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A Dual Model of Product Involvement for Effective Virtual Reality: The Roles of Imagination, Co-creation, Telepresence, and Interactivity

Abstract

Virtual reality (VR) is a domain of increasing interest to marketers as this technology provides significant opportunities for engagement and consumer responses. However, to date, the field lacks a cohesive description of available VR technologies, especially in the marketing domain, and needs a guide for effective VR based on consumer product involvement. Therefore, we first outline a typology of VR based on different levels of product involvement delineating how brands might implement VR. Second, after conducting a comprehensive literature review, we propose a dual model of product involvement for VR strategies. High product involvement situations operate through the imagination, co-creation, and telepresence, directly influencing consumer responses. Meanwhile, low involvement contexts operate through the less cognitively taxing process of interactivity, leading to brand engagement and indirectly influencing consumer responses. This work includes nine propositions that outline elements of effective strategies in each route and offers several implications for theory and practice.

A Dual Model of Product Involvement for Effective Virtual Reality: The Roles of Imagination, Co-creation, Telepresence, and Interactivity

1. Introduction

Virtual Reality (VR) is receiving increasing attention from marketers. Formally defined, VR is the application of three-dimensional computer technology to generate a virtual environment (VE) that allows users to navigate and interact with elements of the environment (Berg and Vance, 2016; Guttentag, 2010). By 2020, the retail market size of VR is expected to rise to $41.5 billion (Blum, 2017). VR will likely expend beyond current capabilities in the next decade, including increasing multisensory product interactions (Dalton, 2017; Pantano and Servidio, 2012).

Several brands have incorporated VR into their strategies. Real estate agents use virtual views to entice clients to view properties, and even the *New York Times* has used virtual storytelling with Google Cardboard viewers as part of a campaign to enhance readership. Though more brands are integrating VR technologies to connect with consumers (Clark, 2017), little is understood about how brands should use VR or how to engage clients with VR. The same was once considered digitally: should brands use websites to sell online or create engagement? Similarly, brands have had to decide whether to join exiting social networks or build their own. For VR, these decisions should reflect a similar line of questioning – should brands use VR technologies to create relationships or sell? More importantly, though, how can brands facilitate sales or engagement? While research exists in other domains such as education (Winn *et al.*, 1999), management (Seidel and Chatelier, 1997), and others, marketing has not yet fully addressed VR (Saren *et al.*, 2013). Furthermore, VR research in marketing tends to focus on consumer characteristics and motivations within singular applications of VR (e.g. Bates *et al.*, 2008; Buhalis and Law, 2008; Eisenbeiss *et al.*, 2012; Schlosser, 2013).

Why the recent focus on VR by marketing? VR is useful for brands because it allows consumers to view a different, virtual dimension, with a large potential for both selling and the creation of consumer-brand relationships. Permitting higher user control compared to 2D environments, VR incorporates enhanced sensory elements, and in high involvement situations, elicits telepresence, the feeling of being present in another world (Berg and Vance, 2016). Subsequently, the experiences and visceral reactions felt in VR are tantamount to actual, physical experiences (Baird, 2017; van Herpen *et al.*, 2016). Importantly, effective VR can lead to more positive brand attitudes and purchase intentions (Choi *et al.*, 2016). However, the combined lack of understanding of and research on VR despite its opportunities merits further examination.

Therefore, in conducting a thorough, comprehensive literature review, the scope of this research is to examine marketing opportunities via a VR typology and a dual-route involvement model for effective strategies, which offers nine propositions outlining optimal strategies for each involvement level. Specifically, this conceptual article considers several moderators and mediators in VR that can enhance consumer brand attitudes via two routes: the high involvement route, which relies on the imagination and telepresence, and the low involvement route, which integrates interactivity. The propositions herein can help scholars better understand the psychological underpinnings of VR, provide direction for future study, and suggest avenues for marketers to optimize the impact of VR on consumer responses.

2. Procedure for Development of the Research Model

Prior to developing the typology and conceptual model, the authors undertook a representative literature review of the topic of virtual reality, beginning with a bibliographic keyword search using the online library services of Google Scholar, Web of Science, and Scopus, following the example of Choudrie et al. (forthcoming). The goal of this review was

not to document all works with ties to virtual reality; rather, the authors sought to locate sources that were most relevant to the goals of this paper. To locate articles and other relevant sources, specific terms were used in the search criteria, involving treating one word as an author-supplied keyword and each of the others appearing throughout the text. Thus, the search involved the following words: "virtual reality," "automated virtual environment," HMD, CAVE, "virtual world," "social world," "MMORPG," "electronic commerce," "avatars," "simulation," "telepresence," "imagination," "product involvement," "consumption," and "retail." The results were crosschecked using other scholarly search engines (Emerald, EBSCO, ProQuest, etc.).

After filtering the results to only peer-reviewed publications in English, the initial list of journal articles was further scrutinized to identify whether they were relevant for the scope of the paper. The authors individually and independently evaluated each paper to decide whether each journal article was relevant for inclusion in the literature review. This process resulted in 66 relevant research articles that spanned 1992 to 2018. To assist with the development and illustration of the typology, the authors also located relevant industry examples using located publications as well as news articles from Google.

