Effects of Game Design Features on Player-Avatar Relationships and Motivation for Buying Decorative Virtual Items

Hao Wang
Department of Computer Science, National Chiao Tung University
wanghau.ms89@gmail.com

Yu-Chun Ruan, Sheng-Yi Hsu, Chun-Tsai Sun
Department of Computer Science, National Chiao Tung University
sherryruan1988@gmail.com, shengyihsu@gmail.com, ctsun@cs.nctu.edu.tw

ABSTRACT
Many online game players are developing strong psychological attachments with the avatars they use for gameplay. Player-avatar relationships can affect gaming experiences in terms of enjoyment, immersion, and virtual character identity, among other factors. For this study we tested various propositions regarding the effects of game design features on player-avatar relationships, and the effects of those relationships on decorative virtual item consumption motivation. Participants recruited from 15 online game forums were asked to complete two questionnaires on these topics. Our results indicate significant correlations between player-avatar relationships and both game design features (e.g., death penalties and pet systems) and decorative item consumption motivation. Our results offer insights into how game designers can, to some extent, manage player-avatar relationships by fine-tuning design features, perhaps facilitating marketing objectives in the process.

Keywords
Avatar, Game design, Player-avatar relationship, Consumption motivation

INTRODUCTION
A distinguishing feature of online digital games is the ability to socialize with people in virtual worlds via characters called *avatars* that players control during gameplay. Taylor (2002) defines avatars as digital representations that allow players to live in game worlds, while Castronova (2003) describes them as cars for moving around in virtual worlds. Players control their avatars to participate in game events, interact with other characters, and otherwise immerse themselves in virtual environments (Bartle, 1996; Yee, 2006). Avatar mechanisms are now widely used in both role- and non-role playing games (RPGs), with an increasing number of commercial titles offering customizable avatars (in terms of appearance) and avatar development features (e.g., leveling-up and skill building, two standard aspects of RPG play). In some racing games, players have access to customizable racer appearances and "career modes" that allow players to monitor their virtual characters' movement from novice to professional level—an example of an RPG feature in a non-RPG environment. van

Proceedings of DiGRA 2019

Ryn, Apperley, and Clemens (2019) further argue that avatar system is crucial in strengthening players' bond to certain gaming platform, benefiting game publishers and platform owners.

From an outsider's perspective, avatar behaviors look similar from one player to another due to game system limitations of what players can do. For example, RPG players can move their characters to visit new places, pick up items, and fight or communicate with other characters. What non-players are not aware of is the complexity of player-avatar relationships, with many players viewing their avatars as self-extensions while participating in game worlds. Identifying with avatars can influence player self-identities (Cohen, 2001;Klimmt, Hefner, Vorderer, Roth, and Blake, 2010; Liau and Khoo, 2012), and game experiences, loyalty, immersion, and enjoyment can all be affected by player attachments to and expectations for their avatars (Teng, 2010). Birk, Atkins, Bowey, and Mandryk (2016) also found that avatar identification helps to develop intrinsic motivation, immersion, and positive affect.

Researchers have observed that players perceive their avatars as far more than simple tools to extend their agency to game worlds, and that player-avatar relationships exert significant effects on both in-game and real-world behaviors and experiences. Accordingly, one of our study goals is to clarify the link between game design features and player-avatar relationships in order to identify possible ways to enhance game enjoyment and loyalty. A second goal is to expand our understanding of how player-avatar relationships affect an activity that game designers and publishers are very interested in: shopping for in-game virtual items. According to Arnold and Reynolds (2003), shopping motivation is affected by both expected usage of merchandise and social relationships (e.g., connections to the recipients of purchased items and shopping companions). Yoo, Peña, and Drumwright (2015) also found that choices of avatar type affect consumer behavior and motivation unconsciously. Here we will examine whether specific characteristics of player-avatar relationships affect virtual item purchases, and whether links exist between physical world social relationships and digital game player-avatar relationships.

LITERATURE REVIEW

Player-avatar relationships share some similarities with film viewer attachments to film characters (Hoffner and Buchanan, 2005; Livingstone, 1998). Cohen's four dimensions of film character attachment include the sharing of feelings (empathy), the sharing of similar perspectives, internalized thought (e.g., shared motivations and goals), and loss of self-consciousness while viewing a film (Cohen, 2001).

Boundaries between digital online game players and their characters are more ambiguous because players control rather than simply observe their avatars (Klimmt et al., 2010). In digital games there is greater potential for merged identities—that is, for players to perceive themselves as extensions of their avatars (Klimmt et al., 2010; Liau and Khoo, 2012). The potential for strong player identification with an avatar increases when character personality and/or background story is vividly depicted. Some game researchers have created classification systems addressing the depth of player involvement and avatar usage in games that lack vivid characters or story lines;

most multi-player online games are in this category. Bartle's system (1996) is based on level of immersion: player, avatar, character, and persona. Lewis, Weber and Bowman's *character attachment* concept also consists of four dimensions: identification/friendship, suspension of disbelief, control, and responsibility (Lewis, Weber and Bowman, 2008); the last one refers to the ways that players feel responsible for and take care of their avatars. Items on Lewis et al.'s instrument designed to measure the responsibility dimension include "I know what my character needs" and "I make decisions with my avatar's best interests in mind." Players who score high in this dimension likely view their avatars as having individual characteristics similar to friends and pets. Based on his observations of single player gameplay, Linderoth identified three kinds of avatar usage: a role to be played, a tool to extend player agency to virtual worlds, and a prop for self-presentation (Linderoth, 2005). In multi-player game environments, players may project their personalities, identities, or even virtual selves onto their avatars, depending on individual usage and expectations (Bessière, Seay and Kiesler, 2007; Kim, Lee and Kang, 2012; McCreery, Krach, Schrader and Boone, 2012; Turkle, 1995).

Game design features can affect how players feel about their avatars, with avatar customization an obvious example. According to Lim and Reeves (2009), customizable avatar appearances increase emotional involvement, as measured in terms of player heartbeats per minute. In their study of the customization process, Ducheneaut, Wen, Yee and Wadley (2009) described significant player concerns about certain virtual body parts, and noted stronger connections to avatars when those parts were customizable. An example of a non-appearance design feature that can influence player-avatar relationships is avatar death, which can create a sense of heroism (Klastrup, 2006).

