From ‘touch’ to a ‘multisensory’ experience: The impact of technology interface and product type on consumer responses

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Abstract

Online retailers are increasingly using augmented reality (AR) and virtual reality (VR) technologies to solve mental and physical intangibility issues in a product evaluation. Moreover, the technologies are easily available and accessible to consumers via their smartphones. The authors conducted three experiments to examine consumer responses to technology interfaces (AR/VR and mobile apps) for hedonic and utilitarian products. The results show that AR is easier to use (vs. app), and users find AR more responsive when buying a hedonic (vs. utilitarian) product. Touch interface users are likely to have a more satisfying experience and greater recommendation intentions, as compared to AR, for buying utilitarian products. In contrast, a multisensory environment (AR) results in a better user experience for purchasing a hedonic product. Moreover, multisensory technologies lead to higher visual appeal, emotional appeal, and purchase intentions. The research contributes to the literature on computer-mediated interactions in a multisensory environment and proposes actionable recommendations to online marketers.

Keywords: Multisensory technologies, augmented reality (AR), virtual reality (VR), mobile apps, haptic interface, emotional appeal, visual appeal

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1. INTRODUCTION

Consumers prefer a novel, vivid, and visually rich sensory environment that offers a multisensory shopping experience and enhances their cognitive and affective responses (Krishna, 2012; Labrecque, 2020; Simmonds, Bogomolova, Kennedy, Nenycz-Thiel, & Bellman, 2020). Online and offline retailers have an arduous task of fulfilling the multisensory needs of shoppers, especially young consumers, who extensively use technology-mediated environments to make purchase decisions (Heller, Chylinski, Ruyter, Mahr, & Keeling, 2019; Petit, Velasco, & Spence, 2019). Firms (e.g., Sephora and IKEA) are experimenting with cutting-edge technologies such as augmented reality (AR), virtual reality (VR), and 3D projections to simplify the consumer decision journey, which leads to higher consumer engagement and purchase intentions (Biswas, 2019; Grewal, Noble, Roggeveen & Nordfalt, 2020; Holzwarth, Janiszewski, & Neumann, 2006). The global AR and VR market is expected to generate revenue of US $22.1 billion in 2020 and is projected to reach US $161.1 billion by 2025 (Vynz Research, 2020).

One of the most prominent competitions, as well as an enabler for AR/VR technologies, is the omnipresent smartphone, which offers a haptic experience to online shoppers (Chung, Kramer, & Wong, 2018). In the context of online purchases, most of the research has explored the effects of one sensory modality in isolation, for example, the role of touch interface (Chung et al., 2018) and influence of interactive music in online shopping contexts (Hwang, Oh, & Scheinbaum, 2020). On the other hand, extant research on AR/VR is mostly limited to the immersive and vivid experiences of technology (Bonetti, Warnaby, & Quinn, 2018; Flavián, Ibáñez-Sánchez, & Orús, 2019) and how consumer responses vary between AR/VR and non-AR/VR environment like websites (Javornik, 2016).

The consumer journey significantly varies across devices such as desktop, laptop, smartphone, and tablets (Kannan & Lee, 2017; Wagner, Schramm-Klein, & Steinmann, 2018). Despite the extensive research on the influence of sensory marketing on consumer behavior (Krishna, 2012), considerably less is known about how consumer responses differ between multisensory (e.g., AR/VR) and unisensory interfaces. Moreover, how consumers interact with immersive technologies is an underexplored research area (Labrecque, 2020). For example, previous work has investigated the impact of AR/VR on consumer satisfaction and loyalty (Hudson, Matson-Barkat, Pallamin, & Jégou, 2019), but the effects on overall consumer experience, emotional appeal, and word-of-mouth (WOM) behavior are yet to be ascertained.

Furthermore, consumers display higher involvement and willingness to pay for hedonic products and services presented in dynamic formats (e.g., using videos on a website) that appeal to multiple senses (Roggeveen, Grewal, Townsend, & Krishnan, 2015; Simmonds et al., 2020). Similarly, a VR interface facilitates a better understanding of high experiential products than low experiential products (Suh & Lee, 2005). Whether consumers display similar behavior for utilitarian and hedonic products in a multisensory environment is not yet researched (Yim, Chu, & Sauer, 2017).

Therefore, the purpose of the present research is to investigate how consumer responses vary between different interfaces (multisensory and haptic) and product types (utilitarian and hedonic). Compared to unisensory interfaces, multisensory interfaces (AR/VR) offer users vividness and interactivity in a sensory-rich environment (Flavián et al., 2019; Steuer, 1992). This research builds on the theory of vividness (Nisbett & Ross, 1980) that emphasizes the vividness perspective of VR/AR interfaces and suggests that the vivid information generates higher imagination in consumers' minds leading to increased consumer involvement and experience.

The present study contributes to the growing literature on integrating digital, haptic, and multisensory interfaces and their effects on consumer behavior (Kannan & Lee, 2017; Labrecque, 2020). We conduct three experiments in this research, and the results show that AR is easier to use (vs. app) and more responsive when buying a hedonic (vs. utilitarian) product. A multisensory environment (AR) results in a more positive user experience for purchasing a hedonic product. Furthermore, multisensory technologies lead to higher visual appeal, emotional appeal, and purchase intentions. The findings favor the introduction of multisensory features to improve consumers' cognitive and affective responses. We recommend marketers to develop and promote multisensory experiences and utilize them to generate favorable WOM for their products and services.

2. THEORETICAL BACKGROUND

A vast amount of literature exists on sensory marketing, with recent research paying more attention to the emergent technologies that provide a multisensory experience to consumers (Heller et al., 2019; Labrecque, 2020; Petit et al., 2019). By definition, sensory marketing deals with consumer perceptions, judgment, behavior, emotion, and cognition (Krishna, 2012). A unisensory interface stimulates only one sense (e.g., listening to a song streaming on a smartphone), whereas a multisensory interface engages with multiple senses (visual, auditory, haptic, olfactory, and taste), for example, watching a song on YouTube influences visual and auditory senses. Immersive technologies like VR and AR are the frontrunners that offer unique multisensory digital experiences to users (Spence, Puccinelli, Grewal, & Roggeveen, 2014). VR is a realistic computer-generated multisensory environment (e.g., a virtual scuba diving stimulation or a virtual car showroom) where users can interact with virtual objects in real-time using headsets or other devices (Petit et al., 2019; Steuer, 1992). On the other hand, AR technology superimposes sensory information on real world

objects (e.g., IKEA place app). Both technologies facilitate information search, solve physical and mental intangibility issues, and reduce the cognitive load of shoppers (Heller et al., 2019).

