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ARTICLE INFO	Jiyeon Kim (2014). Object interactivity and Millennial shoppers’ perceptions towards interactive product simulator. *Innovative Marketing* , *10*(1)
RELEASED ON	Thursday, 03 April 2014
JOURNAL	"Innovative Marketing "
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
0	0	0

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Abstract

In order to offer shoppers product experiences as close to those from direct examinations, online retailers have started turning into interactive product virtualization technologies that can provide shoppers with detailed information about the products through simulated product experiences when shopping online. This research explores how interactive product virtualization technologies (i.e., interactive product simulator) can engender virtual product experiences, affecting Millennium generation shoppers' use of interactive product simulators for online shopping. Through an online survey, the researcher identified perceptions of using interactive product simulators for online shopping. The research focused on Millennium generation, considering their high Internet usage levels, strong social ties and interdependency among millennial shoppers through social media. Based on Diffusion of Innovation, Theory of Reasoned Action, and Technology Acceptance Model, the research model was developed. The effects of object interactivity and beliefs on attitudes toward using interactive product simulators for online shopping as well as the effect of subjective norm on the intention to shop online using interactive product simulators were investigated. Potential gender difference in the relationships among the variables in the model was also examined.

Keywords: Internet retailing, Millennium generation, interactive product stimulator.

Introduction

Internet has made business easier to start than in traditional brick and mortar settings. Every day, new online sellers are jumping into the market. In order to survive in this fierce competition, online retailers have been striving for making shopping at their sites functional as well as entertaining by providing shoppers with accurate information about their products while making shopping fun.

Online product visualization technologies have come far advanced compared to the beginning of the 21st century. With help of wide spread high-speed Internet connection at work and home, product virtualization technologies (i.e., interactive product simulator), have become widely available in online retail environments. In order to provide shoppers with close-to-direct product experience, online retailers have applied interactive product simulators (i.e., virtual 3D product imagery enhanced with object interactivity) in their shopping sites. Using an interactive product simulator, online shoppers can rotate the 3D virtual product from 360 degree angles, zoom in on product features, and examine the product inside and outside. The product simulators also allow shoppers try some basic functions of the product as if it's right in front of them. Thus, shoppers can get more accurate product information from simulated product experiences than the information obtained from static image with standard descriptors. In addition to the functionality, the interactivity and customer involvement provided by the interactive product virtualization technologies (i.e., interactive product simulator) can enhance the entertainment value of the online shopping experience. Online shoppers would find such type of technology useful for getting more accurate information about a product than static images while having fun.

For many online retailers, Millennium generation shoppers represent a significant opportunity. Often considered to be a lower edge of the generation Y, Millennium generation is 8-25 years old, computer-savvy, and their spending power exceeds $200 billion. They influence another $300 billion to $400 billion in family purchasing (Kleber and Associates, 2004). The Internet is not a new technology for them; it is an integral part of their lives. Internet for them is where they can get information as well as being connected with others. Their personalities and shopping patterns are vastly different from what was previously exhibited by older generations. Getting into their earning age, 18-25 year-old Millennial shoppers have gained importance as a lucrative market from online retailers. The retailers who are embracing and adapting to their needs are the retailers from which they are purchasing products. Interactive product simulators can attract Millennial shoppers to the site and aid their shopping by providing detailed information of the product and increasing shopper involvement with interactive features.

Advertising literature showed the effects of interactive features of Internet advertising on subjects' attitudes (Coyle, 1997; Bezjian-Avery, Calder & Iacobucci, 1998). Recent research in Internet advertising has shown that 3D virtual product display lead to higher buying intentions than when the product is displayed in 2D images alone (Li, Daugherty & Biocca, 2003; Schlosser, 2003). However, there was not much research regarding how interactivity enhances the 3D product experience for a product demonstration for shopping. Particularly, relationships between object interactivity and perceive usefulness, ease-of-use, and

