

Something for Nothing: Understanding Purchasing Behaviors in Social Virtual Environments

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ABSTRACT

The present paper is composed of two studies. The first study explored the variables influencing the purchase of avatar-related products through the avatar users' survey research. This proposed a theoretical model of the purchase of avatar-related products using attitude toward an avatar, subjective norm, self-presentation, identification, and immersion. Although significant relationships were found for the individual links, the model was not supported. The second study focused on which variables predict the intention to use avatar-related products. A model was tested with avatar non-users. Results indicated that all relationships among variables in the Technology Acceptance Model (TAM), such as perceived ease of use of avatar, perceived usefulness of avatar, attitude toward using avatar, and intention to use avatar-related products, were strongly supported, as was the link between Internet self-efficacy and perceived ease of use of avatar. Also, the peer groups' subjective norm component which was a unique variable successfully predicted intention to use avatar-related products. Overall, all hypotheses were supported and the data were judged to be consistent with the model.

INTRODUCTION

AVATARS are graphic icons representing users through various forms online. Avatars have long been used in various fields on the Internet such as games, chat rooms, and a live forum for on-line conversation. When Lucasfilm created Habitat, one of the first attempts to create a large-scale, commercial, multi-user, graphical virtual environment in the 1980s, players were identified by an avatar.¹ Avatars could move around, pick up, put down, and manipulate objects, talk to each other, and gesture, each under the control of an individual player. Avatars can represent their users with a humanoid or animal appearance or even abstract symbols. Suler categorizes various avatar styles according to visual characteristics, such as animal, cartoon, celebrity, evil, and real face.² Avatars are different from the agents, which refer to a computer program designed to interact with or on behalf of a

human. Although both agents and avatars are virtual embodiments of characters, the difference is whether the entity behind the character acting as the puppeteer is a human in real time or an autonomous computer program.³

Then, why do young people enjoy avatars in the cyber world? People cannot touch, feel, or wear the products. However, young people continue to be absorbed with these intangible products. This research will disclose which variables influence the purchase of avatar-related products.

Avatars

In the United States, avatars are primarily used in the entertainment industry as high-tech novelties for high-end video games and realistic Internet chat rooms. Avatars were named one of 10 up-and-coming technologies for 1999 by the research firm Gartner Group.⁴

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Many real-time role-playing games based on Dungeons & Dragons support avatars. For instance, to play *Neverwinter Nights* <<http://nwn.bioware.com>>, players customize avatars to represent themselves and enter a detailed, highly textured world where they interact with each other to solve problems, gain knowledge and riches, and most importantly, kill monsters. Also, many users in popular role-playing games, such as Electronic Arts' *Ultima Online* <www.uo.com> and Sony Corp's *EverQuest* <<http://everquest.station.sony.com>>, make real money by auctioning off characters, weapons and other objects.

Avatar usage has no limits. This technology promises to change the way businesses identify and track the flow of products, packages and people. The Chicago Museum of Science and Industry's *Network World* exhibit <www.msichicago.org/exhibit/networkworld/networkworld.html> is an example. The museum's *Network World* puts guests "inside" the Internet using an avatar. Visitors can digitize themselves and personalize the avatar in their own likeness. The museum's exhibit brings the possibilities of avatars to life as well as uses cutting edge wireless and identification technology. Many other fields use avatars in cyberspace, including music, movie and sports. *Worlds.com Inc.* <www.worlds.com/> has utilized its advanced, proprietary three-dimensional (3D) web technology and content with branded entertainment, primarily in the music and sports genres. This company creates communities of member/users who form the basis for multi-user chat, e-commerce and advertising forums in a broad range of categories based on an avatar circumstance. Musicians such as *Aerosmith* (*Aerosmith World*), *Hanson* (*HansonWorld*), and *David Bowie* (*BowieWorld*), as well as movies, such as *The Blair Witch* (*Blair Witch World*) have virtual worlds in which fans "live" in the shape of avatars.

Avatars benefit both recreational and commercial users. Already, public and private entities have established virtual cities, conference centers and institutions, such as the virtual high school created by the University of California.⁴ Recently, MSN has tied new avatar technology into Microsoft Passport, aiming to monetize its messaging services, allowing the avatar to be downloaded onto mobile handsets.⁵

Recently, the avatar-based online world has become the focus of the information technology industry's attention. Three companies lead netizens in high technology-based online world. The first, *Sims Online* <www.thesimsonline.com>, allows users to romance, chat, and eat with other "Sims." The *Sims Online* allows users to create personal

avatars and steer them through a virtual life, interacting with other characters, engaging in everything from going to the bathroom to establishing a career. For example, users have their own piece of land to do with as they please. They can create a house, coffee bar, dance club, museum or whatever else they can imagine. Users can explore the neighborhoods around them and meet other real Sims along the way, and will also be able to develop a network of real Sim friends to enhance their power, wealth, reputation and social standing. In these activities, avatars represent users and play a main role in the Sims world.

Second Life <<http://secondlife.com>> is another online society. Again, the participants both build and reside in this world. Users choose their own goals—travel and explore, claim and build on virtual land, make friends and socialize, or vie for status and wealth. Users can change their avatar appearance—even gender—as often as they like. These avatars can easily express themselves by gestures such as smiling, laughing, wink, shrugging, sticking their tongue out, etc. Users can express feelings with literally hundreds of animated emotions and gestures. Also, there are many ways to move around and be physical. They take in the sights as they walk through a 3D living landscape, become airborne and fly to the corners of the earth, show off smooth dance moves, and play a game of "Bump and Run."

Users can create anything they imagine in this world. They can build a lavish mansion or a secret underground hideaway, design furniture, or invent intricate weapons or unimaginable animals. After amassing a fortune, they can spend weekly stipends any way they want—on shopping, transporter travel, land, or admission to private events. To build wealth, they make and sell popular items or host fun parties or events. Most importantly, finding people who have similar interests and skills is necessary. Users can join the *American West*, the *Dark Ages*, or *Medieval Japan*. Or, they can start a group and build their own community around whatever they are interested in.

Finally, *There, Inc.* <<http://www.there.com>> is an entertainment and communications platform company that has created a new application for online interaction. *There, Inc.* is a website that combines chat with the fun of online games. It is supported by thousands of paying members and partners including *iVillage*, *HP*, *Levi's* and *Nike*. This company has spent \$17 million and more than four years building online world that is designed to let users take the form of simulated avatars that can move, chat, have fun and flirt. *There* leverages the

popularity of two mass-market activities: online socializing, such as chat rooms and instant messaging, and online casual games, like cards, trivia and board games. The web-based, 3D environment provides consumers with greater online connections through a broader, more sophisticated range of competitive, social, and creative activities when compared with conventional chat rooms or online games.

