A HIERARCHICAL MODEL OF VIRTUAL EXPERIENCE AND ITS INFLUENCES ON CUSTOMER PERCEIVED VALUE AND LOYALTY

Abstract

Many businesses use virtual experience (VE) to enhance the overall customer experience, though extant research offers little guidance for how to improve consumers' VE. This study, anchored in activity theory, examines key drivers of VE and its influences on value perceptions and customer loyalty. A hierarchical model indicates that VE comprises second-order variables (i.e., social presence, social capital, flow experience, and situational involvement) and third-order variables (i.e., communal and individual experience). The results obtained from a substantive model further reveal that VE positively influences perceptions of both economic and social value and thus influences loyalty in both the real world and virtual environments.

Keywords: Virtual experience; Perceived value; Customer loyalty; Hierarchical model

Virtual worlds (hereafter, VWs) are simulated three-dimensional online environments for social and economic interaction. Users are represented by avatars and engage with each another in real time via computer-mediated communication, for example as textual or voiced interactions (Bartle 2004). VWs have grown steadily in popularity; more than 1,900 million avatars have been created across VWs such as Poptropica (292 m), Habbo (290 m), Club Penguin (220 m), Weeworld (75 m), and Second Life (37 m) (KZero 2013). Different categories of VWs exist, depending on their prescribed goal, such as, game-oriented VWs (e.g., World of Warcraft and Runescape) and social-oriented VWs (e.g., Second Life and IMVU) (Hassouneh and Brengman 2013). The former focus mostly on game play involving avatar characteristics, levels and skill systems, while the latter allow players to extend their social interactions to more complex virtual communities, often also including commercial activities (tVPN 2008). For commercial applications, social-oriented VWs offer more opportunities to integrate brand contacting points than game-oriented VWs, because brands can be more easily included in the VW's content. Hence, social-oriented VWs have been hyped as a new frontier for building interactive, collaborative customer-company relationships. They can offer real benefits to businesses (Wasko et al. 2011, , p. 645), and are no longer limited to gaming and socialization activities. Instead, they provide a great opportunity for commercialization. Many individuals and businesses offer virtual goods and services in VWs (e.g., training, marketing, and design) in exchange for real currencies, generating more than USD$7.3 billion in revenues in 2010 (Sorom 2010).

Many leading brands have incorporated VWs as a new channel of commercialization and brand communication. More than 100 brands (e.g., IBM, AOL, Xerox, Vodafone, and American Apparel) opened virtual stores in VWs, such as in Second Life, albeit with limited success.

Despite the high expectations of VWs as a potential to merge online and offline worlds, the continuously declining interest in VWs has led companies, such as Toyota, Adidas, and Sony

BMG, to close their virtual storefronts. Those that remain struggle with poor bottom-line results, and some VW visitors express disappointment with their experience (Kuntze et al. 2013; Morrison 2009; Nino 2011). Yet practitioners and academics agree that VWs have great potential as a worthwhile online channel, because of their interactional richness and value-added relational exchanges (Hoffman and Novak 2009). For example, whereas social networking sites offer limited possibilities for rich interaction, merging them with VWs may create intelligent virtual communities with connected interoperability across platforms. Furthermore, avatar-mediated communication is likely to be a common feature of Web 3.0 social networking (Cremorne 2010), and leading companies (e.g., Nike+, Dell, Starbucks, MLB.com) now incorporate gamification (Hamari and Koivisto 2013), which integrates gaming concepts (e.g., experience points or rewards for finishing a quest) into non-game activities to enhance customer engagement. This new practice may better engage customers in marketing activities and customer loyalty programs (Harwood 2012; Huotari and Hamari 2012), which may lead to five types of benefits: (1) receiving real-time feedback, (2) providing new ways to educate and train employees and customers, (3) achieving global reach and accessibility, (4) creating relationships and engagement with customers, and (5) testing the market with inexpensive prototyping and virtual focus groups (Dey 2007).

With this transformation of the marketspace, engaging customers may demand a game-like environment not only in virtual but also in real life (Reeves and Read 2009). Research into customer experiences has a long tradition in the real, non-virtual world, offering important lessons for the virtual customer experience. The interrelation and potential substitution of virtual and real world activities is a dazzling issue with potential ramifications for individuals' quality of life (Novak 2012). Table 1 summarizes the key insights, parallels, and differences from research on the customer experience in the real and virtual worlds. For example, the virtual

presentation of products is an integral part of consumers' brand experiences (Brakus, Schmitt and Zarantonello 2009). Accordingly, we seek to identify which elements drive virtual customer experiences that customers perceive as valuable, resulting in greater loyalty and favorable bottom-line results.

