Ugly Duckling by Day, Super Model by Night:
The Influence of Body Image on the Use of Virtual Worlds

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Abstract

The use and importance of virtual worlds is growing worldwide but little is known about what influences participants to use them. The current study extends the Theory of Planned Behavior (TPB), using sociometer theory, to explore influences on the use of virtual worlds. It is hypothesized that perceptions of body image are negatively related to the desire to become someone else, and that this and attitudes towards telepresence (i.e., sense of being there), social norms, and perceived behavioral control are positively related to the use of virtual worlds. Findings suggest that perceptions of body image through the desire to become someone else, attitudes toward telepresence, and subjective norms significantly affect the use of virtual worlds. Perceived behavioral control was found to have no significant impact on the use of virtual worlds. Implications and directions for future research are discussed.

Key Words: body image; TPB; telepresence; virtual worlds; consumer behavior; sociometer theory; attitude; subjective norms; perceived behavioral control.

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The use of virtual worlds, as a subset of virtual environments, is growing worldwide and practitioners and academicians alike are interested in understanding these environments. In virtual environments individuals can socialize, play games, form affiliation to groups, teach/learn, and/or shop/sell (Balkin & Noveck, 2006; Rockwell, 2008; Messinger, Stroulia, & Lyons, 2008). Virtual worlds, on the other hand, are designed mainly for social interactions without keeping score or accumulating points like virtual gaming (Schroeder, 2008). Virtual worlds are persistent virtual environments within a computer network for social interactions, in which users experience others as "being there" and can interact with others within the virtual environment, such as Second Life (Bell, 2008; Messinger et al., 2008; Schroeder, 2008).

It is estimated that up to 50 million people regularly participate in virtual environments (Bennett, 2008).   For example, Balkin and Noveck (2006) estimate that participants in virtual environments spend an average of twenty-two hours per week in adult environments such as Second Life and World of Warcraft; children's environments such as Habbo and Neopets; media-focused such as v-Side; community-specific such as Cyworld and HiPiHi; and educational environments such as Active Worlds and Forterra Systems. Virtual environments have been found to enhance online sales (Papadopoulou, 2007), increase online advertising/Web site effectiveness (Griffith & Chen, 2004; Coyle & Thorson, 2001; Li, Daugherty & Biocca, 2002), improve understanding of human interaction, and influence behavior (Yee & Bailenson, 2007).

Driver, Jackson, Moore, and Schooley (2008) predict that in five years virtual worlds will become as important to companies as the Web is now. However, worlds have the ability to be a waste of time and perhaps dangerous because they allow individuals to live out fantasies including leading a double life (Bailenson, 2006; Bennett, 2008). Nevertheless, the growing use of virtual worlds as a social environment and its importance to firms makes it an environment in need of understanding.

It is expected that 80% of Internet users will have an avatar presence in a virtual community by 2011 and that virtual world participation could reach a billion users by 2017 (Gartner, Inc., 2007; Virtual Worlds News, 2008a). An avatar is a three dimensional (3-D) representation of a person and his/her alter ego (i.e., becoming someone else) in a virtual environment. In virtual worlds participants can personalize their avatar by choosing a first and last name, which may vary from their real name, determine the avatar's physical appearance, which may vary from their real physical appearance, and show only those traits that s/he wants to present to others (Talamo & Ligorio, 2001).

The available literature suggests that the allure of choosing one's destiny, finding fulfillment and like-minded individuals, and becoming someone else, including changing one's physical appearance (i.e., body image), attracts individuals to virtual worlds and may be context specific (Yee & Bailenson, 2007; Talamo & Ligorio, 2001). However, little is known about how a person's perception of their body image, the influence of referents, and perceptions of

telepresence or the "sense of being there" influences the use of virtual worlds. Using the Theory of Planned Behavior (Ajzen, 1991) and sociometer theory (Leary, 1999), this study explores (a) the relationship between body image (i.e, a person's perception of his/her physical appearance) and his/her desire to become someone else, and (b) the influence of the desire to become someone else, perceptions of telepresence, perceived behavioral control, and subjective norms on the use of virtual worlds.

The present study concentrates on young adults, mostly college students, because of their potential to become heavy virtual world users. Internet users, ages 12-28, are more likely than older users (i.e, over age 28) to send and receive instant messages, play online games, create blogs, download data, search for information, and visit social networks (Vsodera, 2007; Fox, 2005). Approximately 98% of college students use the Internet (Packaged Facts, 2005). While Internet use is high among college students, gender differences can be found in what they access on the Internet. For example, male college students are more likely than female college students (49.3% vs. 34.3%) to view streaming video content and female college students (32.8%) are more likely than male college students (21.7%) to research health information (BurstMedia, Corp., 2007). Currently most virtual worlds users are under the age of 18 (e.g., Habbo) and over the age of 30 (e.g., Second Life). However, the 18-30 year age group offers tremendous potential for virtual worlds because of their affinity to social networks and online gaming (Fox, 2005; Virtual Worlds News, 2008b). For example, Gaia Online virtual world has increased its over 18 users by 30% during the past few years and that has made the site more edgy, which appeals to the over 18 and under 30 year old crowd (Virtual World News, 2008b).

