meaningful characteristics of luxury brand items to the virtual space when their authenticity and ownership are verified (Seong et al., 2021). Verification of digital NFT luxury fashion items is enabled by blockchain technology, which can record digital ownership data; thus, NFT items become certified as authentic. Notably, selling NFTs involves transferring ownership of an item, not the copyright, unless a contract includes a specific "copyright transfer" term. Therefore, purchasing NFT items is like collecting character cards (Seong et al., 2021). With an NFT certificate of authenticity, the relationship between a digital item's scarcity and abundance (e.g., launching additional NFTs for copies of a specific art/fashion item) does not need to be mutually exclusive; for example, when many copies of an item are circulating, the value of NFT certification becomes greater (Seong et al., 2021).

2.3.2 | Scarcity

Byun and Sternquist (2012) found that the scarcity of affordable fast-fashion (nonluxury) items influences behavioral intentions in offline stores. Fostering perceptions of scarcity is an important psychological marketing tactic for inexpensive, fast-fashion brands (e.g., Zara, H&M) that may lead to hoarding behavior (Byun & Sternquist, 2012). This is in line with commodity theory, which explains the psychological effects of scarcity in

which consumers put high value on scarce goods or opportunities (Brock, 1968; Vasantkumar, 2019).

Applying these insights to our study context, one characteristic of luxury brand items compared with nonluxury items is inaccessibility (Brioschi, 2006). Even if luxury fashion brand products are available for purchase, not many consumers can afford them. In the metaverse market, luxury brand marketers need to maintain their brand reputations by using NFTs to differentiate their items from non-luxury fashion items. For example, in the metaverse, luxury brand marketers may promote the scarcity of NFT luxury fashion items by issuing a small number of items at affordable prices, emphasizing their future value (similar to stocks) based on reputation or by charging exorbitant prices at the outset. Marketers take different approaches to managing scarcity in the metaverse depending on the purpose for releasing NFT luxury brand items. For its NFT digital shoes (see Figure 2), Nike used the strategy of selling a few rare NFTs, which are traded less frequently, at high prices. Depending on their preferences for social value or economic value, consumers seek luxury NFT items with authenticity or scarcity. Furthermore, recent studies have shown that perceived scarcity and perceived value of NFTs lead to positive brand attitudes (Lee et al., 2023) as well as purchase intentions (Kiliçaslan & Ekizler, 2022).

In our structural path model reflecting consumer decision-making processes, we argue that higher *perceived economic value* of NFTs based on potential resale without NFT depreciation leads to higher perceived value of NFT authenticity and scarcity. Overall, in line with commodity theory (Lynn, 1991), consumers who desire higher economic and social value of luxury brand NFT items may collect NFT luxury fashion items with high perceived value of *authenticity* and *scarcity* based on copyright and NFT ownership in the metaverse community. In other words, the perceived economic value of collecting NFTs directs consumers' attention to NFTs of interest, which are often scarce and authentic in the metaverse. We test the *perceived economic value* of an NFT digital asset in terms of its potential resale value, and its perceived *scarcity* and *authenticity* in the technology-enhanced context. These constructs reflect consumers' psychological perceptions of NFTs that may be of interest to them. Therefore, we predict:

H1: The higher the perceived economic value of NFT luxury brand items, the higher the perceived value of NFT (a) authenticity and (b) scarcity in the metaverse.

H2: The higher the perceived social value of NFT luxury brand items, the higher the perceived value of NFT (a) authenticity and (b) scarcity in the metaverse.

2.4 | Anticipated gains/losses associated with (not) buying NFTs

Game theory (Aumann, 2008; Osborne, 2004; Shubik, 1981) describes consumer behavior in conscious decision-making when the decisions of one player are based on the choices of other players. This theory helps explain why consumers might (not) buy blockchain-based NFT luxury brand items in the metaverse. Combined with game theory, prospect theory (Byun & Sternquist, 2012; Kahneman & Tversky, 1979) argues that consumers tend to be risk-averse and evaluate likely gains and losses associated with (not) buying. That is, consumers make an evaluation during the decision-making process; here, the *perceived economic value* of luxury NFT items influences the *anticipated losses of not buying* these items through *perceived NFT scarcity value*, which in turn affects purchase intentions. For example, similar to purchases of stocks, cryptocurrency, and real estate (e.g., buying a house for potential investment), consumers decide to buy (e.g., accept risk) or not buy luxury NFTs. In the digital asset decision-making process (to purchase an NFT or not), consumers make their own evaluation about the NFT item, determining whether they can resell the item in the future without depreciation in value based on their preconceived notions regarding NFT value. That is, consumers evaluate potential gains and losses based on their subjective experiences. Prospect theory predicts that because people tend to be loss-averse, they associate losses with psychological discomfort more than they associate gains with pleasure.

Under the condition of limited availability, consumers must evaluate anticipated gains before opportunities are lost (Spears, 2001). In other words, scarcity can increase consumers' willingness to pursue gains associated with buying and avoid losses associated with not buying. As noted previously, both game theory and prospect theory explain this psychological evaluation process. Consumers may weigh "emotional losses" or other negative emotions resulting from an anticipated lost or delayed purchase opportunity against any potential gains (Bechwati & Qualls, 2001; Cooke et al., 2001).

Offering a limited number of items for a limited time creates a "use-or-lose" option that drives consumer behaviors explained by sensitivity to anticipated losses or gains (Aggarwal & Vaidyanathan, 2003). Thus, limited promotions increase sales by activating consumers' psychological purchasing behavior (Byun & Sternquist, 2012). Similarly, when consumers observe that inventory is high, they may not purchase items immediately (Kwon, 2001). Purchase acceleration occurs when consumers purchase items and inventory decreases (Aggarwal & Vaidyanathan, 2003).

To mitigate anticipated losses associated with not buying products, consumers are likely to purchase items (Frost & Gross, 1993; McKinnon et al., 1985). Furthermore, when consumers perceive product scarcity (e.g., limited availability), they tend to buy a product even if they do not need it immediately (Sternquist, 2007). In addition, when consumers project the consequences of inaction (not buying) against the action of other consumers, that anticipation becomes a strong driver of action under a limited timeframe (Abendroth & Diehl, 2006).

For fast-fashion (nonluxury) brands, the perceived NFT scarcity value of a product intensifies the losses associated with not buying, and consumers tend to minimize those losses by buying (Byun & Sternquist, 2012); thus, a fashion marketing strategy based on scarcity (i.e., promoting perceptions of a limited quantity of NFT clothing) can be an influential psychological approach. Here, we apply

a combination of game theory and prospect theory to understand the mechanism of psychological consumer behavior toward NFT luxury brand items in the metaverse.