Previous research has led to some conceptual and empirical confusion about what determines a valuable virtual customer experience, largely due to the plethora of constructs that have been suggested as drivers of VE in the research domains of user experience (e.g., Hassenzahl and Tractinsky 2006), real-world customer experience partially determined by technological interfaces (e.g., Verhoef et al. 2009), and specific studies on the virtual customer experience (e.g., Novak 2009; Daugherty, Li and Biocca 2005; Li, Daugherty and Biocca 2001). Some of the most prevalent constructs are flow or compelling experiences (e.g., involvement, enjoyment) (Hoffman and Novak 2009; Kohler et al. 2010; Takatalo, Nyman and Laaksonen 2008; Animesh et al. 2011); emotional and physiological arousal (Waterworth and Waterworth 2001); needs and motivations (Barnes and Pressey 2011); personal and social interactions (Choi and Kim 2004); sense of presence (e.g., telepresence, co-presence social presence and physical presence) (A. Davis et al. 2009; Faiola and Smyslova 2009; Takatalo, Nyman and Laaksonen 2008; Waterworth and Waterworth 2001; Animesh et al. 2011); situational involvement (Takatalo, Nyman and Laaksonen 2008); or virtual affordances (Li, Daugherty and Biocca 2001). For example, Takatalo et al. (2008) integrate psychological and emotional aspects of individuals to measure VE and suggest that physical presence and flow experience lead to a holistic human experience. Barnes and Pressey (Barnes and Pressey 2011) examine individual experiences in VWs and propose that arousal, pleasure, and individualism are particularly important for the formation of VE. With our research focus on commercially oriented VWs, the distinction between user experience and (virtual) customer experience fades.

[TABLE 1 about here]

However, previous research has mostly concentrated on explaining VE at the individual, not the communal, level and neglected social interactions and mutual bonds, which contradicts activity theory and its assertion that an activity system inherently unifies individual consciousness and social interactions (Hwang and Park 2007; Kaptelinin 1996). A notable exception is Novak's conceptualization of quality of virtual life as an explanation as to why and how individuals participate in VWs to achieve desirable positive outcomes, which goes beyond modeling the virtual customer experience (Novak 2009). Activity theory indicates that most forms of human activity, including human–computer interactions, are driven by social motives, and that both individuals and communities make links simultaneously within specific contexts (Fjeld et al. 2002; Kaptelinin 1996; Vygotskiĭ and Cole 1978). Studying human interactions in VWs through the lens of activity theory thus appears appropriate for illustrating how consumers engage in VWs, interact with others, gain a holistic VE, and achieve possible outcomes. Accordingly, we clarify conceptual components and a model of VE, grounded in activity theory, which comprises higher-order constructs of both individual and communal experience.

We also recognize that prior investigations of VE use inconsistent measures and offer conflicting results, especially with respect to flow and a sense of presence (Choi, Kim and Kim 2007; Hoffman and Novak 2009). Despite the strong interest of business strategy research in VWs (Hemp 2006; Messinger et al. 2009; Wasko et al. 2011), we lack empirical results that directly correspond to value propositions or business outcomes. The marketing literature could benefit from an in-depth understanding of VE constructs, its underlying elements, and its consequences for firms' success. In response, we offer empirical evidence regarding how customers engage in. We also identify market outcomes of VE and help extend

the well-established link between value and loyalty (Cronin, Brady and Hult 2000; Harris and Goode 2004) to VWs. That is, we explore whether value perceptions of VE mediate customer loyalty in both virtual and real worlds.

This study contributes to the emerging but limited research knowledge on customers' virtual experience and their engagement with brands in these settings. The primary aim is to understand the nature and extent to which customers' holistic VE with brands in VWs (in our research context Second Life) affects their perceptions of value and subsequent loyalty. Taking an activity theory approach, we propose that individual interactions with dynamic activity systems in VWs, such as those undertaken to buy a virtual product from a particular brand, can result in intended and unintended possible outcome(s). We propose a conceptual model of holistic VE, starting from a foundation that consists of the lower-order dimensions of flow, situational involvement, social presence, and social capital. We discuss VE as an antecedent of both value and loyalty, and we test these propositions. To conclude, we note some limitations and offer recommendations for practitioners that hope to engage customers and enhance their VE.