In the context of technology-mediated environment, vividness refers to the "ability of a technology to produce a sensorially rich mediated environment" (Steuer, 1992, p.80). We draw on the theory of vividness (Nisbett & Ross, 1980) to evaluate and compare haptic-only and multisensory interfaces on various consumer responses. Past research suggests that vivid environments are perceived more visually appealing, playful, novel, interesting, and emotionally arousing than non-vivid environments (Flavián et al., 2019; Roggeveen et al., 2015; Yim et al., 2017).

A rich sensory environment also has a feedback mechanism to help consumers in product evaluation (Heller et al., 2019). Hence, responsiveness of sensory interface significantly influences consumer experiences and usage intentions (Petit et al., 2019). Moreover, an intuitive user interface that is easy to use and its performance (responsiveness) are the two critical characteristics of any successful mobile app (Fisher, 2019). Hence, in this research, we evaluate the two sensory interfaces on ease of use and responsiveness.

One of the most prominent features of AR/VR is the projection of the real-life world and visualization of the physical environment. Consumers can see how a piece of furniture will fit into their homes or do a virtual trial of a dress before making a purchase. Marketers in the tourism industry use VR to offer potential travelers an immersive experience of destinations (e.g., undersea environment) to increase the chances of bookings (Tussyadiah, Wang, Jung, & tom Dieck, 2018). Such imaginative simulations cater to the emotional and visual needs of potential visitors by providing enjoyable and playful experiences (Flavián et al., 2019). Moreover, touch and multisensory interfaces enhance consumer engagement, affect, and purchase intentions in an online environment (Chung et al., 2018; Hwang et al., 2020). Consumers having a positive and novel experience are more likely to discuss and recommend

the brand to others (Berger, 2014). Thus, we examine the effects of sensory interfaces on emotional and visual appeals, word-of-mouth behavior, and overall experience to understand users' affective and conative responses in a technology-mediated environment. Furthermore, we evaluate and analyze consumer responses toward hedonic and utilitarian products for a holistic understanding of the role of product type in a rich sensory environment (see Figure 1).

2.1 Ease of use and responsiveness: AR interface

Extant research suggests that many factors determine the perceived ease of use of any new technology (Venkatesh & Bala, 2008). Consumers perceive technology easy to use when technology embeds an additional dimension of playfulness, such as mobile games (Labrecque, 2020). From a task achievement perspective, the technology must reduce the cognitive efforts such that consumers should be able to complete the task with minimum efforts. In an online purchase, consumers face the uncertainties of how a product would fit with the surrounding space in their homes because they cannot physically evaluate the product. In such situations, AR provides 3D visualization, which reduces the cognitive load of making a consumer decision and simplifies product evaluation (Petit et al., 2019). Moreover, users find AR playful and enjoy AR features on their mobile phones (Delage, 2018).

Generally, AR interface is embedded into the existing mobile app, which means it uses the same set of device resources. Technically, AR would need more time to project visualization, but the time-delay could be so small that users would not notice it. Moreover, AR can significantly reduce the total purchase time because of 3D projections and visualization. We believe that users may perceive AR more responsive to their needs due to a playful and enjoyable experience. Thus, we propose the following hypotheses:

H1: Consumers will perceive AR (vs. mobile app) (a) easier to use, and (b) more responsive.

2.2 Word-of-mouth and overall experience: AR interface

Consumers share positive or negative WOM with others based on their overall satisfaction with the products and services (Berger, 2014). Consumers' WOM activities depend on post-purchase experiences and overall experiences with the purchase process (King et al., 2014). AR provides an immersive experience to users and enhances the overall experience for various situations, including product evaluation and purchase process (Petit et al., 2019). Multisensory interfaces (e.g., AR and VR) provide interactivity and vividness that positively influence consumer attitude toward interface and purchase intentions (Yim et al., 2017). In comparison, though haptic interfaces lead to a faster purchase decision (compared to non-haptic interfaces), they fail to provide a vivid and immersive experience to users (Chung et al., 2018). The online media has praised and written favorable content for AR/VR apps by IKEA and Sephora, resulting in thousands of app downloads. Similarly, Sephora's Virtual Artist, an AR-based app, has also received favorable mentions in the online media (Delage, 2018). This app allows users to try-on makeup in a real-life 3D virtualization, which has significantly reduced the number of clicks required and increased the online conversions. Many users are using AR/VR apps to create and post innovative content (e.g., selfies) on social media. An immersive and vivid experience is more likely to encourage consumers to talk about their experiences with others and make favorable recommendations (King et al., 2014). Thus, we propose the following hypotheses:

H2: For AR (vs. mobile app), consumers will display higher (a) WOM recommendation, and (b) an overall positive experience.

2.3 Visual appeal, emotional appeal, and purchase intentions: VR interface

The vividness theory suggests that when information is presented in a rich and vivid format, receivers are more likely to interpret and understand the communication (Steuer, 1992).

For example, a video conference is more effective than a phone call because video conferencing offers a multisensory experience (visual and auditory) to the participants. Similarly, virtual reality falls into the category of a very rich sensory medium for information communication because it is highly immersive (Flavián et al., 2019), where users can be part of the environment and enjoy sensory stimulations like in a real-world (Grewal et al., 2020).

Multisensory interfaces evoke higher emotional arousal (e.g., feelings of guilt and empathy) that encourages people to donate more money and participate more in social services (Kandaurova & Lee, 2019). The media-rich environment provides an excellent replica of real-world experiences. A good example is Hollywood movies, where users can enjoy mesmerizing experiences due to the extremely rich 3D projection of movie scenes. In contrast, media richness of a smartphone app varies depending on the functions and features used by users. For example, an audio call is less rich than a video call on the same phone. Though smartphones can facilitate voice interactions and haptic interactions (Chung et al., 2018), they lack VR's immersive experiences. Moreover, online retail stores have successfully used 'avatar sales agents' to induce the human touch leading to higher purchase intentions and satisfaction for consumers (Holzwarth et al., 2006). Both AR and VR provide a sensory-rich, aesthetic, and visually appealing interactive environment (Bonetti et al., 2018) that should enhance consumers' perceived visual and emotional appeals (Simmonds et al., 2020). Therefore, we hypothesize:

H3: For VR (vs. mobile app), consumers will display higher (a) visual appeal, (b) emotional appeal, and (c) purchase intentions.