The remaining article is organized in three sections. The next section discusses the relevant literature and presents hypotheses underlying the study. This is followed by a description of the methodology, analysis, and results. The final section concludes with a discussion of results and future research directions.
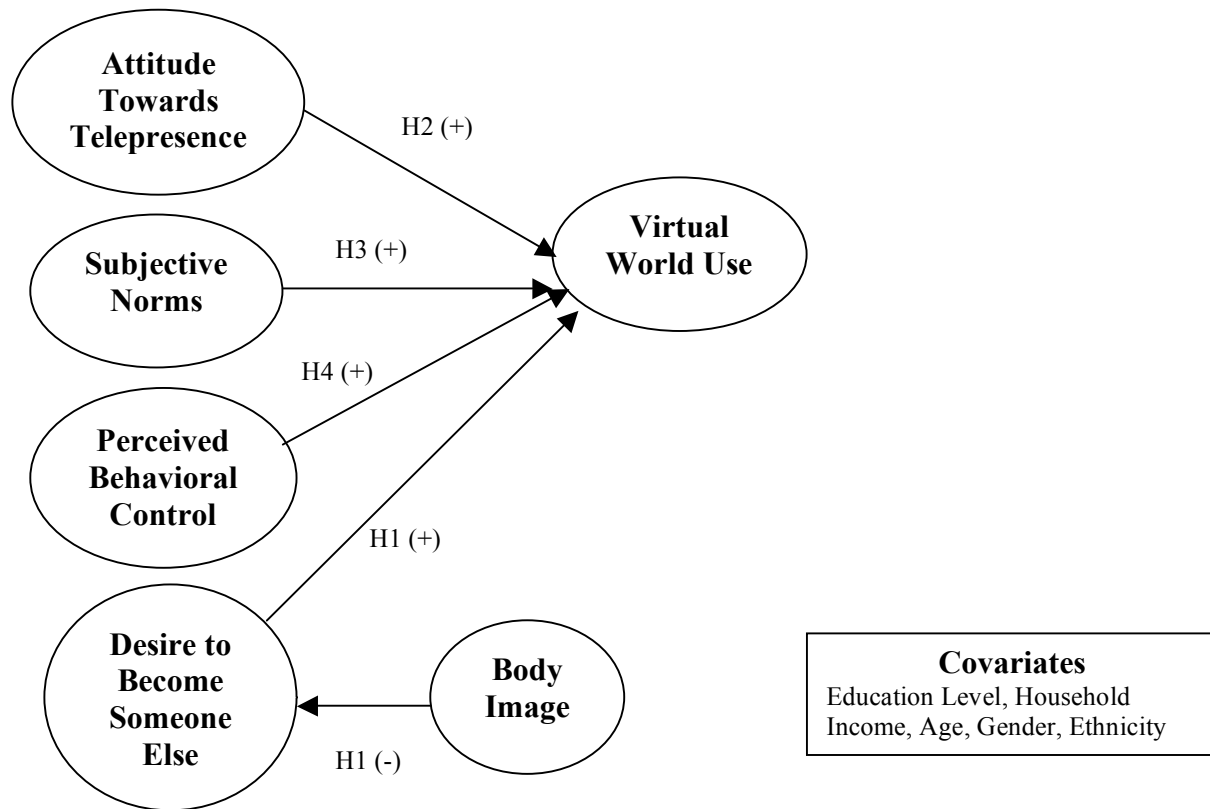
Background and Hypotheses

The current study extends the Theory of Planned Behavior (TPB) model (Ajzen, 1991), using sociometer theory (Leary, 1999), to explore the influence of attitudes, subjective norms, perceived behavioral control, and the desire to become someone else on the use of virtual worlds (see Figure 1). The TPB is an extension of the Theory of Reasoned Action (TRA), which posits that attitudes and subjective norms towards a behavior influence the behavior in question (Fishbein & Ajzen, 1975). The TPB extends the TRA by capturing non-volitional aspects of behavior (i.e., perceptions of ease or difficulty in performing the behavior in question) or perceived behavioral control. The TPB increases the prediction of behavior over the TRA because many behaviors, such as accessing the Internet, are not volitional (Ajzen, 1991). Sociometer theory posits that a person's relationships are determined by his/her self-esteem, which is influenced by social acceptance cues such as perceptions of physical appearance. Sociometer theory in this study incorporates the influence of a person's desire to become someone else, which is posited as being influenced by body image or a person's perceptions of his/her physical appearance, as an influence on the use of virtual worlds.