A 3D chat room supports various functions, for instance, your avatars talk as you type, with speech balloons coming out of their heads. They blink, breathe, and nod when you type yes. Start throwing in actions like winking, yawning, gasping, even burping—and what you've got is conversation that looks like a cartoon yet feels uncannily real.

Also, plenty of activities are available—for example, dune-buggy racing, dog training, jet packing. Everything from the cute Toy Story—style graphics to the clothing stores where characters can dress up in the latest fashions (provided courtesy of Levi's and Nike) are designed to give you something to chat about. Tens of thousands of users are signed up for this website.

There uses its own currency, called Therebucks. Users have 20,000T when signing up for a year, or 10,000T for the monthly plan. Additional Therebucks can be purchased with genuine U.S. currency, at the rate of 1,787T per dollar. The average users spent \$7 per month on "in-world" goods.

This new innovative approach to socializing is still developing for widespread success given the weak track record of other multi-player online entertainment products. The Sims Online's subscriptions have been only an estimated 70,000–105,000, and Second Life has targeted a relatively modest 10,000 subscribers. More narrowly focused games like Sony's "Everquest" and "Star Wars Galaxies" have done better at signing up hundreds of thousands of players. So far, There Inc., has had 27,000 unique visitors.^{6,7} As Baig stated in *USA Today*, the multi-player online entertainment product is one of the best tech-inspired treats for the gift-giving pleasure, and numbers of users are growing more rapidly.⁸

STUDY 1

The purpose of this study is to analyze the variables influencing avatar-related product usage. This study attempts to discover a path model to recognize avatar users' characteristics. In the following section, the Theory of Reasoned Action (TRA) will be discussed, and supplemented with

the concepts of self-presentation, immersion, and identification.

Theory of reasoned action

The Theory of Reasoned Action (TRA), developed by Fishbein and Ajzen, states that the most immediate determinant of a person's behavior is the person's behavioral intentions.^{9,10} Thus, to influence a person's behavior, one must influence a person's intentions. Behavioral intention is influenced by two components: the person's attitude toward performing the behavior and perceived social pressure, called subjective norm. Attitude toward any behavior is simply a person's general feeling of favorableness or unfavorableness for that behavior. The attitudinal component refers to the individual's attitude, which is weighted by the strength of the attitude. As a second predictor, subjective norm refers to a person's perception that people who are important to him/her think s/he should or should not perform the behavior in question. Specifically, the subjective norm consists of normative beliefs and motivation to comply. Normative beliefs are defined as what others think about behavior and the motivation to comply is defined as how much s/he is motivated to adhere to the opinions of others who are important.

Many studies have shown that TRA is proved as a successful model and attitude and subjective norm are useful factors in predicting a wide variety of behaviors, or behavioral intentions in many contexts such as unethical behaviors,¹¹ purchasing habits,¹² recycling,¹³ AIDS or condom use,^{14,15} education,¹⁶ and technology use.^{17,18} Therefore, this research uses attitude and subjective norm as factors which predict use of avatar-related products.

H1. *The more positive the attitude toward an avatar, the more likely one is to purchase avatar-related products.*

H2. *The higher the subjective norm, the more likely one is to purchase avatar-related products.*

Self-monitoring. Goffman provided a great insight on the concept of "face" by comparing our daily self-presentation behaviors to a person acting on the stage.^{19,20} According to Goffman, people approach self-presentation as if they are performing onstage. He described daily impression management efforts using dramaturgical play terminology, such as acting skills, rehearsing, costumes, and proper settings. Goffman suggests that everyone

engages in self-presentational behaviors. However, there are individual differences as to how much an individual engages in impression management in different circumstances and how sensitive an individual is to such cues in the environment. One personality trait that is strongly linked to self-presentational behavior is self-monitoring.

Self-monitoring is a construct developed by Snyder, and references the extent to which individuals regulate how they present themselves to the public and are sensitive to external circumstances.^{21,22} This concept carries the assumption that people can and do have control over their self-presentation. In addition, it is assumed that individuals differ in the manner and degree to which they modify their impressions. Therefore, self-monitoring explains the degree to which people monitor the way individuals express themselves.

High self-monitors are expressive people who control and adjust how they present themselves in response to social and interpersonal cues in various situations. Conversely, those who tend not to control or adjust their self-presentation as much, are less sensitive, and less responsive to social and interpersonal cues in various situations are referred to as "low self-monitors." Numerous research studies have been done regarding the concept of self-monitoring and how it relates to other behaviors. High self-monitoring is correlated with impression management abilities, such as the ability to react to situational cues,²¹⁻²³ to discern the meaning of nonverbal behaviors,²² to adopt the behavior of another person,²⁴ higher cross-situation variability in behavior,³⁵ and positive impression making in organizational settings.³⁶ On the other hand, low self-monitoring is correlated with the tendency to respond more to internal demands,²¹⁻²³ increased attraction to people with high attitude similarity,²⁷ and less situational variability in behavior.²⁵

This idea can be applied in cyber society. People use avatars as a form of identification (ID) at most popular sites that young people enjoy. When people want to join and be involved in any community, they should follow the community's rules and ways of communicating. Avatars are one way in which people engage in self-presentation online, since face-to-face communication is not an option. Therefore, high self-monitors, or people with high self-presentation needs, would purchase avatar-related products in order to conform to the expectations of the avatar-related cyber society. This study attempts to investigate how differing levels of self-monitoring can influence young people to use avatars as a means of self-presentation in an online community.

H3. *The higher the self-monitoring, the more likely one is to purchase avatar-related products.*

Immersion (Telepresence). A virtual environment would be an environment that provides a sense of presence. An environment is deemed virtual if an individual feel a sense of presence in the environment.²⁸⁻³⁰ Therefore, a social virtual environment is defined by the sense or perception of the users.³

Interest in the concept of presence stretches across many academic disciplines, resulting in a variety of approaches to defining presence.³⁰ Though there are multiple definitions of presence, the most common of those being the perceptual illusion of the person; presence is generally divided into two phenomena: telepresence and social presence. Telepresence is the concept by the medium itself. This phenomenon usually happens in human-computer of "being there," and social presence is that of "being together."^{28,31,32} For the purpose of this study, the concept of telepresence is more appropriate because avatars are a mediated, graphical representation of self. The focus of presence, defined as the sense of being somewhere, is not the actual physical body of a person. Loomis³³ and Heeter^{32,34} refer to "phenomenal body" and "self" as the subject of presence and suggest that the phenomenal body or the self is not always in correspondence with the physical body.