3. A Typology of Virtual Reality

First, we discuss the VR typology before introducing the resulting model. VR simulates a realistic world in a digital realm as it provides a physical and psychological immersion, which isolates the user within another world (Gutierrez *et al.*, 2008). Naturally, the more sensory inputs (haptic, visual, olfactory, etc.) present in a VE, the easier the user can visualize and feel incorporated into the world (Loomis *et al.*, 1999; Martins *et al.*, 2017). Thus, industry has been motivated to create virtual environments (VEs) that stimulate all five

senses (Price *et al.*, 2013). Though virtual experiences can only create indirect experiences of senses, such as touch or sight (Heeter, 2000), these experiences are nevertheless felt in reality.

VR applications encompass three areas: product simulations, automated virtual environments, and virtual worlds (VWs). Product simulations enable consumers to view objects in a 3D world, including features such as rotation, zooming, and in some cases virtual use (Algharabat and Dennis, 2010). Automated virtual environments (AVEs) allow firms to test product ideas and retail layouts using virtual spaces or headsets. VWs, such as Second Life and World of Warcraft, consist of a network of users in a virtual space that incorporates elements of play, creativity, and ritual (Boellstorff *et al.*, 2012).

As mentioned earlier, a brand may consider engaging with consumers using VR directly, such that the consumer opts into communication with the brand (e.g. when a consumer visits a virtual store of the brand). In other words, the brand's intention is to motivate high consumer involvement, potentially leading to purchase of a product. In contrast, the consumer may be motivated to play and have fun; yet, he/she may see immersion in VR technology alone, and the involvement with the brand would be a byproduct of the experience (e.g. brand advertisements within Second Life). In these low involvement situations, interactions with the brands' products would be little to non-existent, and the brand engagement itself indirect.

Based on the three types of VR applications (e.g. simulations, AVEs, and VWs), we propose a typology of brand engagement opportunities with VR. See Table 1 below. A discussion of each VR technology follows, describing instances of using direct (high involvement) or indirect (low involvement) strategies.

Insert Table 1 Here

2.1 Simulations

Simulations, defined as virtual interactions with virtual objects in realistic settings (Aurich *et al*., 2009), can improve consumer engagement, learning experiences, future satisfaction, purchase intentions, and the relationship between the retailer and the user (Algharabat and Dennis, 2010; Li *et al.*, 2002; Papagiannidis *et al.,* 2014). Jiang and Benbasat (2005) classified types of online simulation applications: visual control (e.g., move, rotate, and zoom to evaluate a product) and functional control (e.g., testing how a camera works and the sounds it emits). Higher quality controls lead to higher perceived helpfulness of the simulation, affective responses, and individual learning (Algharabat *et al*., 2017).

Retailers have invested in simulating real experiences through web technology that affords realistic perception of a product, typically in three-dimensional terms (i.e., Krasonikolakis *et al.*, 2018; Lee, 2012; Li *et al.*, 2001). For example, StubHub, an online ticket vendor, allows consumers to see virtual views of their seats before committing to purchase (i.e. visual control). Likewise, Japanese cosmetic retailer Shiseido has invested in "cosmetic mirrors," digital screens that allow customers to try on cosmetics via a virtual image of the face with the virtually applied product. These "cosmetic mirrors" provide advice, recommendations, virtual makeovers, and shopping lists (Reddy, 2015), though misattributions based on psychological effects, such as liking of the image rather than the actual product itself or technology, tend to inform product favorability and evaluations (i.e., Cho and Schwarz 2012). Additionally, several home improvement retailer websites allow users to create designs of their home spaces, including 360-views and life-like trials, such as remodeled kitchens, to virtually try different functions inside home spaces (i.e. functional control).

Additionally, retailers and brands have begun experimenting with more immersive technology through advertising. For example, engagement advertising allows users to opt into

viewing an advertisement, which piques positive word of mouth and brand attitudes (Cassinelli, 2017). The television network USA offered consumers on Facebook a virtual tour of the house on its drama *Graceland* in exchange for watching a trailer about the show (Tune, 2013). Further, mobile advertising integrates greater sensory input and helps consumers experience products in innovative ways. For instance, haptic ads using vibrations occur in tandem with audible and visual cues, such as the rumble of a car engine or the working of food processor, which boost involvement, emotional engagement, and capture attention (AdBiz, 2017; Yalch and Spangenberg, 2000). In all of these cases, the virtual experiences are built to lead consumers to a decision.

For low-involvement simulation experiences, users may be motivated to have a fun experience or learn more about a brand; in particular, when they are looking for a less product-focused experiences, mobile applications provide a suitable alternative. Mobile applications have afforded retailers the ability to provide enhanced brand experiences that avoid specific product information. As one such example, Swedish McDonald's includes VR goggles in Happy Meal boxes to be used with a special app. In these instances, the brands focus on the brand experience and not just selling a product or service. Thus, these situations build the connection between the brand and consumers in a technological approach.

2.2 Automated Virtual Environments (AVEs)

AVEs are full reality-based environments that promote user control over and interaction with a simulation in which the consumer is transported alone into a different environment without any visuals of the real world. These AVEs use the five senses (Gutierrez *et al.,* 2008) and come in two forms: Cave Automatic Virtual Environments (CAVEs) and head-mounted displays (HMDs; Loomis *et al.*, 1999). While both can be used within retail stores to directly build high involvement consumer purchases, these VR technologies can also

be used within a low involvement context in order to inspire more experiences that are less product-specific.