In the area of shopping and purchasing behaviors, Tauber (1972) is one of many researchers noting that in addition to satisfying simple needs or desires for products and services, people enjoy shopping with close friends and relatives, discovering new trends and fashions, and giving gifts. Bridges (2018), Dholakia (1999), and Westbrook and Black (1985) have identified consumption motivation categories such as functional, social, hedonic, adventure, and role-playing, among others. Functional shoppers focus on product and service utility, while social shoppers are more concerned about fitting in with peer groups. Hedonic shoppers emphasize the fun of shopping as a recreational activity, adventure shoppers enjoy visiting new stores and malls or trying exotic foods, and role-play shoppers focus on the recipients of their purchases—for example, parents buying clothes for their children. Similarities in incentives have been noted between purchases of real-world items and virtual items for games, including social motivation and peer pressure (Brown, Pope and Voges, 2003; Kim and Chan, 2007; Lehdonvirta, 2009; Rohm and Swaminathan, 2004). However, important differences in motivation have been noted in terms of computer-mediated communication (avatar-to-avatar versus face-to-face) and the anonymous nature of a large number of gaming activities (Park and Lee, 2011; Shang, Chen and Huang, 2012). For example, online game players may purchase items for purposes of expressing their emotions in virtual environments, which in most cases is unnecessary in real-world face-to-face communication. Anonymity allows players to

experiment with a wide range of character roles, including unrealistic ones (Turkle, 1995).

For some game publishers, the sale of virtual items has become a primary source of revenue (Lehdonvirta, 2009; Levy, 2013). This is especially true for many free-to-play (F2P) games, in which players are essentially required to purchase certain functional items in order to go beyond the most basic gameplay levels. F2P games contain features that stimulate the consumption of functional items that are marketed through the use of pop-up windows that make purchase recommendations when players can benefit the most from those items. During the heat of gaming sessions, players are less likely to engage in comparison shopping to find better prices. There are drawbacks to this system: both researchers and players have commented on how functional virtual item sales can hurt player experiences. Games with challenges that can only be solved by paying real money are viewed by many as breaking the "magic circle" of gaming, defined by Huizinga (1950) as the separation of an individual in a game environment from the real world. As Wang and Sun note, the ability to use real currency to gain advantages can decrease the meaning of in-game systems that reward players for their devotion and gaming skills (Wang and Sun, 2011). However, Lin and Sun (2011) report that a new consensus is emerging among player societies about what constitutes fairness in F2P games, with a small but significant percentage of players asserting that paying to gain advantage is acceptable (a) when boundaries between game worlds and the physical world are ambiguous, and (b) by players who have less free time to engage in gameplay because of other responsibilities.

Game companies are also interested in selling decorative items that do not confer gaming advantages to their owners. Depending on the game genre, these items include avatar clothes and accessories, furniture, and virtual pets, among many others. The value of such items has been described using terms ranging from "eye candy" to "social tools" (e Silva, 2012; Martin, 2008; Park and Lee, 2011; Shelton, 2010). Decorative item purchases (which sometimes represent player loyalty to a specific game) are much less likely to attract anger from players concerned with the "purity" of gaming. Our study represents one of the first efforts to identify ways that game design features can affect decorative virtual item consumption.

RESEARCH DESIGN

Our focus in this study is on death mechanisms, pet systems, and decorative virtual item systems—three common mainstream game features that share the characteristic of design flexibility, especially compared to primary game attributes such as story, genre, and protagonist setting. Avatars can be killed in almost all avatar-centered MMOGs, thereby losing virtual equipment or character properties. Pet systems are now considered a standard feature in many MMORPGs, and the number of games that allow avatars to wear purely decorative, non-functional "clothing" is growing. In non-F2P games, these items must be earned through effort and skill development.

We purposefully ignored certain game design features in this study due to their level of similarity across games and game genres. For example, although most games allow players to use a first or third person point of view—a decision that can affect player-avatar relationships (Kallinen, Salminen, Ravaja, Kedzior and Sääksjärvi,

2007; Schilbach, Wohlschlaeger, Kraemer, Newen, Shah, Fink and Vogeley, 2006)—almost all players choose third person for its ease of control, among several other advantages (Black, 2017). Further, even though inter-player communication interfaces may be influential, they are very similar in most games, certainly in most mainstream MMORPGs. When talking to a nearby avatar, text usually appears above the communicating avatar, but when talking to avatars at a distance, the text appears in the other player's chat window. Avatars are not required to be on the same screen to communicate.

We looked at four aspects of player-avatar relationships that we believe exert the strongest influences on gaming experiences and decorative item consumption. We believe that all four can be manipulated via game design.

1. *Shared feelings and actions between players and their avatars*. While developing our research model, we spent a large amount of time observing the gaming behaviors of *World of Warcraft* (*WoW)* and *The Sims* players, and were intrigued by the decisions of some to give their avatars sit-down breaks after long walks, as well as by the embarrassment that other players expressed when their avatars were not fully clothed. To our knowledge, no attempts have been made to study these kinds of actions and feelings, but we do believe that they are associated with important gaming concepts such as presence (Lee, 2004; Lombard and Ditton, 1997), immersion, and the merging of action and awareness as described in Csikszentmihalyi's flow theory (Csikszentmihalyi, 1997).

2. *Viewing avatars as companions, friends, or comrades*. These kinds of relationships share similarities with two well-studied psychological phenomena: film character identification (Cohen, 2001) and animism. When studying children's developmental processes, Piaget (1929) coined the term *animism* to describe their habit of assigning real-life characteristics to objects. Although the strength of this habit decreases with age, there is no definite age or level of maturity at which it completely disappears (Beran, Ramirez-Serrano, Kuzyk, Fior and Nugent, 2011; Inagaki and Sugiyama, 1988). Both phenomena entail perceptions of actors or non-human characters as real individuals, similar to the ways that many online game players perceive their avatars as comrades in battle.