entertainment value in shopping have not been examined previously in the literature. Of the few studies in marketing that have been conducted to determine the relationship between subjective norm and online purchase intentions, the majority have focused solely on family and friends/peers' opinions while ignoring the influence of virtual social network reviews. Technology acceptance model has been widely used by researchers to test relations between perceptions, attitudes, intentions, and behaviors in the context of technology adoption. Most of them, however, did not take subjective norm into an account when predicting intentions and behavior. Subjective norm, others' opinions and motivations to comply with others, may also be very important considering strong social ties and interdependency among Millennial shoppers. These areas are important to be investigated particularly in understanding Millennium generation, the generation of human-computer interaction with virtual lifestyle, and how they perceive interactive features of online shopping sites and their intentions affected by virtual community.

The purpose of this study is to investigate how interactive product simulators can engender virtual product experiences, affecting Millennial shoppers' use of such technology for online shopping. Object interactivity, beliefs (perceived usefulness, ease-of-use, and entertainment value), attitude, intention are considered together with subjective norm (particularly virtual community and social network reviews) while investigating gender difference in the relationships among the variables.

1. Conceptual frameworks

The conceptual framework of the study is based on several well-known theories addressing behavioral intentions and technology adoption.

1.1. Theoretical background. According to the Diffusion of Innovation Theory, perceptions of innovation characteristics such as relative advantage (usefulness and entertainment value) and complexity (ease-of-use) (Rogers, 1995; Venkatraman, 1990) predict technology usage and adoption behaviors. Thus, perceived relative advantage of the interactive product simulators in providing detailed product information and/or increasing the entertainment value of the online shopping are likely to influence the use of this technology for shopping.

According to the Theory of Reasoned Action (TRA), a specified intention to perform a behavior is predicted by one's attitude toward performing the behavior and subjective norm. Consumers' beliefs, such as perceived usefulness and entertainment value, influence attitude that will influence the intention to perform a behavior. Subjective norms, the perceptions and opinions of others (e.g., family, peers, virtual community reviews, etc.), also influence intention because people often act based on their perception of what others think they should be doing. The Theory of Planned Behavior (TPB) extended TRA by including perceived behavioral control (the perceived ease or difficulty of performing a behavior) as a factor that can influence the intention (Ajzen, 1991). Ease of use has been evidenced as an important factor in information technology acceptance (Davis, 1989; Dabholkar, 1996). Therefore, perceived behavioral control (ease-of-use), and beliefs (usefulness and entertainment value), attitudes, and subjective norm (family, peers, and virtual community reviews) are expected to influence the use of interactive product simulators.

Based on TRA, the Technology Acceptance Model (TAM) focuses on the role of ease-of-use, usefulness, and entertainment value in predicting attitudes toward using a new technology (Davis, 1989; Davis, Bagozzi & Warshaw, 1992; Heijden, 2004). TAM is consistent with previous research on retail shopping behavior and supports the presence of both utilitarian and hedonic motivations for online shopping (Babin, Darden & Griffin, 1994; Childers, Carr, Peck & Carson, 2001). Just as motivations for engaging in retail shopping include both functional and hedonic dimensions (Childers et al., 2001), the use of interactive product simulators is expected to be influenced by shoppers' functional and hedonic motivations for shopping online (Lee, Fiore and Kim, 2006). Within the TAM framework, perceived usefulness reflects functionality, and enjoyment reflects hedonic aspects of an interactive product simulator usage.

Object interactivity allows the user to manipulate objects in a virtual world. With direct manipulation, there is a continuous change in graphics as a result of user behaviors that resemble physical actions (Shneiderman, 1987). Interactivity is a critical element of user control that can influence intention to perform the behavior (Ariely, 2000; Benzjian-Avery & Calder, 1998). Object interactivity can increase consumer involvement, a motivational state that drives consumers' behavior (Fiore, Kim & Lee, 2005). Interactivity, consumers being able to manipulate the 3D product image on the screen (i.e., rotate, zoom, and move) and having them try some functions of the product, may provide a consumer a great sense of control. Previous research shows that shoppers tend to find more enjoyment in interactive environments than in pure text environments (Joines, Scherer & Scheufele, 2003; Johnson, Moe, Fader, Bellman & Lohse, 2004). With increased user control (due to high level of object interactivity) and consumer involvement, online retailers can increase functionality and entertainment value of online shopping aided by interactive product simulator.