CAVEs involve stationary display surfaces enabled by multiple projectors and loudspeakers surrounding the consumer. The user can walk around the room and feel more present in the environment compared to other types of VR. The technology involves glasses that provide stereoscopic stimulation (i.e., displaying two images of the same scene designed for each eye) of projections on the room's surfaces, with quality varying by pixel size, and the floor integrating perspectives for users to manipulate objects (Meissner *et al*., 2017). Less complex versions are available, such as single projection screens (Power Walls) that may be combined with floor projections (L-Shape).

While CAVEs permit research-oriented behavior tracking, product manipulation information, and eye tracking (Bigne *et al*., 2016; Meissner *et al*., 2017), they can also engage customers through v-commerce, defined as commercial transactions occurring in a virtual environment, leading to improved brand attitudes. For example, IKEA launched VR in stores, allowing customers to walk around kitchens, customize views, and even cook (Dalton, 2017). Similarly, Lowe's installed spaces that show shoppers virtual representations of renovations (Li, 2016). Additionally, pop-up stores implementing CAVEs can provide unique experiences, such as virtual visits to corporate offices and test drives of rare and expensive cars (i.e., Porsche). Retailer Kith created a pop-up shop in Aspen, merging Instagram stories and products with a CAVE experience of Aspen (Tran, 2017). Because CAVEs require a significant investment in equipment and face-to-face engagement with consumers, CAVEs are better suited for environments in which consumer interactions occur in physical spaces (i.e., brick-and-mortar retailers).

Like CAVEs, HMDs change position and orientation along with user changes but have reduced field of vision and less interactive capability. Additionally, the HMD provides visual

and auditory input based on user position and orientation (Meissner *et al.*, 2017). Because HMDs are less expensive than CAVEs they require fewer spatial resources and may be a more ideal source of automated VR for retailers. V-commerce presents opportunities for HMDs, and in fact, several brands (including supermarkets, Swarovski, and Marriott) are exploring HMD integration, as consumers may be more prone to buy impulsively in v-commerce due to artificial intelligence algorithms that place relevant items in the consumer's VR path (Li, 2016; Pham, 2016; Slefo, 2017). Continued investments from other retailers (e.g. Alibaba, Amazon, and eBay) tend to suggest that HMDs are low-risk yet innovative ways to engage consumers in v-commerce (Blum, 2017).

From a low involvement perspective, HMDs can be used to enhance experiential aspects unrelated to the actual buying of products. As it is currently difficult to replicate the quality of HMD features in-home, consumers are coming to pop-up shops and ephemeral in-store experiences (Li, 2016). Nordstrom and Hermès, for example, have created a "pop-in" experience showcasing experiences with a theme (Tran, 2017). Additionally, Toms has HMDs in 100 stores which allow consumers to see a view of children as they are handed boxes of shoes. In North Face, consumers can see the wilderness through HMD technology (Li, 2016). In these situations, the focus is less brand- and product-centric, and more focused on creating an experience for consumers.

2.3 Virtual Worlds

Virtual worlds, computer-simulated spatial environments supporting communications amongst users via avatars, can be segmented into social virtual worlds (SVWs) and Massively Multiplayer Online Role Playing Games (MMORPGs). All virtual worlds can be classified along two dimensions: fantasy-realism and progression-emergence; while MMORPGs tend to involve more progression, since the game is scripted and determined by the game creator and

SVWs tend to provide more emergence, that is natural interactions and results, each virtual world may have varying components of fantasy versus realism (Schultze and Rennecker, 2007). Further, compared to simulations and AVEs, virtual worlds tend to draw participation from consumers seeking to fulfil needs related to socialization or escape (i.e., Eisenbeiss *et al.* 2012; Vrechopoulos *et al.*, 2009), which can reinforce existing brand meaning or lend new meaning to the brand through consumer co-creation processes (c.f. Vallaster and von Wallpach, 2013). Notwithstanding, past research suggests that the nature of social worlds makes it difficult for brands to effectively communicate or connect with users, since the world itself may incorporate distracting elements (Barnes *et al.*, 2015; Wasko *et al.*, 2011). However, feelings of telepresence can boost immersion (Faiola *et al.*, 2013), thereby enhancing persuasiveness of brand messages (Burrows and Blanton, 2016) and brand-related consumer responses (Cheung *et al.*, 2015; Nah *et al.*, 2012).