An avatar exists as a representation of a "physical body," "phenomenal body," or "self" in telepresence. Young people view an avatar as another self and become immersed in the experience. Telepresence as immersion includes a psychological component. As Lombard and Ditton³⁰ stated, when users feel immersed presence, they are involved, absorbed, engaged, and engrossed. Immersion is determined by the environment's ability to isolate people from other stimuli available in their surroundings.³⁵ It is a psychological state characterized by the perception that one has become enveloped by, included in, and interacts with an environment that provides a continuous stream of stimuli and experiences.

This study is interested in assessing how young people feel about experiences they have had in a "displayed environment," which refers to the environment of decorated avatars that people have encountered. Whatever people can see, hear, or sense happening within the displayed environment is also an important component of immersion. Although the displayed environment and its content are different from the "real world" that people live in from day-to-day, people are immersed in the experience.

The idea of the avatar as a perspective of presence, as used in this study, is not simple to define. An avatar is a certain representation of self as realism. This realism exists in cyberspace as "being there." That is, an avatar exists in cyberspace as a representation of the self. Users also experience perceptual and psychological immersion as a result of an avatar. When users interact naturally with an avatar, they are able to both affect and be affected by the avatar stimuli.

TRA shows when people have a positive attitude toward performing a certain behavior, it is highly likely they will perform that behavior. Since people who have a positive attitude toward using avatars frequently use an avatar, they are likely to be more immersed in an avatar as a representation of self. Therefore,

H4. The more positive the attitude toward an avatar, the greater immersion in an avatar.

Also, in high telepresence situations, people become highly involved, absorbed, engaged, and engrossed with an avatar, and they feel immersed in an avatar. Therefore, they spend more time and money to decorate the avatar.

H5. The more immersion, the more likely one is to purchase avatar-related products.

Identification

When the user's body (self) gives shape to an avatar, a number of changes in self-presence are possible. Self-presence is defined as the effect of one's representation (i.e., an avatar) on the perception of physiological states, emotional states, perceived traits, and identity of the self. Hence, identity becomes a central issue in self-presence.

The concept of identification is important in media research. Noble³⁶ believes that identification can and does occur with movie characters, whereas Zillmann³⁷ asserts that identification rarely occurs with media characters. Also, the role of virtual identity has been thoroughly investigated. Multi-User Domains or Multi-User Dungeons, often called MUDs, are a prime example of how computer-mediated communication can serve as a place for identity construction and reconstruction. MUDs are text-based multi-user virtual-reality environments. They provide worlds for anonymous social interaction in which a person can play a role as close to or as far away from his or her "real self" as

s/he chooses, making possible the creation of a multi-faceted identity so fluid it strains the limits of the perception.³⁸ Identity, after all, refers to the sameness between two qualities, in this case between a person and his or her persona. Turkle states that the many manifestations of multiplicity in culture, including the adoption of online personae, are contributing to a general reconstruction of traditional, unitary notions of identity.³⁸ For instance, in MUDs, the body is not an immutable property, and players may manifest themselves in any way they please, unrestrained by physical measures that may limit their self-presentation in actual life.³⁹

Like MUD players, avatar users can create their own virtual personas, their own characters, and names, decorate their features, and express their emotions and moods. Through the avatar, users express their feeling to friends, families, or strangers. That is, avatar users consider themselves the avatar, and spend money and time to dress up and put on make-up, for example.

Despite the multiple definitions of identification, this study defines identification as perceived similarity, likeness, or semblance of self. Identification refers to how the avatar is similar or like the self. Like an immersion, people who have a positive attitude toward using avatars would frequently use an avatar. They are likely to be more identified with an avatar as a representation of self, much like people who have a positive attitude toward characters in television and movies identify with them.^{30,36,37}

H6. The more positive the attitude toward an avatar, the greater identification with an avatar.

Also, people treat their avatars as "real" extensions of their identity. That is to say, an avatar can look, sound, and/or feel just like the real self. They feel identify with an avatar. Consequently, more attention is given to decoration and personalization of the avatar.

H7. The higher the identification with the avatar, the more likely one is to purchase avatar-related products.

Overall, Figure 1 shows the relationships among variables. Since the variables are not independent of each other, this study will test the fit of the causal model.

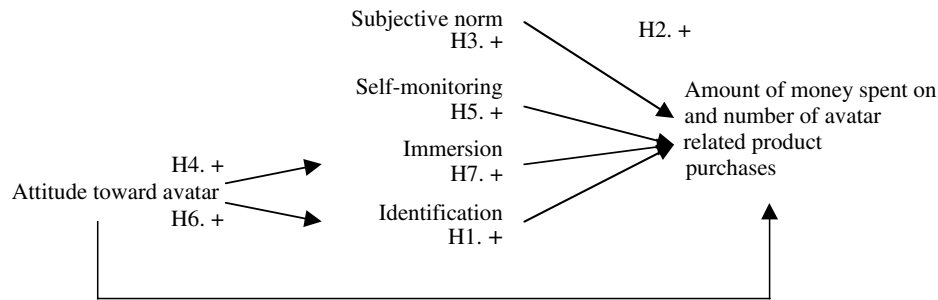


FIG. 1. Proposed path model 1.

METHODS

Procedure and sample

Since teenagers and young adults are the primary purchasers of avatar-related products, this study targeted these people. In order to maximize external validity, samples were chosen from three high schools and two universities in Seoul, Korea. Two classrooms in each high school and two introductory communication classes at universities were randomly chosen, and about 30–40 surveys were distributed in each class. Finally, 335 (93%) valid surveys of 360 were collected. The participants were 138 males and 193 females (four missing) in Seoul, Republic of Korea. The mean age was 18.3 ($SD = 2.7$).

Measures

Confirmatory factor analysis (CFA) using the Package computer program⁴⁰ was performed on attitude toward an avatar, subjective norm, self-presentation, identification, and immersion. In this study, items that did not meet criteria of internal consistency and parallelism were deleted from some of the scales to maximize unidimensional solutions.

Attitude toward using avatar-related products. Using a semantic differential scale,⁴¹ respondents were asked to indicate their agreement or disagreement with a series of bipolar adjectives. This scale was composed of five items and the response to each scale was scored from -2 to $+2$. All five items fit a unidimensional solution as indicators for avatar users' attitude toward an avatar index ($M = -0.39$, $SD = 0.79$, $\alpha = 0.86$).

Subjective norm. Belief-based measures, consisting of two parts, were used to assess subjective norms.⁹ The first part, normative beliefs, are beliefs about what others think about a particular behavior,

and the second part, motivation to comply, is associated with normative beliefs.