2. Research model and hypotheses

The conceptual model extends the TAM and explains the adoption process of an interactive product simulator for online shopping. Perceived ease-of-use influences shoppers' attitudes toward using interactive product simulators and indirectly influences their attitudes through its influence on perceived usefulness and entertainment. Object interactivity will have impact on all three beliefs – perceived usefulness, perceived ease-of-use, and perceived entertainment value. Shoppers' positive attitudes toward using interactive product simulators are expected to favorably influence their intention to use interactive product simulators. In addition, family members, peers, and virtual community reviews are also expected to influence their intention to use interactive product simulators.

Based on the proposed model, research hypotheses are posited regarding (1) the relationships among perceived usefulness, ease of use, and entertainment value of interactive product simulators, (2) the impact of the object interactivity on these beliefs (perceived usefulness, ease-of-use, and entertainment value), (3) the impact of these beliefs on attitude (4) the impact of the attitude and subjective norm on intention to use interactive product simulators for online shopping.

Insufficient information on product attributes and shoppers' inability to accurately evaluate the quality of the product online result in increased product risk. Online shoppers can use interactive product simulators to reduce the probability of a poor choice through better evaluation of the online product prior to purchase. Purchasing a product online is considered to be risky because many of the characteristics of different products that are important in consumer decision making are difficult to present on screen and standard descriptors of a product are often insufficient for product evaluation (Grewal, Iyer & Levy, 2004). Therefore, using interactive product simulators as a proxy for physical examination may be especially important when shopping for a product (Jiang & Benbasat, 2004; Citrin, Stem, Spangenberg & Clark, 2003) as it provides proxy sensory experiences that can serve as a surrogate for direct product examination when evaluating a product products online. Thus, the following hypothesis is developed.

H1: Perceived usefulness of interactive product simulators will have a positive influence on attitudes towards using interactive product simulators.

The entertainment provided by shopping has been found to be an important motivator both in traditional shopping environments (Darden & Griffen, 1994) and online (Childers et al., 2001). Manipulating a dynamic product image can provide entertainment in addition to facilitating product evaluation. Given that hedonic use of the Internet plays an important role in online shopping (Menon & Kahn, 2002), the entertainment value provided by interaction with interactive product simulators is likely to create more positive attitudes toward using interactive product simulators when shopping for a product online. This leads to the following hypothesis.

H2: Perceived entertainment value of interactive product simulators will have a positive influence on attitudes towards using interactive product simulators.

Research has confirmed that ease-of-use is an important factor in predicting attitudes toward technology-based self-service (Davis et al., 1992; Heijden, 2000). According to Rogers (1995), complexity, the antithesis of ease-of-use, reduces an individual's willingness to adopt the system. Previous researchers found that perceived ease-of-use had a positive influence on users' attitudes towards using the Internet for different functions (Gefen & Straub, 1997). Liao, Shao, Wang and Chen (1999) reported that the easier it is to use an Internet banking service, the more positive the attitude toward using this service. Therefore, perceived ease-of-use is expected to have a positive effect on consumer attitudes towards using interactive product simulators. Thus, the following hypothesis is developed.

H3a: Perceived ease-of-use of interactive product simulators will have a positive influence on attitudes toward using interactive product simulators.

Previous research demonstrates strong empirical support for a positive relationship between perceived ease-of-use and perceived usefulness (Adams, Nelson & Todd, 1992; Segars & Grover, 1993). Thus, the easier an interactive product simulator is to use, the more useful it will be perceived (cf. Heijden, 2000).

H3b: Perceived ease-of-use of interactive product simulators will have a positive influence on perceived usefulness of interactive product simulators.

