Tell Me Your TMI (Technology, Merchandise, and Information) in Virtual Reality

Jeongah Shin, Jewon Lyu, Yoo-Kyoung Seock
Department of Textiles, Merchandising, and Interiors
The University of Georgia

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Introduction and Literature Review Virtual reality (VR), which is described as 'consumer-facing technology', is growing as an alternative shopping channel. VR is expected to provide consumers with a realistic and appealing shopping experience by combining the benefits of on- and offline stores (Boardman et al., 2019). With the enormous possibilities of VR technology, an increasing number of recent studies have identified the key factors that impact the consumer's VR shopping experience (Lau & Lee, 2019). There is yet a dearth of studies that investigate how the VR experience affects consumers' purchase intention. To gain a better understanding of factors that may lead to consumers' purchase intention via VR shopping experience, we explore the role of product involvement and product information. Product involvement is defined as consumers' thoughts, feelings, and behavioral responses toward a product category (Gordon et al., 1998; Miler & Marks, 1996). Product involvement is known to significantly influence not only consumers' motivation but also cognitive and behavioral responses to a product category (Miller & Marks, 1996). Since product involvement is derived from the consumer's value system, it has an impact on perception development towards the product, which in turn, leads to future intention (Howard, John, & Sheth, 1969; O'Cass & Muller, 1999). Although previous studies have validated the role of product involvement in purchase intention, whether the involvement of different types of products would be critical in a VR environment has not been investigated. An online shopping environment is unlike physical stores in that consumers tend to highly rely on product information provided by the company or reviews by peer consumers, due to the lack of opportunity to touch or wear the product in-person (Yang et al., 2010). Accordingly, product information and reviews serve as a key component to support consumers' positive or negative evaluation for a product before making purchase decisions (Kharae & Rakesh, 2011). Previous studies (e.g., Park & Lee. 2009) identify the effect of text-based eWOM (electronic word-of-mouth) in a text-based format on purchase intention. Although any product-relevant information provided by the company or customers are expected to affect the consumer decision process, there is no research, to the author's knowledge, that has investigated the effects of types of product information on consumers' purchase intention in the VR shopping environment. As an exploratory study, we examine how levels of involvement (high vs. low) and information type (seller vs. buyer) affect consumer's future intention to purchase the product in a VR shopping environment.

Methods *Stimuli Development* We designed a 2 (high involvement product vs low involvement product) x 2 (consumer perspective vs. seller perspective) between-subjects experimental research. Two pre-surveys were conducted to develop VR stimuli properly before the main experiment, using the convenience sampling method. The first survey was developed to select stimuli for product involvement, using no brand fashion items (shoes, backpack, and tank-top). The survey items were adapted from the existing literature (Lin & Chen, 2006). The results based on 49

responses demonstrated that a pair of shoes as the high involvement fashion product (*M = 5.69, SD = .99)* and a tank-top as the low involvement fashion product (*M* = 3.50, *SD* = 1.52). The backpack took the middle (*M* = 4.31, *SD* = 1.46). Therefore, a pair of shoes and a tank-top were used for actual VR experimentation stimuli of this study. To develop proper stimuli for product description type, another pre-test was performed, using a convenient sample (n=32). Participants were asked to read/review two different types of product descriptions (A: buyer vs. B: seller) in a mock apparel (tank-top, Bananarepublic.com) and shoes (running shoes, Nike.com) online store. Each version of the description included the same objective product characteristics (size, color, material, etc.). Participants answered whether the description is written by a consumer or a seller, based on experience or not, and objective or not on a 5-point scale. The results indicated that type A description was generated in consumer perspective ($M_{shoesA} = 4.58, SD = 0.81$, $M_{TanktopA} = 4.62$, *SD*=0.56) and written experience-based ($M_{shoes} = 4.39, SD = 0.96$, $M_{tanktop} = 4.76, SD = 0.51$) *while* type B description was generated in seller perspective ($M_{shoesB} = 4.76, SD = 0.51$, $M_{tanktopB} = 4.71$, *SD*=0.59), and not experience based ($M_{shoes} = 1.86, SD = 1.16$, $M_{tanktop} = 1.74, SD = 1.13$). The results showed that all four descriptions had a similar level of objective ($M_{shoesA} = 3.32, SD = 1.35$, $M_{ShoesB} = 3.62$, *SD*=1.45, $M_{TanktopA} = 3.24$, $SD = 1.45$, $M_{tanktopB} = 3.58$, $SD = 1.61$). *VR Experiment procedure* Participants were invited to the lab and randomly assigned one of the four experimental cells (n=24 each): product involvement (tank-top vs. shoes) x product description (seller vs. buyer). Before the actual VR experience, participants were asked to take pre-survey regarding demographic information and familiarity with VR equipment. In addition, participants were asked to examine a virtual backpack to be familiarized with a VR handler and the environment, and then moved onto the main experiment stimuli. Lastly, participants completed post-survey after the completing VR experiment. In the post-survey, a total of 7 sets of questions were asked about purchase intention, VR experiment, etc.

Results and Discussion Data were analyzed using SPSS 21 for reliability check and analysis of variance (ANOVA). The individual items of purchase intention reliabilities were extracted by the constructs for these stimuli. To confirm the internal consistency of a set of multi-item scales, Cronbach's Alpha of purchase intention was calculated and had acceptable levels of reliability (α= .926). A one-way ANOVA was conducted to test for significant differences in average scores among independent groups. The results of ANOVA demonstrated significant group difference among four conditions (F(3, 93) = 5.137, *p < .002)* with the means of purchase intention. Post-hoc comparison showed that shoes*buyer group's purchase intention(I) was higher than tank top*seller group(J) (Mean difference I-J: 1.26, *p<.01*) and shoes*seller group's purchase intention(I) was higher than tank top*seller group(J) (Mean difference I-J: 1.24, *p<.012*). Thus, our study results indicated that product involvement and description perspective/type are key determinants of purchase intention. As shown in the mean comparison results, the participants indicated a higher purchase intention with shoes than with another product regardless of the type of information. In other words, the participants were also more influenced by the type of product than the type of

information presented in the virtual reality. The findings of the present study shed light on the feasibility of using VR equipment as a future shopping venue. To the best of our knowledge, this was the first attempt to investigate the effectiveness of VR environment as an alternative and/or added shopping experience. This finding provides an implication for retailers to consider what type of product will be most effective and what types of product information should provide to attract consumers' attention and intention to buy in virtual reality.

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