2.4 The moderating role of product type

Product type significantly influences many consumer decisions, such as purchase behavior, attitude, and experience (Bonetti et al., 2018). Extant research on multisensory technology mostly focuses on interactivity and immersive experiences and ignores the

importance of product characteristics (hedonic and utilitarian) that may influence consumer perceptions and behavior. For example, VR provides a realistic experience that enhances consumer learning and improves knowledge about products (Suh & Lee, 2005). In this study, we follow the widely used product classification of hedonic and utilitarian attributes to examine whether the hedonic nature of multisensory technology impacts the purchase of a hedonic (or utilitarian) product.

Utilitarian products provide functional benefits, and users can fairly evaluate a product on parameters like quality and performance without consuming it. Conversely, consumers must consume or use a hedonic product to evaluate their performance (Voss, Spangenberg, & Grohmann, 2003). Research in the tourism and hospitality industry proposes that VR can act as a proxy for real tourism experience (Tussyadiah et al., 2018). Users can enjoy the virtual experiences of sea-exploration, scuba diving, and explore landscapes by using VR headsets and without visiting the real places (Flavián et al., 2019). Multisensory interfaces offer an environment of playfulness, interactivity, and entertainment, which resonates with the characteristics of hedonic products and enhances users' overall experience.

From a product evaluation perspective, a user can reasonably estimate the performance of a phone (utilitarian) based on technical specifications (e.g., processor, camera megapixels, screen size, and operating system). Nevertheless, a consumer must go to a restaurant (hedonic) to evaluate the parameters like ambience, taste of food, and service quality. The psychological concept of flow explains how consumers behave and respond to technology-mediated environments that offer fun, joy, interactivity, and immersion (Petit et al., 2019). Multisensory interfaces like VR applications (e.g., IKEA and Sephora apps) lead to a more intense flow (Javornik, 2016) because these interfaces offer users more control over their actions (e.g., product evaluation). A sensory interface provides instant feedback to users that simplify their purchase decisions leading to higher purchase intentions (Chung et al., 2018; Javornik, 2016).

For example, a consumer may have concerns about a tourist destination. She can explore (test) the physical destination using VR technology, which helps her make the final decision by reducing uncertainty and risks. Thus, we propose the following hypotheses:

H4: For hedonic products (vs. utilitarian products), the AR experience (vs. app) will lead to higher (a) word-of-mouth, and (b) overall positive experience.

H5: For hedonic products (vs. utilitarian products), the VR experience (vs. app) will lead to higher (a) visual appeal, (b) emotional appeal, and (c) purchase intentions.

To test the proposed hypotheses, we conducted three studies. Study 1 examines how users perceive multisensory technology (AR) and mobile apps for ease of use and responsiveness (H1a and H1b). Study 2 tests the user's WOM recommendation and overall experience with AR and app while purchasing hedonic and utilitarian products (H2a, H2b, H4a, and H4b). Study 3 investigates the visual and emotional appeal of VR and mobile app and explores users' purchase intentions (H3a, H3b, H3c, H5a, H5b, and H5c). We controlled for age, gender, and previous exposure to technology in each study.

3. STUDY 1

3.1 Method

A total of 128 students (M_{age} = 22 years, 39% females, age range = 18 to 29 years) from an Indian management university participated in the 2 (product type: utilitarian vs. hedonic) × 2 (technology: AR vs. app) between-subjects design. Young consumers were selected because they are heavy users of smartphones, do most of their shopping online, and have been used in prior research on multisensory interfaces (e.g., Chung et al., 2018; Heller et al., 2019). The experiment was conducted at a computer lab with partially-enclosed and separated seating such that participants could not see what others were doing.

Participants were assigned randomly to one of the four conditions. Participants were asked to imagine a situation where they were planning to make a purchase. They could buy

furniture (chair) for the college computer lab (utilitarian) or buy paint for decorating the house for festive decoration (hedonic). Prior research has used furniture (a utilitarian product) to examine the effects of multisensory interfaces on consumer responses (e.g., Javornik, 2016). We selected paint because the color of paint appeals to the vividness and visual modality (Labrecque, 2020). We selected the two products because participants had already used these products and were quite familiar with the features of products. Thus, participants could focus more on the buying aspect of the task rather than searching for product attributes. To manipulate the sensory interface, participants were asked to buy the product via a mobile app, with AR option switched on or off (see Appendix A for more details). Participants were told to add the selected product to the app's shopping cart to imitate the online purchase. All the participants were asked to use their own devices to avoid any potential issues due to the unfamiliarity with a new user interface or device size. After the completion of the task, participants completed an online questionnaire where they evaluated the following measures (adapted from Kim and Stoel, 2004) on a 7-point Likert scale: ease of use ($\alpha = 0.82$) and responsiveness ($\alpha = 0.86$; see Appendix A for more details). Participants also provided answers to demographic questions and time taken to complete the task. Lastly, participants were thanked for their time and received a fraction of course credit.

3.2 Results

A two-way analysis of variance (ANOVA) was conducted to analyze the data (see Table 1).

3.2.1 Ease of use

As predicted in H1a, the multisensory interface of AR was perceived more responsive than the haptic interface of smartphone app ($F(1, 124) = 13.35$, $p < .001$). Participants who used AR to make a purchase decision found the interface more responsive than those who used the app

(M_{AR} = 4.12, M_{app} = 3.96). The main effect of product type and interaction effect were not significant (*Fs* < 1).

3.2.2 Responsiveness

Contrary to our prediction in hypothesis H1b, the main effect of technology was not significant. The main effect of product type was also non-significant. But there was a significant two-way interaction of technology × product type (F (1, 124) = 4.27, p = .04), which was not earlier hypothesized. Planned contrasts revealed that participants perceived AR interface more responsive than the app while buying a utilitarian (chair) product (M_{AR} = 3.79, M_{app} = 3.35; F (1, 124) = 4.32, p = .04). On the other hand, participants did not display any significant difference in the responsiveness of the two interfaces for purchasing a hedonic product (*Fs* < 1, NS). The results suggest a boundary condition for the perceived responsiveness of the interface.