Hierarchical Model of Holistic Virtual Experience

To illustrate how holistic VE forms and how it influences business success, we derive a higher-order hierarchical model, on the basis of activity theory as the principal framework to incorporate individual- and social-level constructs from previous literature (Engeström, Miettinen and Punamäki 1999). Activity theory can explain human computer interfaces. It posits that any activity results from the mutual interaction of an individual with his or her surroundings, during an effort to achieve intended or unintended outcome(s) (Fjeld et al. 2002). The basic structure of an activity consists of mutual relationships among a subject, an object, and a community, which take place through mediating artifacts (Kuutti 1996). Participation in

VWs constitutes an activity system, in which the subject is the virtual resident or consumer; the mediating artifacts include a computer, Internet connection, software, and customized avatar; the object entails some desired physical or mental outcome, such as socializing; and the community features activities created by residents or a virtual shop, as is common in SL (Diehl and Prins 2008; Jonassen and Rohrer-Murphy 1999).

In Figure 1, the holistic VE gained from a particular VW is a reflective, higher-order construct, which we treat as latent. In line with activity theory's focus on mutual, communal relationships among individual members embedded in rules, objects, and community, we anticipate two key dimensions of holistic VE: the communal experience (social presence, social capital) and the individual experience (flow, situational involvement). In our causal model, holistic VE explains the possible outcomes of participating in an activity system, which include customer perceived value (i.e., economic and social) and loyalty in real and virtual worlds.

[FIGURE 1 about here]

Communal Experience

According to activity theory, a VW is an interactive, intact activity system, featuring both individual participation and communal relationships (Steinkuehler 2006). Communal experience originates from a sense of virtual community created through social interaction among members and participation in a VW (Koh, Kim and Kim 2003). In SL for example, members exchange and trade with others globally; businesses also use VWs for their training and development activities. In this sense, VWs can enhance relationships between businesses and consumers (Kingsley and Wankel 2009), such as when IBM opened a virtual business center in SL in 2007 to service customers, conduct business, collaborate with strategic

planners, and connect the virtual world with the real world through an immersive web environment.

A communal experience involves interactivity, mutual interdependence, awareness of other members, and a state of immersion in the community, which lead to feelings of belongingness, deep involvement, cognitive absorption, spirit, commitment, and trust (Koh, Kim and Kim 2003; Rovai 2002; Westheimer and Kahne 1993; Goel et al. 2011). The presence of sociality and member connections appear essential; we thus empirically examine both social presence and social capital as dimensions of communal experience.

Social Presence

The avatar-mediated interactions typical in VWs convey social cues and relational information, similar to face-to-face communication, and thus should enhance customers' sense of social presence (Bente et al. 2008). According to activity theory, possible outcomes arise from the interactions of closely related subjects, objects, and communities (Diehl and Prins 2008). Social presence refers to a sense of "being together" with another in the same location and time, and its dimensions are self-presence, co-presence, and identification (Hwang and Park 2007). In a virtual setting, self-presence requires participants to be able to project themselves socially and emotionally as "real people" in an virtual community (Caspi and Blau 2008, p. 325; Garrison, Anderson and Archer 1999, p. 4), leading to the subjective feeling of being there (Heeter 1992; Steuer 1992). Consumers rely on avatars to represent their self-presence and virtual persona, as well as their idealized real-world identities. This virtual identification facilitates a sense of social presence and collective interactions in the activity system (Gerhard, Moore and Hobbs 2004; Slater et al. 2000), because it provides social cues important for stronger ties among members in the virtual community (Gerhard and Moore 1998; Koh, Kim and Kim

2003). A sense of co-presence augments self-presence with the feeling of being with another person in a particular location (Heeter 1992). According to Davis et al. (2009), an avatar-mediated interaction can indeed affect this sense, because people interact, directly or indirectly, with other avatars using verbal (e.g., voice chats, text messaging) and non-verbal (e.g., avatars' facial expressions, animated posture) social cues (Hwang and Park 2007).