Attitudes toward a behavior have been found to influence the behavior, including online information search and purchase behavior (Shim, Eastlick, Lotz, & Warrington, 2001). The influence of referents (i.e., subjective norms) has been found to positively influence online

purchasing behavior (Jones & Vijayasarathy, 1998; Shim & Drake, 1990) and online game behavior (Wu & Liu, 2007) and, thus, it could influence the use of virtual worlds. Perceived behavioral control is related to perceptions of possessing the required resources and opportunity to perform the behavior in question, in our case accessing virtual worlds and the Internet. It has also been found to influence online behavior (Shim et al. 2001). Next we discuss the variables of interest in the study.

Figure 1. Influence on the Use of Virtual Worlds
(Based on Theory of Planned Behavior and Sociometer Theory)

Body Image and The Desire to Become Someone Else

The literature abounds with studies of the self-concept and how it affects a person's behavior, including social interactions and shopping behavior, but it has not been applied to virtual worlds. Participants in virtual worlds are able to experience "becoming someone else" through the design and manipulation of their avatars by altering parts of their self-concept and relationships with other people, if only for a brief time.

The self-concept is a multidimensional set of thoughts and feelings that a person has toward his/her self as an object (Sirgy, 1982). The self-concept includes the actual self, ideal self, and social self (Burns, 1979; Rosenberg, 1979). Additionally, self-esteem and self-consistency exert an independent influence on the self-concept (Epstein, 1980). Self-esteem is

the tendency to seek experiences that enhance the self-concept and self-consistency is the tendency for an individual to behave consistently with his/her self-concept.

Sociometer theory posits that self-esteem determines a person's past, present, and future relationships (Leary & Baumeister, 2000). Individuals with high self-esteem feel that they are valued by others while individuals with low self-esteem doubt their value to others (Leary, Tambor, Terdal, & Downs, 1995; Murray, Holmes, & Griffin, 2000). A person's self-esteem, especially in western societies, is influenced by cues that impact social acceptance, such as physical attractiveness (Anthony, Holmes, & Wood, 2007; Leary et al., 1995). Easily observable cues, such as physical attractiveness, influence a person's self-esteem because they impact social acceptance, particularly when other cues, such as honesty and/or kindness may take longer to assess (Anthony et al., 2007). Physical attractiveness allows individuals to assess another person accurately in a short time; good looking individuals are better liked, better treated, and they are sought out more by others (Anthony, et al., 2007; Reis, Wheeler, Spiegel, Kernis, Nezlek, & Perri, 1982).

Similar to other computer-mediated interactions, participants of persistent online social environments (i.e., virtual worlds) may apply social rules and expectations, such as judging other participants based on their appearance (i.e., the appearance of their avatar). Holzwarth, Janiszewski, and Neumann (2006) found that in the online retailing environment perceptions about an online assistant or avatar, specifically its physical appearance, increases its persuasiveness because its physical appearance, similarly to the real world, increases perceptions of likeability and persuasion. Similarly, Keeling, McGoldrick, and Beatty (2007) found that online purchase intentions, for customers who like to interact with a sales person, increase when the Web site adds an Onscreen Assistant (OSA), confirming that social rules and expectations apply in computer mediated environments, such as virtual worlds.

Body image (i.e., self-perceptions of physical appearance) is as important in virtual worlds as it is in the real world because virtual worlds are social networking places and, thus, social acceptance is desired. Interacting with others in a virtual world, where real identities may not be disclosed, could heighten the importance of easily observable traits. For example, Yee and Bailenson (2007) found, similar to research offline (Reis et al., 1982), that the more attractive and taller a person (i.e., an avatar) is perceived, the more social and confident the person represented by the avatar will act.

In virtual worlds participants present the physical appearance that best suits them, including having more than one physical presence (i.e., more than one avatar at a time). In other words, in the social environment of virtual worlds, obtaining social acceptance through physical appearance matters. Because a person may physically appear as he/she wishes, other socially acceptable traits may become more salient than in the real world. For example, Victor Pineiro, producer of *Second Skin*, a film that follows seven hardcore virtual world participants, was surprised to find out that a person he met and perceived as fun and affable, has cerebral palsy, is only able to move one finger, and is not able to talk (Bennett, 2008).