Although brands can choose to enter existing social worlds (e.g. Second Life, Habbo Hotel) or may look to future social worlds (Eadicicco, 2017), brands also can invest in creating their own worlds to enrich brand engagement (Addis, 2005). Importantly, from a high product involvement perspective, brand involvement determines willingness to visit virtual stores in social worlds (Krasonikolakis *et al.*, 2014), where users are commonly involved in virtual consumption activities that resemble actual experiences (Bloomfield and Rennkamp, 2009). In addition to selecting virtual stores, users can spend virtual money, visit virtual shopping malls, and shop with the several brands with established retail shops inside existing SVWs (e.g. Toyota, Reuters, Nokia, and Dell); brands use feedback from these experiences for concept testing and product development (Hemp, 2006). Within these shops, brand avatars interact with users to communicate personalized marketing messages and provide customer service (Belisle and Bodur, 2010; Hanus and Fox 2015). Although little research exists on virtual consumption in SVWs (Animesh *et al.*, 2011), most recent research

demonstrates that virtual product and brand preferences reflect real-world product preferences (Jung and Pawloski, 2014a), such that experiential factors impact users' intention to purchase items in a SVW (Animesh *et al.*, 2011). However, brands should realize that the social dynamics of the virtual world can bring new meaning to the brand through co-creation processes depending on brand involvement (Vallaster and von Wallpach, 2013).

MMORPGs offer a less-involving brand experience. Approximately 20 million users are engaged in MMORPGs (MmoData, 2012), and thousands of players interact through avatars in detailed 3D virtual worlds independent of others (Billieux *et al.*, 2013). Members often develop strong bonds with one another (Blanchard and Markus, 2004) and exhibit the same social group rules as those who meet face-to-face (McKenna and Bargh, 1998). Within both MMORPGs and SVWs, brands have several options for reaching consumers indirectly, including endorsement deals, product placement, and sponsorship.

Marketers can engage social influencers to speak about products or give information (Barnes and Pressey, 2012). As credible sources, social media influencers can speak about certain brands within MMORPGs, use the brand within the virtual world, or spread vWOM (virtual world of mouth) as an avatar. More relevant for MMORPGs, brands can engage in product placements or sponsorships. In fact, avatar clothing, accessories, animation, and virtual estate or furniture jointly corresponds to 85% of virtual good sales (Jung and Pawloski, 2014b). However, product placement should be carefully executed. Product placement in virtual worlds (e.g. purchasing Nike shoes within the game) can increase brand attitudes and brand saliency but can backfire if not a relevant fit for the game (Homer, 2009).

Moreover, brands can choose to sponsor a special edition of a game or a product line, depending on level of fit with the type of MMORPG chosen. Tiffany Cartier, a blend of two luxury jewellery retailers, is present in World of Warcraft's Dalaran. The extent of message boards about the products available at this store indicates high user interest. While no brand

has sponsored a level yet, such a sponsorship provides an additional opportunity for marketers (Meta Gamer, 2015).

4. A Dual Model of Effective VR: High & Low Involvement

Consumers may engage with VEs in states of either high or low product brand involvement. Again, we define involvement as the extent of a user's engagement with the brands' offerings to motivate purchase in an environment and/or the situation (Vorderer, 1992). High (low) involvement, therefore, refers to situations in which a user interacts with the products and the retail environment at greater levels compared to any other engaging experience (Jin 2009).

Further, involvement may be an antecedent state prior to the experience or a contextual state induced by the environment (i.e., Goh and Ping, 2014). Consumers with high antecedent involvement likely have a high interest in the application of the technology aside from the sensory engagement of the experience (i.e., an interesting virtual world or a highly-anticipated remodeling of one's house). Contextual involvement, by contrast, can be spurred through greater sensory input – the extent to which a user's real senses are engaged by a VE directly influences the level of the user's engagement with the overall experience (Gutiérrez *et al.,* 2008; Guttentag, 2010), especially when this engagement leads to flow (i.e., Cheon, 2013; Huang *et al.,* 2011; Papagiannidis *et al.*, 2013).

Antecedent involvement arises from consumer interest in the context of the brand and affords the opportunity for compelling VR-based strategies. Marketers seeking to enhance antecedent involvement, therefore, should ensure that brand-oriented VR applications are targeted to consumer segments that are likely to respond well to the brand. Conversely, contextual involvement arises from the VR experience itself. Even if consumers do not enter a VR experience with antecedent brand involvement, marketers can induce states of high

involvement through multisensory environments. Thus, marketers should emphasize the sensory experience to consumer segments with low antecedent brand involvement and ensure that the experience delivers on its sensory promise. Through both routes – high and low involvement – brands can utilize VR to boost consumer outcomes, such as purchase behavior, satisfaction, and brand loyalty.

We propose that consumers may follow one of these two involvement routes in their engagement with VR, as illustrated in Figure 1 below. One route, focused on high involvement, operates through the imagination and telepresence to influence consumer responses. The low involvement route, on the other hand, operates through interactivity. As indicated by prior research, the high involvement route with imagination (versus interactivity) leads to more enduring consumer attitudes and responses toward the brand (Coyle and Thorson, 2001). Each of these routes is discussed in turn.

Insert Figure 1 Here

3.1 The High Product Involvement Route

We argue that high involvement VR directly affects consumer responses through the imagination, co-creation, and telepresence as a result of active processing (Li *et al*., 2001). Active processing relates to a direct strategy of influence, where the retailer has a strong presence in VR and incorporates both enjoyment and tangibility that feed the imagination and telepresence. Additionally, this route affords the ability to engage in co-creation due to the high engagement, extent of interaction, fun, and potential presence of brand-related others afforded in the high involvement route. Because telepresence requires deep engagement and processing, telepresence is unlikely to exist in low involvement strategies.