We argue that perceived NFT authenticity and scarcity value of luxury fashion items influence consumers' assessments of potential gains and losses of (not) buying, as explained by game theory and prospect theory. Some consumers in the metaverse buy NFT items after considering the perceived NFT authenticity and scarcity value. For a new product such as a luxury brand NFT, consumers do not have enough information to make a purchase decision. In particular, the volatile cryptocurrency and NFT markets harbor a significant level of risk (Wilson et al., 2022). Due to the nature of risk associated with NFTs as digital assets, consumers anticipate gains and losses. Thus, we posit that both perceived NFT authenticity value and perceived NFT scarcity value drive benefit assessment processes, leading to decisions to buy luxury brand NFTs.

In summary, both the perceived NFT authenticity and scarcity value likely affect anticipated gains or losses associated with (not) buying such items. Consumers may consider the emotional losses resulting from an anticipated lost or delayed purchase opportunity (Bechwati & Qualls, 2001; Cooke et al., 2001) and, after purchase, leverage its economic value by reselling it in the future. Furthermore, the evaluation of anticipated gains or losses associated with (not) buying relative to other consumers on the metaverse platform likely leads to behavioral outcomes in both the virtual world and the real world, as consumers in the metaverse are likely to engage in similar activities in the real world. Therefore, we predict:

H3: Perceived NFT authenticity value in the metaverse positively influences (a) anticipated gains associated with buying and (b) anticipated losses associated with not buying.

H4: Perceived NFT scarcity value in the metaverse positively influences (a) anticipated gains associated with buying and (b) anticipated losses associated with not buying.

H5: Anticipated gains associated with buying luxury brand NFTs in the metaverse positively influence luxury brand purchase intentions in (a) the metaverse and (b) the real world.

H6: Anticipated losses associated with not buying luxury brand NFTs in the metaverse positively influence luxury brand purchase intentions in (a) the metaverse and (b) the real world.

2.5 | Effects of ideal self-image congruence on behavioral outcomes

The theory of ideal self-image congruence (Sirgy, 1982, 1986) can further explain consumers' desire for luxury fashion brands for avatars in the metaverse, because luxury brands may help consumers express their ideal selves (Chebat et al., 2006; Kressmann et al., 2006; O'Cass & Grace, 2008). Consumer behavior studies define "self-image congruence" as the consistency between consumers' self-concept (actual self, ideal self) and a brand image (Kressmann et al., 2006; Sung & Huddleston, 2018). In addition, self-image can be categorized as the actual self or ideal self, depending on the extent to which the images associated with specific products and brands match a consumer's self-concept. When the COVID-19 pandemic forced people to maintain social distance, they found new virtual platforms that enabled them to express or hide aspects of themselves through fashion. In line with this digital virtual world trend, luxury fashion brands have become interested in blockchain-based NFTs as an authenticity verification mechanism in the metaverse's virtual luxury fashion market.

In the metaverse, digital entities (e.g., avatars, game characters) represent consumers and provide ways for them to express themselves via digital fashion. Because luxury brands convey symbolic associations with luxury or prestige (Belk, 1988), image and identity are salient factors in fashion retailing (Cheng et al., 2008). Conspicuous consumption can increase consumers' status or self-esteem because they perceive luxury items as symbols of individual or social identity (Vickers & Renand, 2003; Wang & Griskevicius, 2014).

Just as appearance shapes evaluations during social interactions in the real world (Jung, 2006), the appearance of an avatar or game character conveys information about a consumer's image in the metaverse. Self-schema theory posits that consumers are concerned about how they represent themselves to their social groups (Markus, 1977), leading them to focus on "external beauty, including attractive dress and youthful appearance" (Sung & Huddleston, 2018, p. 65).

We apply these theoretical concepts to our current study in the virtual metaverse environment. The metaverse provides new avenues for marketers to connect with current and prospective consumers through engaging and immersive encounters (Dwivedi et al., 2023). Furthermore, marketing within the metaverse is currently in a highly experimental phase, presenting marketers with a wide range of obstacles to overcome (Hazan et al., 2022). Unlike the real world, interactions in the metaverse occur via representative fashionable avatars that do not necessarily reflect their owners' actual appearances; thus, from a marketing perspective, it is important to empirically assess whether social value influences ideal self-image congruence and consumers' behavioral intentions in this context.

In the metaverse, users are likely to carefully select brands for their avatars or game characters, leading them to consider the social value of NFT luxury fashion items. Given the importance of appearance in the metaverse, the social value of NFT luxury fashion items likely influences the extent to which they foster ideal self-image congruence. Furthermore, high ideal self-image congruence likely has a positive influence on purchase intentions in the metaverse platform as well as in the real world. Thus:

H7: Social value stemming from the importance of avatar appearance in the metaverse positively influences ideal self-image congruence.

H8: Ideal self-image congruence between avatars and NFT brand items in the metaverse positively influences purchase intentions in (a) the metaverse and (b) the real world.

2.6 | Cultural dimensions

2.6.1 | International consumer behavior

International luxury brand marketing and luxury value studies have compared similarities and differences in consumer perceptions and behavior (Hennings et al., 2012). Understanding cultural differences or different cultural orientations in consumer perceptions of luxury and luxury value can help luxury brand marketers develop effective marketing strategies (Wiedmann et al., 2009). Several studies on luxury brand consumption have shown that cultural differences shape consumers' attitudes and preferences (Seo et al., 2015; Shukla & Purani, 2012; Wong & Ahuvia, 1998).

Applying these insights to the metaverse, we examine the impact of cultural orientation on users' attitudes toward and preferences for NFT luxury fashion items. According to Hofstede's (1991, 2018) cultural dimensions, consumers in individualist and collectivist cultures exhibit different behaviors, especially in the luxury brand context (Choi et al., 2020; Sung et al., 2020). Individualism reflects "individuals' tendency to make their own decisions and choices," whereas collectivism reflects "a sense of knowing one's place within a social group" (Hofstede, 2018), indicating that social image in public is important. The United States is considered an individualist country, while South Korea is a collectivist country (Hofstede, 1991).

According to prior studies, prestige/luxury brands function as a means of signaling high social status (Lichtenstein et al., 1993; Veblen, 2005), and prestige sensitivity varies by culture (Moore et al., 2003; Sternquist et al., 2004). Psychological motivation for purchasing prestige brands could come from culturally grounded social interactions, a desire for social belonging, and heightened public self-image when using luxury brand items (Sung et al., 2020). Furthermore, according to Hennigs et al. (2012), as the perceived value of luxury differs across cultures, the social aspect of luxury brands is valid. For example, prestige, as a social value, holds importance among South Koreans, particularly as their social groups emphasize collectivism as a cultural orientation (Sternquist et al., 2004; Sung et al., 2020); thus, prestige brand purchases are higher in South Korea than in the United States because of social aspects such as social belonging and public image. Social impact theory (Latane & L'Herrou, 1996; Latané, 1981; Rashotte, 2007) explains how a person's behavior becomes more similar to that of others during social interactions. That is, individual behavior is affected by the behavior of other people. Furthermore, according to this theory, social influence is a progression of modifications in a person's attitudes, opinions, behaviors, or emotions that stem from his or her interactions with others who help shape the person to be like-minded (Rashotte, 2007).

