

## **IMPACT OF VIRTUAL BRAND EXPERIENCE ON PURCHASE INTENTIONS: THE ROLE OF MULTICHANNEL CONGRUENCE**

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### **ABSTRACT**

Online virtual environments have been identified as emerging marketing channels, whereby consumers can learn about brands through experiences that involve both functional and social interaction. This research examines the impact of virtual experiences on attitude formation, and offline purchase intentions, and identifies three types of channel congruence (perceived diagnosticity, self-image congruence, and behavioral consistency) that help explain the cross-channel effects. The findings from this study indicate that multichannel effects exist between virtual brand experiences and real-world purchasing decisions. These effects depend on the extent to which the virtual shopping experience is believed to be accurate and useful for evaluation, shared self-concept with other users of the brand, and perceived behavioral consistency across marketing channels.

Keywords: multichannel marketing, brand experience; virtual worlds; Second Life; channel congruency

### **1. Introduction**

In recent years a number of technologies that permit consumers to search for information, interact with brands, communicate with other consumers, try out products, and buy real and digital products over the internet have emerged. Some examples of these types of technologies include online product simulations (e.g. test driving automobiles, virtually trying-on clothing), avatars [“animated representations of the user”; see Holzwarth et al. 2006] for engaging in virtual environments (e.g., Second Life), and online chat. Many consumers use the internet to collect information on products and brands before making purchases offline [Venkatesan et al. 2007; Teltzrow et al. 2007]. Online virtual environments have been identified as emerging marketing channels [Li et al. 2002; Barnes and Mattsson 2008; Shen and Eder 2009], whereby consumers can engage in information search, trial, and purchasing. These virtual environments may offer important advantages over traditional, two-dimensional websites through increased functional and social interactivity, and can provide valuable brand experiences that lead to increased customer loyalty and sales [Arakji and Lang 2008].

Firms are particularly interested in how these virtual brand experiences may impact consumer attitudes and purchasing behavior in other marketing channels. Several global brands have, or have recently had, a presence in Second Life (an online virtual environment) including Adidas<sup>®</sup>, BMW<sup>®</sup>, Dell<sup>®</sup>, IBM<sup>®</sup>, Mercedes-Benz<sup>®</sup>, Microsoft<sup>®</sup>, Reebok<sup>®</sup>, Reuters<sup>®</sup>, and Coca-Cola<sup>®</sup>. During the first quarter of 2008 commercial investments in "virtual worlds" were estimated to be around \$184 million [Virtual Worlds Management 2008]. In the same year, there were over 139 real-world brands in Second Life. Companies with a brand presence in virtual environments are attempting to create and increase brand awareness with the hope that they will eventually influence real world purchase intentions and behaviors, thus translating into sales in other marketing channels [Arakji and Lang 2008; Barnes and Mattsson 2008]. Virtual environments serve as potential platforms for retailers in understanding and influencing offline purchasing behavior, in addition to promoting the company's brand and products.

Although researchers [Barnes and Mattsson 2008; Arakji and Lang 2008] have suggested that brand experiences in 3D virtual environments may affect consumers' purchasing behavior in traditional marketing channels, this phenomenon has yet to be empirically examined in the e-commerce literature. Thus, it is unclear whether virtual brand experiences have a significant impact on consumers' offline purchase intentions and behavior. Many

companies are still skeptical about the ability of virtual environments to shape real world purchasing intentions and behavior, and as a result these companies may be hesitant to allocate the resources necessary for developing an official brand presence in such environments [Clemons 2009]. The extant literature on virtual environments has offered little guidance concerning brand-building strategies that may influence the cross-channel effect on purchasing behavior, and serves as an important gap in the marketing and e-commerce literature [Barnes and Mattsson 2008].

The main objective of this study is to investigate whether a brand experience in a virtual environment can affect attitude formation and purchasing decisions in an offline marketing channel. Furthermore, this research examines the role of functional, social, and behavioral factors in determining cross-channel effects, by identifying and testing three types of cross-channel congruence (perceived diagnosticity, self-image congruence, and behavioral consistency), which may influence the effect of virtual brand experiences on real world purchasing decisions. Both the functional (e.g., environment, interactivity, realism) and social aspects (e.g., social norms, social presence, self-concept) of marketing channels, although often studied separately, have been identified as important for understanding consumer attitudes and purchasing behavior [Sirgy 1997; Barnes and Mattsson 2008; Arakji and Lang 2008; Suntornpithug and Khamalah 2010; Cha 2011]. This paper proposes a model of channel congruence that examines the effects of these two dimensions together in the same model in order to address this shortcoming in prior studies.

Consumer perceptions regarding their behavior across multiple marketing channels, has received considerably less attention and is also examined in this paper. It has been suggested that consumers may behave realistically in a virtual environment when the environment has a high degree of realism [Suntornpithug and Khamalah 2010], and when consumers replicate their real identity and existence into the virtual world [Arakji and Lang 2008; Hemp 2006]. Studies have shown that brand experiences and consumer behavior in an online channel may affect consumer decision making in other marketing channels [Kwon and Lennon 2009]. An understanding of consumer behavior across multiple marketing channels may provide further insights into how consumers view their multichannel shopping experience and the relationships they develop with retailers. Using an exploratory approach, a scale for measuring consumers' perceived behavioral consistency across marketing channels is developed and tested in this study.

This study uses a unique dataset from users of the popular 3D virtual world, Second Life. Very few studies on virtual worlds have collected data from actual virtual world users [Barnes and Mattsson 2008; Gabisch 2011]. Past research in this area has typically employed laboratory experiments where buyers (typically student participants) interact with 3D objects on websites or interact with computer-operated sales avatars [Li et al. 2002; Schlosser 2003; Suh and Lee 2005; Jiang and Benbasat, 2005; Wang et al. 2007; Holzwarth et al. 2006; Jin 2009]. The use of actual virtual world users allows for further insight into how functional and social interactivity play a role in shaping multichannel shopping behavior.

The remainder of the paper is organized as follows: first, background literature on virtual brand experience and multichannel congruence is discussed. Next, the conceptual framework for this paper is introduced. After developing hypotheses for the relationships in the model, the methodology and results of the study are presented. The final section discusses the study's findings and implications for managers and theory.

## **2. Background Literature**

### **2.1 Virtual Brand Experience**

Brand experience has recently been defined in the marketing literature as the sensations, feelings, cognitions, and behavioral responses evoked by brand-related stimuli that are part of a brand's design and identity, packaging, communications, and environments [Brakus et al. 2009]. Brand experience has been shown to have a significant effect on consumer perceptions of the brand and purchasing decisions [Brakus et al. 2009]. Consumers may experience brands by coming in contact with them through a number of mediums, including the internet [Chattopadhyay and Laborie 2005]. Brand experiences entail a wide range of behaviors including search, shopping, consumption, and when consumers examine and evaluate products [Brakus et al. 2009]. It is pertinent that companies explore new technologies for creating meaningful brand experiences [Chattopadhyay and Laborie 2005; Zhuang 2005].