3. *Giving avatars roles*. Role-playing supports strong narrative experiences (Murray, 1997). Whereas real-world role-playing often involves famous characters from fiction, films, or television programs, MMORPG and other online game players can create original roles and determine how they should be played in individual settings. In these situations, players tend to behave as they believe their avatars should behave, instead of acting naturally or spontaneously. A feeling of fantasy is an important element in such relationships—that is, a clear sense of separation must exist between virtual and physical worlds. Further, players must feel safe when creating roles and adhering to them (Turkle, 1995).

4. *The feeling that avatars are simply tools to be used*. Developing and decorating an avatar so that it can function well is an important part of gaming fun. Such efforts are associated with feelings of achievement, progress, and enjoyment (Wang and Sun, 2011). However, when players only pay attention to avatar functionality, we view that as evidence that they have weaker emotional connections

with their avatars, and are less likely to feel a sense of fun or enjoyment due to the game's narrative aspects.

Our core propositions are (a) game design features affect player-avatar relationships, and (b) player-avatar relationships affect decorative item consumption motivation. To our knowledge, this is the first systematic attempt to understand these relationships. The first two hypotheses address the effects of specific design features on player-avatar relationships. We believe that players whose avatars are more likely to die are less likely to experience a merging of feelings and action with those avatars, and more likely to view their avatars as unrealistic and consumable entities rather than irreplaceable items. Our reasoning is that high death potential makes it less likely that players will view their avatars as self-extensions, and high death frequencies indicate that game challenges exceed player skill levels, thereby triggering feelings of anxiety and frustration, and reducing player sense of effortless control (i.e., merging of action and awareness with an avatar). Our assumption is that effortless control is essential to a strong connection between players and avatars because it supports high levels of immersion.

Avatar death severity refers to the degree of penalties (i.e., property loss) incurred when an avatar dies—the higher the penalty, the larger the amount of time that a player must spend recovering. In non-F2P games, some penalties are so severe that players must wait on the sidelines for very long periods of time before they can rejoin play; in F2P games, they can simply make a payment to immediately rejoin the action. Regardless of game type, players are more likely to attend to functional rather than immersive aspects of their avatars so as to avoid death, and therefore treat their avatars as tools. Accordingly, we propose the following hypotheses:

Hypothesis 1. Avatar death frequency is negatively correlated with player feelings of closeness (i.e., shared feelings) with their avatars.

Hypothesis 2. Death penalty severity is positively correlated with player perceptions of their avatars as functional tools.

Pet systems are now found in most MMORPGs, but to our knowledge no efforts have been made to determine how they affect player-avatar relationships. We assume that avatars with pets are more likely to give appearances as masters exerting control over other entities, and therefore more likely to present autonomous and life-like characteristics to their player-owners—the opposite of viewing avatars as tools. MMORPG pets include fantasy creatures such as unicorns and fairies. We believe that players are more likely to have strong fantasy feelings regarding their avatars (i.e., stronger perceptions of playing in distinctly separate worlds) when these kinds of pets are involved, and therefore have stronger motivations to design and control their avatars' roles. Accordingly, the next two hypotheses are expressed as:

Hypothesis 3. Players whose avatars have pets have stronger emotional attachments with their avatars.

Hypothesis 4. Players whose avatars have pets have stronger role-playing tendencies.

Advanced graphics software allows players to optimize and decorate their avatars in detail. Customizing flexibility varies from game to game, with some making dozens of virtual decorative items available to their players and others offering thousands.

We tried to determine whether decoration flexibility exerts any effect on player-avatar relationships, starting with the assumption that greater availability of customizing objects increases the likelihood of players using their avatars as props for self-presentation or for flaunting their skills or wealth. Thus we have:

Hypothesis 5. Players of games that provide larger quantities of decorative items in online stores are more likely to view their avatars as functional tools.

In the same manner that real-world consumption motivation is influenced by the relationship between the buyer and the person receiving the purchased object, we believe that online game player consumption decisions are affected by the relationships they have with their avatars. As shown in Table 2, we have identified five motivation categories for purchasing decorative virtual items for avatars: (a) peer group approval (e.g., buying clothing in the same style as a friend's avatar); (b) feeling a sense of fun in the activity of shopping (i.e., hedonic as opposed to utilitarian shopping); (c) avatar customizing, which is similar to dressing up dolls for play; (d) self-presentation, based on a desire to make certain impressions on other players (Dunn and Guadagno, 2012; Vasalou and Joinson, 2009; Yee and Bailenson, 2007); and (e) flaunting game skills or purchasing power, similar to making purchases of real-world luxury goods that have no functionality. In some cases, purchases in the last category are made to show devotion to a particular game—that is, to indicate core player identity.

We believe that players with a strong focus on functionality are more likely to decorate their avatars for specific purposes such as flaunting skills or wealth and fitting into a game society. In contrast, players with weak focuses on functionality are more likely to decorate their avatars for purposes of enjoyment. Accordingly, our next hypothesis is expressed as:

Hypothesis 6. Players with strong functional perceptions of their avatars have higher levels of peer-group approval and flaunting consumption motivation, and players with weak functional perceptions of their avatars have higher levels of customizing consumption motivation.

Two of Arnold and Reynolds's (2003) six categories of hedonic shopping are role and social shopping. Role shopping consists of buying for known persons, motivated by their perceived roles (e.g., parents or friends). We believe that players who view their avatars as comrades and/or friends are more likely to make purchases in accordance with these roles. The social shopping category includes the fun of interacting with relatives and friends while shopping. The appearance of a player's avatar on a computer screen may enhance this sense of social shopping. We also believe that players who view their avatars as companions are likely to have higher levels of customization motivation, analogous to parents dressing their children or pet owners grooming their pets. We therefore propose the next hypothesis as:

Hypothesis 7. Players with a strong sense of companionship with their avatars have higher levels of hedonic shopping and avatar customizing consumption motivations.