3.1.1 Building Imagination: Product Knowledge & Sensory Information

The core process of the high involvement route begins with the imagination, defined as the mind's visions resulting from the combination of pre-existing information and new information in the sensory environment (Cowan and Dai, 2014). Thus, consumers engage their imagination when experiencing sensory marketing as if they are interacting with a product (Cian *et al*., 2014; Eelen *et al*., 2013; Elder and Krishna, 2010). In order for the imagination to engage effectively, the user must have both product knowledge and incoming sensory information (Spears and Yazdanparast, 2014).

Because the imagination requires pre-existing information, higher product knowledge improves the ease of imagining. In fact, encountering non-visual sensory cues biases individuals to expect consistent visual perceptions (Madzharov *et al.,* 2015). Consumers may already have high product knowledge or can gain product knowledge through VR, which enhances such knowledge through greater sensory input and cognitive processing (Ariely, 2000; Pantano and Servido, 2012). Without specific knowledge of a product, imagining the nature of and interactions with that product is difficult (Spears and Yazdanparast, 2014); thus, in VR, retailers can increase knowledge through sensory cues to facilitate the imagination, especially when such cues are non-visual (Eelen *et al*., 2013; Madzharov *et al.,* 2015). In support of this assertion, rich sensory environments can promote information processing and reduce the need to rely on memory (i.e., Maity *et al.*, 2018).

VR systems' ability to provide high quality, sensory information has improved since the emergence of VR-type technologies (Burdea and Coiffet, 2003; Gutiérrez *et al.,* 2008), and modern VR systems strive to create VEs that enable users to experience situations through interaction that stimulates the five senses and evokes vividness (Coyle and Thorson, 2001; Price *et al.,* 2013; van Kerrebroeck *et al.,* 2017). In VR, sensory engagement requires accounting for all the senses (i.e., vision, taste, touch, smell, and hearing) and can make

virtual experiences both more immersive and tangible (Krishna, 2012; Nilsson *et al.*, 2016; Shih, 1998). Through their senses, consumers are more persuaded of brand attributes (Sengupta and Gorn, 2002).

A review of extant literature shows that sensory marketers have focused primarily on vision because it leads to higher brand appeal (Krishna, 2012; Yoo and Kim, 2014). Thus, enhancing the visual senses increases the imagination and telepresence (Cowan *et al.*, 2017). Following, auditory stimuli is easy to facilitate as music can lead to enhanced consumer evaluation, especially when consistent with consumer expectations (Hui *et al.*, 1997). In VR, music influences consumers' physiological responses through vividness and volume and enhances cognitive and emotional involvement via tone, brand congruity, and attention (Cuny *et al.*, 2015; Richard, 2005; Zentner *et al.*, 2008).

Olfactory stimulation, while not easily integrated into VR, can be achieved with olfactory displays (Gutiérrez *et al.*, 2008; Washburn and Jones, 2004). Smells in VR can increase product focus and enhance awareness and memorability of product features due to heightened immersivity and, therefore, telepresence (Tomono *et al.*, 2011). Although olfactory stimuli are not widely used, retailers can control smell within a CAVE or in combination with an HMD in-store, and some games and movies include options for smells (Brkic and Chalmers, 2010; Murray *et al.*, 2017).

Like olfactory stimuli, gustatory stimuli are in early stages of development in VR (Iwata *et al.*, 2004) and currently rely on haptic interfaces to mimic the tastes, sounds, and feelings of eating (Hashimoto *et al.,* 2008). Because this sense is the most complicated to implement due to technological constraints, it will likely be the last sense to become integrated in VR. However, retailers who use VR in stores can overcome this challenge by complementing experiences with real gustatory products (i.e., food and beverages).

Finally, touch enhances purchase intentions and requires greater physical proximity in that it is harder simulate (Peck *et al.,* 2013). Effective haptic cues can increase tangibility and product desirability through the imagination, even for those who have a high need for touch (Cowan *et al.,* 2017; Jin, 2011). Currently, VR utilizes instructions or images of textures to focus individuals on haptic features or integrated sensations reminiscent of actual product characteristics, such as vibrations (Peck *et al*., 2013). For instance, vibratory (versus auditory) signals were perceived as more personal and thus received stronger responses (Hadi and Valenzuela, 2016).

Research suggests that greater sensory input is better, with congruent stimuli leading to increased consumer evaluations (Krishna, 2012; Yalch and Spangenberg 2000) and that consumers will allocate more attention and involvement to such stimuli (Huang, 2006). Because individuals who have low or non-existing knowledge about a product have difficulty using their imagination without additional input (Cowan *et al.,* 2017; Eelen *et al*., 2013; Spears and Yazdanparast, 2014), marketing efforts using tailored sensory stimuli can provide enough information to assist in imagining, making individuals feel part of the virtual experience and more present. However, excessive information can lead to information overload – enhanced product knowledge combined with high sensory information can actually decrease consumer responses (Cowan *et al.,* 2017). Thus, sensory information should be balanced with pre-existing information to avoid under- or overstimulation, which would impede the imagination. By assessing prior knowledge and adjusting sensory input accordingly, marketers can keep users within an optimal range for the imagination.

P_1: Product knowledge and sensory input increase the effectiveness of the imagination along an inverted parabola, such that too little or too much knowledge/input renders the imagination ineffective.