Virtual 3D environments have been identified in the virtual reality and marketing literature as a new type of marketing channel where consumers can experience brands and products [Burke 1997; Shen and Eder 2009]. Research has found virtual product experience to be similar to direct product experience, because it offers a high degree of interactivity with products and other users of the brand [Li et al. 2001]. Users of a virtual world, such as Second Life, employ avatars - an animated "representation of the user" - to navigate the environment, shop for virtual products and services, and socialize with other avatars [Holzwarth et al. 2006]. The emergence of virtual 3D

technology allows companies to simulate real shopping environments, product demonstrations, and provide rich interactions with other consumers and sales representatives [Urban et al. 1997; Kim and Forsythe 2008]. Studies have shown that consumer interactions with products and brands using 3D website technology has the potential to influence product knowledge, purchase intentions, and lead to more confident brand attitudes [Li et al. 2002; Suh and Lee 2005; Li et al. 2001; Suh and Chang 2006].

Virtual experience has been defined in the marketing literature as the psychological and emotional states that consumers undergo while interacting with products and brands in a 3D environment [Li et al. 2001]. Virtual experiences are computer-mediated experiences that simulate physical experiences and can generate a compelling sense that the consumer is actually present in the virtual environment. The feeling that one is actually present in a virtual environment, known as telepresence, is a function of vividness (ability of the technology to produce a sensory rich environment) and interactivity (degree of control over form and content manipulation) [Steuer 1992; Hoffman and Novak 1996]. The more realistic virtual product and brand experiences are perceived to be the more likely users are to experience telepresence [Li 2001; Chin and Swatman 2005]. Similar to the concept of telepresence is the notion of social presence, also known as para-social presence. Social presence refers to the extent to which an individual perceives other people to be physically present when interacting with them through a communications medium [Jahng et al. 2000; Kumar and Benbasat 2002]. Virtual environments in which individuals use avatars to communicate with each other in real-time creates a greater sense of telepresence and social presence, thereby making the online experience more pleasurable and authentic. It has been suggested that higher levels of functional interactivity and social presence, via realistic shopping environments on the Internet, may positively influence a consumer's brand attitude and purchasing behavior in other marketing channels [Suntornpithug and Khamalah 2010].

## 2.2 Multichannel Congruence

Multiple marketing channels are considered essential for a firm's sustained growth and firms are increasingly utilizing multiple channels to help them reach more customers, retain existing customers, increase sales and improve their long-term competitiveness [Kumar and Venkatesan 2005; Venkatesan et al. 2007; Sharma and Mehrotra 2007]. Some consumers use the internet to increase their knowledge about product attributes before making the purchase in the store. Brand experiences and behavior in one channel may affect consumers' decision making in another channel, as studies have found cross-channel effects between online and offline channels [Kwon and Lennon 2009].

As more consumers adopt multichannel shopping, they increasingly demand consistent experiences across channels [Kwon and Lennon 2009]. However, little academic research has offered insights into how shoppers respond to multichannel retailers' various types of cross-channel marketing activities or how consumers' experiences with a retailer in one channel may affect their brand evaluations and purchasing behavior in another channel. Few studies have looked at how consumers experience their shopping environments across retail channels when making their purchase decisions, and what drives those shopping decisions [Choi 2008; Mathwick et al. 2002]. It is apparent that additional research is needed for examining how shopping decisions are made through a multichannel shopping environment and to identify the factors that effect shopping behaviors across these multiple marketing channels.

The importance of channel congruence in multichannel retailing has been identified as an important topic for further research. In particular the inability to evaluate products and the limitations for social interaction on the internet have been cited as significant inhibitors of online shopping [Levin, Levin, and Weller 2005; Holzwarth et al. 2006; Suh and Chang 2006]. Jahng et al. [2000] propose a theory of congruence in the design of e-commerce environments. They argue that unless an online retailing environment provides rich experiences with a product or service, comparable to the types of experiences in the physical world, the online experience will fail to arouse motivation or interest in purchasing the product. Thus, for online shopping experiences to have a favorable impact on consumer perceptions the environment must be able to provide a congruent experience with the product. Online environments have traditionally struggled with providing consumers with highly interactive experiences with products and sales representatives, which leads to uncertainty and ambiguity, especially for complex and experiential products [Brunelle 2009]. Choi [2008] also proposed a theory of shopping congruence between offline and online stores, and found that the level of consistency across channels affects consumers' brand attitudes and purchase intentions. The greater the level of congruence between the shopping task and capabilities of the channel environment, the more useful the channel for the purchase decision process.

Studies in the multichannel literature have suggested that offline and online marketing channels offer both advantages and limitations. Consumers' channel preferences are largely determined by how compatible the marketing channel is with different stages in the buying process [Albesa 2007; Frambach et al. 2007]. While traditional retail stores allow consumers a full range of sensory and social experiences with the product, online channels have been deficient in these types of experiences. However, the emerging technological capabilities of online channels are beginning to enable retailers to provide consumers with more dynamic experiences, and allow

consumers to utilize online shopping channels throughout each stage of the buying process [Balasubramanian et al. 2005; Varadarajan et al. 2010; Dholakia et al. 2010]. Some scholars have even suggested that the next generation of retail websites will incorporate more advanced functional and social capabilities through the use of avatars and highly interactive website designs, thereby resembling the experience of playing a video game rather than reading a book [Burke 1997; Wang et al. 2007]. A number of researchers are investigating the impact of 3D virtual product experience as a substitute for physical product experience [Chin and Swatman 2005]. These more interactive experiences may help to reduce the current incongruities between offline and online channels [Frambach et al. 2007].

### 3. Conceptual Model and Hypotheses

Research has found that a person's experience with a product and their self-concept within a marketing channel play important roles in shaping their perceptions and behavior. For example, Sirgy et al. [1997] found that both functional-congruence (matching between functional attributes of a product, brand, store and expectations) and self-image congruence (cognitive matching between value-expressive attributes of a given product, brand, or store and consumer self-concept) are strong predictors of attitudes, intentions, and behavior. Several studies have recognized that consumers may have multiple self concepts that affect their consumption experiences [Bahl and Milne 2009]. The extent to which a consumer's interactions with a brand within a marketing channel are consistent with, or conflict, with their self-concept may influence the ability of those brand experiences for influencing their purchasing decisions. The examination of a person's experiences with a product and their self-concept may be particularly helpful for researchers in understanding consumer behavior across multiple marketing channels. However, most of the research on cross-channel effects has considered these factors in isolation of each other.

The model presented in this paper examines three types of multichannel congruence (perceived diagnosticity, self-image congruence, and behavioral consistency) within the context of virtual and offline marketing channels (see Figure 1). Channel congruence is conceptualized in this paper as a consumer's perception of relatedness and compatibility between the virtual and offline marketing channels. Perceived diagnosticity is a consumer's evaluation of the accuracy of a product trial experience, and the quality of product trial experiences have been found to differ across marketing channels [Li et al. 2002; Suh and Chang 2006; Jiang and Benbasat 2005]. Self-image congruence describes the relationship between an individual's self-concept and how the brand's image is perceived within the marketing channel. The perceived image of the brand may vary across marketing channels and be either compatible, or incompatible, with a consumer's self-concept. Behavioral consistency is the consumer's perception of how consistent their responses are to stimuli across marketing channels, and is measured using a newly developed scale. This construct suggests that how a consumer responds to marketing stimuli in one channel may be dependent on how they view their actions and experiences with the brand across marketing channels. As consumers increasingly use multiple channels in the buying process, how they communicate and respond to a brand within a particular channel is likely to affect their evaluation of information collected within the channel and the importance they place on that information in the purchase decision process.