This study asked the respondents directly who was the most important person to them. Respondents answered questions about the four individuals whom they indicated were very important to them. According to Ajzen and Fishbein, normative beliefs were scored from "unlikely (-2)" to likely (2), whereas motivation to comply scales were scored from "unlikely (1)" to "likely (5)." To test unidimensionality for subjective norm, normative beliefs for each person consisted of four items and motivation to comply had a single item. Each normative belief was multiplied by its motivation to comply, and the four products were summed and averaged over the four referents. All items fit a unidimensional solution as indicators for subjective norm (person 1, $M = -1.29$, $SD = 0.92$, $\alpha = 0.91$; person 2, $M = -0.77$, $SD = 1.14$, $\alpha = 0.91$; person 3, $M = -0.65$, $SD = 1.18$, $\alpha = 0.92$; person 4, $M = -0.72$, $SD = 1.12$, $\alpha = 0.93$).

Self-Monitoring. Snyder developed five hypothetical components of the self-monitoring constructs which have a 25-item measure for a general self-monitoring score.²² Snyder's original self-monitoring scale²⁸ has been used in a variety of studies, but its factor structure was questioned. Numerous researchers debated over factor analytic issues on the self-monitoring scale.^{42–45}

Prompted by these factor analytic debates on the self-monitoring scale, Lennox and Wolfe⁵³ reviewed the theoretical structure presented by Snyder,²¹ and developed two-factor solution models to the self-monitoring scale: (1) the ability to modify self-presentation, and (2) sensitivity to expressive behaviors of others. Lennox and Wolfe's Revised Self-Monitoring scale⁴⁶ consisted of 13 items with seven items for ability to modify self-presentation and six items to measure sensitivity to the expressive behavior of others. The Lennox and Wolfe's revised scale was reported to have reasonable

reliability, reporting the reliability of $\alpha = 0.77$ and $\alpha = 0.70$, respectively. Also, Li and Zhang found the same factor structure for self-monitoring scale to be applicable to Chinese audiences.⁴⁷

Lennox and Wolfe presented a series of studies to examine the validity of their Revised Self-Monitoring Scale. Therefore, this study used Lennox and Wolfe's Revised Self-Monitoring Scale. Items were assessed with a five-point response scale, ranging from "Generally false (1)" to "Generally true (5)." Out of seven items to measure ability to modify self-presentation, two items that did not fit a unidimensional solution were deleted. Five items fit a unidimensional solution as indicators for self-presentation measure ($M = 3.6$, $SD = 0.8$), and it was found reliable ($\alpha = 0.73$). Six items to measure the sensitivity for expressive behavior of others did not fit a unidimensional solution and were not included in the following analyses.

Immersion. Although Witmer and Singer created an immersion tendency scale, it does not pertain to immersion of a medium.³⁵ Instead, this study made a new immersion scale. Examples of immersion are "When I decorated an avatar, I felt I was visiting the places in the displayed environment," "When I decorated an avatar, I had a sense of being in the scenes displayed." This scale was composed of six items, which were assessed with a five-point response scale ranging from 1 to 5, where 1 indicated "Strongly Disagree" and 5 indicated "Strongly Agree." All six items were retained as indicators for immersion index ($M = 2.0$, $SD = 0.9$), which was also reliable ($\alpha = 0.94$).

Identification. McCroskey et al.'s measure of perceived homophily was modified as an identification scale.⁴⁸ Originally, this scale was concerned with homophily or interpersonal similarity in human communication. Although an avatar is not a real person, this study applies the concept of homophily/similarity to avatars. The homophily scale is composed of four factors and 16 questions. However, this study places emphasis on the attitude measure of the perceived homophily dimension because an avatar is a materialized self, and therefore it is hard to apply background or value to an avatar. Examples are "My avatar . . . Doesn't like me/Thinks like me, Doesn't behave like me/Behaves like me, Different from me/Similar to me, and Unlike me/Like me." These four items were assessed with a five-point response scale ranging from 1 to 5. All four items were retained as indicators for identification index ($M = 2.3$, $SD = 1.0$), which was reliable ($\alpha = 0.89$).

Purchase of avatar-related products. Two dependent variables asked subjects about money spent on avatar-related products and frequency of avatar-related product purchases. The questions were "Generally, about how much money did you spend buying avatar-related products in past one year?" and "How many times did you buy avatar-related products in past one year?" The monetary unit used in this study was the Korean Won, which was converted into American dollars for this article.

Statistical analysis

This study has two dependent variables, amount of money spent on avatar-related product purchases and number of avatar-related product purchases. To test these two models, the least squares criterion was used to estimate the parameters, parameter size was examined, and the fit of the model was assessed. Parameter size was determined in the path diagram by performing a simple regression of each endogenous variable onto its causal antecedent and model fit was tested by comparing the estimated parameter size to the reproduced correlations (for information on reproducing correlations in path analysis, see Hunter and Gerbing⁴⁹). To the extent that the path coefficients are substantial and the differences between parameter estimates and reproduced correlations (errors) are attributable to sampling error, the model is said to be consistent with the data. If errors are larger than what is expected from sampling error, the model is said to be inconsistent with the data.

RESULTS

The average amount of money spent purchasing avatar-related products in the past 1 year was \$5.4 ($SD = 8.4$), and the average number of avatar-related product purchases was 3.4 ($SD = 3.9$). Respondents had 2.64 ($SD = 2.19$) avatars on the average.

Evaluation of the models

The first model posited that when an avatar user has a favorable attitude toward avatars, s/he is more likely to experience greater immersion, identification, and purchases of avatar-related products. Additionally, the higher subjective norm, self-presentation, immersion, and identification with avatar, the more likely one is to purchase avatar-related products. The correlations used to

estimate the fit of the model parameters are in Table 1, and the path coefficients are in Figure 2.

One may observe from Figure 2 that all of the path coefficients are in the direction predicted but not all paths are significant. The path coefficients from the attitude toward avatar to immersion and identification were 0.49, $p(0.41 \leq \rho \leq 0.57) = 0.95$, and 0.50 $p(0.42 \leq \rho \leq 0.58) = 0.95$, respectively, indicating that the attitude toward avatars had an effect on immersion and identification with an avatar. The coefficient linking subjective norm and the amount of money spent on avatar-related product purchases was 0.13, $p(0.03 \leq \beta \leq 0.23) = 0.95$, such that the greater a participants' subjective norm, the greater a participants' purchases of avatar-related products.