3.3 Discussion

Study 1 shows that users perceive a multisensory interface (AR) easier to use than a haptic-only interface (mobile app). However, we find a boundary condition about the perceived responsiveness of a device-interface. A multisensory interface appears more responsive than an app when users buy a utilitarian product, which is counter-intuitive. From a technological perspective, AR requires more hardware resources and computing power to process the user inputs and information. The finding can be explained with the multisensory experience of an AR environment, which provides instant feedback about how a piece of furniture will fit into the physical surroundings. The immediate feedback reduces the cognitive load of processing the information and risks associated with the purchase due to the physical intangibility (Heller et al., 2019).

The findings confirm the positive influence of a multisensory environment on the cognitive responses of consumers. In the next study, we focus on consumers' affective responses such as word-of-mouth recommendations and overall experience while buying hedonic or utilitarian products.

4. STUDY 2

4.1 Method

A total of 159 management graduate students (M_{age} = 24.7 years, 29.4% females, age range = 18 to 30 years) participated in this 2 (product type: utilitarian vs. hedonic) × 2 (technology: AR vs. mobile app) between-subjects design. The procedure and physical setup of this study were identical to the first study.

Participants were randomly assigned to one of the four conditions. The same products from Study 1 were used in this study, where participants were asked to imagine a situation to buy a product (chairs or paint). After completing the task, participants assessed the following parameters on a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree): word-of-mouth recommendation (α = 0.84, Mishra, Maheswarappa, Maity, & Samu, 2018), overall experience (single item), and purchase intentions (α = 0.88, Venkatesh & Bala, 2008; see Appendix A for more details). Lastly, participants were thanked for their time and received a course credit of 3 points.

4.2 Results

A two-way analysis of variance (ANOVA) was conducted to analyze the data (see Table 2).

4.2.1 WOM recommendation

The main effects of technology and product type were not significant (*Fs* < 1). Hence, hypothesis H2a is not supported. However, there was a significant two-way interaction of

technology × product type (F (1, 155) = 7.58, p = .007). Planned contrasts revealed that participants were more likely to provide WOM recommendations when they used AR interface (versus mobile app) to buy hedonic (paint) product (M_{AR} = 4.17, M_{app} = 3.80; F (1, 155) = 6.87, p = .007). While buying a utilitarian (chair) product, participants did not report a significant difference in WOM recommendations for both interfaces (Fs < 1, NS). Thus, hypothesis H4a is supported.

4.2.2 Overall experience

The main effects of technology and product type were not significant (Fs < 1). Hence, hypothesis H2b is not supported. There was a marginal significant two-way interaction of technology × product type (F (1, 155) = 3.45, p = .066). Planned contrasts revealed that participants had a more positive experience in using VR (versus app) when they bought a hedonic (paint) product (M_{AR} = 4.21, M_{app} = 3.97). When participants purchased a utilitarian product (chair), they had a more positive experience in the mobile app condition versus VR interface (M_{AR} = 3.93, M_{app} = 4.21). Therefore, the results support hypothesis H4b. The interaction effects are plotted in Figure 2.

4.3 Discussion

The results indicate that a multisensory interface (AR) has a positive influence on users' word-of-mouth recommendations and overall experience for hedonic purchases. However, AR does not show any significant impact on utilitarian purchases. In contrast, users show a more positive experience when they use an app to buy a utilitarian product. We believe this effect can be attributed to the matching characteristics of product and technology characteristics, where apps are considered more utilitarian and AR features are perceived more hedonic on the dimensions interactivity and vividness (Yim et al., 2017). People have a more positive experience for utilitarian products using a mobile app, and for AR (immersive) technology,

people show a more positive experience for hedonic products. This confirms the earlier finding of Study 1, where the product and technology characteristics are aligned with each other to positively influence consumer responses. In the next study, we decided to replace AR with VR technology, which offers relatively more vivid and immersive experiences to users (Flavián et al., 2018).

5. STUDY 3

In the first two studies, we examined the role of multisensory and haptic interfaces in the context of purchasing hedonic and utilitarian products. In this study, to capture the immersive experience and visual appeal of VR, we did not use the purchase task for manipulation. Instead, we used two advertisements, one for each product type (utilitarian and hedonic) to measure consumer responses.

5.1 Method

A total of 138 university graduate students (M_{age} = 22 years, 39% females, age range = 18 to 29 years) participated in this 2 (ad type/product type: utilitarian vs. hedonic) × 2 (technology: VR vs. mobile app) between-subjects design. The procedure and physical setup of this study were identical to the first study.

Participants were assigned randomly to one of the four conditions. Two ads were selected from YouTube, one for each product type. The first ad was about a tourism experience (hedonic), and the second ad was about a car (utilitarian). In the VR condition (multisensory), the ads were shown to participants (via a YouTube link) on a VR headset attached to their mobile phones. In the app (haptic) condition, participants saw the ads directly on their mobile phones via a YouTube link. After watching the ad, participants evaluated the following parameters on a 7-point Likert scale: visual appeal (α = 0.84) and emotional appeal (α = 0.85, Kim & Stoel, 2004; see Appendix A for more details), and purchase intentions (α = 0.91,

Venkatesh & Bala, 2008). In the end, participants were thanked for their time and received a course credit of 3 points.

5.2 Results

A two-way analysis of variance (ANOVA) was conducted to analyze the data (see Table 3).

5.2.1 Visual appeal

The main effect of technology was marginally significant such that participants rated the ad more visually appealing in VR vs. app interface (M_{VR} = 3.85, M_{app} = 3.64, F (1, 134) = 2.75, p = .09). The main effect was qualified by a marginally significant interaction effect between ad type and technology (F (1, 134) = 3.33, p = .07). Planned contrasts revealed that participants reported hedonic ad more visually appealing in VR (vs. app) condition (M_{VR} = 4.02, M_{app} = 3.41; F (1, 134) = 6.14, p = .015), whereas participants' rating of utilitarian ad did not differ significantly between VR and app interface (M_{VR} = 3.71, M_{app} = 3.68; *Fs < 1*). The main effect of ad type was non-significant. Thus, H3a and H5a are marginally supported.