3.1.2 Stimulating Imagination: Tangibility & Immersivity

Tangibility and immersivity are critical components to stimulate imaginations of direct experiences (Huang, 2006). Consisting of mental, physical, and specific components, tangibility is the ease with which one can comprehend, physically experience, or precisely describe attributes of a product or experience (Laroche *et al.,* 2005). In VR, tangibility stems from gustatory and haptic factors because these senses involve more tactile qualities and require greater proximity. As the imagination requires incoming information in the present as well as previously stored knowledge, tangibility engages and accelerates the imagination by enhancing the ease of processing of incoming sensory information. As a result, the better imaginations foster greater telepresence, which leads to more favorable product evaluations (i.e., Wang and Datta, 2010).

Meanwhile, immersivity is defined as a technology's ability to develop a convincing and realistic environment in which the user can interact (Li *et al.*, 2002; Schultz, 2010; Slater and Wilbur 1997). Slater and Wilbur (1997) identify five characteristics of immersivity: inclusiveness (diversion of focus from the real world), extensiveness (extent of sensory input), surroundingness (extent of panoramic display), vividness (richness of features; Shih, 1998), and proprioceptive matching (alignment of perceptual means with virtual interface; Nash *et al.*, 2000). Immersivity creates an experiential context that completely invades users' perceptual, emotional, and psychological processes, such that immersed users become involved (Foulsham *et al.*, 2011). Therefore, we propose that immersivity increases the absorption of the person in VR, engaging the imagination and leading the consumer to experience telepresence.

P$_2$: Tangibility and immersivity increase the effectiveness of the imagination in VR.

3.1.3 Building Co-Creation Opportunities

It is worth noting that co-creation opportunities may present unique and varied opportunities for brands. Because individuals may participate in VEs due to the level of interactivity, fun, and socialization (Eisenbeiss *et al.* 2012; Vrechopoulos *et al.*, 2009), specific consumer-brand interactions in VEs should involve more participation and co-creation, which can shape the meaning of the brand (Vallaster and von Wallpach, 2013). For instance, brand purchase and product evaluations when using virtual mirrors stem not from the product itself but from co-creation in the process and from the photo uploaded by the user (Cho and Schwartz, 2012). Entertainment and socialization can increase purchase intentions (Schlosser *et al.*, 2003), whereas co-creation opportunities increase purchase behavior (Cheung et al., 2015; Hanus and Fox, 2015). Thus, the level of engagement stems from control over the VE and co-creation activities, which induce flow states and telepresence (Huang *et al.*, 2011; Papagiannidis *et al.*, 2013).

Because SWs involve other users, brands should understand how these other users promote the brand to reinforce existing brand meaning or spread alternative, negative brand messages (Vallaster and von Wallphac, 2013). Moreover, SWs allow users to escape their own worlds to create new ones, be creative, and socialize with others (Eisenbeiss *et al.*, 2012). This could be beneficial to brands allowing co-creation opportunities, especially for consumers who have high brand involvement. Thus, we propose co-creation as an additional mechanism, an alternative to the imagination, through which the high involvement route can be achieved. As such, co-creation opportunities can elicit telepresence.

P₃: Activities in VEs that co-create brand experiences can increase or decrease the effectiveness of brand messages, depending on who spreads the brand message (e.g., offender, promoter, or brand) and the manner in which the brand enables user co-creation.

3.1.4 Telepresence

Telepresence is the rewarding sense of being present in an environment that appears natural and indirectly flows from the combination of tangibility and immersivity in the imagination (Beuckels and Hudders, 2016; Hopkins *et al.,* 2004; Hyun and O'Keefe, 2012). According to Sheridan (1992), five variables induce telepresence: sensory information (i.e. stimuli), control of sensors, ability to control the physical environment, task difficulty, and greater degree of automation. While in telepresence, consumers are in a deep state of attention and involvement from imagination of direct experience (Cuny *et al.,* 2015; Huang, 2006). Telepresence can also reinforce the link between education and entertainment in VEs (Rheingold, 1992), thus the double arrow from telepresence and imagination in Figure 1.

Likewise, engagement with the brand as a result of co-creation opportunities or via others' co-creation of the brand message can create states of flow and telepresence (Huang *et al.*, 2011). In fact, regardless of whether a person is warned that the co-creation opportunity is intended to boost sales, co-creation increases brand attitudes and purchase intentions (Cheung *et al.*, 2015; Hanus and Fox, 2015; Hyun and O'Keefe, 2012). Though there has been little research in this area to explore co-creation activities in VEs, we predict that telepresence can be used in high product involvement situations to increase consumer responses toward the brand. As a type of socializing activity (Schlosser et al., 2003), co-creation can be used to build consumer-brand relationships, especially for brand promoters, who spread the brand's good word (Vallaster and von Wallpach, 2013).

The ultimate result of telepresence is enhanced consumer evaluations (Badrinarayanan *et al.,* 2015; Spielmann and Mantaonakis, 2018; Suh and Chang, 2006) and even increased product value (Cheon, 2013). For example, Fiore *et al.* (2004) find that customizing products leads to positive, unique, and stimulating experiences, and Hyun and O'Keefe (2012) found that telepresence boosted consumer intentions to act on travel information gained during a

computer-mediated experience. Moreover, when imaginations evoke more vividness, they stimulate heightened telepresence and result in more enduring brand attitude change (Coyle and Thorson, 2001). Because VEs offer a suitable environment for simulated product customization, brands can leverage VEs as mass customization tools that boost or reinforce brand involvement and lead to stronger purchase and loyalty behaviors.