However, the coefficient linking the attitude toward avatars and amount of money of avatar-related product purchases was 0.01, $p(-0.1 \leq \beta \leq 0.12) = 0.95$, indicating that the attitude toward avatars did not have a substantial effect on the amount of money spent on avatar-related product purchases. The coefficients linking immersion and the amount of money spent on avatar-related product purchases [0.07, $p(-0.04 \leq \beta \leq 0.18) = 0.95$], self-presentation and the amount of money of avatar-related product purchases [0.10, $p(-0.01 \leq \beta \leq 0.21) = 0.95$], and identification and the amount of money spent on avatar-related product purchases [0.06, $p(-0.05 \leq \beta \leq 0.17) = 0.95$] were not within sampling error of zero, so both of these were not significant. Therefore, these results showed that hypotheses 2, 4, and 6 were supported whereas hypotheses 1, 3, 5, and 7 were rejected.

The differences between predicted and obtained correlations for all unconstrained bivariate relationships in the model were examined, and three of the five differed substantially from what was expected

from sampling error. These largest errors were 0.20 (between subjective norm and immersion), 0.28 (between subjective norm and identification), and 0.36 (between immersion and identification). Further, the global test for goodness-of-fit indicated that the data were not consistent with the model, $\chi^2(5) = 45.82$, $p < 0.001$. Given that not all of the path coefficients were large in magnitude, and that the model and parameter estimates did not accurately predict the unconstrained correlations, the data were judged to be inconsistent with the model.

The second model is similar to the first model except for the dependent variable, the number of avatar-related product purchases. One may observe from Figure 3 that all of the path coefficients are in the direction predicted but not all paths are significant. The coefficient linking self-presentation and immersion to the number of avatar-related product purchases were 0.13 $p(0.03 \leq \beta \leq 0.23) = 0.95$, and 0.14, $p(0.04 \leq \beta \leq 0.24) = 0.95$, respectively, such that the greater a participants' self-presentation and immersion, the greater a participants' purchase frequencies of avatar-related products. However, the coefficient linking the attitude toward avatar [0.07, $p(-0.04 \leq \beta \leq 0.18) = 0.95$], subjective norm [0.07, $p(-0.04 \leq \beta \leq 0.18) = 0.95$], and identification [0.08, $p(-0.03 \leq \beta \leq 0.19) = 0.95$] to the number of avatar-related product purchases were not significant. Therefore, these results showed that hypotheses 3, 4, 5, and 6 were supported, whereas hypotheses 1, 2, and 7 were rejected.

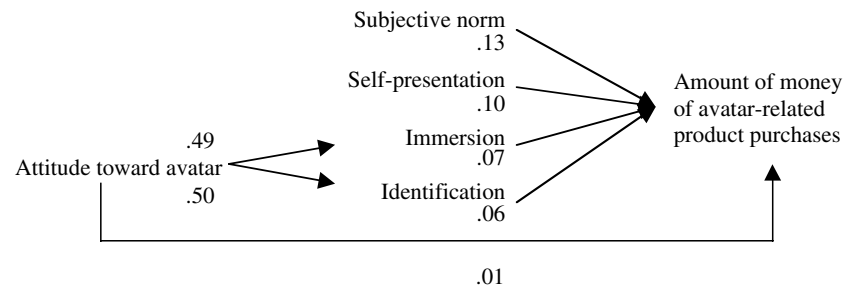
The differences between predicted and obtained correlations for all unconstrained bivariate relationships in the model were examined, and three of the six differed substantially from what was expected from sampling error. These largest errors were the same as in model 1, 0.20 (between subjective norm and immersion), -0.28 (between subjective norm

TABLE 1. INTERCORRELATIONS BETWEEN SUBSCALES USED TO CALCULATE PARAMETER ESTIMATES IN PATH MODEL 1

	1	2	3	4	5	6	7
1. Attitude toward avatar	1						
2. Subjective norm	0.267**	1					
3. Self-presentation	0.146**	0.104	1				
4. Immersion	0.486**	0.326**	0.06	1			
5. Identification	0.496**	0.417**	0.107	0.605**	1		
6. Amount of money of avatar-related product purchases	0.120*	0.191**	0.130*	0.155**	0.169**	1	
7. Number of avatar-related product purchases	0.223**	0.188**	0.162**	0.261**	0.249**	0.366**	1

** $p < 0.01$, two-tailed.

* $p < 0.05$, two-tailed.



$$\chi^2(5) = 45.82, p < .001$$

FIG. 2. Obtained path model 1 with path coefficient—amount of money of avatar-related product purchases.

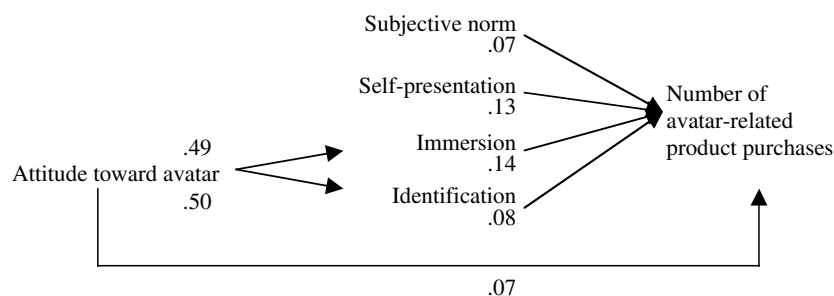
and identification) and 0.37 (between immersion and identification). Further, the global test for goodness-of-fit indicated that the data were not consistent with the model, $\chi^2(5) = 45.82, p < 0.001$. Given that not all of the path coefficients were large in magnitude, and that the model and parameter estimates did not accurately predict the unconstrained correlations, the data were judged to be inconsistent with the model.

Finally, the purchase behavior was also tested as a combined measure of amount of money and number of avatar-related product purchases. The coefficients linking the attitude toward avatar, subjective-norm, self-presentation, immersion, and identification to the purchase behavior were respectively, $0.05, p(-0.06 \leq \beta \leq 0.16) = 0.95$, $0.12, p(0.01 \leq \beta \leq 0.23) = 0.95$, $0.14, p(0.03 \leq \beta \leq 0.25) = 0.95$, $0.13, p(0.02 \leq \beta \leq 0.24) = 0.95$, and $0.08, p(-0.03 \leq \beta \leq 0.19) = 0.95$. Therefore, these results showed that all hypotheses, except for hypothesis 1 and 7, were supported. Also, the global test for goodness-of-fit indicated that the data were not consistent with the model, $\chi^2(5) = 45.82, p < 0.001$.

DISCUSSION

The results of study 1 showed that a few variables predict the antecedents to purchase of avatar-related products. First, the link between the attitude toward an avatar and identification was very strong. High correlation was also obtained for the attitude toward an avatar and immersion. These results intuitively make sense in that a positive attitude toward an avatar causes one to get more involved and identify with it as a form of telepresence, through using the avatar. The more positive they feel about the avatar, the more likely they will feel immersed in the avatar.