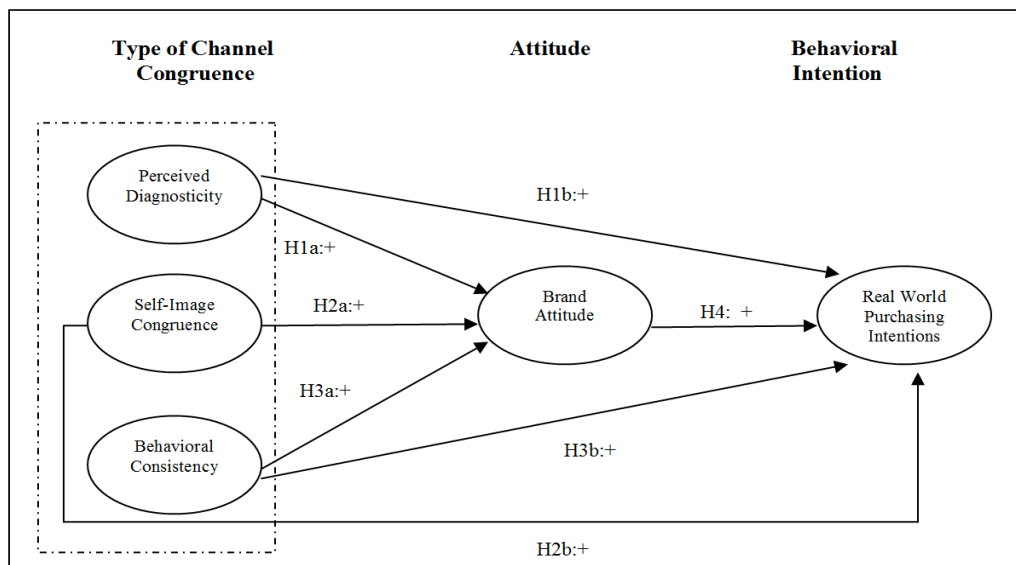


Figure 1. Research Model and Hypotheses

The framework presented in this study proposes that perceived diagnosticity, self-image congruence, and behavioral consistency may be important types of multichannel congruence that affect brand attitudes and purchase intentions. The rationale and supporting literature for each hypothesis is presented in the following sections.

### 3.1 Perceived Diagnosticity

Perceived diagnosticity is a key variable in the product trial literature for evaluating the usefulness and validity of a product trial [Hoch and Ha 1986; Kempf and Smith 1998]. The concept has recently been used in the virtual reality literature to measure the perceived accuracy of online interactive product experiences [Griffith and Chen 2004; Jiang and Benbasat 2005]. Perceived diagnosticity has been defined as “the extent to which a consumer believes that a particular shopping experience is helpful for evaluating the product's attributes”, and higher perceived diagnosticity has been shown to strengthen consumers' beliefs and belief confidence [Kempf and Smith 1998; Jiang and Benbasat 2005]. Because online product and brand experiences are limited by certain sensory information such as physical inspection of the product, it is important to understand how helpful an online brand experience has been for a consumer in evaluating a product. It is likely that the more helpful a virtual brand experience has been for evaluating a product, the more confident the consumer will hold their beliefs and attitudes, and the greater influence the virtual experience will have on real world purchase intentions.

Research has found that virtual interaction with a product may influence brand attitudes, product knowledge, involvement, and purchase intentions [Schlosser 2003; Chin and Swatman 2005; Fiore et al. 2005]. The extent to which users can clearly and easily see themselves using a product should affect their expectations to purchase it [Schlosser 2003]. Product simulation experiences can be highly persuasive marketing tools when product attributes are consistent with consumers' expectations as information from the experience is more trustworthy [Suh and Chang 2006; Jin 2009]. However, when the believability of the simulation experience is questionable, the information gathered from the experience may be devalued. The degree of realism and believability of commercial content in the virtual environment is important for developing persuasive brand experiences [Witmer and Singer 1998; Schubert et al. 2001].

Companies may employ strategies in the virtual world that differ in terms of how consistent their brand, products, and presence (i.e., virtual store environment, product displays, location, and format) are with the firm's real-world image and offerings. Suh and Chang [2006] define product discrepancy as the inconsistencies between online product information and experiences with the actual product. Discrepancy between online products and actual products may lead to consumer dissatisfaction, a less favorable product evaluation, and reduced purchase intentions [Urban et al. 1997; Kaltcheva and Weitz 2006]. Virtual brand experiences that are inconsistent with physical experiences may also lead consumers to remember inaccurate information about the product or brand' attributes [Schlosser 2003]. Virtual brand experiences that provide consistent information and experiences with the physical environment are likely to be perceived as more useful in assisting consumers in the brand evaluation and decision making process [Griffith and Chen 2004]. Hence, we hypothesize:

**Hypothesis 1a.** Perceived diagnosticity is positively related to brand attitude.

**Hypothesis 1b.** Perceived diagnosticity is positively related to real world purchase intentions.

### 3.2 Self-Image Congruence

Consumers are increasingly turning to computer-mediated communications for information on which to base purchase decisions. For instance, consumers frequently make product and brand choices based on social interactions they have with other users in the online environment [Kozinets 2002], especially when the medium allows for a high degree of social interaction with other consumers [Kumar and Benbasat 2002]. Some online consumers form virtual communities organized around the consumption of products and brands whereby consumers share ideas and co-create the identity and symbolism of the brand [Kozinets 1999]. Consumers in these virtual communities often use communal consumption to establish shared self-identities and values within the virtual context [Mathwick 2002; Mathwick et al. 2008; Suntornpithug and Khamalah 2010].

Self-image congruence has been identified in the marketing literature as the extent to which a product or brand matches a consumer's self-concept [Kressmann et al. 2006]. Self-image congruence theory suggests that individuals prefer to interact with products and brands that fit with their self-image, and they tend to hold more favorable attitudes towards these products and brands [Sirgy et al. 1997]. Consumers also prefer products and brands that they perceive to be used or owned by people who they can relate to and who match their self-identity [Chebat et al. 2006]. Self-image congruence theory suggests that consumers prefer brands and users of the brand associated with a set of personality traits congruent with their own [Aaker 1999]. People have a need for consistency that arises from a preference for situations that are predictable and familiar. When product and brand experiences in the virtual world are consistent with a consumer's actual, or ideal, self-image in the real world these brand experiences are more likely to affect brand attitudes and lead to actual purchasing intentions. Hence, we hypothesize:

**Hypothesis 2a.** Self-image congruence is positively related to brand attitudes.

**Hypothesis 2b.** Self-image congruence is positively related to real world purchase intentions.

### 3.3 Behavioral Consistency

A number of studies in the social psychology literature have shown that people have a strong desire to maintain consistency across their beliefs, attitudes, and behaviors [Heider 1946; Festinger and Carlsmith 1959]. For example, individuals often refer to their past behavior for determining their attitudes and for deciding how to act in other situations [Bem 1972]. Yet, there has been a scarcity of research in multichannel marketing for considering how attitudes and behaviors in one marketing channel influence attitudes and behaviors in another marketing channel [Kwon and Lennon 2009]. This paper proposes a newly developed construct, perceived behavioral consistency, as a potential antecedent to purchase intentions within a multichannel framework. The perceived behavioral consistency construct is defined as a user's belief that their behavior is consistent across marketing channels (i.e., the online and offline channel), and was developed to address issues discussed in the multiple selves, and hypothetical bias literature.