We assume that players who feel a stronger sense of merging their feelings and actions with their avatars are more likely to view their avatars as extensions of their own bodies, and therefore dress up their avatars so as to fit in with an online group or to present ideal self-images. The next hypothesis reflects this assumption:

Hypothesis 8. Players who experience stronger senses of merging their feelings and actions with their avatars have higher levels of peer-group approval and self-representation consumption motivation.
Last, we believe that players who enjoy immersing themselves in role-play have greater motivation to decorate their avatars in ways that are appropriate to their roles, a simple example being dance clothes for dancer avatars. Further, players in MMORPG societies frequently use their avatar identities when joining groups (Bessière, Seay and Kiesler, 2007; Taylor, 2006; Turkle, 1995); these players may dress their avatars so as to make it easier for other players to identify their roles. Accordingly, the final hypothesis is expressed as
Hypothesis 9. Players with stronger role-playing feelings for their avatars have higher levels of peer-group approval and avatar customizing consumption motivation.

METHOD

In an attempt to produce generalizable results, we recruited participants from fifteen online game forums. Participants were asked to complete two questionnaires based on their experiences playing the games that were the focuses of their respective forums. The final sample consisted of 376 participants (301 male, 75 female) between the ages of 12 and 55. When searching for correlations between decorative virtual item shopping and player-avatar relationships, we limited our data to games that sell virtual items for real currency.

To determine ways that game design features might affect player-avatar relationships, we asked the participants to complete two author-developed questionnaires, one on player-avatar relationships, the other on decorative item consumption motivation. Additional questions were aimed at collecting information on player experiences using selected game design features. The first questionnaire addressed player feelings about their avatars according to the four dimensions described above: as virtual bodies (i.e., shared feelings with avatars), roles, companions, or tools. The second collected information on five aspects of consumption motivation: peer-group approval, hedonic shopping, avatar customizing, self-presentation, and flaunting. Combined, the two questionnaires took 10-15 minutes to complete.

We created a four-dimension player-avatar relationship questionnaire. Responses were recorded using a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.” Consumption motivation questionnaire items (using the same 5-point scale) reflect hypotheses 6 through 9. The texts of all questionnaire items are shown in Tables 1 and 2.

Dimension	Question	Factor loading	Cronbach’s alpha

Role	I have designed a set of personality traits for my avatar.	.754	.755
	I have created a background story for my avatar.	.751	
	When I converse during a game, I often think about what my avatar should say rather than talking naturally.	.515	
Virtual Body	I feel hurt when my avatar dies, even if there is no avatar death penalty.	.423	.453
	I feel embarrassed when my avatar is not wearing clothes.	.484	
	When I want to be alone, I move my avatar to a quiet place.	.349	
Companion	I sometimes feel like talking to my “live” avatar to learn what it is thinking.	.541	.744
	During fights, I feel that my avatar and I are fighting side-by-side.	.670	
	When I see my avatar, I feel that I am not alone.	.677	
Tool	I feel fine if my avatar is replaced by another one, as long as it is as good as the original.	.714	.778
	I would sell my avatar for real money whenever possible.	.691	

	I want to replace my avatar with a more attractive one.	.693	

Table 1: Factor loading and Cronbach's alpha data for player-avatar relationship questions.

Dimension	Question	Factor loading	Cronbach's alpha
Peer group approval	I buy decorative virtual items because I want to look like other members of my game society.	.787	.902
	I buy decorative virtual items because I want to fit in with my friends.	.767	
	I buy decorative virtual items because my friends notice when my avatar wears new clothes.	.794	
	I buy decorative virtual items because I want to attract other players for conversation.	.682	
Hedonic shopping	When I feel bad, I shop for decorative virtual items to make myself feel better.	.789	.837
	Shopping for decorative virtual items is a stress-relieving activity for me.	.865	
	I shop for decorative virtual items when I want to reward or encourage myself.	.620	

	Shopping for decorative virtual items is adventurous—every product can be a surprise.	.610	
Customization	I like to customize my avatar's appearance.	.750	.891
	I think my avatar should look like what it is supposed to represent.	.733	
	I feel a sense of achievement when I customize my avatar's appearance.	.862	
	I customize my avatar because I think it should be dressed in a certain style.	.790	
Self-presentation	I dress my avatar because I want other players to think I am fashionable.	.629	.845
	I dress my avatar to look like me whenever possible.	.692	
	I customize my avatar to indicate my personality.	.723	
	I sometimes dress my avatar to give impressions about my own fashion style.	.708	
Flaunting	I buy decorative virtual items to make others think I am rich.	.633	.830
	I think players who buy decorative virtual items are superior to players who don't.	.643	
	I think that buying decorative virtual items shows I am rich.	.763	

	I think that dressing avatars with purchased items indicates my game-related superiority.	.818	

Table 2: Factor loading and Cronbach's alpha data for consumption motivation questions.

RESULTS

T-tests (95% confidence level) were performed for H1 through H5, and a Pearson's product-moment correlation test was used to address H6 through H9. For comparison purposes, we computed average player-avatar relationship scores for each of the 15 games played by the study participants (Table 3).

Title	Genre	Role	Virtual body	Companion	Tool
Maple Story	MMORPG	7.71	8.87	8.77	8.19
Ragnarok Online	MMORPG	7.89	9.28	8.83	7.22
Mabinogi	MMORPG	6.82	8.29	8.29	6.47
Lineage	MMORPG	8.59	9.29	7.59	9.94
World of Warcraft	MMORPG	6.95	8.96	8.93	6.03
Guild War 2	MMORPG	8.85	8.82	8.45	6.65
TERA	MMORPG	7.35	8.39	8.43	7.39
SD Gundam Online	Online FPS	7.80	8.47	7.80	8.33
Counter Strike	Online FPS	8.47	9.33	9.60	8.07
A.V.A.	Online FPS	7.06	7.88	9.00	8.75
Crazy Arcade	Online Action	6.32	7.37	7.11	10.53

Audition Dance Battle Online	Online Action / Rhythm	8.38	8.19	9.56	9.19

Table 3: Average player-avatar relationship scores for selected games (score range from 3 to 15.)