Igbaria, Parasuraman and Baroudi (1996) found support for a positive relationship between perceived entertainment value and system usage. By contrast, perceived complexity (the opposite of ease-of-use) was negatively correlated with perceived entertainment value (Igbaria et al., 1996). These findings lead to the expectation that the easier interactive product simulators is to use, the greater the perceived entertainment value for online shopping using the interactive product simulators.

H3c: Perceived ease-of-use of interactive product simulators will have a positive influence on the perceived entertainment value of interactive product simulators.

In direct product experience, consumers have a high level of control over how they interact with the product – what/where to look at, etc. Ajzen (1991)

asserted that beliefs about a behavior are strongly influenced by perceived ability to perform that behavior. Object interactivity offers a high level of control over computer-mediated environments in terms of users' abilities to adjust the information by providing an online shopper an ability to manipulate the 3D product image on the screen and having them try some functions of the product. Online shoppers are likely to perceive interactive product simulators useful, easy to use, or entertaining in situations where more control options is available. Object interactivity, an ability to have online objects act upon mouse movements (3D product image reacting to mouse passing over them, clicking on them or dragging on them) will give a shopper a sense of control. With increased user control (high level of object interactivity) and consumer involvement, online retailers can increase functionality and entertainment value of online shopping aided by interactive product simulator. This leads to the following hypotheses.

H4: Object interactivity is positively related to (a) perceived usefulness, (b) perceived ease-of-use, and (c) perceived entertainment value of interactive product simulators.

Research suggests that user attitude toward technologies provide explanatory insights into explaining adoption of the technologies (LaRose & Atkin, 1992). The innovation literature specifies that an individual's attitude toward using an innovation influences adoption of the innovation (Rogers, 1995). Therefore, an individual's use of a technology is a function of his/her attitude toward its intention to use (Moore & Benbasat, 1991). The Theory of Reasoned Action, on which TAM is based, suggests that the more positive the attitude to perform a behavior, the more likely an individual is to perform that behavior (Ajzen & Fishbein, 1980). Since the behavior is preceded by intentions, consumers who have a positive attitude toward using interactive product simulators are expected to have positive intention to use interactive product simulators for online shopping.

H5: Attitudes towards using interactive product simulators will have a positive influence on intention to use interactive product simulators.

Intentions are formed based on a consumer's attitude toward the behavior and on perceived subjective norms. Subjective norm is the perceived social pressure to engage or not to engage in a behavior (Ajzen & Fishbein, 1980). Thus, an individual's perceptions of the significant others' (e.g., family, friends, peers, etc.) influence his/her intention to perform a behavior. Social media has opened up an arena for the consumers to share opinions, insights, experiences, and perspectives. It a tool which helps people from all over the world to communicate, interact and build strong relationships. Considering social media being embedded in Millennials' lifestyle, it is particularly important to understand how virtual community reviews and opinions can affect shoppers' intentions to use interactive product simulators to aid their shopping.

H6: Subjective norm will influence intention to use interactive product simulators.

Previous research suggests that men and women differ with respect to information processing and have different levels of technology self-efficacy (Venkatesh & Morris, 2000). Men and women also differ with regard to characteristics they consider important in evaluating products and in information processing strategies (Meyers-Levy & Maheswaran, 1991). Thus gender difference may exist in perceptions of the functional and hedonic roles of interactive product simulators, attitude toward using interactive product simulators. Therefore the adoption process for interactive product simulators in online apparel shopping may differ by gender.

H7: The adoption process of interactive product simulators for online shopping will differ by gender.

3. Methods

This study is to identify factors affecting Millennial shoppers' use of interactive product simulators available for online shopping (an interactive cell phone simulator was used for the current study). The research particularly focuses on the object interactivity affecting functionality and entertainment value as well as family and peer opinions affecting intention to use such technology for online shopping are main focuses of this study.

3.1. Online survey. An online survey was developed to examine the usage of interactive phone simulator by male and female online Millennial shoppers. The constructs were measured using 7-point Likert-type scales ranging from 1 (strongly disagree) to 7 (strongly agree). Latent constructs are object interactivity (OI), perceived usefulness (PU), perceived ease-of-use (PEOU), perceived entertainment value (PE), attitude (ATT), intended use (USE), and subjective norm (SN).