This study had two indicators of avatar-related behavior, money and frequencies regarding purchasing avatar-related products. Since adolescents might not spend a significant amount of money, but frequently purchase inexpensive accessories for their avatar, this research was divided into two dependent variables. For the amount of money spent on avatar-related product purchases, self-presentation and subjective norm were significant factors.



$$\chi^2(5) = 45.82, p < .001$$

FIG. 3. Obtained path model 2 with path coefficient—number of avatar-related product purchases.

For the frequency of avatar-related product purchases, attitude toward avatar, self-presentation, subjective norm, immersion, and identification were significant factors. There are some implications resulting from these findings.

First, self-presentation was an important construct for avatar usage, since self-representation, or the ability to modify self-presentational behavior, was significantly related with purchase behaviors. The present study applied the concept of self-presentational ability displayed by an individual online. The results of this study suggests that the higher self-presentational ability in real life, the more motivation people have to engage online self-presentation, which in turn affects their online purchasing behavior of avatar-related products. The significant implication here is the question regarding our behavioral differences in real life and online. Do people engage in self-presentational behaviors differently online versus offline? If so, how do people demonstrate themselves differently online and in real life? This could be explored further. The results of this study imply that real life self-presentational ability carries over to online self-presentation, which motivated users to engage in self-presentational behaviors online, such as using avatars and purchasing avatar-related products.

Second, because this study came from Korea, which is categorized as collectivistic country, subjective norm was also a significant predictor for online purchase of avatar-related products. Individuals in collectivistic cultures tend to behave in a more collectivistic way, so present research expected that subjective norm should influence behavior. Hofstede pointed out that one cultural variable is individualism-collectivism.^{50,51} Since then, extensive cross-cultural research has been done using this construct.⁵²⁻⁵⁴ Later on, the concept of self-construal started to be employed as an indicator of individual level cultural dimensions. Park et al.,¹³ and Park and Levine⁵⁵ examined the relationship between independent and interdependent self-construal with both subjective norms over the attitudinal components in Ajzen and Fishbein's TRA in predicting behaviors. Interdependent self-construal was positively related to normative beliefs, motivation to comply, and hence subjective norm. This suggests a moderating effect of culture, or self-construal and points out the importance of the subjective norm in predicting behavior. This study also provides evidence that TRA was proven to predict behavior cross-culturally.^{13,55,56}

One should carefully interpret the effect of the subjective norm. Our open-ended questions, which asked respondents to list significant others, our

subjects listed parents, teachers/professors, friends in school (classmates), romantic partners, and other. The researchers think that for a certain type of adolescents' social interaction, such as their online avatar use, they are mostly concerned with their peer groups, that adolescents and young adults might rely more heavily on peer significant others rather than significant others in general. Therefore, it is possible that the effect of subjective norms will become stronger if peer group's subjective norms were the only subjective norms considered in the study.

Third, it is surprising that identification was not significant, and immersion was partially significant. These two factors were barely within sampling error of zero to the amount of avatar-related product purchases, but immersion was significant to the number of avatar-related product purchases. The possible problem could be a flaw in the conceptual definition of identification of an avatar. Since the items came from the attitude measure of perceived homophily dimensions, the theoretical application might be the source of the problem. For future research, this measure can be altered to vicarious satisfaction/pleasure through the avatar because one of the end goals of avatar users is to feel a certain satisfaction/pleasure through identification with their avatar.

STUDY 2

Even though the first study contains important implications regarding our online communication behaviors and usage of avatars, which are emerging as new tools to join and stay involved in the online community, because this is a cross-sectional self-report survey on the young adults, further elaborate research is necessary to understand avatar usage.

The second study is conceptually and theoretically developed from the first study. Through avatar non-users' participation, the second study will analyze the variables influencing intention to use avatar-related product. The Technology Acceptance Model (TAM) is provided as a main theory and Internet self-efficacy and peer group's subjective norms are combined in a model to understand the use of avatar-related products.

Technology acceptance model and internet self-efficacy

The TAM is to provide an explanation of the determinants of technology.^{57,58} Like TRA, the attitude-intention relationship represented in TAM

implies that, all else being equal, people form intentions to perform behaviors when positive affect is present. In addition, perceived ease of use and perceived usefulness are the two basic mechanisms in TAM. Perceived ease of use refers to the degree to which the prospective user expects the technology to be free of effort and perceived usefulness refers to the prospective user's subjective probability that using the technology will increase his or her job performance.⁵⁸

The easier a technology is to interact with, the greater should be the user's sense of efficacy, and efficacy is thought to operate autonomously from instrumental determinants of behavior.⁵⁹ According to Bandura, perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments.⁶⁰ Here, Internet self-efficacy refers to a person's judgment of his or her ability to apply Internet skills in a more encompassing mode. Also, perceived usefulness is influenced by perceived ease of use, and attitude is jointly determined by perceived usefulness and perceived ease of use.

According to Venkatesh and Davis, self-efficacy can be, and needs to be, explored and understood in the context of user acceptance of information technology.⁶¹ Based on perceived ease of use measures, they concluded that in addition to the theoretical and intuitive basis to believe that computer self-efficacy and perceived ease of use might be related. There also exists preliminary empirical support to suggest that self-efficacy may serve as an anchor for early ease of use and perceived usefulness perceptions, which is then adjusted after direct usage experience to reflect specific system characteristics. Chung,⁶² Lee,⁶³ Glassberg,⁶⁴ Agarwal et al.,⁶⁵ McFarland,⁶⁶ Venkatesh,⁶⁷ and Igbaria and Livari⁶⁸ also verified this relationship. Therefore,

H1. *The higher one's Internet self-efficacy, the more likely one is to perceive avatars to be easy to use.*

As stated above, TAM suggests a theoretical path model, and numerous empirical studies have shown that the data fit this model.⁶⁸⁻⁷¹ Therefore,

H2. *The higher the perceived ease of use of avatars, the more likely one is to perceive avatars to be useful.*

H3. *The higher the perceived ease of use of avatars, the more likely one is to attitude toward using avatar.*

H4. *The higher the perceived usefulness of avatars, the more likely one is to attitude toward using avatar.*

H5. *The higher the perceived usefulness of avatars, the greater one's intention to use avatar-related products will be.*

H6. *The more positive one's attitude toward using avatars, the more likely one is to intend to use avatar-related products.*

Peer group's subjective norm

Subjective norm is one of two main factors constructing TRA. In the first study, subjective norm was partially supported. Theoretically, this second study assumes that one's peer group's subjective norm about avatar positively influences attitude toward using avatar because Chung,¹⁷ Chung and Kim,¹⁸ and Park⁷² show that the effect of their friends in technology use is one of the most important factors for young people. Therefore,

H7. *The stronger the peer group's subjective norm about avatars, the more likely one is to have a positive attitude toward using avatars.*

H8. *The stronger the peer group's subjective norm about avatars, the greater one's intention to intention to use avatar-related products.*

Overall, Figure 4 shows the relationships among variables. Since the variables are obviously not independent of each other, this study will test the fit of the causal model.