Building on our literature review, we predict that consumers in a collectivist culture (e.g., South Korea) are more likely to value digital luxury brands than those in an individualist culture (e.g., United States). We apply this concept in the context of digital NFT brand item purchase behavior in the virtual world to investigate whether this view holds true in this setting. Thus, we predict:

H9: In the proposed model, consumers in the collectivist culture of South Korea exhibit more positive responses to NFT luxury brand items than consumers in the individualist culture of the United States.

2.6.2 | Effects of gender on responses

In addition to the different cultural orientations, we investigate the effect of gender on consumer responses. Gender differences have attracted research attention as a moderator in the technology adoption literature (e.g., online learning, gaming; Park & Kim, 2020; Suh et al., 2021; Wang, 2014). In a study based on the technology acceptance model, Minton and Schneider (1980) accounted for gender differences in the use of technology in terms of perceived usefulness, perceived ease of use, and subjective norms (social pressure), indicating that men tend to be more task-oriented than women when using technology; moreover, performance expectancy is likely to be more salient for men. Furthermore, high effectance and sociality motivation due to technology anxiety (Blut & Wang, 2020) or social connection purposes (Epley et al., 2007) could explain why men hold more favorable attitudes toward technologies, especially robotic technologies (De Graaf & Ben Allouch, 2013). Building on these findings, we investigate the effect of gender on consumer responses in each cultural orientation (individualism and collectivism) with regard to NFT brand items in the metaverse. Thus:

H10: Gender moderates consumer responses to NFT luxury brands, such that men exhibit more positive responses to NFT brand items than women.

3 | METHOD

We tested our overall conceptual framework (Figure 1) and investigated cross-cultural differences in consumer behavior in the metaverse based on Hofstede's cultural dimensions (individualism vs. collectivism). In particular, we tested a series of antecedents (appearance, NFT authenticity, NFT scarcity, NFT social value, and NFT economic value) and consequences (purchase intentions in the metaverse and the real world) of consumers' evaluations of anticipated gains and losses of (not) buying NFT luxury items. We used PLS-SEM to perform the analyses as well as analysis of variance (ANOVA) to analyze the interaction effects.

3.1 | Sample characteristics

The main model test is based on 469 actual metaverse platform users across the United States and South Korea (see Table 2). In the United States, a marketing research firm collected usable data from 146 respondents, who completed the survey and passed the screening

questions (i.e., metaverse user, attention check, and familiarity with NFTs). Most metaverse users are active on multiple platforms. Respondents were actual metaverse platform users who used Fortnite (69.2%), Roblox (58.9%), Horizon (30.1%), ZEPETO (6.2%), and other gaming/virtual social platforms (15%). Of the 146 respondents, 65.1% were men; respondents were in their 20s (30.1%), 30s (39.8%), 40s (21.2%), and 50s (8%).

A local marketing research firm in South Korea recruited 323 actual metaverse platform consumers, who completed the survey and passed the screening questions. Respondents were actual metaverse platform users who used Fortnite (13%), Roblox (28%), Horizon (19.5%), ZEPETO (46%), and other gaming/virtual social platforms (4.6%). Of the 323 respondents, 42.7% were men; respondents were in their 20s (31.9%), 30s (22.9%), 40s (24.1%), and 50s (21.1%).

3.2 | Measurement

3.2.1 | Manipulation check

As noted above, the sample contains actual metaverse platform users. For the manipulation check, we used individualism (United States) and collectivism (South Korea) as an indicator of different cultural orientations. Both measures are based on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). Following prior studies (Evanschitzky et al., 2014; Sung et al., 2020), we included items that measure individualism (Furrer et al., 2000) and collectivism (Yoo et al., 2011) to validate cultural orientation. The individualism items are "Everyone grows up to look after him-/herself and his/her immediate family only," "People are identified independently of the groups they belong to," and "People are identified by their position in the social networks to which they belong;" the collectivism items are "Individuals should sacrifice self-interest for the group," "Individuals should stick with the group even through difficulties," "Group welfare is more important than individual rewards," "Group success is more important than individual success," and "Group loyalty should be encouraged even if individual goals suffer." As the results show, individualism scores were significantly higher for participants in the United States ($M = 4.87$, $SD = 1.12$) than for participants in South Korea ($M = 4.44$, $SD = 1.10$, $t(1, 467) = -3.824$, $p < 0.001$). Moreover, collectivism scores were significantly higher for participants in South Korea ($M = 4.47$, $SD = 1.52$) than for participants in the United States ($M = 4.17$, $SD = 1.09$; $t(1, 467) = 2.353$, $p < 0.001$), validating the cultural dimensions.

3.2.2 | Measurement

We developed the measures and modified them by drawing on concepts from previous studies to fit the metaverse context using 7-point Likert scales (1 = *strongly disagree*, 7 = *strongly agree*). Table 3 reports the results of the convergent and discriminant validity tests using SmartPLS across the two culture orientations (individualism and collectivism). The results show that: all rho_A values exceed the threshold of 0.70 (Hair et al., 2017); all average variance extracted (AVE) values are between 0.653 and 0.880, indicating that the AVEs for all constructs are greater than the squared correlations between constructs (Fornell & Larcker, 1981); and all factor loadings are well above the threshold of 0.50 (Bagozzi & Yi, 1988). Moreover, all HTMT values are less than 0.848, below the threshold of 0.85 (Henseler et al., 2015). In addition, the results of the lateral collinearity test of common method variance (Kock, 2015) show that all variance inflation factor values are less than 1.85, well below the threshold of 5. Thus, the results confirm measurement validity across the two cultures.

Furthermore, for the instrumentation and procedure across the cultures, we used two versions of the survey questionnaires (one in English and one in Korean). All three researchers are bilingual: two researchers translated the English questionnaire into Korean and the third researcherback-translated the Korean version into the English version. Finally, all three researchers cross-examined both versions to make final adjustments to ensure measurement equivalence.

3.3 | Invariance test across culture

Because we used PLS-SEM to establish theoretical composite model building, we employed the measurement invariance of composite model (MICOM) for our cross-cultural study (Hair et al., 2017). Specifically, we followed a three-step MICOM procedure (Henseler et al., 2016): (a) configural invariance, (b) compositional invariance, and (c) equal mean values and variances. In the first step, we established configural invariance across groups, which serves as an initial assessment of the composites' specification (our theoretical model) across the two groups and indicates the proper use of identical indicators per measurement model (see Table 3). In the second step, we ran a compositional invariance test provided by the SmartPLS MICOM procedure to ensure a composite is built properly and equally across the groups (Hair et al., 2017). The composite is the same in our measurement, meaning that the composite scores are not significant across the two groups, supporting compositional invariance. Although the permutation p value of one construct is

TABLE 2 Sample characteristics.