Some users of the virtual world may behave similar to how they act in the real world, and they may even consider their avatar (i.e., representation of the user in the virtual environment) to be an extension of themselves. Other users may use the virtual world to behave in ways that they normally would not in the real world, and to try out new personas in the virtual world [Hemp 2006]. Arakji and Lang [2008] suggest that the extent to which a consumer's identity and actions in the virtual world resemble their real world existence, may determine how their behavior in virtual worlds affect their actual purchases in the real world. It is expected that consumers who perceive their behavior to be highly consistent across the real world and virtual world are more likely to form real purchase intentions based on information gathered through virtual world brand experiences. Interacting with virtual products has the potential to influence expectations to purchase the product, as the user imagines actual use and ownership of the product [Li et al. 2001; Schlosser 2003]. The extent to which users can clearly and easily imagine themselves actually using and owning a product in the real world should affect their intentions to purchase the product. However, when consumers view their behavior in virtual environments as inconsistent with their actual behavior (or self-concept) in real world marketing channels, the information gathered from virtual brand experiences is likely to be devalued and is expected to have a weaker effect on purchase intentions.

While some companies, such as Kellogg's Cereal and Aloft Hotels, have found strong correlations between consumer product choices in the virtual environment and offline shopping behavior, this may not always be the case [Palmer 2008]. Hemp [2006] suggests that users in virtual environments may try out new identities, personas, and behaviors that do not correspond with how they present themselves in other marketing channels. This creates a real challenge for marketers as it may be difficult to differentiate between actual and hypothetical responses to marketing stimuli in the virtual shopping environment [Arakji and Lang 2008]. Studies in the social psychology and marketing literature have found that peoples' behavior in hypothetical settings may not always be indicative of their true behavioral intentions [Ajzen et al. 2004; Ding 2007]. Traditionally, consumers were assumed to have a stable set of personality traits and therefore should behave similarly across situations, however recent studies have shown that people act and present themselves differently in different situations, as they are influenced by both personality and situational factors [Aaker 1999]. Situational factors are composed of both physical aspects of the situation and social surroundings, such as other people present in the situation. A considerable amount of research has suggested that the self is composed of multiple aspects or dimensions and that different situational cues help determine which personality trait is accessible within that situation. Studies have also suggested that consumers' multiple selves (identities) may be inconsistent with each other and create conflict within the individual [Bahl and Milne 2009].

As more consumers use multiple marketing channels to establish relationships with brands and make purchasing decisions, it is important for managers to understand how consumers manage their self-identity and behavior across these channels. Inconsistencies in a persons' desire to express their actual or alternative self across marketing channels is likely to be an important determinant of how product information is evaluated in each channel and its effect on purchase intentions. Hence, we hypothesize:

**Hypothesis 3a.** Perceived behavioral consistency is positively related to brand attitude.

**Hypothesis 3b.** Perceived behavioral consistency is positively related to real world purchase intentions.

### 3.4 Brand Attitude and Real World Purchase Intentions

Available literature defines attitudes towards a brand as the degree to which a person has favorable or unfavorable evaluations of the brand [Smith et al. 2007]. A person's attitude towards a brand conveys an overall evaluation that can be derived from multiple information sources including both online and offline experiences with the brand. Favorable evaluations of the brand can encourage a consumer to develop positive attitudes towards purchasing the brand [Mitchell and Olson 1981; LaTour and Rotfeld 1997; Teng and Laroche 2007]. An important function of a brand's online presence is its ability to persuade consumers to make actual purchasing decisions,

thereby resulting in sales to the firm [Suntornpithug and Khamalah 2010]. Prior research has predominantly used purchase intention as a proxy for actual choice, as a person's intentions are often an accurate predictor of their behavior [Ajzen 1991]. In this study, it is posited that a positive attitude towards the brand will have a positive impact on real world purchase intentions. Thus, we hypothesize:

**Hypothesis 4.** Brand attitude is positively related to real world purchase intentions.

#### 4. Methodology

##### 4.1 Design and Procedure

To test the proposed hypotheses, an online questionnaire was administered to registered users of the virtual world, Second Life. 209 surveys were received and 158 of those surveys contained complete and usable data. The survey was made possible by collaborating with a marketing research firm that specializes in data collection within virtual worlds. Each respondent had to be 18 years or older, had a Second Life account for at least three months, and had encountered real life brands in Second Life. These criteria were established in order to verify that respondents would have at least a basic level of experience using Second Life. Given the commercial nature of Second Life, it is very common in Second Life for users to encounter real life brands. Respondents who completed the survey were provided with a monetary incentive of 500 Linden dollars (about 2 U.S. dollars), which can be exchanged within Second Life for U.S. dollars and other currencies.

Following the brand elicitation technique used in the social psychology literature by Smith et al. [2007], the survey asked respondents to think about real life brands that they have encountered in Second Life, and to list up to five of these brands. Respondents were then instructed to select one brand, from the brands that they listed, that they have had the most memorable experience with in Second Life. Throughout the remainder of the questionnaire, respondents were asked to answer the questions with this brand in mind. A single wave of data was collected using the questionnaire. A pre-test was conducted prior to full administration of the online survey, to identify and revise any questions that were reported to be confusing.

As this study collected data for both dependent and independent variables using the same method (self-report scales), Harmon's one-factor test [Podsakoff et al. 2003] was conducted to test for common method bias. Five factors emerged from our factor analysis with eigenvalues greater than 1 and the variance explained was 58.46%. As none of the factors explained the majority of the variance, common method bias is unlikely to be a concern in the analysis.

##### 4.2 Respondents

The respondents were registered users of the virtual world, Second Life. The gender, age, and country of residence statistics for the sample were similar to the average reported statistics for the overall population of registered users in Second Life [KZero Consulting, 2007]. Respondents' age range was 19 to 71 years ( $M = 38.76$ ). The sample consisted of 75 males (47.5%) and 83 females (52.5%). Nearly half of the respondents (47.8%) reported an education level of having earned a bachelor's degree or higher. Roughly half of the respondents ( $n = 82$ , 51.9%) reported the United States as their country of residence, while the remainder reported residency outside the United States (e.g., United Kingdom 7.6%, Canada 6.3%, Germany 5.1%, Netherlands 6.3%, France 3.8%, and Italy 3.8%). A summary of the characteristics of respondents is provided in Table 1.