5.2.2 Emotional appeal

As predicted in H3b, participants displayed higher emotional appeal when they used VR interface versus app (M_{VR} = 3.63, M_{app} = 2.98, F (1, 134) = 13.8, p < .001). The main effect of ad type was marginally significant such that participants displayed higher emotional appeal for hedonic (vs. utilitarian) ad ($M_{hedonic}$ = 3.45, $M_{utilitarian}$ = 3.16, F (1, 134) = 3.11, p = .08). The interaction effect for ad type × technology was non-significant (F*s < 1*). Thus, the results did not support H5b.

5.2.3 Purchase intentions

The main effect of ad type and technology were non-significant, hence no support for H3c. However, there was a significant interaction effect for ad type × technology (F (1, 134) = 4.56, p = .035). Planned contrasts revealed that participants were more likely to buy utilitarian products in VR (vs. app) condition (M_{VR} = 3.55, M_{app} = 2.96, F (1, 134) = 5.86, p = .017), supporting H5c. For utilitarian products, participants did not show any significant difference in their purchase intentions between two interfaces (Fs < 1, NS). The interaction effects are plotted in Figure 3.

5.3 Discussion

As expected, users perceive a multisensory interface like VR more visually and emotionally appealing, which supports the findings about the immersive nature of VR technology (Flavián et al., 2018; Tussyadiah et al., 2018). The results extend and reaffirm the conclusions of the previous two studies on the combined effect of product and technology characteristics on consumer responses. For example, when users see the ad for a hedonic product in a hedonic interface (VR), they find it more visually appealing than the utilitarian ad. Similarly, the ad evokes more emotions for a hedonic product than a utilitarian product. Furthermore, the immersive experience of VR significantly increases purchase intentions to buy utilitarian products.

6. GENERAL DISCUSSION

Research on the influence of multisensory technologies (AR/VR) on consumer behavior is nascent. The technology itself is evolving, and the research is context-specific (Grewal et al., 2020). Our research attempts to answer the two research calls: first, we expand the context of AR/VR to purchase of utilitarian and hedonic products (Yim et al., 2017), and second, we compare consumer responses (affective and cognitive) between a multisensory and a haptic interface (Petit et al., 2019; Spence & Gallace, 2011).

The findings of this study offer new insights into the impact of technology (or device) interfaces on consumers' affective and cognitive responses in online purchases. One of the key findings is the moderating role of product type (utilitarian and hedonic), which shows that consumer responses to an interface (multisensory or haptic) in a purchase process are also influenced by the product they are purchasing. Moreover, consumers prefer a purchase environment where product and interface characteristics are similar and complementary.

6.1 Theoretical contributions

The present study provides meaningful contributions to the literature on sensory marketing, emergent multisensory interfaces (AR/VR), and vividness and media richness. First, previous research identifies many antecedents to the adoption of mobile phones and multisensory technology in isolation. In contrast, this study compares the two technologies on parameters of ease of use and responsiveness. Though AR is part of the app itself, users find it relatively easier to use than the standalone app. This finding fits with the prior literature, which suggests that people find technology easier to use if there is a degree of playfulness and enjoyment in using the technology (Venkatesh & Bala, 2008). Mobile apps fulfill functional needs and are rated lower on the dimension of enjoyment (Wagner et al., 2018), whereas AR delivers a much more enjoyable experience to consumers (Bonetti et al., 2018).

Furthermore, users are already familiar with apps, and hence, their learning curve for AR is negligible. Prior research did not find any significant difference in the responsiveness of VR and non-VR application (Javornik, 2016). Our findings support the previous results with a notable exception that the perceived responsiveness of the interface depends on the type of purchased product. Technically, AR is slower than mobile apps (even by few milliseconds, which humans cannot differentiate or notice). We believe that the multisensory experience of AR blends seamlessly with the consumption attributes of a hedonic product (Voss et al., 2003), which not only compensates for the negligible delay but also enhances the perception of AR

being more responsive than apps for buying hedonic products. Therefore, one of the contributions of this research is identifying a boundary condition of product type in the context of AR responsiveness. Moreover, our findings indicate that the VR interface results in more favorable WOM recommendations, which can significantly increase the adoption of VR technology (Laurell, Sandström, Berthold, & Larsson, 2019).

Second, this research contributes to the literature on the role of digital technologies in providing multisensory consumer experiences. While a phone app is limited to images, videos, and emojis to communicate, inclusion of AR/VR takes the consumer experience to a much higher level due to highly interactive technology and real-world like immersive experiences. Consumers are more engaged in online shopping when they use a haptic interface (vs. traditional mouse-based interface), which positively affects their purchase intentions (Chung et al., 2018). We extend and contribute to the research by comparing consumer responses between haptic interfaces with multisensory interfaces. We reaffirm the importance of sensory marketing using the latest technologies to drastically enhance the consumer experience and improve the decision-making process (Hudson et al., 2019; Spence & Gallace, 2011).

Third, a vast amount of literature exists on traditional WOM and online versions of WOM, known as eWOM (Mishra, Maheswarappa, Maity, & Samu, 2018). Extant research proposes many antecedents (e.g., positive experience with the purchase process) to WOM behavior (Berger, 2014). Prior literature suggests that consumers engage in WOM recommendations when satisfied with purchase experience (King et al., 2014). Though WOM literature considers many factors that can influence consumers' purchase experience (e.g., product type, convenience, trust, and discounts), it has overlooked the importance of a technology-mediated environment (King et al., 2014; Mishra et al., 2018). We find that a multisensory interface enhances overall purchase experience and hence technology (interface)

used for buying should be added as a critical antecedent to users' WOM intentions (e.g., Berger, 2014; King, Racherla, & Bush, 2014).