Samples	*N* (469)	Gender (male)	Age (<40 years old)	Fortnite	Roblox	Horizon	Zepeto	Others
United States	146	65.1%	69.9%	69.2%	58.9%	30.1%	6.2%	15.0%
South Korea	323	42.7%	54.8%	13.0%	28.0%	19.5%	46.0%	4.6%

TABLE 3 Measurement validity tests.

Construct	Measurement item	Factor loading (United States/ Korea)	rho_A (United States/Korea)	AVE (United States/Korea)
Importance of appearance in metaverse (Sung & Huddleston, 2018)	I work at trying to maintain a youthful appearance via my avatar in the metaverse.	0.716/0.809	0.826/0.885	0.652/0.739
	I enjoy getting my avatar dressed up in the metaverse.	0.803/0.868		
	Dressing well via my avatar is an important part of my metaverse life.	0.912/0.885		
	An avatar's attractive appearance is crucial for success in the metaverse platform.	0.785/0.875		
Social value of luxury brand (Shang et al., 2012)	I like to know which luxury fashion brands in the metaverse make good impressions on others.	0.840/0.796	0.941/.915	0.755/0.697
	Metaverse community members' perceptions of luxury fashion brands are important to me.	0.878/0.854		
	I pay attention to what types of avatars buy certain luxury fashion brands in the metaverse.	0.860/0.845		
	It is important to know what others think of avatars who use certain luxury fashion brands in the metaverse.	0.886/0.836		
	I am interested in determining which luxury fashion brands my avatar should buy to make good impressions on others in the metaverse.	0.855/0.865		
	It is important that others have a high opinion of how my avatar dresses (e.g., luxury fashion brands) and looks in the metaverse.	0.895/0.811		
Perceived NFT authenticity value (Park et al., 2019)	The purpose of collecting NFTs is to secure products that do not exist in the real world.	0.628/0.865	0.806/0.852	0.657/0.767
	The reason for collecting NFTs is product originality, as NFTs prove that items are luxury brand products.	0.878/0.867		
	The reason for collecting NFTs is product authenticity, as NFTs prove that items are luxury brands.	0.897/0.895		

(Continues)

TABLE 3 (Continued)

Construct	Measurement item	Factor loading (United States/Korea)	rho_A (United States/Korea)	AVE (United States/Korea)
Perceived NFT scarcity value (Byun & Sternquist, 2012)	The luxury brand items with NFTs that I was interested in were almost out of stock in the metaverse.	0.771/0.905	0.784/0.883	0.700/0.796
	There were only a limited number of luxury brand items with NFTs in each size, style, and color in the metaverse.	0.857/0.870		
	Luxury brand items with NFTs of interest were often scarce in the metaverse.	0.878/0.900		
Anticipated gains of buying luxury brand NFTs (Byun & Sternquist, 2012) When I found a product of interest in the metaverse, I thought that…	This luxury brand NFT item would enhance my self-image.	0.930/0.927	0.939/0.929	0.880/0.875
	This luxury brand NFT item would make me feel good about myself.	0.946/0.945		
	This luxury brand NFT item would make me feel special.	0.939/0.934		
Anticipated losses of not buying luxury brand NFTs (Byun & Sternquist, 2012) When I found a luxury brand NFT item of interest in the metaverse, I thought that…	If I do not buy it right now, I would regret it later.	0.726/0.927	0.942/0.964	0.802/0.875
	I was afraid that this item would be out of stock in my next visit.	0.943/0.928		
	I thought that it would be a loss if I did not buy it today.	0.922/0.941		
	I was concerned that this item might not be available if I came back later.	0.950/0.949		
	If I do not get it immediately, I would lose an opportunity to purchase it because it will be gone tomorrow.	0.919/0.931		
Ideal self-image congruence in the metaverse (Malär et al., 2011)	The personality of Brand X [your chosen luxury brand] in the metaverse is consistent with how I would like to be.	0.886/0.934	0.889/0.923	0.818/0.866
	The personality of Brand X (your chosen luxury brand) in the metaverse is an image of the person I would like to be.	0.908/0.929		
	The personality of Brand X (luxury brand) in the metaverse reflects how I would like to be.	0.919/0.928		
Luxury brand purchase intentions in the metaverse (Raggiotto et al., 2019; Visentin & Scarpi, 2012)	After this metaverse experience, I will purchase more frequently from luxury fashion brands in the metaverse.	0.953/0.944	0.955/0.935	0.918/0.885
	As a result of the metaverse experience, I will increase my spending on luxury fashion brands in the metaverse.	0.970/0.954		
	I will purchase more avatar products from luxury fashion brands in the metaverse due to the metaverse experience.	0.951/0.924		

TABLE 3 (Continued)

Construct	Measurement item	Factor loading (United States/Korea)	rho_A (United States/Korea)	AVE (United States/Korea)
Luxury brand purchase intentions in the real world (Raggiotto et al., 2019; Visentin & Scarpi, 2012)	After this metaverse experience, I will purchase more from luxury fashion brands in the real world.	0.966/0.933	0.961/0.937	0.927/0.888
	As a result of the metaverse experience, I will increase my spending on luxury fashion brands in the real world.	0.970/0.955		
	I will purchase more products from luxury fashion brands in the real world due to the metaverse experience.	0.952/0.935		
Economic value of luxury brands	The reason for collecting NFTs is economic, as NFTs ensure that luxury products can be resold in the future without depreciation in value.	1.00		

Abbreviations: AVE, average variance extracted; NFT, nonfungible tokens.

borderline (0.05), the overall compositional invariance test is satisfied and thus acceptable. Finally, in the third step, we used partial measurement invariance, as "the standardized coefficients of the structural model can be compared across groups" (Hair et al., 2017, p. 299). Given the results of the MICOM procedure, we proceeded to test the main model.

4 | RESULTS

4.1 | Main model test

We conducted our analysis for the main structural model using PLS-SEM with a bootstrapped sample of 5000 cases to estimate path coefficients. Figure 4 shows the results of the PLS-SEM test for each country.

With regard to H1, the results indicate that the higher the perceived economic value of NFT luxury brand items, the higher the perceived value of NFT (a) authenticity (United States: $\beta = 0.268$, $t = 3.24$, $p = 0.001$; South Korea: $\beta = 0.373$, $t = 7.56$, $p = 0.000$) and (b) scarcity (United States: $\beta = 0.427$, $t = 5.63$, $p = 0.000$; South Korea: $\beta = 0.407$, $t = 7.61$, $p = 0.000$), providing support for H1 in both countries. The results also show that the higher the perceived social value of NFT luxury brand items, the higher the perceived value of NFT (a) authenticity (United States: $\beta = 0.367$, $t = 3.60$, $p = 0.000$; South Korea: $\beta = 0.501$, $t = 9.79$, $p = 0.000$), and (b) scarcity (United States: $\beta = 0.197$, $t = 2.252$, $p = 0.024$; South Korea: $\beta = 0.215$, $t = 3.438$, $p = 0.001$), providing support for H2 in both countries. The R^2 values for the social value of luxury brands are 0.369 in the United States and 0.363 in South Korea, indicating that the importance of avatar appearance in the metaverse explains 36.9% (United States) and 36.3% (South Korea) of the variance in the social value of luxury brands.