When respondents were asked to select the real life brand that they have had the most memorable experience with in Second Life (e.g., from the list of real life brands that they recalled from memory), the following show the frequency that each real life brand was selected: IBM (11.9%,  $n = 25$ ), Adidas (6.2%,  $n = 13$ ), Coca-Cola (5.26%,  $n = 11$ ), Dell (4.78%,  $n = 10$ ), and Nike (4.30%,  $n = 9$ ). About 66% of the respondents reported that they frequently purchase virtual products in Second Life, and 36.4% of the respondents indicated that they had purchased products from the selected brand in Second Life. As evidence of multichannel effects, 26.3% of respondents reported that they have purchased a product in real life after seeing information about the product in Second Life, and 12% of the respondents indicated that they have purchased a product in real life after first purchasing the product in Second Life.

Table1. Sample Characteristics (n=158)

|   |             | <i>N</i> | <i>Percentage</i> |
|---|-------------|----------|-------------------|
| <b>Gender</b>                                   | Male        | 83       | 52.5%             |
|   | Female      | 75       | 47.5%             |
| <b>Length of Second Life Membership (Years)</b> | 0-1         | 12       | 7.6%              |
|   | 1-2         | 58       | 36.7%             |
|   | 2-3         | 68       | 43.0%             |
|   | 3-4         | 15       | 9.5%              |
|   | 4-5         | 3        | 1.9%              |
|   | >5          | 2        | 1.3%              |
| <b>Real Life Country of Residence</b>           | USA         | 82       | 51.9%             |
|   | UK          | 12       | 7.6%              |
|   | Canada      | 10       | 6.3%              |
|   | Netherlands | 10       | 6.3%              |
|   | Germany     | 8        | 5.1%              |
|   | France      | 6        | 3.8%              |
|   | Italy       | 6        | 3.8%              |
|   | Other       | 24       | 15.2%             |
| <b>Real Life Age</b>                            | 18-25       | 20       | 12.7%             |
|   | 26-30       | 21       | 13.3%             |
|   | 31-35       | 25       | 15.8%             |
|   | 36-40       | 29       | 18.4%             |
|   | 41-45       | 18       | 11.4%             |
|   | 46-50       | 17       | 10.8%             |
|   | 51-55       | 15       | 9.5%              |
|   | 56-60       | 9        | 5.7%              |
|   | >60         | 4        | 2.5%              |
| <b>Hours Spent on Second Life (per week)</b>    | 0-24        | 99       | 62.7%             |
|   | 25-48       | 41       | 25.9%             |
|   | 49-72       | 11       | 7.0%              |
|   | >72         | 7        | 4.4%              |

#### 4.3 Measurement

The survey instrument was an online questionnaire containing multi-item measures of perceived diagnosticity, self-image congruence, behavioral consistency, brand attitude, real world purchase intentions, and a standard set of demographic variables. The items used in each of the measures are detailed in Appendix 1.

*Perceived Diagnosticity.* Three items on a 7-point scale were adapted from the literature [Kempf and Smith 1998; Witmer and Singer 1998; Jiang and Benbasat 2005] and were used to measure perceived diagnosticity. Respondents were asked to indicate the degree to which they believe that their experience with the brand in the virtual world provided an accurate test of products with this brand in the real world, the extent to which they believe their experience with the brand in the virtual world was helpful, and how helpful they believe experience with the brand in the virtual world to be for judging the quality and performance of products with the brand in real life.

*Self-Image Congruence.* Three items on a 7-point scale were used to assess self-image congruence. The items were adapted from the instrument used by Sirgy et al. [1997] to fit the context of the current study. Respondents were asked to indicate the degree to which they identified virtual world users who use products with the brand, the degree to which they perceive themselves as being similar to other users of the brand in the virtual world, and the degree to which their self-concept in the virtual world is consistent with the brand image.

*Behavioral Congruence.* A new three item 7-point scale was developed and used to measure behavioral congruence. Respondents were asked to state the extent to which they believed that their actions in the virtual world reflect how they behave in the real world, the degree to which they believe that their avatar is an extension of themselves, and the extent to which their behavior in the virtual world is consistent with their behavior in the real world.



*Real World Purchase Intentions.* Two items on a 7-point scale were used to measure real world purchasing intentions. These items were adapted from Holzwarth et al. [2006] and asked respondents to indicate whether they were interested in buying products with the brand in the real world.

*Brand Attitude.* A four-item scale was used to assess respondents' attitudes towards the brand that they selected as having the most memorable experience with in Second Life. Respondents evaluated the brand that they selected using the following adjective pairings: “unpleasant-pleasant”, “bad-good”, “negative-positive”, “unfavorable-favorable”. The four attitude items were adapted from Smith et al. [2007].

**5. Results**

Partial Least Squares (PLS) regression was used to test the research model. PLS is a structural equation modeling (SEM) technique that is useful for simultaneously estimating multiple relationships among latent constructs. PLS was chosen over other covariance-based structural equation modeling techniques such as LISREL, because PLS makes minimal demands on sample size and data distribution [Fornell and Bookstein 1982; Henseler and Chin 2010], is suitable for exploratory research studies [Igarria, et al. 1994; Barclay et al. 1995; Gefen et al. 2003], and has been considered by some researchers to provide relatively more straightforward model specification and interpretation [Chin, 2010]. Other covariance-based approaches tend to be more restrictive in terms of their assumptions, and may not be suitable for the current study since the sample size is relatively small and the research is exploratory [Chau 1997]. To run PLS we used the software Smartpls [Ringle et al. 2005], which enabled us to develop and assess the measurement and structural model proposed in this study.

**5.1 Measurement Model**

The measurement scales used in this study are shown in Appendix 1. Reflective indicators were used to operationalize each construct in the model since the indicators for each construct were expected to be highly correlated [Baxter, 2009]. Reflective indicators represent manifestations of a construct (Roberts and Thatcher, 2009), thus the indicators need to be internally consistent [Nunally and Bernstein 1994]. We assessed the model’s internal consistency using three approaches: Cronbach's alpha, composite reliability and average variance extracted (AVE). For a scale to be considered reliable Cronbach's alpha and composite reliability must be equal to or greater than 0.7. All the scales used in this study exceed this threshold. AVE can also be used to assess the reliability of a scale. Chin [1998] suggests that if a scale has an AVE equal to or greater than 0.5 then it can be considered to be reliable. The AVE of our scales ranged from 0.678 to 0.935 exceeding the minimum threshold. A summary of the measures of unidimensionality and reliability is provided in Table 2.