Most of human "social behavior is shaped by a concern that others like us and attribute to us such characteristics as warmth, humor, reliability, charm, and physical attractiveness" (Jones & Pittman, 1982, p. 235). Evidence suggests that less physically attractive individuals are less liked and less sought by others (Reis et al., 1982; Langlois et al., 2000). Additionally, evidence

suggests that declines in young adults' social circles can lead to loneliness and may increase their use of the Internet, including social networks (Matsuba, 2006). Likewise, increased use of the Internet may reduce young adults' social circles (Kraut, Patterson, Lundmark, Kiesler, Mukophadhayay, & Scherelis, 1998), which increases their loneliness and Internet use. We may conclude that individuals with low perceptions of body image may have smaller social circles and may feel lonely but still desire social acceptance which they may find in online social environments, such as virtual worlds. We speculate that having the ability to become someone else is an incentive, especially for less physically attractive individuals, to participate in virtual worlds because in virtual worlds they can put their best face forward, be socially accepted, and have rewarding social interactions without the worries of others seeing their true physical appearance. Therefore, perceptions of body image will be negatively related to the desire to become someone else, and the desire to become someone else will be positively related to the use of virtual worlds (Hypothesis 1).

Attitude towards telepresence. Telepresence is the "sense of being there" caused by perceptions of interactivity and vividness. Telepresence occurs when the perception of the mediated environment takes precedence over the unmediated one (Steuer, 1992). Virtual environments enhance telepresence by increasing interactivity and vividness (Coyle & Thorson, 2001; Steuer, 1992; Scheck et al., 2008). Interactivity is "the extent to which users can participate in modifying the form and content of a mediated environment in real time" (Steuer, 1992, p. 84), and is determined by the speed with which a medium can be manipulated, the range of ways content can be manipulated, the similarity between the mediated environment control and manipulation to the real world, and the ability to interact as if one was present in the mediated environment (Ha & James, 1998; Steuer, 1992). Vividness relates to "representational richness of the mediated environment defined by its formal features; that is, the way in which an environment presents information to the senses" (Steuer, 1992, p. 81), and can be determined by the number of senses engaged by the medium and how closely the medium replicates parts of the human sensory system (Steuer, 1992). For example, activities in virtual worlds can replicate touch, sight, and movement while allowing voice or chat communication compared to email or text messaging which do not replicate touch, sight, or movement and do not allow voice communication, making them less vivid and, thus, having less telepresence than virtual reality.

Virtual worlds are attractive to individuals, including consumers and firms, because they enhance the online experience (e.g., engage more senses) and provide the illusion of being there, which increases their effectiveness (Li, Daugherty, & Biocca, 2002; Griffith & Chen, 2004; Papadopoulou, 2007; Schlosser, 2003). Papadopoulou (2007) found that virtual experiences, because they stimulate real-world experiences, increase trust of the online vendor, which in turn increase online sales. Griffith and Chen (2004) and Li, Daugherty, and Biocca (2002) found that online advertisements with virtual reality experiences (e.g., 3-D) are more effective than online ads without it. Schlosser (2003) found that increasing the interactivity of an object online or a craving (e.g., smoking) in a virtual world (Baumann & Sayette, 2006) influences intentions more than when the same information is provided passively.

McMillan, Hwang, and Lee (2003) explored the effect of structural variables, such as Website features and message strategy, and perceptual variables, such as involvement and perceived interactivity on subjects' attitudes toward the Web site (A_{st}). Involvement with the subject of the site and perceived interactivity that measured engagement (i.e., telepresenc*e*) were the best predictors of A_{st}. Positive attitudes were associated with websites that took advantage

of Web-specific features such as virtual tours and online reservation systems that engaged the consumer. Sohn, Ci, and Lee (2007) found that consumers' A_{st} may be influenced by their anticipated degree of interactivity at the product level (i.e., expected interactivity). Greater vividness and interactivity increase positive attitudes toward the Web site and increases in vividness create more enduring A_{st} (Coyle & Thorson, 2001).

Mazursky and Vinitzky (2005) found that greater telepresence positively impacts online search duration, the number of brands examined, and actually changes online search behavior. Li, Dughterty, and Biocca (2002) found that increases in telepresence positively influence product knowledge, brand attitudes, and purchase intentions. These findings suggest a positive relationship between telepresence and use of virtual worlds. Therefore, attitudes toward telepresence will be positively related to the use of virtual worlds (Hypothesis 2).

Subjective norms and perceived behavioral control. Subjective norms or the approval of others, called referents, have been found to affect behavior. For example, referents have been found to influence shopping center patronage intentions (Evans, Christiansen, & Gill, 1996), online apparel purchases (Shim & Drake, 1991), online game behavior (Wu & Liu, 2007) and purchases in general (Jones & Vijayasaranthy, 1998). We speculate that because social acceptance is desirable, and if others whose opinions we value do not approve of virtual worlds, a person may be less likely it to use them. Therefore, subjective norms will be positively related to the use of virtual worlds (Hypothesis 3).