Game design features and player-avatar relationships

According to our virtual body hypothesis (H1), a higher avatar death frequency will result in the reduced merging of player-avatar actions and feelings. Study participants were divided into two groups according to their self-reported in-game death frequencies: high (more than once per day) and low (less than once per day). *T*-test results revealed a significant difference in scores between the two groups (high, M = 8.57, SD = 2.66 versus low, M = 9.23, SD = 2.62; t = -2.052, p = .042), thus supporting H1. H2 states that stronger death penalties in terms of virtual property loss are more likely to cause players to view their avatars as tools whose functional aspects are more important than their immersive qualities. Participants were divided into two groups (high, ≥1 hr to recover losses and low, <1 hr), and a statistically significant difference was found between them (high, M = 7.05, SD = 3.11 versus low, M = 8.13, SD = 3.09; t = -2.569, p = .012), thus supporting H2.

H3 and H4 address pet ownership. The first posits that players whose avatars own pets are less likely to view their avatars as tools, since the avatars give appearances as autonomous masters exerting control over separate entities. For this hypothesis we had to limit our focus to MMORPGs, since they are the only game type in our sample that features pet systems. Players were divided into pet- and non-pet owning groups; *t*-test results indicate significantly lower tool perception scores for the pet owning group (M = 6.46, SD =2.94 versus M = 7.64, SD = 3.01; t = -2.198, p = .03), thus supporting H3. H4 states that players with pet-owning avatars will have stronger role-playing tendencies due to the fictitious nature of virtual pets, giving them more obvious appearances as characters in distinctly separate worlds. The difference between the two groups was not statistically significant, therefore H4 was not supported.

According to H5, the players of games that provide larger quantities of decorative items in online stores are more likely to view their avatars as functional tools due to the practice of using them and their purchases for flaunting and socializing purposes. We created two player categories based on the quantities of decorative items for sale online in games favored by the players in our sample, purposefully selecting games in which such items were quantifiable. Games whose online stores sell a mix of functional and decorative items on the same page were deleted due to the time required to distinguish between the two, leaving six games in the two categories (Table 4). A higher tool relationship score was noted for players who favored games with higher quantities of decorative items for sale (M = 9.10, SD = 3.18 versus M = 7.29, SD = 3.12; t = -3.682, p < .001), thus supporting H5.

Title	Quantity	Group
Mabinogi	67	Lower
Guild War 2	25	Lower
TERA	35	Lower
Maple Story	1,285	Higher
Audition Dance Battle Online	4,980	Higher
Crazy Arcade	224	Higher

Table 4: Numbers of virtual decorative items sold in online shops of selected games. Games for which quantities could not be counted are excluded.

Player-avatar relationships and consumption motivation

The samples used to test H6 through H9 consisted of players of games whose publishers sell decorative virtual items. Game titles and average consumption motivation scores are shown in Table 5.

Title	Peer group approval	Hedonic shopping	Customizing	Self presentation	Flaunting
Maple Story	10.52	10.45	14.42	12.23	9.10
Ragnarok Online	9.50	8.94	13.40	11.44	8.17
Mabinogi	9.65	9.53	15.30	10.12	8.24
Guild War 2	9.20	8.95	15.35	10.84	7.65
TERA	9.35	10.04	14.26	10.13	7.30
SD Gundam Online	8.93	9.80	13.87	9.40	6.13
Counter Strike	10.00	11.33	14.53	11.67	8.53
A.V.A.	7.69	8.75	11.25	10.06	7.00

Crazy Arcade	9.89	11.47	12.74	10.95	8.84
Audition Dance Battle Online	11.25	10.56	15.06	12.19	9.69

Table 5: Average consumption motivation data for selected games that sell virtual decorative items (score from 4 to 20).

H6 predicts that players with strong perceptions of their avatars as functional tools will have stronger consumption motivation for purposes of flaunting and peer-group approval, and weaker consumption motivation for avatar customizing. Support was found for this hypothesis in the form of positive and significant Pearson's product-moment correlations between each participant's tool relationship score and flaunting ($r = .245$, $p < .001$) and peer-group approval consumption motivation scores ($r = .155$, $p < .005$). The correlation between tool relationship and customization consumption motivation scores was negative and significant ($r = -.242$, $p < .001$). Support was also found for H7, which predicted that players who view their avatars as companions will have stronger consumption motivation associated with hedonic shopping and avatar customizing. Positive and significant correlations were found between companion relationships and hedonic ($r = .289$, $p < .001$) and customization consumption motivation scores ($r = .326$, $p < .001$).

According to H8, players with stronger experiences of merging feelings and actions with their avatars will have stronger consumption motivation associated with peer-group approval and self-presentation. Our results support this hypothesis: positive and significant correlations were noted between virtual body relationship scores and (a) peer-group approval ($r = .282$, $p < .001$) and (b) self-presentation consumption motivation scores ($r = .261$, $p < .001$). Support was also found for H9 which predicted that players with stronger role-playing tendencies were more likely to have stronger consumption motivation associated with avatar customizing and peer-group approval. Our results indicate positive and significant correlations between role relationship scores and (a) avatar customizing ($r = .258$, $p < .001$) and (b) peer group approval consumption motivation scores ($r = .218$, $p < .001$).

PAIRWISE GAME COMPARISON INTERVIEWS

We paired six games based on their similarities in terms of genre, goals, graphical representations, control features, and interfaces: *World of Warcraft (WoW)* and *Guild War 2 (GW2)*; *Ragnarok Online (RO)* and *Lineage*; and *Alliance of Valiant Arms (AVA)* and *Counter Strike (CS)*. When we noted significant differences in player-avatar relationship scores, we conducted interviews to identify additional factors that might influence those relationships. For each game pair we interviewed three players who had played both games for at least three months, a requirement that reduced the number of potential interviewees to 7 males and 2 females between the ages of 23 and 30. Each interview lasted 10-15 minutes. Questions included:

- In which game do you feel a stronger emotional bond with your avatar? Why?
- In which game do you feel that you are playing with a character that has its own identity and story, and therefore you should act as it does rather than as you do naturally? Why?
- In which game do you feel strongly that your avatar is your friend or comrade? Why?
- In which game do you feel that your avatar is an extension of your own virtual body? Why?
- Describe what you generally do in each game. What are your goals? How do you interact with other players?