MATERIALS AND METHODS

Procedure and sample

To analyze data by the model, this research had participants play the social activity first and then ask research questions. Although the variables of interest were not manipulated, this study is concerned with testing causal processes and theory development.⁷³

One hundred and seven undergraduate students lacking any avatar experience were drawn from introductory communication classes at a large Mid-western university. Of the 107 participants, 46 were male (43%) and 61 were female (57%). The average age was 20 ($SD = 1.39$). The average year of Internet

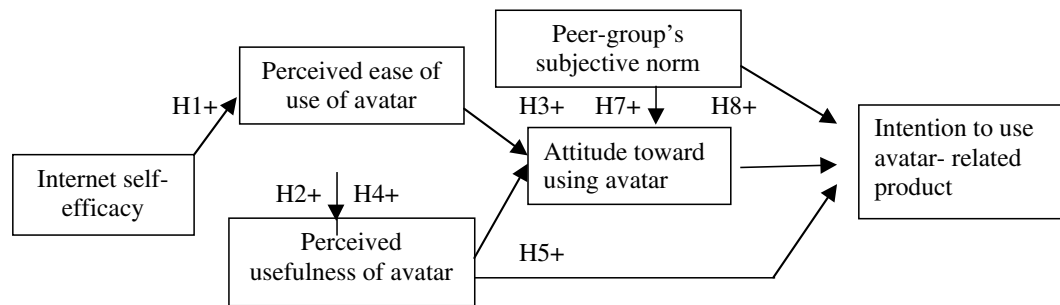


FIG. 4. Proposed path model 2.

use was 6 1/2 years, and about 94% of respondents used cable/ISDN/DSL or T1 connections to access the Internet. On a typical day, they spend 2.8 h ($SD = 2.01$) using the Internet. Procedures for data collection are detailed below.

First, after signing a consent form indicating their voluntary participation in this study, participants filled out their pretest using paper and pencil in a laboratory. The pretest asked for demographic information, including biological sex, age, and Internet use. Participants then watched a 4-minute video file which introduced what avatars and <www.secondlife.com> are. Since participants were not familiar with avatars and would play their avatar in the secondlife.com virtual world, this introduction to avatar use was necessary to familiarize them with this virtual world.

Second, the participants completed a brief, 5-min interactive training session in <www.secondlife.com> to help orient themselves to the activity. A researcher helped guide them during this time. After the researcher had reviewed the functions of the control system, participants practiced with a researcher overseeing their activity for 3 min. At the end of that time, the participants played alone for 20 min. Third, once the player had begun independent use of the avatar in the virtual world, the researcher dimmed the light and left the room. After 20 min, the researcher entered the room and stopped the activity. Finally, the participants completed the main questionnaire, were thanked for their participation and assured that their responses would be processed in confidence.

Measures

Like the first study, all conditions had to be followed CFA and path analysis criteria.

Internet self-efficacy. Self-efficacy scales should measure people's beliefs in their abilities to fulfill different levels of task demands within the psycho-

logical domain selected for study. Seven items were made for this measure and each item had a five-point Likert scale. All seven items fit a unidimensional solution as indicators for internet self-efficacy index ($M = 3.48$, $SD = 0.79$, $\alpha = 0.84$).

Perceived ease of use of avatar. Perceived ease of use of avatar consisted of six items. It was measured with a five-point Likert scale. Participants were asked to indicate the extent to which they agree or disagree with the following statements. Six items fit a unidimensional solution as indicators for perceived ease of use of avatar ($M = 2.72$, $SD = 0.80$), and it was found reliable ($\alpha = 0.90$).

Perceived usefulness of avatar. Perceived usefulness of avatar was composed of eight items. Like the measure of perceived ease of use of avatar, a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) with the reasons for avatar was also used. All eight items were retained as indicators for perceived usefulness of avatar index ($M = 3.2$, $SD = 0.78$), which was also reliable ($\alpha = 0.82$).

Attitude toward using avatar-related products. Using a semantic differential scale (Osgood et al., 1957), respondents were asked to indicate their agreement or disagreement with a series of bipolar adjectives. Four items were made for this measure and each item has a five-point Likert scale. All four items fit a unidimensional solution ($M = 2.88$, $SD = 0.79$, $\alpha = 0.83$).

Peer group's subjective norm. Peer group's subjective norm scale was similar to subjective norm measure in the TRA for the objects. In this research, normative beliefs were restricted to friends because the effect of their friends in avatar use is one of the most important factors.¹⁸ Consequently, normative beliefs were what close friends think about behavior, and the motivation to comply was how

motivated the user was to comply with those important others.

This study asked the respondents directly who was the most important person to them in their peer groups. For example, "Think of four close friends who are very important to you. List their initials on the lines provided." After this instruction, respondents were asked questions about four close friends who were very important to them (person 1, $M = 20.71$, $SD = 14.11$, $\alpha = 0.91$; person 2, $M = 20.44$, $SD = 14.11$, $\alpha = 0.94$; person 3, $M = 19.91$, $SD = 12.61$, $\alpha = 0.94$; person 4, $M = 21.17$, $SD = 15.13$, $\alpha = 0.97$).

Intention to use avatar-related products. The responses to each scale were scored from "extremely unlikely (-2)" to "extremely likely (2)," and four items made the intention measure. All four items were retained as indicators for the intention index ($M = 1.68$, $SD = 0.90$), which was reliable ($\alpha = 0.91$).

Statistical analysis

The correlations used to estimate the fit of the model parameters are in Table 2, and the path coefficients are in Figure 5.

RESULTS

One may observe from Figure 2 that all of the path coefficients are in the direction predicted and all paths are significant. The path coefficients from the Internet self-efficacy to perceived ease of use of avatar was 0.28, $p(0.11 \leq \rho \leq 0.45) = 0.95$, such that the greater a participants' Internet self-efficacy, the greater a participants' perceived ease of use of avatar. The path coefficients from the perceived ease of use of avatar to perceived usefulness of avatar and attitude toward using avatar were 0.38, and 0.29, respectively. The path coefficients from the perceived usefulness of avatar to attitude toward using avatar and intention to use avatar-related product were 0.11, and 0.20, respectively. The path coefficients from the peer-group's subjective norm to attitude toward using avatar and intention to use avatar-related product were 0.32, and 0.20, respectively. The path coefficient from the attitude toward using avatar to intention to use avatar-related product was 0.20. Overall, all hypotheses were supported.