Access to the Internet is important to participation in virtual worlds. Perceived behavioral control, or the ease of accessing the Internet, has been found to influence intentions to search and to purchase online (Shim et al., 2001). Accordingly, if perceptions of access to the Internet are low, a person may not use virtual worlds. Therefore, perceived behavioral control will be positively related to the use of virtual worlds (Hypothesis 4).

Demographics. The published literature on demographics and the use of virtual worlds is scant and, thus, we control for demographic variables, such as age, gender, income, ethnicity, and education level, believed to influence online behavior, but do not speculate on their influence on the use of virtual worlds.

Methodology

Data and subjects' characteristics

Adult Internet users from an introductory marketing class, open to all majors, at a large liberal arts Southwestern university that maintains an active presence in Second Life, were asked to voluntarily participate in the study. Seventy-eight adults completed the paper and pencil survey and were asked to administer it, in exchange for extra credit, to at least two adult friends or co-workers for a total of 252 participants with 215 usable responses. The majority of the subjects were male (55.5%), 18 to 24 years old (69.3%), white other than Hispanic (69.7%), attending college (74%), and with a household income of less than $40,000 (54.8%).

Measurements

All scales were derived from existing literature on telepresence, physical attractiveness, perceived behavioral control, and subjective norms (Anthony et al., 2007; Korgaonkar, Silverblatt, & Becerra, 2004; Lessiter et al., 2001; Reis et al., 1982; Shim et al., 2001; Simmons, 2006; Cash, Morrow, & Hrabosky, 2004).

Virtual world use

Virtual world use is conceptualized as the experience with virtual worlds (Shim et al., 2001; Korgaonkar et al., 2004). Subjects were asked to indicate how often they visit virtual worlds, such as Second Life, Habbo, and/or Activeworlds, on a seven-point Likert scale (1= never, 4= once a week, 7= two or more times a day), and if they agree with the following two statements, using a seven-point Likert scale (1=strongly disagree, 7=strongly agree): I often visit virtual worlds, and I am very much like people who visit virtual worlds. The respondents' virtual worlds experience is as follows: 30% (28.1% females and 31.8% males) participate more than once a month but less than once a week, 10.8% (2.7% females and 15.8% males) at least once a week but less than once a day, 2.4% (0.9% females and 2.9% males) at least once a day, 19.2% (21.8% females and 17.4% males) visited virtual worlds at least once but do not actively participate in them, and the remaining 37.6% (46.3% females and 30.3% males) do not participate in virtual worlds at all.

Telepresence attitude

For this study, the authors have conceptualized attitudes as a composite of the importance of telepresence attributes and beliefs that the Internet possesses the same attributes (Shim et al., 2001). Telepresence attitude encompasses 27 attributes derived from the ITC-Sense of Presence Inventory (ITC-SOPI) (Lessiter et al. 2001; Simmons, 2006). Lessiter et al. (2001) validated the ITC-Sense of Presence Inventory (ITC-SOPI) questionnaire which offers researchers using a range of media systems (e.g., 3-D, films, VHS films, TV/computer) a tool with which to measure four facets of media experience: sense of physical space (e.g., presence or "being there"); engagement (e.g., psychologically involved); ecological validity (e.g., lifelike or real); and negative effects (e.g., adverse physiological reactions such as dizziness or nausea).

Telepresence attitude was measured using an expectancy-value model (e.g., A= $e_i b_i$) in which the subjects' evaluation of each attribute was weighted by his/her belief that the Internet will provide that attribute. Subjects were asked to indicate on a seven-point Likert scale (1= not important at all, 7= extremely important) how important (e_i) each attribute was to them. The twenty-seven attributes included items such as anonymity, vividness, ease of use, feelings of being with another, sense of fantasy, easy to discern the other's identity, communication is effective, enhances social connections, easy to present one's image, and feels like a real face-to-face interaction (for complete list see Table A2). In another section of the questionnaire subjects were asked to indicate on a seven-point Likert scale (1= strongly disagree, 7= strongly agree) their agreement or disagreement that the Internet would provide (b_i) each attribute.

Body image and desire to become someone else

Body image was conceptualized as the person's opinion about perceptions of their own physical attractiveness (Reis et al., 1998). Subjects were asked if they agree/disagree with the following two statements on a seven-point Likert scale (1= strongly disagree, 7= strongly agree): I like the way my body looks, and others like the way my body looks.