Fourth, our results extend the findings of Suh and Lee (2005) in the context of hedonic and utilitarian product classification. Suh and Lee (2005) distinguished the product types based on visual and auditory cues (virtually low and high experiential products). We find that the hedonic nature of the interface complements and enhances consumer preferences for hedonic products. Furthermore, consumers prefer hedonic options over utilitarian ones when products and services are presented in visually appealing and vivid formats in online stores (Roggeveen et al., 2015). However, an interesting contribution lies in the counter-intuitive results of spill-over of attributes from technology to products. Consumers display a positive overall experience for a hedonic (utilitarian) product in AR (app) experience, but they show higher purchase intentions for a utilitarian product in VR (vs. app) experience. This supports the findings on the influence of VR on purchase intentions (e.g., Manis, & Choi, 2019; McLean et al., 2020). However, we put forth a boundary condition of product type, which has a significant impact on purchase intentions in a VR environment. Surprisingly, the results favor utilitarian products in the VR condition. To explain this counter-intuitive finding, we consider the concept of media richness. A possible explanation could be that for a utilitarian product, the purchase decision using an app (or websites) may be monotonous, but the immersive experience of VR (relatively a much richer medium) leads to a higher degree of consumer satisfaction (Hudson et al., 2019), and hence, increases the likelihood of purchase.

Fifth, many users access and use AR/VR via their smartphones or external accessories like headsets. To the best of our knowledge, this research is the first attempt to examine consumer responses in multisensory and haptic environments (AR/VR and smartphone app). The findings address certain gaps in sensory marketing research specific to technology-

mediated environments by adding new insights into the comparative performances of a widely used haptic interface (mobile apps) and recent multisensory interfaces.

6.2 Managerial implications

The findings of this study provide valuable insights to the marketers who would like to experiment with various technologies and multisensory Marketers interface to influence consumer decisions, especially in emerging markets like India. Recent COVID-19 pandemic has enforced shutdown of physical retail stores in many parts of the world, which has significantly changed consumer behavior. A majority of consumers is gradually shifting to online channels and e-shopping (Scott, Martin, Wiener, Ellen, & Burton, 2020). Marketers must offer online alternatives such as websites or mobile apps to survive in the current crisis. Globally, smartphones are the primary devices used to do online shopping via apps. We think that a multisensory shopping experience has the potential to become a source of strategic advantage and differentiation for marketers. Our research offers novel insights to marketers about emerging markets (such as India), which has immense potential for emergent technologies in various sectors like education, health, and tourism (TNN, 2020).

Marketers may hesitate to invest in new technologies (AR/VR) due to the low adoption and usage of AR/VR among consumers. Our findings offer strategic insights to marketers who must make decisions about development, application, and promotion of multisensory features. In our study, AR/VR interfaces perform better than apps on the parameters of ease of use and responsiveness, which are two widely acknowledged antecedents to technology adoption and usage intentions (Venkatesh, & Bala, 2008). So, marketers should focus on developing technologies and features, which gradually extend the haptic interface of smartphones to a multisensory (audio-visual) interface. Moreover, an easy-to-use user interface, which is also responsive, reduces consumers' cognitive load of decision-making that should lead to higher purchases and satisfaction with the shopping experience.

Online consumers have numerous options of smartphone shopping apps and many users install multiple apps on their phones. Marketers face a practical challenge of persuading users to install their apps and continue to use it for their shopping needs. In such cases, a positive word-of-mouth recommendation from users and higher levels of satisfaction can definitely help marketers expedite the adoption and subsequent usage of their apps. For example, AR-based IKEA place app received wide coverage and favorable WOM in online media that resulted in hundreds of thousands of downloads of apps within a few months (Delage, 2018). Our results suggest that a VR interface leads to more favorable WOM recommendations, which should enable firms to break the barriers (e.g., network externalities and trialability) to adoption of VR technology (Laurell et al., 2019). Hence, marketers should utilize the positive WOM potential of multisensory interfaces to promote their offerings. We strongly believe that the technology-mediated multisensory environments offer many untapped and innovative opportunities to marketers to significantly enhance online shopping experience.

Marketers strive to build an emotionally strong and long-lasting relationship with consumers for mutual benefits. A multisensory interface with impressive visuals generates higher emotional arousal than a haptic interface. For products where visual interactions and emotional appeals are crucial, firms should utilize multisensory technology to offer test-and-buy concept similar to the tourism industry. Similarly, NGOs should engage with their target audience in a multisensory environment to improve donations and support for a social cause. Even policymakers can use multisensory experiences to effectively promote campaigns on dangers of smoking or drug abuse. Moreover, the immersive experience offered by a multisensory interface can be useful in areas like healthcare, higher education, and tourism (e.g., a virtual tour of museums and galleries). For example, doctors at different locations can work together using the VR projections of the body parts. Similarly, students in healthcare sciences can visualize and learn about human anatomy more effectively than using a textbook.

Nowadays, when international travels are restricted due to the COVID-19 pandemic, cities that extensively rely on tourism or amusement parks like Disney World Resort may offer alternatives to the potential travelers in the form of virtual multisensory VR tours.

Consumers prefer immersive real-life experiences to nullify risks associated with their purchase decisions, which provides immense opportunities to firms to influence consumers at various touchpoints including online and physical retail stores (Biswas, 2019). Generally, mobile apps provide easy access to relevant information that is critical for evaluating a utilitarian product (Wagner et al., 2018), which makes phone a better functional fit-to-task device. Our findings indicate that a multisensory interface positively influences consumer responses for both utilitarian and hedonic products. Consumers feel happy and joyful as they immerse themselves in the process of buying a utilitarian product such as a piece of furniture (e.g., sofa or table) using AR/VR. Firms are already experimenting with the 'try-on' concept for typical hedonic products such as beauty, makeup, and even shoes (Bonetti et al., 2018). Such features have additional psychological benefits that reduce the risk associated with the purchase. Hence, marketers should invest in providing 'app plus AR/VR' features. Firms should continue to offer browse and search features on apps and gradually introduce multisensory features such that users can evaluate and experience products as in a real-life physical world.

The unprecedented popularity of 'Pokemon Go', an AR-based mobile game, has drastically changed the gaming industry. Millions of online gamers regularly spend a considerable amount of time in playing AR/VR based games. These gamers also spend a significant amount of money to buy external hardware to enhance their gaming experience. Such consumers expect a comparable immersive and enjoyable experience while they do online shopping. We believe that marketers have an excellent opportunity to benefit from the 'first-

mover advantage' if they can adequately respond and successfully fulfill the consumers' desire for a vivid and multisensory experience.