The online surveys were administered to the U.S. national panel of online shoppers (18-26 years old) randomly selected from a pool of participants included in the database purchased from a survey company. A survey with a link to the stimulus website (with a cell phone simulator) was sent to participants. Upon clicking the hyperlink provided in the survey, a respondent was lead to a stimulus site. As a stimulus site, an interactive phone simulator (as an interactive product simulator) at sonyericson.com was used. It provides a function for a shopper to simulate some features of its cell phones. Shoppers can not only view the product in 360 degrees but also push a menu button and change settings (e.g.

background, ring tons, etc.). The reason for choosing a cell phone simulator is a cell phone is a preferred basic communication device for millennial shoppers and is being frequently shopped for an update.

After completing the online shopping simulation using the interactive phone simulator, the respondent completed the survey questions with respect to his/her experience with this technology.

3.2. Sample characteristics. There were 491 valid and complete responses from the 2,000 online survey invitees, for a 25% response rate. Of these, 54% were male and 46% were female. The sample included shoppers with very little to extensive online shopping experience and was generally representative on online shoppers (see the detailed Internet usage by respondents in Table 2). Forty-nine percent of the respondents had cable, 40% had moderate to fast DSL, and the remaining 11% had slow modem for Internet connection. Although 62% of the respondents had past experience with some type of interactive product simulator, the Chi-square difference test between non- vs. experienced users showed no significant differences ($\Delta\chi^2 = 8.62$, $\Delta df = 7$, $p = .21$) in the overall parameter estimates, indicating the level of familiarity was not a main issue affecting the results.

Table 1. Sample Internet usage

Internet shopping history		Time spent on Internet		Time spent on browsing on Internet		Time spent on searching on Internet	
Yr(s)	%	Hr(s)/week	%	Hr(s)/week	%	Hr(s)/week	%
Less than 1	13.1	Less than 1	.1	Less than 1	2.5	Less than 1	2.3
1-2	9.0	1-5	7.1	1-5	32.7	1-5	46.7
3-4	22.2	6-10	16.6	6-10	25.6	6-10	22.1
5-6	18.6	11-20	27.3	11-20	17.6	11-20	14.4
Over 6	37.2	21-30	23.9	21-30	12.3	21-30	7.2
		31-40	10.0	31-40	3.5	31-40	3.8
		Over 40	15.0	Over 40	5.7	Over 40	3.5

4. Results and discussion

The results of the reliability tests showed that all the construct measures were reliable, with Cronbach alphas greater than .8. CFA item factor loadings for the latent constructs (greater than .6), indicated the scale items were a good manifestation of the constructs (Marsh & Hau, 1999). Based on a rule of thumb for the incremental goodness-of-fit indexes (Hu & Bentler, 1999), the model fit for eight measurement models was good, with all CFI and GFI values greater than .9. Composite reliability of the measurements was greater than the benchmark (0.7 or 0.8) for acceptable reliability suggested by researchers (Fornell & Larcker, 1981; Nunnally & Bernstain, 1994) and average variance extracted (AVE) estimates were well above 0.5, indicating good internal consistency and convergent validity (Hair, Anderson, Tatham & Black, 1998; Bagozzi, 1994). AVE estimates for all eight constructs exceeded the squared correlation between constructs, indicating discriminant validity among the constructs (Fornell & Larcker, 1981).

The hypothesized model was assessed by maximum likelihood estimation and evaluated by three fit measures – the comparative fit index (CFI), the goodness of fit index (GFI), and the root mean square error of approximation (RMSEA) – using Amos. According the threshold suggested by researchers (Browne & Cudeck, 1993; Hu & Benler, 1999), the fit indexes indicated an acceptable model fit for the proposed model across the groups, with CFI = .8, GFI = .9, and RMSEA = .05.