Table 2. Unidimensionality and Reliability

| Scale                       | Variable | Factor Loading | Cronbachs Alpha | Composite Reliability | AVE   |
|-----------------------------|----------|----------------|-----------------|-----------------------|-------|
| Behavioral Consistency (BC) | BC1      | 0.831          | 0.728           | 0.863                 | 0.678 |
|                             | BC2      | 0.764          |                 |                       |       |
|                             | BC3      | 0.872          |                 |                       |       |
| Brand Attitude (BA)         | BA1      | 0.958          | 0.971           | 0.971                 | 0.919 |
|                             | BA2      | 0.965          |                 |                       |       |
|                             | BA3      | 0.965          |                 |                       |       |
|                             | BA4      | 0.946          |                 |                       |       |
| Perceived Diagnosticity(PD) | FC1      | 0.887          | 0.908           | 0.942                 | 0.845 |
|                             | FC2      | 0.924          |                 |                       |       |
|                             | FC3      | 0.945          |                 |                       |       |
| Real World Intention (RWPI) | RWPI1    | 0.967          | 0.931           | 0.966                 | 0.935 |
|                             | RWPI2    | 0.967          |                 |                       |       |
| Self-Image Congruence (SIC) | SIC1     | 0.879          | 0.851           | 0.909                 | 0.770 |
|                             | SIC2     | 0.868          |                 |                       |       |
|                             | SIC3     | 0.885          |                 |                       |       |

Gefen and Straub [2005] suggest that when using PLS discriminant validity can be established if 1) measurement items load on their corresponding latent variables a magnitude higher than they load on other latent variables and 2) the square root of AVE greater than the correlations between latent variables. The factor analysis revealed that each of the items loaded heavily on their corresponding latent variables and less on other latent variables (Table 3). Moreover, the square root of the AVE for each latent variable was considerably higher than the correlations of the latent variables. This is shown in Table 4.

Table 3. Latent Variable Cross Loadings

|       | <b>Brand Attitude (BA)</b> | <b>Self-Image Congruence (SIC)</b> | <b>Real World Intention (RWPI)</b> | <b>Perceived Diagnosticity (PD)</b> | <b>Behavioral Consistency (BC)</b> |
|-------|----------------------------|------------------------------------|------------------------------------|-------------------------------------|------------------------------------|
| BA1   | <b>0.958</b>               | 0.560                              | 0.606                              | 0.386                               | 0.253                              |
| BA2   | <b>0.965</b>               | 0.524                              | 0.591                              | 0.336                               | 0.248                              |
| BA3   | <b>0.965</b>               | 0.514                              | 0.558                              | 0.356                               | 0.245                              |
| BA4   | <b>0.946</b>               | 0.548                              | 0.588                              | 0.341                               | 0.231                              |
| SIC1  | 0.490                      | <b>0.879</b>                       | 0.542                              | 0.528                               | 0.203                              |
| SIC2  | 0.418                      | <b>0.868</b>                       | 0.577                              | 0.417                               | 0.177                              |
| SIC3  | 0.558                      | <b>0.885</b>                       | 0.587                              | 0.500                               | 0.133                              |
| RWPI1 | 0.563                      | 0.648                              | <b>0.967</b>                       | 0.476                               | 0.274                              |
| RWPI2 | 0.620                      | 0.607                              | <b>0.967</b>                       | 0.422                               | 0.332                              |
| FC1   | 0.264                      | 0.398                              | 0.392                              | <b>0.887</b>                        | 0.022                              |
| FC2   | 0.378                      | 0.575                              | 0.442                              | <b>0.924</b>                        | 0.101                              |
| FC3   | 0.367                      | 0.526                              | 0.442                              | <b>0.945</b>                        | 0.099                              |
| BC1   | 0.201                      | 0.163                              | 0.216                              | 0.056                               | <b>0.831</b>                       |
| BC2   | 0.173                      | 0.144                              | 0.255                              | 0.058                               | <b>0.764</b>                       |
| BC3   | 0.247                      | 0.170                              | 0.295                              | 0.089                               | <b>0.872</b>                       |

Table 4. Latent Variable Correlation Matrix

| <b>Latent Variables</b>     | <b>(1)</b>   | <b>(2)</b>   | <b>(3)</b>   | <b>(4)</b>   | <b>(5)</b>   |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|
| (1) Behavioral Consistency  | <b>0.824</b> |              |              |              |              |
| (2) Brand Attitude          | 0.255        | <b>0.958</b> |              |              |              |
| (3) Perceived Diagnosticity | 0.084        | 0.370        | <b>0.919</b> |              |              |
| (4) Real World Intention    | 0.313        | 0.612        | 0.464        | <b>0.967</b> |              |
| (5) Self-Image Congruence   | 0.193        | 0.560        | 0.550        | 0.649        | <b>0.877</b> |

Note: The diagonals represent the square root of the Average Variance Extracted (AVE). Off diagonal values represent latent variable correlations. For discriminant validity diagonal values should exceed the absolute value of the standardized correlations.

Given that our measurement scales demonstrate adequate unidimensionality, reliability and discriminant validity we proceeded with the analysis of the structural model.

## 5.2 Structural Model

Figure 2 shows the results of the structural path analysis conducted using SmartPLS 2.0 [Ringle et al. 2005]. To estimate the significance of the path coefficients we performed bootstrap resampling using 500 resamples. The analysis controls for age, gender and prior real world purchase experience (PRWPE) with the brand, as these variables have the potential to confound the results. With the exception of PRWPE, no significant relationship was found between each of the control variables and the dependent variable. PRWPE was found to have a positive significant impact on real world intentions. This is to be expected given the consensus in the literature that past behavior can influence future intentions and behavior [Azjen 1991; Lanktona et al. 2010]. The analysis reveals that the PD, SIC and BC explain 34.2% of the variance in BA and PD, SIC, the control variables account for 24.7% of the variance in RWPI and the full model (i.e. control variables plus PD, SIC, BC and BA) account for 61.8% of the variance in RWPI. Following Klein and Rai [2009], to determine whether the variance explained by PD, SIC, BC

and BA is large and significant we computed Cohen's  $f^2$  statistic ( $f^2 = (R^2 \text{ full model} - R^2 \text{ control variables}) / (1 - R^2 \text{ full model})$ ) [Cohen 1992] and a pseudo F-statistic with (k-c, N-k-c) degrees of freedom where k = number of estimated parameters in the full model; c = number of estimated parameters in the control variables model. Importantly, the results indicate that effect of PD, SIC, BC and BA on RWPI over and above the control variables is large ( $f^2 = 0.971$ ) and significant ( $F = 146.62$ ;  $p < 0.001$ ).