Social Capital

Social capital results from a combination of intangible resources, emerging from collective interactions among connected actors at individual or communal levels (Paxton 1999). In a virtual community, cultural norms of collective cooperation and voluntarism (e.g., sharing technical knowledge, solutions, and information) offer a rich source of social capital (Rheingold 1993). We consider three main components of social capital to foster social links in a virtual community: reciprocity, civic virtue, and social trust (Bhandari and Yasunobu 2009; Coleman 1990; Gamm and Putnam 1999; Paxton 1999). In VWs, interactions induce reciprocal awareness of other members (Cutler 1995), as represented by their avatars. Virtual communities are "social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace," commonly resulting in social bonds and mutual assistance, or what we refer to as reciprocity (1993, , p. 20). Activity theory posits that VWs require complex activity, including social interactions, community standards, and rules (Rothaermel and Sugiyama 2001). Civic virtue thus acts as a social norm for VW members, and governs member's concern and willingness of community participation (Hars and Ou 2002; Organ 1988), and how they value and foster others' welfare, such as sportsmanship, altruism and supportive behavior, that relates positively to community success (Hars and Ou 2002; Podsakoff and Mackenzie 1994). The final building block of social capital is social trust. This "willingness to rely on an exchange partner in

whom one has confidence" (Moorman, Zaltman and Deshpande 1992, , p. 315) can build mutual confidence and enhance relationships. In online settings, trust results from social contacts through a variety of cues, such as avatar gestures, emotional symbols, video, and speech, induce feelings of warmth and sociability (Cyr et al. 2007; Gefen and Straub 2003; Yoo and Alavi 2001).

Overall, communal experience should lead to feelings of belongingness, spirit, commitment, and because it refers to the totality of online interactions, perceptions of mutual interdependence, and awareness of membership in the community trust (Rovai 2002; Westheimer and Kahne 1993).The presence of sociality and members' connections in turn should be essential to a communal experience, so we hypothesize:

H1: Communal VE is positively associated with (a) social presence and (b) social capital.

Individual Experience

The individual experience then depends on what an individual stands to gain, which in turn reflects their intrinsic or extrinsic motivation to participate in the activity. Motivation is central to computer-related activities and experiences (Smyslova and Voiskounsky 2009). For an excellent comprehensive overview of what motivates people to participate in VWs and other computer-related activities such as MMORPG and social media, please see Novak (2012) (Novak 2012). For any particular activity, each person must be willing to participate to achieve certain goals, or the object in activity theory, regardless of their motives. According to Huang (2003; 2006), both flow and involvement provide strong motivations: The flow experience (intrinsic motivation) enhances hedonic behaviors, while situational involvement (extrinsic motivation)results from its personal relevance, curiosity, and interest, and it relates to utilitarian behavior associated with the experience (Hoffman and Novak 1996). We thus use these two motivational constructs to reflect the individual experience (third-order construct).

Flow Experience

Complementing the sense of social presence discussed previously, is the individual experience of feeling present, i.e. immersed in the VW (Steuer 1992). Presence is closely linked to the more comprehensive construct of flow. Flow is a positive psychology concept that originates from an intrinsic motivation. It is an experience measure that refers to the intrinsically enjoyable feeling that ensues when a person engages in a particular activity with total focus and concentration (1977). A flow experience has a direct, positive influence on people's attitudes and exploratory behaviors, and purchase intentions (Korzaan 2003; Hoffman and Novak 2009). VWs offer the experience of flow through rich individual interactions and their skill demands, which are key components of flow (Hoffman and Novak 2009) alongside a sense of control, focused attention, and enjoyment are prerequisites for achieving a flow experience (Ghani and Deshpande 1994; Huang 2006; Koufaris 2002; Webster, Trevino and Ryan 1993).

A flow experience is most likely when the conditions provide an optimal challenge, such that people's skills match the demands they face and perceive a sense of control (Csikszentmihalyi 1990; Csikszentmihalyi and Csikszentmihalyi 1988; Csikszentmihalyi and LeFevre 1989). In VWs, users feel high levels of control, with less effort, over their environment (2000) as they gain more experience and thus increase their skills. They thus feel happier and engage more frequently in the particular activity (Koufaris, Kambil and LaBarbera 2002). Second, flow is generally fun and intrinsically enjoyable, with an assumption that flow and intrinsic enjoyment exhibit a positive association (Ghani and Deshpande 1994; Privette 1983; Privette and Bundrick 1987). The flow experience can thus be measured by the level of intrinsic enjoyment of an activity (Koufaris 2002). Third, attention focus, i.e. the "centering of attention on a limited stimulus field" (1975, , p. 40), influences the flow experience and improves a user's overall experience with an online environment (Novak, Hoffman and Yung

1998; 2000). For example, when people deeply engage in an online activity, they devote all their concentration to this interaction and often intentionally ignore irrelevant information that can distract them.