After the initial model assessment for the proposed model, multiple-group Structural Equation Modeling was conducted for potential age differences (H7) when testing invariance of path parameters between male/female groups simultaneously. The invariance test for the model was achieved by comparing Chi-square (χ^2) values and degrees of freedom (df) for the base model and the constrained model. In this comparison, the increase in χ^2 values due to the equality constraints was used as a significance test (Byrne & Campbell, 1999; Byrne, 2001; Kline, 1998; Raju, Lafitte & Byrne, 2002). All path parameters were constrained to be equal across two groups to test whether or not the constrained model was invariant between the groups. Then, the fit of the base model (free parameter estimation) and the constrained model (equality constraints imposed on parameter estimation) were compared. The summary of the χ^2 values and $\Delta\chi^2$ values (differences of χ^2 values between the base model and constrained model) for the series of analyses involved in testing invariance are presented in Table 2.

Table 2. Multiple-group structural model invariance test

Groups	Model description	χ^2	df	$\Delta\chi^2$	Δdf	Sig.	Invariant
Male / Female	Base model (free estimation)	3474.28	621	16.6	10	NS ($p = .029$)	Yes
	Model with equality constraint imposed	3490.88	631				

Note: Base model is the two-group structural model (Male/Female).

The first entry shows the difference between the fit (χ^2) of the initially hypothesized structural model (when tested simultaneously for both groups with no equality constraints) and the fit of the invariant model (when equality constraints were imposed on all path parameter estimations). The model fit difference from the two-group test indicated that all structural paths' parameters are not invariant ($\Delta\chi^2$ = 16.6, Δdf = 10, p = .029), indicating significant differences in the parameter estimates between male and female models, supporting Hypothesis 7.

Single model Structural Equitation Modeling was conducted to test hypotheses for each gender group. Path-to-path comparisons showed where the differences existed (see Table 5 and 6 for structural coefficients and p-values). Hypothesis regarding influence of perceived usefulness on attitude (H1) was supported for both male and female groups. The effect of perceived ease-of-use on perceived usefulness (H3b) and entertainment value (H3c) were statistically significant for both groups. Perceived entertainment value (H2) was a strong predictor of attitude for male but not for female group. On the other hand, perceived ease-of-use (H3a) had influence on attitude for only female group. Interesting gender differences were noticed in the effect of object interactivity on the beliefs. For males, the object interactivity had influence on perceived-ease-of-use (H4b) and perceived entertainment value (H4c) but not on the perceived usefulness (H4a). For females, the perceived ease-of-use (H4b) and perceived usefulness (H4c) were affected by the object interactivity. The effect of object interactivity on the perceived usefulness (H4a) was confirmed for female group but barely missed the significant mark for male group. These results indicate that men think an ability to manipulate a virtual object is not quite useful in terms of examining and gaining information about the product. The possible explanation for this result might be because men, in general, tend to be involved in pre-purchase deliberation. Object interactivity may be perceived more experiential yet less efficient than static text and graphics. Thus, the virtual product simulation may seem frivolous and inefficient, as compared with reading a standard descriptor.

Both men and women seem to find the point-click-drag manipulation makes the technology easy to use. Interestingly, women didn't find the interactivity affecting entertainment value whereas men though the interactivity increased the perceived entertainment value of this technology. As expected, attitude influenced intention (H5). Subjective norm (H6) was a strong factor affecting the intention to use the product virtualization technology for both groups. This finding suggests that increased use of virtual community by Millennial shoppers for gaining insights about information regarding online shopping from others' experiences plays important role in affecting one's intention.

Conclusion and implications

As widespread as product visualization technologies are, very little empirical work has been done to investigate Millennial consumers' perceptions about interactive online technologies. This growing consumption group shows a buying power exceeding $200 billion annually and represents a significant opportunity for the Unites States retailers today (Martin & Turley, 2004). Their technology-obsessed virtual lifestyle is reflected in their purchasing habits. When it comes to purchasing products and services, Millennials takes peer recommendation and viral marketing more seriously than company generated information.