We found that *WoW* and *GW2* players were distinctly different in terms of average role relationship scores ($t=2.618$, $p<.001$). Two of the three interviewees described stronger feelings of role-playing in *GW2* because they are required to execute lengthy quests involving multiple avatar background stories. The third player said he had no opinion because he perceives the characters in both games as tools, and never reads the accompanying quest stories.

An unexpected factor that emerged from our interviews was the strict scheduling requirements for cooperative play in *WoW*, especially when play involves tens or dozens of players at a fixed time for several hours multiple days per week. Sessions that start at 7 or 8 p.m. typically last for 2 to 4 hours. The three interviewees stated that their game lives were so tightly interwoven with their real lives that they had lost their sense of entering fantasy worlds. This may explain, at least in part, the lower role relationship scores for *WoW*, since the fantasy feeling is considered a crucial factor in developing role relationships.

RO and *Lineage* players were distinctly different in terms of tool relationship scores ($t=3.263$, $p<.001$). The three interviewees cited two main reasons for describing their *Lineage* avatars as more than simply replaceable tools. First, there is no avatar level cap in *Lineage*, therefore players must focus strongly on leveling up—a lengthy, repetitive, and for many a boring process. For this reason, they all expressed positive feelings about replacing their avatars with higher-level ones. Second, avatar development options are limited in *Lineage*, with all avatars looking very similar despite differences in clothing. Since unique avatar appearances and development styles are not possible, players are more likely to focus on developing avatar strength. We also noted that while the interviewees did not directly discuss game aspects associated with playing alone, they did tell us that they rarely communicated with other players in *Lineage* because it is possible to play the game without inter-player cooperation. Many *Lineage* avatars are bots controlled by the game program rather than players, another factor reducing player motivation to socialize. Taylor (2006) and Turkle (1995) have both observed that avatar identity development is heavily dependent on interaction; since *Lineage* avatar interaction is much less compared to other games, players are less likely to perceive their avatars as having identities, and more likely to view them as tools.

AVA and *CS* players were distinctly different in terms of average role relationship and virtual body scores ($t=-2.152$, $p<.001$), both of which were higher among *CS* players.

This surprised us because *AVA* has more detailed avatar graphics. However, our interviewees reported that they had been playing *CS* with friends for many years, and were therefore completely immersed in that game world. They therefore described themselves as playing the game with a sense of mission, with their avatars serving as their virtual world representatives. In contrast, they described *AVA* as just another multi-player shooting game.

DISCUSSION

We found statistical correlations between player-avatar relationships and several design features, and evidence indicating that the dimensions we established to measure player-avatar relationships affect gaming experiences. However, we failed to discover a clear player-avatar relationship pattern that designers might work with to create better gaming experiences. We believe that developing a strong tool-type relationship with an avatar reduces gaming enjoyment (especially in RPGs) because it contradicts the fun of identity play as well as other aspects of game narratives. Game designs that limit avatar customization capability may enhance this type of relationship due to their negative effects on player-avatar emotional attachments (Bailey, Wise and Bolls, 2009; Lim and Reeves, 2009). Game designs that require players to focus on avatar strength may have the same effect. In contrast, a strong role relationship is an indication of immersion in fantasy play, which is considered a positive factor in gaming experiences. They are also viewed as having potential for use in other applications. According to Gee (2007), students learn more when they are immersed in a subject and when they assume roles, and game designs that facilitate role relationships with avatars may have utility in game-like learning settings. Players with strong virtual body relationships with their avatars may feel a stronger sense of presence—a major attraction of digital 3D games. Game designs that support or promote psychological presence (Schultze and Leahy, 2009) may facilitate this relationship (Kromand, 2007; Martey and Stromer-Galley, 2007), although these same players are more vulnerable to online bullying in the form of avatar abuse (Wolfendale, 2007). In contrast, players who perceive their avatars as life-like may respond to game design features that emphasize character personality, values, and interpersonal relationships (Burn and Schott, 2004).

Our results also suggest that game designers may benefit from managing player-avatar relationships in their efforts to affect consumption motivation. Previous efforts to study decorative item consumption motivation have mostly focused on social factors, without offering suggestions for game designers. Among all of the motivation dimensions in the present study, avatar customization had the highest scores. Note that we did not look at how much money was spent by the participants in each motivation category. Flaunting motivation scores were low compared to other dimensions, but the possibility exists that more money is spent in that category (Lehdonvirta, 2009). Further, even though we believe that strong tool-like relationships decrease the sense of fun associated with game narratives, they may increase functional item consumption motivation.

We acknowledge the possibility of alternative explanations for our results. For example, even though we found statistical support for our hypothesis that a high death

rate mitigates shared feelings between players and their avatars, another explanation is that players with lower shared feelings with their avatars may be more likely to try high-risk activities, resulting in higher death rates. Another example is the hypothesis that owning a pet increases a sense of avatar autonomy, resulting in a lower likelihood that players will treat their avatars as tools. An alternative explanation is that players who view their avatars as tools tend to participate in achievement-oriented and competitive activities, and are less interested in raising virtual pets. Further qualitative analysis is required to find support for our original assertions.

CONCLUSIONS

For this project we measured four dimensions of player-avatar relationships: virtual body, companion, tool, and role. We found that some game design features serve as valid predictors of player-avatar relationships, including mechanisms such as avatar death frequency and penalties, virtual pets, decorative items, avatar customization flexibility, and cooperative play systems. When avatar deaths have stronger penalties and when cooperative play is absent, players tend to view their avatars as easily replaceable tools. In contrast, providing customizable avatars and avatar development flexibility may support player role-play actions. Our interview data also indicate that storylines that emphasize avatar background exert a positive effect on establishing a role-play atmosphere.

The findings for consumption motivation (especially its positive correlations with player-avatar relationships) may also provide useful information for designers. We measured five consumption motivation dimensions: hedonic, customizing, flaunting, self-presentation, and peer-group approval. Players with higher player-avatar relationship scores in certain dimensions also had higher levels of certain consumption motivations. This finding is especially important for the publishers of F2P games, who earn all of their revenue from virtual item sales. In this paper we focused on decorative items, which rarely (if ever) attract the same kinds of complaints regarding game purity as sales of functional items. Also, functional item consumption is primarily about winning games and making game progress easier, therefore we believe that player-avatar relationships are less influential in terms of this type of item consumption. However, we also believe that functional item consumption may be influential in determining player-avatar relationships because spending real money on such items may increase player concerns regarding the functional aspects of their avatars. This can lead to an enhanced sense of avatars as tools, and decreased development of immersive relationship types (e.g., roles and companions)—in some cases to the point that they detract from immersive gaming experiences.