Situational Involvement

Whereas flow is an exploratory (or experiential) behavior, driven by intrinsic motivation, situational involvement is a goal-directed behavior driven by extrinsic motivation (Novak, Hoffman and Duhachek 2003). In online environments, it is "a situation-specific and transitory state in which consumers are made personally relevant by the uncertainty aspect of Web environments. In situations that involve uncertainty, consumers are more concerned about their behavior in order to avoid negative consequence" (Huang 2006, , p. 386)).

Previous consumer behavior research suggests that situational involvement is a function of situational and intrapersonal determinants (Celsi and Olson 1988). One key driver of motivation is personal relevance, defined as "something that has a direct bearing on and significant implication for our lives" (Hoyer and Maclnnis 2008, , p. 49). People tend to expose themselves selectively to a situation or an activity that relates closely to their values, needs, goals, and emotion, aiming to reduce their risk perceptions and avoid negative outcomes (Celsi and Olson 1988; Huang 2006). Higher (or lower) personal relevance drives individual motivation to get higher (or lower) involvement in a situation (Hoyer and Maclnnis 2008). Relevance is complemented by curiosity and interest. Curiosity has been established as a driver of positive individual experiences and personal growth (Kashdan, Rose and Fincham 2004), and creates a positive emotional motivation through . natural inquisitive behaviors, such as inquisitiveness, pursuit, exploration, investigation, or desire for knowledge (Edelman 1997; Kashdan, Rose and Fincham 2004). Interest on the other hand is extrinsic and

related to goal-directed behavior rather than exploratory behavior (Hoffman and Novak 1996). For example, when people find visits to VWs interesting, they spend their time seeking specific information because it "attracts your attention or makes you want to know more about it" (Dictionary 2007, , p. 800).

As we noted previously (2003; 2006), flow and involvement are motivational constructs, such that flow intrinsically enhances hedonic behavior, while situational involvement extrinsically induces utilitarian behavior (Hoffman and Novak 1996). We propose:

H2: Individual VE is positively associated with (a) flow experience and (b) situational involvement.

Combining Individual and Communal Experiences

The interactions among individual members, driven by social motives, can have profound effects on the holistic virtual experience, of which the extensively studied individual experience is only a part (Steinkuehler 2006). Social contacts directly and indirectly influence others' experiences (Bitner 1992). Activity theory advises that in an activity system, interactions in the community facilitate each member's values and goal achievement (Diehl and Prins 2008). According to a comprehensive conceptualization of human experience, individual experiences also are continuously changing and subject to influences by the surrounding community. Experience reflects social interaction, which mutually affects each member of an activity system (McMillan and Chavis 1986). In this perspective, individual members gain and accumulate experiences through the combination of prior and current interaction with others. Their knowledge, feelings, and experiences come from interactions with other people and the social world (Hunt and Hilton 1975). The interplay of social/communal and individual experiences also persists in MMORPGs, where players value social as well as individual

aspects (Yee 2006). Psychology research long established that a person's individual self-representation, labeled the independent self-construal, is embedded in a wider web of social connections to other individuals and groups, i.e. the interdependent self-construal. While the composition of the self-varies with cultural values, the co-existence of independent and interdependent self-construal is universal. In any (real or virtual) society, individuals are not actually isolated but rather are part of that society (Fiore 2003). The more positive interactions and sharing space and time among members, the stronger the formation of a sense of community experience they perceived (McMillan and Chavis 1986). In VWs specifically, the virtual communities focus on mutual interactions and aggregations of activity, through avatars that share common experiences, personal goals, and values. Similarly, the subjective well-being of VW participants comprises of individual and communal aspects, namely social, achievement, immersion, control, and self-expression (Novak 2012). Individual members' knowledge accumulates as an outcome of both individual and community experiences. Because we predict that holistic VE consists of both individual experience and communal experience, we propose:

H3: Holistic VE relates positively to (a) communal and (b) individual experience.

Substantive Model: The Influences of Holistic Virtual Experience on Value Perception

With our theoretical model in Figure 1, we seek to understand the impact of holistic VE on perceived value (including both economic and social value) and customer loyalty to businesses active in VWs (classified as loyalty to the business in the real world and in the virtual world).

Perceived Value

In VWs, the individual and social experiences explicated above result from four main virtual community mechanisms, which often occur in hybrid forms to offer customers various kinds of experiences and value: (1) communities of transaction, which facilitate the buying and selling of goods and services; (2) communities of interest, which allow members to share specific topics of interest; (3) communities of fantasy, which enhance the imaginative persona through avatars and the virtual environment; and (4) communities of relationship, which build social bonds and collective interactions (Armstrong and Hagel 1995). To provide opportunities for social interactions, VWs allow people to exchange information and create collective relationships to meet both social and commercial needs (Rothaermel and Sugiyama 2001). Like all societies, VWs create value through economic transaction and social interactions (Serbmongkolchai and Chen 2008).