Desire to become someone else was conceptualized as the persons' desire to change their persona. Subjects were asked if they agree/disagree with the following three statements in a seven-point Likert scale (1= strongly disagree, 7= strongly agree): I wish I could become someone else, if I could I would change my appearance to be more likable, and if I could I would become someone else.

Subjective norms and perceived behavioral control

Subjective norms are conceptualized as the person's opinion of the importance of approval by their family, friends, and significant other of their participation in virtual worlds. Subjects' subjective norm was measured using a three-item seven-point Likert scale (1= not important, 7= very important). Subjects were asked to indicate the importance of referents (e.g., family, friends, and significant other) approving their participation in virtual worlds.

Perceive behavioral control is conceptualized as a person's perception of how difficult it is to access the Internet and to interact with others online. Perceived behavioral control was measured using a two-item seven-point Likert (1= very easy, 7= very difficult) and measure the ease of accessing the Internet and the ease of interacting with others online.

Demographics

Subjects indicated their household income, age, education, gender, and ethnicity on a seven-point scale (see Table 1).

Preliminary Analysis

We conducted a preliminary analysis to determine the structure of the 27 attitude items before proceeding to test the hypotheses. A principal component factor analysis with varimax rotation, using SPSS 14.0, was conducted; 10 items with severe cross loadings were deleted. The remaining 17 items yielded five factors explaining 70.8% of the variance (see Table A2). The first attitude component, *Closeness*, includes seven items: easy to discern the other's sincerity, sense of physical closeness, transmits emotions effectively, easy to tell if the other is trustworthy, feels like a real face-to-face interaction, and sense of being there with the other. The second attitude component, *Social*, includes three items: allows me to meet other people, involving-time disappears, and enhances social connections.

Immediacy, the third attitude component, includes the following three items: vividness, immediate response from another person, and immediate contact with another person. *Task*, the fourth attitude component, includes: communication is effective, allows me to do my work

easily, and communication is enjoyable. And, the *Anonymity* component includes the item anonymity (see Table A2).

To assess the indicators, a factor analysis with Direct Oblimin rotation was run for all variables. The *Social* and *Task* attitude components did not display external consistency; these attitude components presented severe cross-loadings with other variables. The aim of the study is not to determine the telepresence attitude that exerts the most influence on the use of virtual worlds, rather, to explore if there is a relationship between the telepresence attitude and the use of virtual worlds. Thus, the *Social* and *Task* telepresence attitude components were eliminated and a factor analysis with Direct Oblimin was run again for the remaining variables.

Internal and external consistency was assessed using correlation analysis, factors analysis, and Cronbach's alpha (Churchill, 1979). The factor analysis with Direct Oblimin rotation yielded eight factors accounting for 73.8% of the variance (see Table B3). The values of coefficient alpha were .82 for virtual world usage (average inter-item correlations .60), .82 for desire to become someone else (average inter-item correlations .60), .64 for perceptions of physical attractiveness (average inter-item correlations .48), .90 for subjective norms (average inter-item correlations .75), .3 for perceived behavioral control (average inter-item correlations .20), .91 for the *Closeness* attitude component (average inter-item correlations .60), and .72 for the *Immediacy* attitude component (average inter-item correlations .46). The *Anonymity* attitude component has only one indicator and, thus, reliability is not computed. The perceived behavioral control variable exhibited external consistency but its internal consistency is questionable. However, due to the exploratory nature of the study the variable was kept.

Results

A linear regression with virtual world use as the dependent variables and subjective norms, perceived behavioral control, telepresence attitude components, desire to become someone else, perceptions of attractiveness, and demographics as independent variables was run using SPSS 14.0. Results are presented in Table 1.

Table 1 - Linear Regression Analysis

Dependent: Virtual World Use[1]	Standardized Coefficients
Subjective Norms	.153**
Perceived Behavioral Control	.079
Desire to Become Someone Else	.208**
Body Image	-.020
Closeness	.320***
Immediacy	-.069
Anonymity	-.041
Gender	.222***
Age	.085
Ethnicity	-.152*
Household Income	-.065
Education Level	.004
Dependent: Virtual World Use[2]	
Body Image	-.154*
Dependent: Become Someone Else[3]	
Body Image	-.276***
Dependent: Virtual World Use[3]	
Become Someone Else	.464***
Body Image	-.030

[1]R^2adjusted: .311; F: 9.255; p<.001.
[2] R^2adjusted: .020; F: 5.932; p<.05.
[3] R^2adjusted: .073; F: 20.163,; p< .001
* p< .05, ** p< .01, *** p< .001
Household income (1= $20,000 or less, 7= $120,000 or more)
Age (1= less than 18, 7= 65 or more)
Education level (1= attended middle school, 7= post graduate)
Gender (1= female, 2= male)
Ethnicity (1=American Indian, 2= Alaskan Native, 3= Asian, 4= Hispanic/Latino, 5= Black/African American (other than Hispanic), 6= White (other than Hispanic), 7= Native Hawaiian/Other Pacific Islander, and 8= Other race/ethnicity.