Our decision to include multiple games in this study raises two significant study limitations. First, the Cronbach's α values for the player-avatar relationship questionnaire are lower than average. Using the virtual body dimension as an example, we believe the low α might be due to observations across fifteen games. The second virtual body dimension question is based on observations involving *The Sims*, while the third is based on *WoW* observations. Although we believe these interesting

observations reflect the concept of presence and the merging of feelings with avatars, research in this dimension can benefit from a larger number of questionnaire items. Second, when performing *t*-tests for two groups of games, it was difficult to ensure that significant differences were due to the features we used for grouping because of the many ways that games differ. We relied on our considerable experience playing and observing these games to make grouping decisions.

Two other study limitations concern generalizability, the first regarding players in different regions and cultures. For example, *WoW* players can use a server setting known as *role playing* (*RP*) that emphasizes fantasy worlds. Communication about physical world matters is strictly forbidden, and players behave and communicate as they believe their avatars should based on their roles. This kind of server is not available in certain regions due to lack of demand, suggesting that the development of role relationships is an inherently weak factor among specific player groups, and implying that the effects of game design decisions also differ among game cultures and geographic locations. The second limitation concerns generalization to other game genres. All of the games selected for this research are multiplayer online games, including MMORPGs and action-oriented games. Our results may not apply to single player games in which players do not interact with others via their avatars, but do share avatar data (i.e., appearances and profiles) with players in the same community. How this form of avatar usage affects player-avatar relationships requires further study.

We suggest that interested researchers explore one of two directions. First, in order to clarify how player-avatar relationships are formed and influenced, researchers need to look at a broader range of game genres and create samples of players with different ages and lengths of gaming experience, as well as from different cultures. Qualitative methods such as extended interviews can also be applied to create more detailed bodies of data. Second, games that do not use avatars should also be studied in order to clarify different aspects of decorative virtual item consumption. These games, in which decorative items are arranged in places such as bedrooms, aquariums, and houses, represent a popular social game genre whose publishers rely heavily on virtual item sales for their revenue. Researchers may be interested in testing e Silva's (2012) assertion that hedonic factors such as sharing and fantasy are essential motivations for making purchases for online games.

BIBLIOGRAPHY

Arnold, M. J. and Reynolds, K. E. 2003. "Hedonic shopping motivations." Journal of retailing 79, 77-95.

Bailey, R., Wise, K. and Bolls, P. 2009. "How avatar customizability affects children's arousal and subjective presence during junk food–sponsored online video games." CyberPsychology & Behavior 12, 277-283.

Bartle, R. 1996. "Hearts, clubs, diamonds, spades: Players who suit MUDs." Journal of MUD research, 1, 19.

Beran, T. N., Ramirez-Serrano, A., Kuzyk, R., Fior, M. and Nugent, S. 2011. "Understanding how children understand robots: Perceived animism in child–robot interaction." International Journal of Human-Computer Studies 69, 539-550.

Bessière, K., Seay, A. F. and Kiesler, S. 2007. “The ideal elf: Identity exploration in World of Warcraft.” CyberPsychology & Behavior 10, 530-535.
Birk, M. V., Atkins, C., Bowey, J. T., and Mandryk, R. L. 2016. Fostering intrinsic motivation through avatar identification in digital games. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (pp. 2982-2995). ACM.
Black, D. 2017. Why can I see my avatar? embodied visual engagement in the third-person video game. Games and Culture, 12(2), 179-199.
Bridges, E. 2018. Hedonic and utilitarian shopping goals: a decade later. Journal of Global Scholars of Marketing Science, 28(3), 282-290.
Brown, M., Pope, N. and Voges, K. 2003. “Buying or browsing?: An exploration of shopping orientations and online purchase intention.” European Journal of Marketing 37, 1666-1684.
Burn, A. and Schott, G. 2004. Heavy hero or digital dummy? Multimodal player–avatar relations in Final Fantasy 7. Visual Communication 3, 213-233.
Castronova, E. 2003. “Theory of the Avatar” Cesifo Working Paper Series No. 863. Available at: http://ssrn.com/abstract=385103.
Cohen, J. 2001.” Defining identification: A theoretical look at the identification of audiences with media characters.” Mass Communication & Society 4, 245-264.
Csikszentmihalyi, M. 1997. *Finding flow: The psychology of engagement with everyday life.* Basic Books.
Ducheneaut, N., Wen, M. H., Yee, N. and Wadley, G. 2009. “Body and mind: a study of avatar personalization in three virtual worlds.” In Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems 1151-1160.
Dholakia, R. R. 1999. “Going shopping: key determinants of shopping behaviors and motivations.” International Journal of Retail & Distribution Management 27, 154-165.
Dunn, R. A. and Guadagno, R. E. 2012. “My avatar and me–Gender and personality predictors of avatar-self discrepancy.” Computers in Human Behavior 28, 97-106.
e Silva, S. d. A. 2012. “Buy and Share! Social Network Games and Ludic Shopping.” Proceedings of DiGRA 2012: Games in Culture and Society.
Gee, J. P. 2007. *What video games have to teach us about learning and literacy*. Palgrave Macmillan.
Hoffner, C. and Buchanan, M. 2005. “Young adults' wishful identification with television characters: The role of perceived similarity and character attributes.” Media Psychology 7, 325-351.
Huizinga, J. 1950. *Homo Ludens: A Study of the Play Element in Culture*. Boston, MA: Beacon.
Inagaki, K. and Sugiyama, K. 1988. “Attributing human characteristics: Developmental changes in over- and underattribution.” Cognitive Development 3, 55-70.
Kallinen, K., Salminen, M., Ravaja, N., Kedzior, R. and Sääksjärvi, M. 2007. “Presence and emotion in computer game players during 1st person vs. 3rd person playing view: Evidence from self-report, eye-tracking, and facial muscle activity data.” Proceedings of the PRESENCE, 187-190.
Kim, C., Lee, S. G and Kang, M. 2012. “I became an attractive person in the virtual world: Users’ identification with virtual communities and avatars.” Computers in Human Behavior 28, 1663-1669.