Economic Value. Electronic retailing offers customers perceived economic value through tangible benefits, such as low search costs and maximum utility (Kurki, Tuunainen and Oorni 2007). Individual transactions are important to the wealth of virtual communities (Rothaermel and Sugiyama 2001), because similar to a real-world economy, a virtual economy is driven by supply and demand. Virtual monetary systems, as a medium for transactions, offer conversions with real money. For example, in SL, members convert real currencies into Linden Dollars to make transactions. The virtual price level is determined by market equilibrium. SL participants may also create and design virtual goods, such as avatar clothing, furniture, virtual pets, and vehicles, and subsequently sell the rights over the good in virtual shops or direct trading (Wasko et al. 2011). These relationships between buyers and sellers are bidirectional, involving mutual information exchange, feedback, and evaluation (Reisberger, Reisberger and Strahringer 2008). Virtual communities of transaction allow for trades that are unlimited by physical boundaries. As members gain experience, they often participate in or create more activities in the community,

such as joining the club, designing virtual products, and engaging in economic transactions (Rothaermel and Sugiyama 2001). Therefore, more positive/better experiences in transactional communities should lead to greater perceptions of economic value.

Social Value. Although social interactions in VWs happen among strangers, the support thus obtained can produce camaraderie, social bonds, and future interactions. In an online environment, users often seek social support, so they are willing to exchange information and share resources with others (Rheingold 1993). Moreover, social support encourages both social bonds and transactions. Uncertainty about shopping online can be lessened by interpersonal discussions, information exchanges, and technological support (Hendaoui and Limayem 2008). A better experience with the virtual community thus should enhance awareness of social value. This reasoning leads to the following hypotheses.

H4: Holistic VE relates positively to perceptions of (a) economic and (b) social value.

Customer Loyalty

Virtual worlds have the ability to enhance positive relationships and to create loyalty (Jeandrain 2001). In its most generic meaning, loyalty is a behavioral and attitudinal bias towards a brand (Dick and Basu 1994). In online environments, loyalty refers to behavioral intentions to revisit the website, buy a product, or use the service in the near future (Cyr et al. 2007), and an attractive virtual community is a crucial building block to achieve e-loyalty (Srinivasan, Anderson and Ponnavolu 2002). Various factors influence customer loyalty in the analog and digital worlds, including trust and satisfaction (Anderson and Srinivasan 2003; Lynch, Kent and Srinivasan 2001), but we focus on the linkage between value perceptions and loyalty (Cronin, Brady and Hult 2000; Harris and Goode 2004). Scholars have long studied this relationship for real-world products and services, but few have addressed it in

VWs. Hoffman and Novak were able to establish that a flow experience impacts purchase intentions (Hoffman and Novak 2009).

Because customers can access services both online and offline, we anticipate that virtual loyalty consists of both loyalty in real life and loyalty in the virtual world. Experience gained from social and commercial online interactions may be critical to customers' offline experiences too (2003). Therefore, we propose the following hypotheses:

H5: Perceptions of economic value are positively associated with loyalty in the (a) VW and (b) real world.

H6: Perceptions of social value are positively associated with loyalty in the (a) VW and (b) real world.

Methodology

Research Setting

This study focuses on Second Life, one of the leading VWs, because it is an appropriate platform to demonstrate VWs' business implications in VWs, and it was very popular at the time of data collection: In 2008, the site had more than 8 million registered residents (SecondLife 2010). Moreover, SL offers a real economy and currency, supporting business opportunities for individuals and real-world firms. Companies have become immersed in SL, looking for collaboration possibilities, research insights, concept training, simulation and prototyping, as well as hosting events, promoting their brands, providing education and training, and engaging in customer communication (Dey 2007). In this sense, SL offers an ideal VW to test our model, which applies to any 3-dimensional virtual human-computer mediated interaction.

We collected data from students participating in an international business program. Students were appropriate respondents for the study, because they match the life-stage characteristics of most VW residents (Au 2011). Moreover, student samples are likely to possess the requisite knowledge to function adequately in VWs' activity systems. All students participating in the study received an instruction to ensure they had a similar understanding of VWs. To avoid experience-related biases, the respondents were selected from 423 students to include only novice users, i.e. no sample participants were initially familiar with VWs; all participants undertook the same experience of creating an ID and an avatar, then logging in to SL and visiting the island of a hardware manufacturer. On average, students then spent 14 hours on the hardware manufacturer's island located in SL on multiple visits, before completing a questionnaire about their experience. We obtained a usable sample of 344 respondents of which 52 % were men and the mean age was 22.1 years (SD=1.9). Respondents on average spent 14.8 hours online per week (SD=3.1).