In addition, the results indicate that perceived NFT authenticity positively influences anticipated (a) gains associated with buying (United States: $\beta = 0.281$, $t = 3.533$, $p = 0.000$, $R^2 = 0.426$; South Korea: $\beta = 0.339$, $t = 5.070$, $p = 0.000$) and (b) losses associated with not buying (United States: $\beta = 0.197$, $t = 2.486$, $p = 0.013$; South Korea: $\beta = 0.334$, $t = 5.966$, $p = 0.000$) luxury brand NFTs, providing support for H3 in both countries. The results also indicate that perceived NFT scarcity positively influences anticipated (a) gains associated with buying (United States: $\beta = 0.438$, $t = 5.904$, $p = 0.000$; South Korea: $\beta = 0.464$, $t = 6.785$, $p = 0.000$) and (b) losses associated with not buying (United States: $\beta = 0.483$, $t = 6.298$, $p = 0.000$; South Korea: $\beta = 0.334$, $t = 5.979$, $p = 0.000$) luxury brand NFTs, providing support for H4. The R^2 values for the perceived value of NFT authenticity are 0.264 in the United States and 0.502 in South Korea, indicating that the perceived social and economic value of NFT luxury brand items explains 26.4% (United States) and 50.2% (South Korea) of the variance in the perceived value of NFT authenticity. The R^2 values of the perceived value of NFT scarcity are 0.269 in the United States and 0.261 in South Korea, indicating that the perceived social and economic value of NFT luxury brand items explains 26.9%

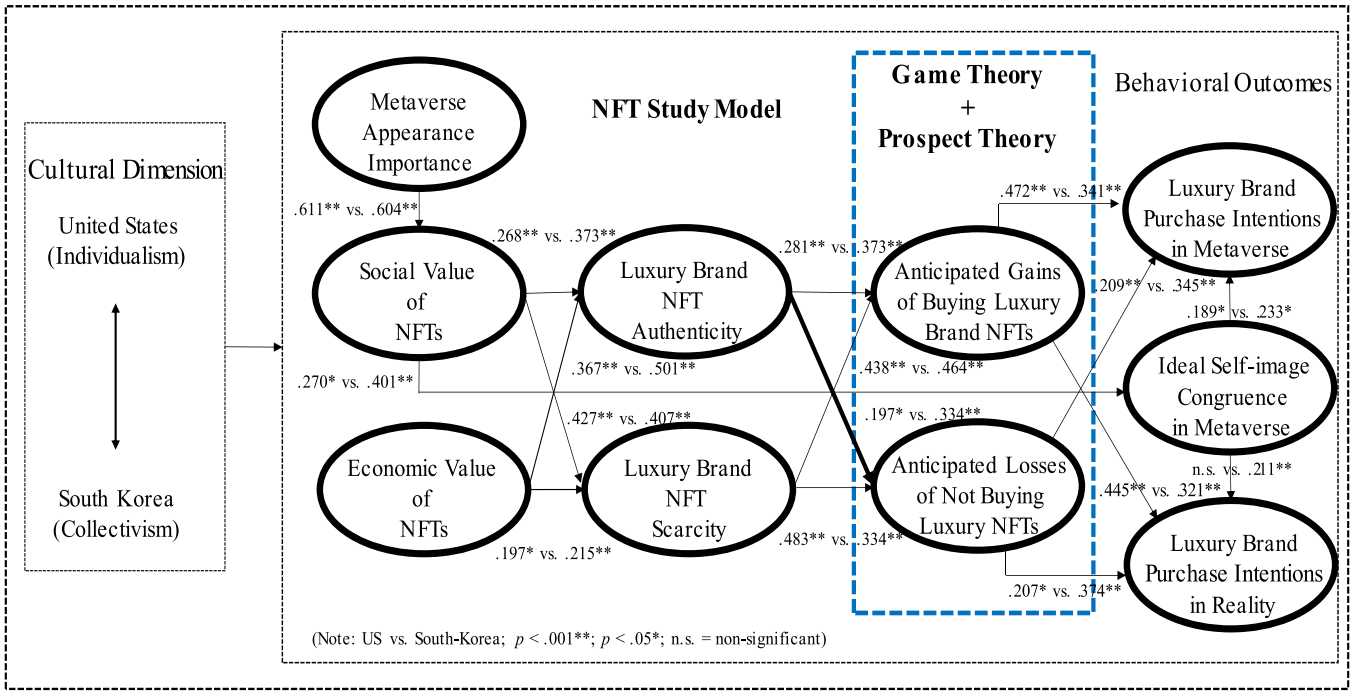


FIGURE 4 Results of NFT main model. NFT, nonfungible tokens.

(United States) and 26.1% (South Korea) of the variance in the perceived value of NFT scarcity.

Moreover, the results show that anticipated gains associated with buying NFT luxury brands positively influence luxury brand purchase intentions in (a) the metaverse (United States: $\beta = 0.472$, $t = 5.759$, $p = 0.000$; South Korea: $\beta = 0.341$, $t = 4.823$, $p = 0.000$) and (b) the real world (United States: $\beta = 0.445$, $t = 5.705$, $p = 0.000$; South Korea: $\beta = 0.321$, $t = 4.304$, $p = 0.000$), providing support for H5 in both countries. The R^2 values of anticipated gains of buying luxury brand NFT items are 0.366 in the United States and 0.522 in South Korea, indicating that the perceived value of NFT authenticity and scarcity explains 36.6% (United States) and 52.2% (South Korea) of the variance in the anticipated gains of buying luxury brand NFT items. Furthermore, the results indicate that anticipated losses associated with not buying NFT luxury brands positively influence luxury brand purchase intentions in (a) the metaverse (United States: $\beta = 0.209$, $t = 2.760$, $p = 0.006$; South Korea: $\beta = 0.345$, $t = 5.440$, $p = 0.000$) and (b) the real world (United States: $\beta = 0.207$, $t = 2.079$, $p = 0.038$; South Korea: $\beta = 0.374$, $t = 5.822$, $p = 0.000$), providing support for H6 in both countries. The R^2 values of anticipated losses of not buying luxury brand NFT items are 0.344 in the United States and 0.418 in South Korea, indicating that the perceived value of NFT authenticity and scarcity explains 34.4% (United States) and 41.8% (South Korea) of the variance in anticipated losses associated with not buying luxury brand NFT items.