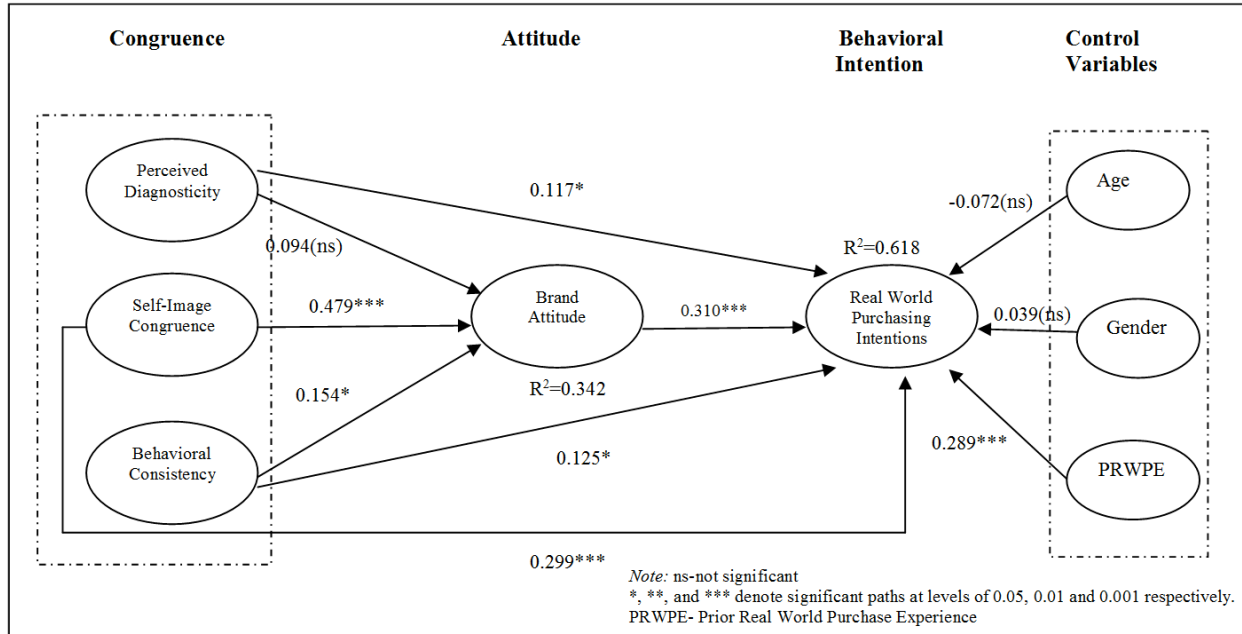


Figure 2. Results of PLS Analysis

The results in Figure 2 show that with the exception of the relationship between PD and BA all the hypotheses are supported. PD positively impacts RWPI ( $\beta = 0.117$ ;  $p < 0.05$ ). SIC positively impacts BA ( $\beta = 0.479$ ;  $p < 0.001$ ) and RWPI ( $\beta = 0.299$ ;  $p < 0.001$ ). Finally, BC positively impacts BA ( $\beta = 0.154$ ;  $p < 0.05$ ) and RWPI ( $\beta = 0.125$ ;  $p < 0.05$ ).

### 5.3 Mediation Effect

The conceptual model suggests that BA may mediate the relationship between the PD, SIC and BC. The conditions necessary to provide evidence for mediation [Baron and Kenny 1986, Thatcher and Perrew 2002] are (1) the independent variables significantly impact the dependent variable (2) the independent variable significantly impacts the mediating variable (3) the impact of the independent variable on the dependent should be zero (full mediation) or reduced (partial mediation) when the moderating variable is entered. Following McKnight et al. [2009] to test for mediation using PLS, we first ran a model with the direct effects from the independent variables (PD, SIC and BC) on the dependent variable (RWPI). Each independent variable PD ( $\beta = 0.151$ ;  $p < 0.05$ ), SIC ( $\beta = 0.440$ ;  $p < 0.001$ ) and BC ( $\beta = 0.173$ ;  $p < 0.01$ ) had significant positive impact on the RWPI, thus the first condition for mediation is satisfied. Next, we ran a model to test the relationship between each of the independent variables and the moderating variable (BA). Both SIC ( $\beta = 0.484$ ;  $p < 0.001$ ) and BC ( $\beta = 0.154$ ;  $p < 0.01$ ) were found to have a significant positive impact on BA, thus satisfying the second condition necessary for mediation. The relationship between PD and BA was not significant, indicating that BA does not mediate the relationship between PD and RWPI. Finally, we ran a model to test for the third condition necessary for mediation. The results indicate BA partially mediates the relationship between SIC ( $\beta = 0.299$ ;  $p < 0.001$ ) and BC ( $\beta = 0.125$ ;  $p < 0.05$ ).

## 6. Discussion and Implications

This study serves as one of the first attempts for empirically investigating whether a brand experience in a 3D virtual environment can affect attitude formation and purchasing decisions in a real-world marketing channel. Furthermore, this research identified three types of channel congruence (perceived diagnosticity, self-image congruence, and behavioral consistency) and their effects on brand attitudes and real-world purchase intentions were investigated. Based on a unique dataset from actual users of an online virtual world (i.e., Second Life), each of the channel congruence variables were found to be significant and positive predictors of consumers' intentions to

purchase the brand in the real world. Self-image congruence and behavioral consistency were also found to have strong effects on attitude formation. Mediation analysis showed that brand attitudes play a vital role in the relationship between cross-channel consistencies and purchase intentions.

The findings from this study provide strong support that multichannel effects exist between virtual world brand experience and real world purchasing decisions, and that cross-channel consistencies are important factors that contribute to these effects. In accordance with the predictions from prior research (Barnes and Mattsson 2008; Arakji and Lang 2008), the results of this study demonstrate that brand experiences in virtual world marketing channels may have a strong influence on real-world purchasing decisions. Virtual world brand experiences may consist of information search by examining, trying, and purchasing virtual products (i.e., digital representations of real world branded products). These virtual world brand experiences may affect a consumer's decision to try and purchase the brand offline. The findings suggest that establishing a virtual world brand presence may be effective for increasing a consumer's interest in purchasing a brand, and has the potential to result in real world sales. A consumer's interactions with a brand in the virtual environment may provide important information about the consumer's desire to develop a relationship with the brand in other marketing channels, and serves as an opportunity for the marketer to assist in the buying process.

The effect of virtual brand experience on attitude formation and purchase intentions is found to depend on the extent to which the virtual shopping experience is believed to be accurate and useful for evaluation, shared self-concept with other users of the brand, and perceived behavioral consistency across marketing channels.

A number of studies [Li et al. 2002; Suh and Lee 2005; Li et al. 2001; Suh and Chang 2006] have shown that consumer interactions with products and brands using 3D website technology has the potential to influence brand attitudes and purchase intentions. However, these studies have often used student subjects and 2D websites in a laboratory setting. The current study offers additional support to previous results in the literature by finding that consumers who perceive their virtual world experience as helpful for evaluating the brand are more likely to form positive attitudes towards the brand and more likely to purchase the brand in the real world. This suggests that realistic product simulations may be effective for informing consumers about brand performance. Brand and product experiences with a high degree of realism tend to provide more useful information, and thus may be more helpful in assisting consumers in the evaluation and decision making process.

These findings have important implications for marketing managers as they demonstrate the ability of brand experiences in the virtual environment to have multichannel effects, and suggests that virtual experiences with a firm's brand, products, and presence that are consistent with the firm's real-world image and offerings are perceived to be more useful for evaluating the brand's product offerings. The results support the notion that the consistency of information between the mediated and real-world channel affects how the usefulness of that information is evaluated and its impact on purchasing decisions [Urban et al. 1997; Griffith and Chen 2004; Kaltcheva and Weitz 2006]. Overall, these findings provide support that brand experiences in the virtual world can be used to shape consumers' buying intentions in the real world, especially when the brand experience is perceived to provide useful information.

Research has found that social interactions with other users on the internet can affect consumers' product and brand choices [Kozinets 2002], and that a sense of shared values and identity is important for these virtual communities of consumption [Mathwick 2002; Mathwick et al. 2008; Suntornpithug and Khamalah 2010]. The current study investigated the role of self-image congruence in a 3D virtual environment and found that brand experiences that were highly consistent with a person's self-concept had a strong positive effect on their attitudes and intentions to purchase the product in the real world. The results suggest that a person's self-identity, and information consistent with that identity, may influence their attitudes and behavior across multiple marketing channels. Virtual world brand experiences may be perceived as more meaningful and memorable when the consumer is able to identify with other users of the brand in the virtual world, and the brand's image in the virtual environment is consistent with the consumer's self-concept.