7 LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The implications suggested are restricted by certain limitations of this study, which provide directions for further research. The first limitation is the generalizability of the research. The research sample is the young population of a university in a developing country (India). Young consumers are heavy users of smartphones and early adopters of technologies. However, the elderly population may not have similar comfort and convenience in using new technologies such as smartphones or VR/AR devices (Mishra, Maheswarappa, & Colby, 2018). Similarly, developed countries have higher adoption and usage of new technologies with better technological infrastructure than developing countries (please see examples in Grewal et al. (2020)). Thus, further studies may include a sample of elderly respondents or a sample from a developed country to improve generalizability.

Multisensory experiences are very much context-specific for users. For example, a VR experience of evaluating a tourism destination may be completely different from playing a virtual game due to the differences in user involvement and the presence of additional visual and auditory sensory cues. Thus, further research can explore the role of involvement on attitudes and behavioral intentions in a multisensory environment. While performing the experiments, we observed that some participants were not comfortable with wearing the VR headset for a long duration. Further research can explore this practical concern of how wearing a VR device for a prolonged period (duration of usage) affects user's perceived ease of use. Some of the results in the third study are marginally significant, which may be due to the use of an ad instead of products. Researchers may explore how purchase tasks of products may influence users' purchase intentions.

In this research, we did not control for the brand (e.g., IKEA is a well-known brand). The impact of the brand (app or tourism firm) and perceived product-image (e.g., destination-image) should be explored in further research. We did not consider the influence of participants' previous exposure to the product category and their role (user or buyer), which can be examined in further research. Recent research suggests that the type of interface influences the time taken to make a purchase (Chung et al., 2018), which can be further explored in the context of touch-based versus a multisensory interface.

We notice some counter-intuitive findings for product and technology combinations. We think that the novel multisensory experience makes purchase process enjoyable, such that users find utilitarian products more playful. Further research can use longitudinal studies to take care of the novelty effects and verify whether consumer responses change over a period.

REFERENCES

Azemi, Y., Ozuem, W., & Howell, K. E. (2020). The effects of online negative word-of-mouth on dissatisfied customers: A frustration–aggression perspective. *Psychology & Marketing, 37*(4), 1-14.

Berger, J. (2014). Word of mouth and interpersonal communication: A review and directions for future research. *Journal of Consumer Psychology*, *24*(4), 586-607.

Biswas, D. (2019). Sensory aspects of retailing: Theoretical and practical implications. *Journal of Retailing, 95*(4), 111-115.

Bonetti, F., Warnaby, G., & Quinn, L. (2018) Augmented reality and virtual reality in physical and online retailing: A review, synthesis and research agenda. In T. Jung, & M. Tom Dieck (Eds.), *Augmented reality and virtual reality*. *Progress in IS*, (pp. 119-132). Cham: Springer.

Chung, S., Kramer, T., & Wong, E. M. (2018). Do touch interface users feel more engaged? The impact of input device type on online shoppers' engagement, affect, and purchase decisions. *Psychology & Marketing*, *35*(11), 795-806.

Delage, S. (2018). Is the IKEA place augmented reality app a success? Retrieved from http://www.moonshotio.com/2018/06/07/ikea-place-augmented-reality-app-success/

Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). The impact of virtual, augmented and mixed reality technologies on the customer experience. *Journal of Business Research, 100*, 547-560.

Fisher, R. (2019). Characteristics of a successful app. Retrieved from https://www.seamgen.com/blog/5-characteristics-of-a-successful-app/

Grewal, D., Noble, S. M., Roggeveen, A. L., & Nordfalt, J. (2020). The future of in-store technology. *Journal of the Academy of Marketing Science*, *48*(1), 96-113.

Heller, J., Chylinski, M., de Ruyter, K., Mahr, D., & Keeling, D. I. (2019). Touching the untouchable: Exploring multi-sensory augmented reality in the context of online retailing. *Journal of Retailing*, *95*(4), 219-234.

Holzwarth, M., Janiszewski, C., & Neumann, M. M. (2006). The influence of avatars on online consumer shopping behavior. *Journal of Marketing, 70*(4), 19-36.

Hudson, S., Matson-Barkat, S., Pallamin, N., & Jégou, G. (2019). With or without you? Interaction and immersion in a virtual reality experience. *Journal of Business Research, 100*, 459-468.

Hwang, A. H. C., Oh, J., & Scheinbaum, A. C. (2020). Interactive music for multisensory e-commerce: The moderating role of online consumer involvement in experiential value, cognitive value, and purchase intention. *Psychology & Marketing, 37*(8), 1-20.

Javornik, A. (2016). 'It's an illusion, but it looks real!' Consumer affective, cognitive and behavioural responses to augmented reality applications. *Journal of Marketing Management, 32*(9-10), 987-1011.

Kandaurova, M., & Lee, S. H. M. (2019). The effects of virtual reality (VR) on charitable giving: The role of empathy, guilt, responsibility, and social exclusion. *Journal of Business Research, 100*, 571-580.

Kannan, P. K., & Lee, H. A. (2017). Digital marketing: A framework, review and research agenda. *International Journal of Research in Marketing, 34*(1), 22-45.

Kim, S., & Stoel, L. (2004). Dimensional hierarchy of retail website quality. *Information & Management, 41*(5), 619-633.

King, R. A., Racherla, P., & Bush, V. D. (2014). What we know and don't know about online word-of-mouth: A review and synthesis of the literature. *Journal of Interactive Marketing, 28*(3), 167-183.

Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology, 22*(3), 332-351.

Labrecque, L. I. (2020). Stimulating the senses: An introduction to part two of the special issue on sensory marketing. *Psychology & Marketing, 37*(8), 1013-1018.

Laurell, C., Sandström, C., Berthold, A., & Larsson, D. (2019). Exploring barriers to adoption of virtual reality through social media analytics and machine learning–An assessment of technology, network, price and trialability. *Journal of Business Research, 100*, 469-474.

Manis, K. T., & Choi, D. (2019). The virtual reality hardware acceptance model (VR-HAM): Extending and individuating the technology acceptance model (TAM) for virtual reality hardware. *Journal of Business Research, 100*, 503-513.

McLean, G., Osei-Frimpong, K., Al-Nabhani, K., & Marriott, H. (2020). Examining consumer attitudes towards retailers' m-commerce mobile applications – An initial adoption vs. continuous use perspective. *Journal of Business Research, 106*, 139-157.