The results also indicate that the importance of appearance in the metaverse positively influences the social value of luxury brands (United States: $\beta = 0.611$, $t = 10.290$, $p = 0.000$; South Korea: $\beta = 0.604$, $t = 13.07$, $p = 0.000$) and ideal self-image congruence (United States: $\beta = 0.378$, $t = 3.40$, $p = 0.001$; South Korea: $\beta = 0.434$, $t = 6.97$, $p = 0.000$). Moreover, the social value of luxury brands positively influences ideal self-image congruence in the metaverse (United States: $\beta = 0.270$, $t = 2.691$, $p = 0.007$, $R^2 = 0.369$; South Korea: $\beta = 0.401$, $t = 6.358$, $p = 0.000$, $R^2 = 0.426$). Therefore, social value stemming from the importance of avatar appearance positively influences ideal self-image congruence, providing support for H7. The R^2 values of ideal self-image congruence are 0.331 in the United States and 0.557 in South Korea, indicating that the importance of appearance and the social value of luxury fashion NFTs explain 33.1% (United States) and 55.7% (South Korea) of the variance in ideal self-image congruence.

In addition, the results show that ideal self-image congruence positively influences purchase intentions in (a) the metaverse (United States: $\beta = 0.189$, $t = 2.512$, $p = 0.012$, $R^2 = 0.426$; South Korea: $\beta = 0.233$, $t = 3.765$, $p = 0.000$, $R^2 = 0.426$) and (b) the real world (United States: $\beta = 0.104$, $t = 1.414$, $p = 0.157$, $R^2 = 0.426$, $f^2 = 0.743$; South Korea: $\beta = 0.211$, $t = 3.597$, $p = 0.000$, $R^2 = 0.426$, $f^2 = 0.743$) only in South Korea, not in the United States, providing support for H8. The R^2 values of purchase intentions in the metaverse are 0.534 in the United States and 0.607 in South Korea, indicating that the anticipated gains associated with buying, anticipated losses associated with not buying, and ideal self-image congruence explain 53.4% (United States) and 60.7% (South Korea) of the variance in purchase intentions in the metaverse. The R^2 values of purchase intentions in the real world are 0.416 in the United States and 0.593 in South Korea, indicating that the anticipated gains associated with buying, anticipated losses associated with not buying, and ideal self-image congruence explain 41.6% (United States) and 59.3% (South Korea) of the variance in purchase intentions in the real world.

4.2 | Multigroup analysis

Figure 4 shows the overall results of a multigroup analysis between the United States and South Korean respondents for each path of our main model. Following the procedure for our main analysis, we adopted a PLS-SEM approach with a bootstrapped sample of 10,000 cases to estimate path coefficients.

First, the path comparison between the United States ($\beta = 0.197$, $p < 0.05$) and South Korea ($\beta = 0.387$, $p < 0.05$), shows a statistically significant difference ($p = 0.05$) only for the path between authenticity and anticipated losses associated with not buying NFT luxury brands (path coefficient difference: $\Delta\beta_{US\text{-}Korea} = |-0.190|$), providing partial support for H9. Although consumers in both countries indicated that the perceived value of NFT authenticity positively influences their evaluations of potential losses associated with not buying NFT luxury fashion items, this influence is stronger in South Korea. Second, indirect effects are significantly stronger ($p < 0.05$) in South Korea across the two mediation processes from antecedents to consequences as follows: appearance → social value → authenticity → anticipated losses associated with not buying → purchase intentions in the metaverse ($\Delta\beta_{US\text{-}Korea} = |-0.023|$, $p = 0.028$) and the real world ($\Delta\beta_{US\text{-}Korea} = |-0.026|$, $p = 0.022$); economic value → authenticity → anticipated losses associated with not buying → purchase intentions in the metaverse ($\Delta\beta_{US\text{-}Korea} = |-0.052|$, $p = 0.008$) and the real world ($\Delta\beta_{US\text{-}Korea} = |-0.058|$, $p = 0.007$).

4.3 | Effects of gender

An ANOVA test of the interaction effect of gender (men vs. women) on consumer responses shows statistically significant differences in drivers of NFT collection behavior (1 = *U.S. men*; 2 = *U.S. women*; 3 = *South Korean men*; 4 = *South Korean women*; $F_{(3,\ 465)} = 4.243$, $p = 0.006$). Specifically, the perceived economic value of NFT luxury fashion items has a stronger influence on the behavior of men than women in South Korea ($M_{S.Korean\_men} = 4.63$, $SD = 1.50$ vs. $M_{S.Korean\_women} = 4.08$, $SD = 1.64$, $p = 0.01$), whereas economic value does not have a significant effect on U.S. men ($M_{U.S.\_men} = 4.54$, $SD = 1.74$) and Korean women ($M_{S.Korean\_women} = 4.08$, $SD = 1.64$, $p > 0.05$). Overall, the economic value of NFTs (i.e., for future resale) has a similar influence on the behavior of U.S. consumers and South Korean men (see Figure 5). South Korean women are not interested in collecting luxury brand NFTs to resell them ($M = 4.08$, where 4 = "*neutral*" on a 7-point Likert scale). Overall, South Korean men exhibit more positive responses to perceived economic value than South Korean women, providing partial support for H10 ($M_{S.Korean\_men} = 4.63$, $SD = 1.50$ vs. $M_{S.Korean\_women} = 4.08$, $SD = 1.64$, $p = 0.01$; see Figure 5).

5 | DISCUSSION

A dramatic digital transition driven by the technologies of the fourth industrial revolution is in full swing. Among these technologies, blockchain-based NFTs are facilitating the emergence of a market for digital assets, particularly those offered by luxury consumer brands. We investigated this emerging NFT field to understand the underlying mechanism in the consumer decision-making process (e.g., whether perceived values/factors hold true in the virtual environment, perceptions toward NFT characteristics), with implications for both theory and practice. A lack of sufficient evidence has impeded luxury brand marketers' understanding of the factors that influence metaverse consumers' decisions to (not) purchase NFT items and how these may differ from the real world.