Measures

The first-order latent variables in the theoretical model are measured using reflective, multi-item scales. The items for each concept were adapted to fit the particular context of VW from validated existing scales (*see Appendix*). To measure individual experience (i.e., flow and situational involvement), we used items adapted from Webster et al. (1993), Ghani (1995), and Takatalo et al. (2008). The measures for communal experience (social presence and social capital) came from Schubert et al. (2001), Bailenson and Yee (2006), Van Dick et al. (2006), and Mathwick et al. (2008). Economic value and social value used relevant scale items from Kurki et al. (2007) and Mathwick et al. (2008). Customer loyalty, in both the real and virtual worlds, was measured with scale items from Zeithaml et al. (1996). Respondents provided their responses to the items using a seven-point Likert-type scale. We also collected demographic

variables, namely, age, gender, hours online (per week), and membership in online communities.

The questionnaire was pretested in two consecutive stages. In the first stage, three experts assessed the questionnaire, and in the second stage, ten respondents used a think-aloud protocol to evaluate the questionnaire (Dillman 2000; Hunt, Sparkman Jr and Wilcox 1982). The pretest resulted in a few minor changes to the item wording.

Data Analysis

We used partial least squares path modeling to estimate the parameters in the inner and outer model of the hierarchical model and the substantive model (see Figure 2), since PLS path modeling is not constrained with respect to distributional properties (multivariate normality), measurement level, sample size, identification and factor indeterminacy (2009; Becker, Klein and Wetzels 2012; Wetzels, Odekerken-Schroder and Van Oppen 2009)

PLS path modeling allows the estimation of complex (hierarchical) models with a large number of latent variables and manifest variables; our model contains 23 latent variables and 46 manifest variables (124 manifest variables taking into consideration the repeated indicators for the higher-order constructs). Furthermore, PLS path modeling does not require multivariate normally distributed manifest variables (Hair et al. 2012). In the preliminary analysis of this study, we conducted the Shapiro-Francia test for multivariate normality and concluded that indicators were not normally distributed ($p<.001$) (Shapiro and Francia 1972). Finally, PLS path modeling is not susceptible to empirical underidentification, which may lead to inadmissible solutions and/or nonconvergence, especially in in higher-order models (Chen et al. 2001; Dillon, Kumar and Mulani 1987; Wetzels, Odekerken-Schroder and Van Oppen

2009). Therefore, it offers the most suitable approach to estimate the parameters in both the hierarchical measurement model and the substantive model of holistic VE.

Analysis and Results

We employed SmartPLS (Ringle, Wende and Will 2005) and the R package 'plspm' (Sanchez, Trinchera and Russolillo 2013) to obtain estimates for the inner and outer model with a path weighting scheme (Tenenhaus et al. 2005). We used nonparametric bootstrapping with 500 resamples with construct level pre-processing changes to obtain the standard errors of the estimates (Tenenhaus et al. 2005). The hierarchical model for VE is of the reflective-reflective type (Ringle, Wende and Will 2005). The higher-order latent variables (from second-order to fourth-order level) were set up through the repeated use of the manifest variables of the lower-order latent variables. We constructed the reflective, hierarchical construct model in PLS path modeling using the four key steps suggested by Wetzels et al. (2009) (Wetzels, Odekerken-Schroder and Van Oppen 2009). The latent variables showed means ranging from 3.54 to 4.06, and standard deviations between 0.62 and 0.97.

Validity and Reliability

To rule out the biasing effect common method variance, we applied a Schmid-Leiman solution (Yung, Thissen and McLeod 1999) to the variables using principal axis factoring, which permitted the inclusion of a general (common) method factor (Podsakoff et al. 2003). The common method factor accounted for only 38% of the total variance. Moreover, we applied Harman's single-factor test, and the results revealed that a single factor only accounted for 26% of the total variance (Podsakoff et al. 2003). Thus, common method bias did not appear to be a significant problem.