Mishra, A., Maheswarappa, S. S., Maity, M., & Samu, S. (2018). Adolescent's eWOM intentions: an investigation into the roles of peers, the internet and gender. *Journal of Business Research, 86*, 394-405.

Mishra, A., Maheswarappa, S. S., & Colby, C. L. (2018). Technology readiness of teenagers: a consumer socialization perspective. *Journal of Services Marketing*, *32*(5), 592-604.

Nisbett, R. E. & Ross, L. (1980). *Human Inference: Strategies and Shortcomings of Social Judgment*. Englewood Cliffs, NJ: Prentice–Hall

Petit, O., Velasco, C., & Spence, C. (2019). Digital sensory marketing: Integrating new technologies into multisensory online experience. *Journal of Interactive Marketing*, *45*, 42-61.

Pettey, C. (2018). 3 reasons why VR and AR are slow to take off. Retrieved from https://gtnr.it/38PBDgn

Roggeveen, A. L., Grewal, D., Townsend, C., & Krishnan, R. (2015). The impact of dynamic presentation format on consumer preferences for hedonic products and services. *Journal of Marketing*, *79*(6), 34-49.

Scott, M. L., Martin, K. D., Wiener, J. L., Ellen, P. S., & Burton, S. (2020). The COVID-19 pandemic at the intersection of marketing and public policy. *Journal of Public Policy & Marketing*, *39*(3) 257-265.

Simmonds, L., Bogomolova, S., Kennedy, R., Nenycz-Thiel, M., & Bellman, S. (2020). A dual-process model of how incorporating audio-visual sensory cues in video advertising promotes active attention. *Psychology & Marketing*, 1-11.

Spence, C., & Gallace, A. (2011). Multisensory design: Reaching out to touch the consumer. *Psychology & Marketing*, *28*(3), 267-308.

Spence, C., Puccinelli, N. M., Grewal, D., & Roggeveen, A. L. (2014). Store atmospherics: A multisensory perspective. *Psychology & Marketing*, *31*(7), 472-488.

Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of Communication*, *42*(4), 73-93.

Suh, K. S., & Lee, Y. E. (2005). The effects of virtual reality on consumer learning: An empirical investigation. *MIS Quarterly*, *29*(4), 673-697.

TNN (2020). In a contactless world, AR could be a business game changer. Retrieved from http://timesofindia.indiatimes.com/articleshow/78726454.cms

Tussyadiah, I. P., Wang, D., Jung, T. H., & tom Dieck, M. C. (2018). Virtual reality, presence, and attitude change: Empirical evidence from tourism. *Tourism Management*, *66*, 140-154.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, *39*(2), 273-315.

Verhoef, P. C., Stephen, A. T., Kannan, P. K., Luo, X., Abhishek, V., Andrews, M., ... & Hu, M. M. (2017). Consumer connectivity in a complex, technology-enabled, and mobile-oriented world with smart products. *Journal of Interactive Marketing*, *40*, 1-8.

Voss, K. E., Spangenberg, E. R., & Grohmann, B. (2003). Measuring the hedonic and utilitarian dimensions of consumer attitude. *Journal of Marketing Research*, *40*(3), 310-320.

Vynz Research (2020). Augmented reality and virtual reality market. Retrieved from https://www.vynzresearch.com/ict-media/augmented-reality-and-virtual-reality-market

Wagner, G., Schramm-Klein, H., & Steinmann, S. (2018). Online retailing across e-channels and e-channel touchpoints: Empirical studies of consumer behavior in the multichannel e-commerce environment. *Journal of Business Research*, *107*, 256-270.

Yim, M. Y. C., & Park, S. Y. (2019). "I am not satisfied with my body, so I like augmented reality (AR)": Consumer responses to AR-based product presentations. *Journal of Business Research*, *100*, 581-589.

Yim, M. Y. C., Chu, S. C., & Sauer, P. L. (2017). Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective. *Journal of Interactive Marketing*, *39*, 89-103.

FIGURE LEGENDS

Figure 1. Conceptual research model

Figure 2. Interaction effects of technology and product type for WOM and overall experience

Figure 3. Interaction effects of technology and product type for visual appeal and purchase intentions

TABLES

Table 1: Results of Study 1

Variable	*F*	*P*
Ease of use		
Technology	13.35	<.001
Product type	.08	.79
Technology x product type	.05	.82
Responsiveness		
Technology	.03	.85
Product type	.90	.35
Technology x product type	4.27	.04

Table 2: Results of Study 2

Variable	*F*	*p*
WOM recommendation		
Technology	.59	.44
Product type	.75	.39
Technology x product type	7.58	.007
Overall experience		
Technology	.01	.92
Product type	.01	.92
Technology x product type	3.45	.07

Table 3: Results of Study 3

Variable	*F*	*p*
Visual appeal		
Technology	2.75	.09
Ad type	.01	.93
Technology x ad type	3.33	.07
Emotional appeal		

Technology	13.8	<.001
Ad type	3.11	.08
Technology x ad type	.002	.97
Purchase intentions		
Technology	1.6	.21
Ad type	.09	.77
Technology x ad type	4.56	.04

APPENDIX A

Mobile apps

Participants used ‘Pepperfry’ app (similar to IKEA app) to buy the chair (https://www.pepperfry.com/mobile-app.html) and ‘Asian paints’ app to select and buy paint (https://www.asianpaints.com/resources/tools/mobile-app.html). Both the apps have AR feature that can be turned on or off.

Measures

Ease of use (Kim & Stoel, 2004; Venkatesh & Bala, 2008) The information displayed in the app was easy to understand. The headings in the app were easy to understand. I think I can easily learn how to use this app. I find it easy to use this app.
Responsiveness (Kim & Stoel, 2004) While using the app there was very little delay in my actions and response from the app. The app response was quick.
WOM recommendation (Mishra et al., 2018) I would recommend this app to others. I would talk good about this app to others.
Overall experience (Yim et al., 2017) My overall experience with app is <bipolar - negative/positive>.
Visual appeal (Kim & Stoel, 2004) The advertisement was visually pleasing. The advertisement was visually appealing.
Emotional appeal (Kim & Stoel, 2004) I feel happy when I see ads on VR. I feel cheerful when I use VR box.
Purchase intention (Venkatesh & Bala, 2008) After seeing this advertisement, how likely you may buy the product. After seeing this advertisement, I would buy the product.