Kim, H. W. and Chan, H. C. 2007. “Why People Pay for Digital Items? Presentation Desire of Online Identity.” PACIS 2007 Proceedings 7.
Klastrup, L. 2006. “Death matters: understanding gameworld experiences.” ACM SIGCHI international conference on Advances in computer entertainment technology.
Klimmt, C., Hefner, D., Vorderer, P., Roth, C. and Blake, C. 2010. “Identification with video game characters as automatic shift of self-perceptions.” Media Psychology 13, 323-338.
Kromand, D. 2007. “Avatar categorization.” Proceedings from DiGRA 2007: Situated Play, 400-406.
Lee, K. M. 2004. “Presence, explicated.” Communication theory 14, 27-50.
Lehdonvirta, V. 2009. “Virtual item sales as a revenue model: identifying attributes that drive purchase decisions.” Electronic Commerce Research 9, 97-113.
Levy, E. 2013. “Game Design is Business Design.” GDC 2013, F2P design &business summit.
Lewis, M. L., Weber, R. and Bowman, N. D. 2008. ““They May Be Pixels, But They're MY Pixels:” Developing a Metric of Character Attachment in Role-Playing Video Games.” CyberPsychology & Behavior 11, 515-518.
Li, D. D., Liau, A. K. and Khoo, A. 2012. “Player–Avatar Identification in video gaming: Concept and measurement.” Computers in Human Behavior 29, 257-263.
Lim, S. and Reeves, B. 2009. “Being in the game: Effects of avatar choice and point of view on psychophysiological responses during play.” Media Psychology 12, 348-370.
Lin, H. and Sun, C. T. 2011. “Cash trade in free-to-play online games.” Games and Culture 6, 270-287.
Linderoth, J. 2005. “Animated game pieces. Avatars as roles, tools and props.” Aesthetics of Play Conference Proceedings, 14-15.
Livingstone, S. 1998. “Making sense of television: The psychology of audience interpretation.” Psychology Press.
Lombard, M. and Ditton, T. 1997. “At the heart of it all: The concept of presence.” Journal of Computer‐Mediated Communication 3. http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.1997.tb00072.x/full
Martey, R. M. and Stromer-Galley, J. 2007. “The digital dollhouse context and social norms in the Sims online.” Games and Culture 2, 314-334.
Martin, J. 2008. “Consuming code: use-value, exchange-value, and the role of virtual goods in Second Life.” Journal For Virtual Worlds Research 1.
McCreery, M. P., Krach, S. K., Schrader, P. and Boone, R. 2012. “Defining the virtual self: Personality, behavior, and the psychology of embodiment.” Computers in Human Behavior 28, 976-983.
Murray, J. H. 1997. *Hamlet on the holodeck: The future of narrative in cyberspace*. The MIT Press.
Park, B. W. and Lee, K. C. 2011. “Exploring the value of purchasing online game items.” Computers in Human Behavior 27, 2178-2185.
Piaget, J. 1929. *The child’s conception of the world*. New York: Harcourt Brace.
Rohm, A. J., Swaminathan, V. 2004. “A typology of online shoppers based on shopping motivations.” Journal of business research 57, 748-757.
van Ryn, L., Apperley, T., and Clemens, J. 2019. Avatar economies: affective investment from game to platform. New Review of Hypermedia and Multimedia, 1-16.

Schilbach, L., Wohlschlaeger, A. M., Kraemer, N. C., Newen, A., Shah, N. J., Fink, G. R. and Vogeley, K. 2006. “Being with virtual others: Neural correlates of social interaction.” Neuropsychologia 44, 718-730.

Schultze, U. and Leahy, M. M. 2009. “The Avatar-Self Relationship: Enacting Presence in Second Life.” ICIS.

Shang, R. A., Chen, Y. C and Huang, S. C. 2012. “A private versus a public space: Anonymity and buying decorative symbolic goods for avatars in a virtual world.” Computers in Human Behavior 28, 2227-2235.

Shelton, A. K. 2010. “Defining the lines between virtual and real world purchases: Second Life sells, but who’s buying?” Computers in Human Behavior 26, 1223-1227.

Tauber, E. M. 1972. “Why do people shop?“ The Journal of Marketing 46-49.

Taylor, T. L. 2002. *Living digitally: Embodiment in virtual worlds The social life of avatars*, 40-62.

Taylor, T. L. 2006. *Play between worlds: Exploring online game culture*, MIT Express, 2006.

Teng, C. I. 2010. “Customization, immersion satisfaction, and online gamer loyalty.” Computers in Human Behavior 26, 1547-1554.

Turkle, S. 1995. *Life on the Screen: Identity in the Age of Internet.* Simon and Schuster.

Vasalou, A. and Joinson, A. N. 2009. “Me, myself and I: The role of interactional context on self-presentation through avatars.” Computers in Human Behavior 25, 510-520.

Wang, H. and Sun, C. T. 2011. “Game reward Systems: gaming experiences and social meanings.” Proceeding of DiGRA 2011: Think, Design, Play.

Wolfendale, J. 2007. “My avatar, my self: Virtual harm and attachment.” Ethics and Information Technology 9, 111-119.

Yee, N. 2006. “Motivations for play in online games.” CyberPsychology & Behavior 9, 772-775.

Yee, N. and Bailenson, J. 2007. “The Proteus effect: The effect of transformed self-representation on behavior.” Human communication research 33, 271-290.

Yoo, S. C., Peña, J. F., and Drumwright, M. E. 2015. Virtual shopping and unconscious persuasion: The priming effects of avatar age and consumers’ age discrimination on purchasing and prosocial behaviors. Computers in Human Behavior, 48, 62-71.

Westbrook, R. A. and Black, W. C. 1985. “A motivation-based shopper typology.” Journal of retailing 61, 78-103.