P4: Telepresence mediates the relationship between imagination and consumer responses, such that consumers who feel greater telepresence exhibit more positive consumer responses to brands (i.e., purchasing, satisfaction, loyalty). However, too much input contributing to the imagination can disrupt this mediation.

P5: Telepresence mediates the relationship between co-creation activities and consumer responses, such that consumers who feel greater telepresence exhibit more positive consumer responses to brands (i.e., purchasing, satisfaction, loyalty). However, brand offenders can disrupt this mediation.

As a key component of high involvement VR, telepresence decreases risk perceptions while increasing accessibility of the environment and product category knowledge (Badrinarayanan *et al.,* 2015; Nilsson *et al.*, 2016; Pantano and Servido, 2012). Thus, because VR allows consumers to experience products in a simulated first-hand manner, much of the perceived risk involved with purchasing products that cannot otherwise be tested or experienced prior to purchase is removed. For example, in non-VR online environments, consumers viewing a static, two-dimensional product image are unable to thoroughly gauge sensory cues related to the product, which leaves a significant level of information asymmetry and, therefore, uncertainty to the purchase decision. However, the use of simulations or even

more advanced VR technologies such as CAVEs or HMDs allow consumers to experience

these cues through proxy, which decreases uncertainty. Thus, in high involvement scenarios,

VR strategies should be especially effective in scenarios with a high level of perceived risk.

> **P6:** High involvement VR strategies are more influential for products with a
>
> high degree of perceived risk.

3.2 The Low Product Involvement Route

In contrast to the highly sensorial nature of the high involvement route, the low

involvement route operates through interactivity. Whereas tangibility and immersivity attempt

to replicate true sensory experiences, interactivity offers a reduced sensory appeal that

engages the consumer with the brand at a more superficial level. While such an approach

would lead to suboptimal use of the imagination in the high involvement route, consumers in

the low involvement route may have low available resources and would be unlikely to

respond well to high sensorial input. Thus, interactivity provides an experience (directly or

indirectly with the brand) that focuses not on the product or purchase, but instead on

engagement in a fun experience. For example, Li *et al.* (2001) find that 3D advergames

enhance brand evaluations when the game theme fits with the brand identity and the game has

high interactivity. Additionally, with advertising messages in Second Life, user ability to

customize the avatar communicating the message (i.e., high user interactivity) increases brand

responses (Jin, 2009), such that interactivity and enjoyment indirectly affect attitudes toward

the brand (Nah *et al*., 2010). Thus, the relatively engaging experience can lead to positive

feelings toward a brand despite low cognitive resources devoted to evaluations.

Because interactivity requires much fewer processing resources, it should be more

effective in low product involvement situations. In some cases, low involvement situations

may feature the retailer/brand in a subtler manner or may provide an experience without

product purchase as a central goal of the interaction. In these cases, interactivity may provide images without entailing most of the criteria for effective high-involvement VR, such as telepresence and affordance (Li *et al.*, 2001). Affordance relates to the product features and evaluation, and since affordance is not granted in low involvement, any sensory elements provided would not relate to product trial and evaluation. For instance, product placement in a MMORPG would not elicit the high tangibility or immersivity with a brand compared to a transaction with the same product in an SVW virtual mall. However, engagement with games in virtual worlds can influence how consumers evaluate a brand (Cheung *et al.,* 2015).

Additionally, consumers in situations of low involvement are less willing to process incoming information. While sensory information is suitable for low involvement VR, we argue that the focus in low involvement situations should be on visual and verbal inputs as these create a fun, pleasurable environment. Meanwhile, other senses are more taxing, perhaps even too taxing, since they require greater levels of processing. By reducing the number of sensory inputs, the experience shifts from one of tangibility to one of interactivity, which provides a pleasurable and processable experience. The pleasure arising from the interactive, low involvement route should become associated with the brand or product in an indirect manner. Therefore, low-involvement VR experiences should boost elements of interactivity, leading to indirect attitude change.

> **P7:** Low involvement strategies should be less tangible, which should lead to indirect attitude and intention change through the process of interactivity.

3.3 Choosing a Strategic Level of Involvement: The Role of Product Types

At least two product types should moderate the effectiveness of the dual involvement routes in VR: products with sensory classifications and hedonic products. VR may be more

effective among design-focused products, including apparel, home, and automobile, provided that the relevant VR attributes align with the product attributes (Jung and Powloski, 2014a). For products that have visibly salient attributes (e.g. buttons or colors), consumers only need to see them to select them and make a purchase. According to McCabe and Nowlis (2001), these types of products are called geometric (i.e., visual) products. However, products with tactilely salient attributes (e.g., material products; McCabe and Nowlis, 2001), such as a fur coat or fuzzy blanket, require further information from tactile input; some products require tasting or smelling, like wine or perfume. Lastly, other products are more mechanical, requiring control and manipulation to identify how the product functions. This classification may include more complex tactile products. Depending on the sensorial classification of the product (visual, tactile, or mechanical), users require difference levels of sensory input to evaluate the product (Li *et al*., 2003).