The model explains 31.1% (R^2 adjusted) of the variance of virtual world use. Desire to become someone else (p< .01), supporting H1, subjective norms (p< .01), supporting H3, and the *Closeness* attitude component (p< .001), supporting H2, have a significant influence on the use of virtual worlds. Perceived behavioral control, perhaps because of its questionable internal consistency, did not exert a significant influence on the use of virtual worlds, questioning H4.

Gender (p< .001) and ethnicity (p< .05), as suggested by the online literature but not hypothesized, have a significant influence on the use of virtual worlds. Males display a greater use of virtual worlds than females. Virtual world use is highest among Asians which is similar to findings of Internet use by Korgen, Odell, and Schumacher (2001). Age, income, and education level do not exert a significant influence on the use of virtual worlds but these results may be due to the homogeneity of the respondents.

Body image or perceptions of attractiveness do not exert a significant influence on the use of virtual worlds but its influence, as posited, could be mediated by the desire to become someone else. To determine this, following the Baron and Kenny (1986) test for mediation, three linear regressions and the Sobel test for mediation were run. The first linear regression (see Table 1) tested whether perceptions of attractiveness influence the use of virtual worlds (p< .001). The second linear regression tested whether perceptions of attractiveness influence the desire to become someone else (p< .001). The third and final linear regression tested whether the desire to become someone else influences the use of virtual worlds (p< .01) while controlling for perceptions of attractiveness (p< .6). Following the linear regressions, a Sobel test of mediation (Preacher & Leonardelli, 2001) was conducted.

The Sobel test results confirm the linear regression results in that the desire to become someone else mediates (t = -3.9, p< .001) the influence of body image on the use of virtual worlds, supporting H1. Body image is negatively related to the desire to become someone else and this is directly related to the use of virtual worlds, as predicted by H1.

Discussion and Conclusions

The results indicate that telepresence attitude, subjective norms, and the desire to become someone else are directly related to the use of virtual worlds and the influence of body image on the use of virtual worlds is mediated by the desire to become someone else. The results confirm that a person's body image or perceptions of attractiveness are inversely related to his/her desire to become someone else and this in turn is directly related to virtual world usage. Low body image or perceptions of attractiveness increase the desire to become someone else, which in turn increases the use of virtual worlds. Attitude towards telepresence, through its *Closeness* attitude component, exerts the most influence on the use of virtual worlds followed by gender, desire to become someone else, subjective norms, and ethnicity.

The *Closeness* telepresence attitude component, such as being with others, physical closeness, and transmission of emotions, exerts the greatest influence on the use of virtual worlds. The desire to become someone else and body image exert the third greatest influence on the use of virtual worlds. These results highlight the relational aspect of virtual worlds which suggest that if individuals and firms want to be successful in virtual worlds, they should concentrate on providing relational experiences.

Results also suggest that males use virtual worlds more than females, which is consistent with prior research that found males to be heavier users of the Internet (Packaged Facts, 2005). Age, probably due to the homogeneity of the respondents, was not significant but the findings suggest that the use of virtual worlds increases with age. Age and physical attractiveness are related; physical attractiveness is at its peak during one's youth (Langlois et al, 2000; Cash et al., 2004) and, thus, external traits may be more important. However, it is possible that older individuals value internal traits more than younger individuals and may have a greater inclination to use virtual worlds than younger individuals. These results suggest that the demographic influence on the use of virtual worlds should be explored further.

The findings corroborate that a person's desire for social acceptance, reflected by perceptions of physical attractiveness, influence their use of virtual worlds. Easily observable traits, such as physical attractiveness, influence a person's self-esteem, as suggested by Anthony et al. (2007), and low self-esteem increases the desire to become someone else, which may increase the use of virtual worlds. However, this does not suggest that only individuals with low self-esteem use virtual worlds. It suggests that environments, such as virtual worlds, that reduce the importance of an easily observable trait, such as physical attractiveness, allow individuals to be valued on traits that may not be easily observable such as kindness, warmth, and/or honesty. The anecdote about the cerebral palsy individual met by Victor Pineiro is an example of an individual being valued by non-physical traits. Therefore, virtual worlds may be frequented by individuals that value "internal" (e.g., honesty) traits more than external traits (e.g., physical attractiveness) despite their looks.