How consumers relate to brands and other users in an interactive online environment may affect their perceptions of the brand in offline channels as it may help to confirm or disconfirm certain beliefs about the brand. The findings from this study suggest that marketers must consider the extent to which consumers' self-concept are compatible with the brand's virtual world image and their ability to identify with other users of the brand in the virtual environment. Consistency between the brand's image across the virtual and offline channels is found to affect consumers' evaluations of the brand and intent to purchase the brand in the real world. A brand image in the virtual world that is inconsistent with the consumers' self-concept may have a negative effect on the consumers' evaluation of the brand in the real world, as a result of receiving contradictory information about the brand.

This study provides an initial test of the perceived behavioral consistency construct, a new measure developed in this paper, which may help to explain how consumers think about their multichannel behavior. It is well recognized by both researchers and marketers that consumers occasionally behave differently across retailing

situations and marketing channels. The results of this study show that the extent to which a user believes that their online behavior is consistent with their real-life consumption behavior has an impact on whether interactions with brands in the virtual world will affect their attitudes and real-life purchase intentions. Purchasing decisions in one marketing channel may be affected by a user's perceptions about their behavior in another channel. Our findings suggest that consumers place more importance on information collected from virtual marketing channels when they perceive their behavior as being consistent with their offline behavior. The results of this study provide additional support for the cross-channel effects found by Kwon and Lennon [2009], and suggest that, in addition to attitudes, consumption behaviors may also be transferable across marketing channels. Understanding how consumers view their behavior across marketing channels is likely to have important implications for practitioners. 3D virtual environments allow managers the unique ability to observe shopping behavior in a simulated environment which may provide useful information for understanding offline behavior and modifying store environments or product design. Companies can leverage this cross-channel information to improve marketing decisions in other channels and integrate marketing strategies across channels [Zhang et al. 2010; Keller 2010; Berry et al. 2010].

## 7. Future Research and Limitations

While traditional websites are still the dominant online platform for learning about products and making purchase decisions, Web. 2.0 technologies are emerging that offer higher levels of functional and social interactivity, and an understanding of how they impact behavior is limited. There are many opportunities for future research in the area of virtual world brand experience.

Object and social interactivity are unique attributes of 3D virtual environments. While this study found higher diagnosticity of the brand experience to increase interest in the brand, this relationship may depend on the shopping goals of the consumer. Companies can establish a presence in the virtual environment in several ways. For instance, some companies use a virtual brand strategy where they focus on providing a realistic and simulated experience with the intent of letting consumers evaluate their products [Hemp 2006; Arakji and Lang 2008]. Others employ a fantasy-based brand experience with a focus on heightening the user's experience rather than on providing experiences with the product for evaluation [Hemp 2006]. The results of the current study seem to suggest that a virtual-world brand strategy that focuses on providing realistic experiences and shopping environments may lead to more favorable outcomes for the company. However, the way consumers respond to different branding strategies in the virtual world may depend on their motivations and goals for using the virtual world [Arakji and Lang 2008]. Some users may be interested in learning about and evaluating real world products through simulated experiences. Others may be more interested in a fun, fantasy-based experience with the brand. Understanding user motivations for using virtual worlds is important for developing effective brand presence strategies [Schlosser 2003; Smith et al. 2005; Kaltcheva and Weitz 2006; Hemp 2006].

Additional research on the effect of social influences and self-concept across channels may also provide valuable insights. Self-image congruence theory suggests that consumers prefer products and brands that they perceive to be used or owned by people who they can relate to and who match their self-identity. Consumers may also be attracted to brands that are used by a reference group that they aspire to be a member. It may be useful to compare the effects of users' actual self-image with their ideal self-image in determining which brands they interact with in the virtual world. Some users of a virtual world may employ actual, or ideal, self-concepts that fit their real-life counterpart, while other users may try on fantasy-based self-concepts. Additional research is needed for investigating which self-concepts are most salient when users interact with brands in virtual environments and their effects on consumption behavior. Researchers may also need to consider the particular context and marketing channel when measuring social influences. Social influences in the virtual world may have a greater influence on decision making when consumers are immersed and highly involved in the virtual world environment.

The findings should be interpreted with regard to potential limitations of the study. First, while several attempts were made to reduce common method variance or response bias by including negatively worded items and through the use of multi-item measures the study relied on self-report measures which may have impacted responses. Future studies may also wish to confirm the findings of this study using a larger sample size and alternate analytical tools such as covariance-based SEM. While PLS was chosen as the most appropriate analytical technique for this study given the nature of the data, PLS is not "silver bullet", it does have a number of limitations [Marcoulides and Saunders, 2006; Sosik et al. 2009]. For instance, Sosik, Kahai, and Piovoso [2009] suggest that when bootstrapping is used, small samples tend to produce more variable results. Additionally, PLS may be less suited to confirmatory analysis. A second limitation of the study is that the results may not generalize to other populations or virtual environments, as users of Second Life may differ from other consumers in terms of online shopping goals and experience. The Second Life virtual world may also differ from other virtual world environments in terms of real-world brand presence and the realism of the 3D environment. Lastly, the use of a brand elicitation technique and

single-wave data may be inadequate for demonstrating causality. It is suggested that future studies employ a longitudinal or experimental design to convincingly demonstrate causal effects between variables.

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## APPENDIX 1: SURVEY ITEMS USED

| Construct & Items  | Source   |
|--|--|
| <b>Real World Purchase Intentions (RWPI)</b><br>RWPI1-I would be very interested in buying products with this brand in the real world.<br>RWPI2-I would consider buying products with this brand in the real world.  | Holzwarth et al. 2006  |
| <b>Perceived Diagnosticity (PD)</b><br>FC1-Do you feel that your experience with this brand in Second Life provided an accurate test of products with this brand in the real world?<br>FC2-How helpful would you rate your experience with this brand in Second Life?<br>FC3-Overall, how helpful would you rate your experience with the brand in Second Life for judging the quality and performance of products with this brand in real life? | Items adapted from Kempf and Smith 1998; Witmer and Singer 1998; Jiang and Benbasat 2005 |
| <b>Self-Image Congruence (SIC)</b><br>SIC1-I can identify with avatars who use products with this brand in Second Life.<br>SIC2-I am very much like the typical avatar that uses products with this brand in Second Life.<br>SIC3-The brand image is highly consistent with how I see myself in Second Life.   | Items adapted from Sirgy et al. 1997   |
| <b>Behavioral Consistency (BC)</b><br>BC1-My actions in the virtual world reflect how I behave in the real world.<br>BC2-I consider my avatar to be an extension of myself.<br>BC3-My behavior in the virtual world is consistent with my behavior in the real world.  | New Scale  |
| <b>Brand Attitude (BA)</b><br>In general, how would you rate this brand?<br>BA1-{Unpleasant ... Unpleasant}<br>BA2-{Bad... Good}<br>BA3-{Negative...Positive<br>BA4-{Unfavorable...Favorable}  | Smith et al. 2007  |