The findings from our main analysis support our structural model of the psychological decision-making process: the desire for NFTs increases as a result of higher perceived economic value (i.e., resale

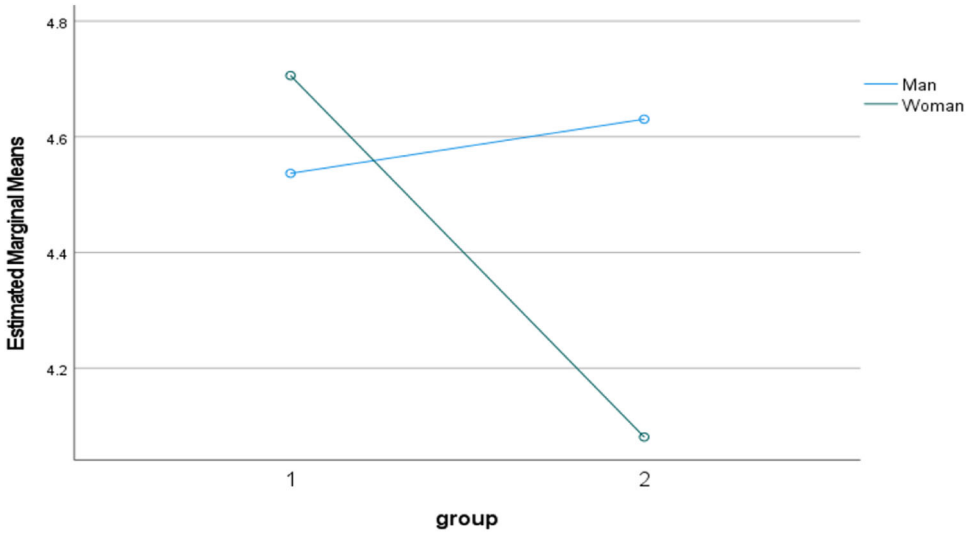


FIGURE 5 Results of interaction effects of gender on economic value of NFTs (group 1 = United States; group 2 = South Korea). NFT, nonfungible tokens.

without depreciation) and social value, and higher perceived NFT authenticity and scarcity, which influence consumers' assessments of potential gains and losses associated with (not) buying NFTs. These processes affect purchase intentions in the metaverse as well as in the real world. In addition, the importance of avatar appearance and the social value of luxury brands influence ideal self-image congruence, which in turn influences behavioral intentions.

We also investigated the NFT behavior of consumers in two countries with different cultural orientations (United States: individualism; South Korea: collectivism). The overall structural model is valid in each country. Our analyses of consumers' psychological evaluation process and cultural differences indicate that the perceived value of NFT authenticity has a stronger influence on anticipated losses associated with not buying for consumers in South Korea (vs. the United States), indicating that these consumers worry that they may lose an opportunity to gain benefits by not buying NFTs.

In addition, we measured the interaction effects of gender on the economic and social value of NFTs to determine which value has a stronger influence on NFT collection behavior for specific demographic groups in the metaverse. The overall results show that economic value (resale potential) has a stronger influence on NFT collection for U.S. consumers than for South Korean consumers. For the interaction effect, the influence of economic value is significantly stronger for U.S. consumers and South Korean men than for South Korean women on the metaverse platform; the influence of the social value on NFT luxury item collection does not differ across cultures.

5.1 | Theoretical contributions

First, our main empirical findings contribute to literature based on game theory (Aumann, 2008; Osborne, 2004; Shubik, 1981) and prospect theory (Byun & Sternquist, 2012; Kahneman & Tversky, 1979). These theories explain the psychological evaluation process whereby consumers assess potential gains (Spears, 2001) and losses (Aggarwal & Vaidyanathan, 2003) associated with (not) buying (Frost & Gross, 1993; McKinnon et al., 1985) products. Drawing on these theories, we developed a model that explains this process for NFT luxury fashion items that includes several factors—their authenticity (Seong et al., 2021) and scarcity (Byun & Sternquist, 2012) and their economic (resale) and social (self-expression, self-image congruence) value (Shavitt, 1989; Wilcox et al., 2009)—in the virtual space that influence consumers' purchase decisions. Unlike traditional luxury brand products that focus on social value by emphasizing luxury or prestige (Kapferer & Valette-Florence, 2016), we have identified perceived economic value as an important factor influencing purchase decisions regarding luxury fashion brand NFTs in the metaverse. Our findings also show that consumers place high importance on the appearance and image projected by their avatars in the metaverse; thus, the perceived social value of luxury NFTs (supported by authenticity and scarcity) strongly influences NFT purchase decisions.

In particular, the authenticity of NFT digital assets (Seong et al., 2021) plays an important role in consumers' evaluations of potential gains and losses of (not) buying (Bechwati & Qualls, 2001; Cooke et al., 2001) luxury fashion brand NFTs. Blockchain technology also plays a critical role by certifying the authenticity and ownership of digital assets in virtual environments (Seong et al., 2021). We contribute to the blockchain literature (Kaushik, 2021; Seong et al., 2021) by demonstrating the importance of NFT authenticity for luxury brand digital assets in the metaverse.

Second, as cultural differences influence preferences for luxury brands (Seo et al., 2015; Shukla & Purani, 2012; Wong & Ahuvia, 1998), we employed Hofstede's (1991, 2018) cultural dimensions to compare consumer behavior in individualist (United States) and collectivist (South Korea) cultures. Traditionally, prestige brand purchases are higher in South Korea than in the United States due to social norms around belonging and public image (Sternquist et al., 2004; Sung et al., 2020). According to applied social impact theory (Latane & L'Herrou, 1996; Latané, 1981; Rashotte, 2007), people often change their behavior to be similar to that of collective others. We found that the impact of the perceived value of NFT authenticity on perceptions of losses associated with not buying NFT items is stronger for consumers in South Korea. We contribute to the traditional global luxury brand literature by providing evidence of cultural differences in consumer behavior in the metaverse. The perceived value of NFT authenticity is critical to consumers in collectivist cultures when evaluating the potential benefits and costs of (not) buying luxury NFTs. Thus, Korean consumers are concerned more about NFT ownership control and pay attention to transparent transaction histories and blockchain certification of NFT ownership.

Evidence of the importance of NFT authenticity verified by blockchain (Seong et al., 2021) in the risk evaluation of luxury brand digital assets is our most meaningful contribution. There is a lack empirical evidence to explain luxury fashion NFT purchase behavior due to the recent dramatic transition to digital virtual platform usage. Our study provides insights into the psychological evaluation process for luxury brand NFTs in both individualist and collectivist cultures.

Third, whereas consumers evaluate traditional luxury brand items in the real world primarily based on their potential social value (e.g., benefits such as social status, identity, uniqueness, and prestige) (Belk, 1988; Kapferer & Valette-Florence, 2016; Shavitt, 1989; Wilcox et al., 2009), our findings show that consumers evaluate NFT luxury brand items in the metaverse based on both their potential economic value (i.e., resale potential) and their potential social value (Vickers & Renand, 2003; Wang & Griskevicius, 2014). These antecedents, which influence the consideration of and preference for the perceived value of NFT scarcity and authenticity, shape how consumers assess potential gains and losses associated with (not) buying luxury brand NFTs.