The concept of having an avatar(s) in any physical form desired by the owner makes the study of virtual world behavior even more interesting in the sense that an avatar can enhance one's physical attractiveness as well as allow the owner to demonstrate positive non-physical characteristics, such as honesty, humor, and warmth. However, the opportunity for negative behavior (e.g., deception, rude behavior/language) also exists with avatars. The ability to cast out avatars that exhibit negative behavior, especially from group affiliations, already exists. The current study did not look at avatar choice or behavior. Future research should examine a person's choice, design, and behavior of their avatar(s) within virtual worlds. For example, how might an avatar's physical attractiveness affect the owner's "consumer" behavior toward products, services, and/or promotions within virtual worlds? In other words, does a person behave differently as a consumer in a virtual world environment compared to their actual self in the real world, and how is that impacted by their choice of avatars in virtual worlds?

Future studies should also explore the differences in each telepresence attitude component on the use of virtual worlds. The *Social* and *Task* telepresence attitude components were not tested and thus, it is possible that they could influence the use of virtual worlds.

Acknowledgements

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Appendix A

Table 2 - Attitude Towards Telepresence - Analysis

	Factor Loadings[1]	Importance (*e_i*) (mean)[2]	Internet Provides (*b_i*) (mean)[3]	Attitude (A= *e_i b_i*) (mean)
Anonymity	.887[e]	4.31	4.41	19.77
Ease of use[f]	--	5.93	5.50	33.02
Vividness	.719[c]	5.05	4.93	25.71
Immediate contact with another	.806[c]	4.82	4.90	24.58
Emotional contact[f]	--	3.88	3.61	15.25
Feelings of being with another	.702[a]	3.60	3.45	13.58
Immediate response	.704[c]	4.84	4.65	23.84
Sense of fantasy[f]	--	2.98	3.44	11.93
Meet new people	.714[b]	4.04	4.27	18.83
Discern other's sincerity	.746[a]	4.33	3.59	16.57
Communication is effective	.711[d]	5.79	4.98	29.56
Satisfying interactions[f]	--	4.99	4.39	22.94
Easy to know other[f]	--	4.47	3.87	18.35
Easy to like other[f]	--	4.16	3.91	17.43
Engaging interaction[f]	--	4.60	4.22	20.32
Task easy to accomplish[f]	--	5.60	5.13	29.28
Sense of physical closeness	.802[a]	3.22	2.97	11.08
Transmits emotions	.787[a]	3.94	3.20	13.50
Sense of being with other	.756[a]	3.56	3.26	12.79
Involving, time disappears	.698[b]	3.90	4.26	17.86
Enhances social connections	.750[b]	4.71	4.33	21.82
Ease to present my image[f]	--	4.50	4.01	18.97
Ease to tell trustworthiness	.788[a]	4.43	3.14	14.51
Can determine if enjoy other[f]	--	3.90	3.36	14.30
Can do work easier	.812[d]	5.78	5.21	30.94
Communication is enjoyable	.655[d]	5.36	4.71	26.18
Feels like face-to-face	.741[a]	3.98	3.08	13.42

[a] *Closeness* attitude component.
[b] *Social* attitude component. Deleted for the final analysis.
[c] *Immediacy* attitude component.
[d] *Task* attitude component. Deleted for the final analysis.
[e] *Anonymity* attitude component.
[f] Items deleted.
[1]Principal Component Analysis with.Varimax rotation; 70.8% of variance extracted.
[2]Scale range from 1= not important to 7= very important
[3]Scale range from 1= very unlikely to 7= very likely
[4]Average mean

Appendix B

Table 3 - Factor Analysis

	Factor Loadings[1]	Reliability	Inter-Item Correlation
Becoming Someone Else		**.818**	**.600**
I wish could someone else	.859		
If I could I change appearance	.770		
If I could I become someone else	.891		
Body Image		**.644**	**.475**
I like the way my body looks	.838		
Others like the way my body looks	.860		
Subjective Norms		**.898**	**.745**
Family approval of virtual world use	.930		
Friends approval of virtual world use	.892		
Significant other approval of VW use	.893		
Closeness		**.914**	**.601**
Discern other's sincerity	.765		
Sense of physical closeness	.844		
Transmits emotions	.839		
Ease to tell trustworthiness	.776		
Feels like face-to-face	.803		
Feelings of being with another	.762		
	.843		
Social		**.722**	**.463**
Vividness	.733		
Immediate contact with another	.835		
Immediate response	.759		
Anonymity		**NA**	**NA**
Anonymity	-.897		
Perceived Behavioral Control		**.306**	**.181**
Accesses Internet anytime	.830		
Ease to interact on net	.631		
Virtual World Use		**.819**	**.606**
I often visit virtual worlds	.792		
I am like people that visit VW	.830		
How often I visit VW	.820		

[1]Principal Component Analysis with Direct Oblimin rotation; 73.9% of variance extracted.