As argued above, the imagination can make up for the absence of physical touch and manipulation in the virtual environment. Thus, providing the appropriate sensorial inputs will increase product knowledge as it increases cognitive thoughts, brand attitudes, and decision quality. For example, 3D product presentation of visual products produced increased consumer product responses, whereas 2D product presentation increased responses for tactile and mechanical products (Li *et al*., 2003). However, for tactile and mechanical products, more involved VR environments can provide the haptic stimuli or manipulation to move consumers close to preference for a brand or product.

> **P_{8a}:** VR experiences in which product features require sensory
> manipulation, such as mechanical and more complex tactile products,
> should emphasize the high product/brand involvement VR route.

P₈ᵦ: VR experiences lacking the need for sensory manipulation, such as visual and less complex tactile products, should emphasize the low product/brand involvement VR route.

Finally, since hedonic products appeal to the consumer's affective dimension, highly sensorial VR is likely to be more successful among consumers in high involvement. Likewise, as Li *et al.* (2003) indicate, enjoyment is a critical part of VR strategies to induce telepresence. Additionally, higher cognitive involvement with hedonic products leads to more positive brand evaluations (Spears *et al.*, 2016). Therefore, VR strategies for hedonic products are likely to be more successful in the high involvement path.

P₉: VR with hedonic (vs. utilitarian) products should be more successful along the high (vs. low) involvement path.

5. General Discussion

This conceptual paper provides several noteworthy contributions. First, this work unifies multiple divergent literature areas to provide an introduction and typology of VR. This is one of the first instance where all VR instances have been combined in order to provide propositions to guide future research as well as offer suggestions of retailer and brand considerations in the formation of VR strategies. At present, VR consists of simulations, AVEs, and virtual worlds. Each of these categories presents unique opportunities for marketers depending on the level of product involvement designed by the brand. Namely, when brands desire to sell products and engage consumers in high product involvement, responses will be more favorable when VR consists of product simulations, engagement advertising, v-commerce, product-focused AVEs, co-creation activities, or marketer-created/retail-slotted VWs, while low product involvement should necessitate strategies

including mobile applications, pop-up shops, MMORPGs, product placements, and sponsorship/endorsement within VWs. Moreover, for high product involvement, sensory input, such as immersivity and tangibility, as well as building consumer knowledge or co-creation activities permitted in SWs would enhance consumer responses. However, in low product involvement strategies, these facets might take away from brand engagement.

Wisely-created strategies would embody elements of multiple cells in this typology to capture both high and low product involvement by utilizing VR applications and technology within the same broad VR campaign. Of course, more advanced VR (i.e., CAVEs and HMDs) requires more financial investment from either companies or consumers (or both), and participation in VWs can be a significant investment in time, money, and relational capital with software firms. Thus, rather than serving as a catch-all for aggressive modern marketing efforts, the use of VR should be carefully planned, executed, and evaluated, as with any other marketing strategy, as one element in the integrating marketing communications plan.

Second, by conducting a comprehensive literature review, this work proposes a conceptual involvement-based dual process model of effective VR, which can guide both theory and practice. Based on this model, involvement is an important factor in the selection of optimal VR strategies. For high product involvement situations, boosting tangibility and immersivity is desirable – doing so can enhance the imagination, which leads to a heightened sense of telepresence. Similarly, co-creation opportunities can lead to increased consumer responses, likewise through telepresence. However, if product knowledge is already high, then greater levels of immersivity and tangibility may lead to information overload, dampening the effectiveness of the imagination and subsequently reducing telepresence. On a similar note, brand offenders could potentially decrease brand responses or disrupt positive experiences for other consumers. Thus, for consumers possessing a high degree of product knowledge prior to the experience, a tangibility-focused sensory strategy or user co-creation

experiences with the brand are desirable. For low product involvement, promoting interactivity should help motivate consumer-brand relationships and avoid the risk of overburdening consumer processing capabilities. In this vein, future research should investigate the role of types of authenticity (i.e., objective/constructive; Wang, 1999) and hedonic pleasure (Shih, 1998) in interactivity, given that these aspects influence how consumers perceive VR and potential relationships between VR and interactivity.

Finally, product types and inherent risk may influence the effectiveness of various VR strategies at different levels of involvement. Thus, these factors of type and risk should guide the desired route for VR strategies. For example, the ability of high involvement VR to reduce information asymmetry alleviates perceived risk, which means that VR strategies should be more effective among product contexts of higher risk. Additionally, various product types may lend themselves better to high involvement VR, including complex tactile, mechanical, and hedonic products.

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Table 1. Typology of VR Technology

	VR Technology		
	Simulation	**Automated Virtual Environments**	**Virtual Worlds**
High Involvement	Product Display in Websites Engagement Advertisements	CAVEs and HMDs: V-commerce	Marketer-created virtual worlds (Branded Entertainment) Retail in SVWs
Low Involvement	Mobile Applications	CAVEs and HMDs: Pop ups	MMORPGs Product Placement Sponsorship Endorsers

Figure 1. The Dual Model of Involvement for VR.