The findings of this study indicate that the experiences Millennial shoppers get from virtual product demonstration using the interactive product simulator and the virtual community recommenddations are very valuable for them in making purchase decisions. Interactive product simulators allow consumers to simulate the functionality and/or appearance of a product online, enabling online marketers to provide more effective product information – reducing perceived risk, and a more engaging shopping experience – enhancing shopping enjoyment.

The study contributes to the literature by demonstrating that object interactivity clearly affects both gender groups either through affecting perceived usefulness or entertainment value. Object interactivity didn't influence perceived usefulness or men yet did influence the attitude and intention by affecting perceived in the end, the effects that the simulated product experience has on shoppers' attitudes and intentions to buy a product online are significant. It appears that user-ability to interact with a product in the virtual world increases perceived ease-of-use of the product simulator. Previous research applied TAM in online technologies failed to examine gender difference testing the overall adoption and usage of the online technologies. The findings of this study show not only the usage of the interactive product simulator but also where gender difference exists by examination of the equivalence of the hypothesized model between male and female. This information is particularly useful when developing and applying such technologies to sell/promote products targeting different gender groups.

Another important finding is the impact of subjective norm (particularly social media in the case) on shoppers' intention to use the product simulator. Social media, as an extension of word-of-mouth marketing,

with a few keystrokes can put one's thought into the homes of hundreds or even thousands of consumers. This provides considerable power to be harnessed by companies who can influence the conversations that consumers have with one another. An increasing number of studies have investigated social media marketing in terms of brand awareness and promotion. However, there isn't much about how interactive product simulation can spread a word about a product/shopping site through social media and attract shoppers into the site. This study confirmed the power of social media on Millennial shopper behavior.

This study faced some limitations in creating an experimental condition. First, only one interactive product simulator (phone simulator used in the experiment) was used for the experiment, which may affect generalizability of the findings. Second, in order to collect a large number of data, an online survey with a link to the stimulus site was sent to the participants. Just as any self-reported survey administration, there wasn't a monitoring system for an accuracy of a participant actually followed the instruction prior to completing the survey.

Based on the findings of this study and the validation of the proposed model, future studies could examine consumers' perceptions of using interactive product simulators for various product categories. Particular characteristics associated with the usage of such technologies, receptivity, usage patterns, motivations, post-purchase satisfaction aided by them, and future patronage of a web site could also be investigated. The usage may be influenced by consumer characteristics such as time-consciousness, opinion leadership or age differences. Thus, it will be important to identify consumer variables that may influence the use of interactive product simulators. The interactive product simulator can be used for learning purposes; consumers may be able to learn how to maneuver an innovative complex product before making a purchase decision with seemingly unrealistic expectations. This can be an area to be explored.

The results of this study have important implications for online retailers and are consistent with the findings of other researchers, who have reported that the enhanced experience provided by interactive technologies result in stronger purchase intentions than passive product presentations (Li, Daugherty & Biocca, 2002, 2003; Klein, 2003; Schlosser, 2003). It appears that social media and virtual communities have the capability of affecting attitude formation and change and, therefore, can be potentially powerful influence for consumers' decision-making. Online retailers take this information and can (1) better motivate shoppers to shop at their site; (2) interact with virtual products; (3) provide them with information of the product better then in a passive format; (4) provide them with fun shopping experience; (5) utilize social media/virtual community to spread a word about all of the above; (6) hence attract shoppers to their websites and increase likelihood of making them purchase. They can also use this information for site design to influence shoppers' attitudes and intention to purchase their products.

Until very recently, only a small percentage of websites offer 3D product presentations and researchers have recommended that online retailers should improve their performance by adding visual features such as 3D product presentations and virtual models (Khakimdjanova & Park, 2005; Kim & Forsythe, 2008; Kim & Forsythe, 2010). Our findings confirm the need for online retailers to place greater emphasis on employing interactive product simulators to fulfill consumer needs for sensory information as a means of reducing product risk and enhancing shopping enjoyment.

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