The differences between predicted and obtained correlations for all unconstrained bivariate relationships in the model were examined and nothing differed substantially from what was expected from sampling error. Further, the global test for goodness-of-fit indicated that the data were consistent with the model, $\chi^2(6) = 2.36$, $p = 0.88$. Given that the path coefficients were significant, and that the model and parameter estimates predicted accurately the unconstrained correlation, the data were judged to be consistent with the model.

DISCUSSION

As the population on the Internet increases, the interest in online human behavior has also increased. The emergence and prevalence of the Internet has changed the way we socialize and stay connected with our friends and communities. How people engage in self-presentational behavior on

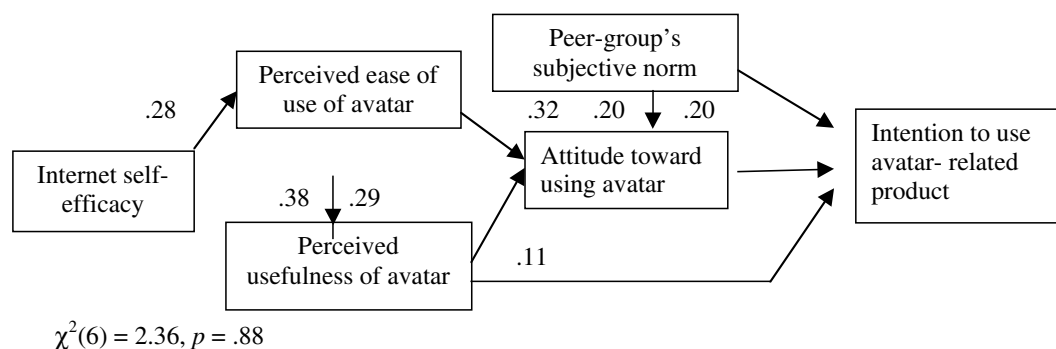


FIG. 5. Obtained path model 3 with path coefficient.

TABLE 2. INTERCORRELATIONS BETWEEN SUBSCALES USED TO CALCULATE PARAMETER ESTIMATES IN PATH MODEL 2

	1	2	3	4	5	6
1. Internet self-efficacy	1					
2. Perceived ease of use of avatar	0.281**	1				
3. Perceived usefulness of avatar	0.160	0.380**	1			
4. Attitude toward using avatar	0.080	0.463**	0.402**	1		
5. Peer group's subjective norm about avatar	0.072	0.196*	-0.021	0.255**	1	
6. Intention to use IM group	0.116	0.230*	0.223*	0.377**	0.268**	1

** $p < 0.01$, two-tailed.

* $p < 0.05$, two-tailed.

IM, instant messaging.

the Internet is one of the major issues in the field of communication. An avatar has become a popular way for teenagers and young adults to represent themselves online. The avatar provides a unique opportunity for an individual in online environment to present himself or herself in a creative way.

Study 2 sought to test an avatar use model for non-users. Results indicated that all hypotheses were supported, and the data were judged to be consistent with the model. Specifically, the TAM was found to be a valid model to understand non-users' avatar use, and Internet self-efficacy was a significant external variable related to the TAM. Also, peer group's subjective norm was a strong predictor of attitude toward using avatars and intention to use avatar-related products. These findings have a few important implications.

First, the relationship between Internet self-efficacy and the TAM was supported. As hypothesized, Internet self-efficacy acts as a determinant of perceived ease of use. As an antecedent variable, the role of Internet self-efficacy is of importance because one of the limitations of the TAM is that it does not help understand and explain acceptance in ways that guide development beyond suggesting that system characteristics impact ease of use and usefulness perceptions.⁷⁴ Therefore, in order to be able to explain user acceptance and use, it is important to understand the antecedents of the key TAM.⁶¹ Also, the relationship of Internet self-efficacy and perceived ease of use between users and non-users demonstrates an interesting finding for some Internet-related behavior. In Chung's study,¹⁸ there was no significant difference between instant messenger (IM) users and non-users for Internet self-efficacy, but perceived ease of use of IM for users was significantly greater than that of non-users. This indicates that IM non-users feel relatively more difficulty in using IM than IM users, even though IM is not diffi-

cult to use in reality. This suggests that differences between users' and non-users' Internet self-efficacy and perceived ease of use are worth comparing, as they are closely related.

Second, as the TAM suggested, perceived ease of use of avatars predicted perceived usefulness of avatars, and both perceived ease of use of avatars and perceived usefulness of avatars also accurately predicted attitude toward using avatars. That is, the more avatar non-users perceived avatars to be easy to use, the more likely they were to perceive avatars to be useful, and subsequently have more favorable attitudes toward using avatars. Also, the more participants perceived avatars to be easy to use, the more likely they were to have a favorable attitude toward using avatars, and perceived usefulness of avatars was a strong predictor of intention to use avatars.

As the Internet environment has developed, user representation has become increasingly more visualized. Visualizations are ideal modes of self-presentation, especially for young people seeking fun and unique ways to express themselves. An avatar is a good example. This demonstrates that avatar non-users perceive that using avatars allows them to represent their emotions or themselves to other Internet users more easily, conveniently, and accurately. In accordance with numerous empirical studies,^{57,58,61,65,68-71} the present study also verified that the TAM was a suitable model for predicting technology usage.

Third, peer group's subjective norm was also a significant predictor for intention to use avatar-related products. This has two important implications. First, the TAM 2 is supported, and second, that normative beliefs in the subjective norm should be more specifically defined. Since Davis et al.⁵⁸ thought that the direct effect of subjective norm on intention in previous research had yielded

inconsistent results, the original TAM omitted it. However, subjective norm had shown a significant effect on intention in many studies, therefore Venkatesh and Davis' TAM 2 added subjective norm to the model because the rationale for a direct effect of subjective norm on intention was acceptable.⁷⁵ Specifically, this study focused on only peer group's subjective norm, which had normative beliefs for the specific target. For certain types of social interactions, such as online avatar use, young people are primarily concerned with their peer groups and might rely more heavily on peer significant others rather than significant others in general. Previous studies^{17,18,72} also found that one of the most important factors for young people was the effect of their friends on technology use. Therefore, this suggests that the effect of specific group's subjective norms should become stronger if the subjective norms of those groups were the only subjective norms considered in the study. Overall, this study provided much insight regarding online behaviors such as online purchase behaviors.

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