Furthermore, especially with regard to the economic value of NFTs, our findings reveal differences between the United States and South Korea, in that economic value has a stronger influence on U.S. consumers and South Korean men than on South Korean women. Notably, conspicuous consumption of traditional luxury fashion items

is common among South Korean women. Indeed, South Korea's luxury goods market totaled US$5.8 billion in 2021, ranking seventh in the world (https://daxueconsulting.com/south-koreas-luxury-market/). Therefore, it might take time for South Korean women to perceive digital NFT fashion brand items as potential investments. This finding aligns with previous research showing that men adopt a more task-oriented approach to technology adoption (Park & Kim, 2020; Suh et al., 2021; Wang, 2014).

Finally, we found that the ideal self-image congruence (Chebat et al., 2006; Kressmann et al., 2006; O'Cass & Grace, 2008) between consumers' avatars and digital NFT luxury fashion brands influences purchase intentions in the metaverse and in the real world through a psychological process. Specifically, consumers perceive luxury fashion NFT items as having social value (Kapferer & Valette-Florence, 2016) because the appearance of representative avatars or game characters is important to them. Notably, these behavioral intentions extend to the real world as well.

5.2 | Practical implications

Our empirical evidence has important managerial implications for luxury brand marketers who are interested in leveraging blockchain-based NFTs on virtual platforms. First, our findings show that the authenticity of luxury brand NFT fashion items influences their economic and social value across cultures. With regard to purchase intentions, the effect of authenticity on risk evaluation (loss associated with not buying) is stronger for South Korean consumers. Therefore, luxury brand marketers using NFTs need to emphasize that NFTs are authentic. They can promote how the blockchain is securely maintained in partnerships with metaverse platforms and transaction security providers. Furthermore, some NFTs allow copied items to circulate on virtual platforms. In such cases, reporting whether the NFT is an unauthorized copy or a counterfeit is a way to increase perceptions of the authenticity of digital assets. Finally, transparently providing information about the ownership history of a luxury brand NFT is a way to preserve authenticity, similar to car titles in the United States. In this way, luxury brands can maintain their reputations in the market for digital NFT fashion items. Importantly, luxury brand marketers should pay particular attention to emphasizing authenticity when promoting digital NFT fashion items to South Korean consumers. Overall, marketers need to consider how to maintain their brands' prestige to harness their full potential in the metaverse.

Second, our findings show that item scarcity also influences the perceived economic and social value of NFT luxury fashion items. Thus, luxury fashion brands should control NFT inventory by offering limited quantities of digital fashion items. In accordance with game theory and prospect theory, consumers evaluate the relative risk of (not) buying items with regard to potential gains or losses associated with each action. To increase the potential gains of buying and the potential losses associated with not buying, luxury brands can reduce the number of allowed copies when releasing an NFT product for a special promotion or event, or as compensation for using certain strategies in games (e.g., *Louis the Game* for Louis Vuitton). Luxury fashion brands also need to identify the purpose of releasing NFTs (e.g., to expose gamers to their brands to support future NFT sales, to make a profit by selling NFTs to mature luxury brand consumers). Then, they need to decide whether to distribute NFTs on gaming platforms such as Horizon and Fortnite, social communities such as ZEPETO, or other metaverse platforms and to test whether and how NFT items can be used across multiple platforms. Marketers can gradually expand NFTs to many different metaverse communities until the platforms begin to be interchangeable or a few dominant metaverse platforms emerge.

Finally, our findings show differences in the perceived economic value of NFTs when considering interaction effects of gender and country, in that U.S. consumers and South Korean men intend to collect NFTs for their economic (i.e., resale) value while South Korean women tend to collect NFTs for their social value. Thus, in South Korea, luxury fashion brand marketers can employ different strategies to target men (emphasizing economic value) and women (emphasizing social value), whereas in the United States, we recommend emphasizing the economic value of NFT luxury items.

5.3 | Limitations and future research directions

Despite yielding findings with valuable implications for luxury brand marketers regarding how consumers evaluate NFT digital assets in the metaverse, our study has limitations that present opportunities for future research. First, as the concept of digital assets (NFTs) is new, the economic value of luxury fashion brand NFTs should be further explored. We focused on the economic value of NFT luxury fashion items from a resale perspective. Traditional luxury fashion brand products typically cannot be resold without depreciation. However, the NFT market is based on game theory, much like the stock market, making the economic value of NFT luxury fashion items more salient. This aspect is new for traditional luxury fashion brands, which typically emphasize the social value of products to support conspicuous consumption.

Combining traditional luxury brand marketing strategies with advanced technology is a cutting-edge practice, and the use of blockchain-based NFTs is still nascent in the metaverse. In future research, scholars might investigate how luxury brands can cooperate with metaverse platforms through joint ventures, partnerships, alliances, or outsourcing to invest in new applications for NFTs. For example, the luxury fashion brand Louis Vuitton established the Aura Blockchain Consortium to develop *Louis the Game* with NFTs.

In future research, the terms “the luxury brand,” “luxury brand items,” and “certain luxury brands” should be consistently and accurately employed. We did not specify the names of luxury brands. Instead, we asked about general perceptions of luxury brand NFTs. Scholars can further test our model using specific luxury brand NFTs in future work.

Furthermore, given the dramatic digital transformation since the COVID-19 pandemic, Gen Z consumers are attracting attention as a key target market on metaverse platforms. During the pandemic, members of Gen Z, who are currently in their teens and twenties,

have shifted many everyday activities such as education (taking classes), consumption, socialization, and entertainment to the virtual environment. Therefore, luxury brand marketers need to integrate marketing strategies wisely to introduce these consumers to luxury brands in virtual spaces to lay the groundwork for future consumption as this generation matures and their disposable incomes increase. Luxury brands also need to maintain their reputations, and thus they need to appropriately manage the authenticity and scarcity of their NFT items in the metaverse to ensure that consumers' behavioral intentions extend to the real world.

We tested the luxury brand consumer behavior of users of virtual platforms (e.g., metaverse). In future research, scholars could investigate NFT behavior beyond the metaverse as well as NFT items in other product/service categories.

Self-indulgence or subtle signals of inconspicuous consumption (Berger & Ward, 2010) may also be a factor for consumers who purchase luxury brands. Thus, in the future, researchers might investigate luxury brand consumer behavior from this angle. Furthermore, current virtual platforms might confront interoperability challenges (Belk et al., 2022; Seong et al., 2021) when transferring consumers' characters and assets to metaverse platforms. Thus, brands need to think about how to develop consistent virtual environments with platform developers to enable consumers to derive benefits from using brand items.

Finally, many studies distinguish between individualist and collectivist culture at the national level. However, we acknowledge that specific individuals or communities within a given nation may not align with the general cultural trend of a country.

In conclusion, our study opens new research avenues related to blockchain-certified NFTs of luxury brands in the metaverse. We have developed a model that explains factors that affect consumers' purchase decisions related to NFT luxury fashion items for their avatars or game characters in the virtual environment. Additional research is warranted to examine how the advent of the fourth industrial revolution and reality-enhancing technologies are transforming the consumer market.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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