To assess reliability and convergent validity, we calculated the composite scale reliability (CR) and average variance extracted (AVE). Reliability is acceptable if CR exceeds .70 and AVE exceeds .50 (Chin 1998; Fornell and Larcker 1981). As Table 2 shows, all our variables in both second-order constructs and substantive model met these requirements. In support of convergent validity, we also inspected the loadings of the measures on their respective constructs and found that their standardized loadings exceeded .70 (Hulland 1999).

[TABLE 2 about here]

To assess the discriminant validity of the measures, we compared the AVE values for any two constructs with the square of the correlation estimate between these two constructs. The square root of the AVE should exceed the intercorrelations of the construct with the other constructs in the model (Chin 1998; Fornell and Larcker 1981; Hair et al. 2010). As Table 3 reveals, all our key variables in second-order constructs met this requirement. Moreover, no item cross-loaded higher of these variables on another construct than on its associated construct (Chin 1998) in support of discriminant validity.

[TABLE 3 about here]

Test of Hierarchical Structure

We explored the relationships in the hierarchical model with PLS path modeling; we provide the path coefficients in Figure 2. All the loadings were significant at the .05 level, in support of the higher-order structure of VE.

[FIGURE 2 about here]

The loadings of the measurement dimensions on the second-order factors were approximately equal to or exceeded .80. As we show in Figure 2, the loadings of all third-order factors exceed.80, in empirical support for H1 and H2. Similarly, the loadings of the third-order factors on the forth-order factors exceed.80; specifically, the loading of communal experience on holistic VE equalled .86, and the loading of individual experience on holistic VE was .81. Thus we confirmed both elements of H3.

Testing Holistic VE as a Driver of Value and Loyalty

In the substantive model, we predicted that holistic VE would drive value perceptions and loyalty. In line with this prediction, we found a positive, significant effect of holistic VE on perceptions of economic value (H4a: β=.38 [p <.05]; R^2 = 14.1%) and social value (H4b: β =.57 [p <.05]; R^2 = 31.9%). Furthermore, the results revealed positive relationships between the value perceptions and customer loyalty in VWs (R^2= 34.6%), explained by perceptions of economic value (H5a: β =.31 [p <.05]) and social value (H6a: β= .41 [p <.05]). We also found positive relationships between perceptions and loyalty in the real world (R^2 = 35.9%), which can be explained by perceptions of economic value (H5b: β =.43 [p <.05]) and social value (H6b: β=.30 [p <.05]). Holistic VE drives perceptions of economic and social value, which in turn positively affect customer loyalty, in both the real and the virtual world. The results support H4–H6 with significant effects at the .05 level.

We also examined our conceptual model in comparison with two alternative models. In Model 2, we specified the direct effects of VE on loyalty in the real world and loyalty in the virtual world (i.e., not mediated by economic and social value). Structural equation models, such as PLS path models, are well suited to testing for mediation (Iacobucci, Saldanha and Deng 2007). We used the incremental F test to determine if the change in R-

square between models was significant (Chin, Marcolin and Newsted 2003; Wetzels, Odekerken-Schroder and Van Oppen 2009). Adding the direct effects from VE to loyalty did not significantly contribute to the variance explained in loyalty in the virtual world ($F_{(1,340)}$=1.47, p =.23), but did significantly affect the loyalty in the real world ($F_{(1,340)}$=5.10, p =.02), albeit with a trivial effect size (f^2<0.02). As Iacobucci et al. (2007) suggest, we also tested for the significance of the indirect effects from VE to loyalty. We obtained the standard errors for these tests with a bootstrap procedure (2002) and determined that the indirect effects were significant at a level of 5% (virtual experience → economic value → loyalty in VW: .11; virtual experience → social value → loyalty in VW: .21; virtual experience → economic value → loyalty in real world: .15; virtual experience →social value →loyalty in real world: .13).

In Model 3, we excluded holistic virtual experience as a higher order construct, and instead directly linked communal and individual experience to social and economic value, and also tested whether real world loyalty may be mediated by virtual loyalty, or vice versa. Further, the direct effects between real world loyalty and virtual world loyalty are not significant (β=.02 [p <.05]). The GoF measure suggested by Tenenhaus et al. (2005) (Tenenhaus et al. 2005) decreased substantially from model 2 (GoF=0.59) to model 3 (GoF=0.42) (Sanchez, Trinchera and Russolillo 2013).

Finally, we used power analysis (Cohen 1988) (1 – β) and calculated the minimum required sample size (using α=.05 and β=.80). We relied on the PWR package in R (Team; Champely 2009).The results showed that for the minimum R-square (.14 for economic value), the power of the test (1 – β) exceeded .99, and the minimum sample size required was 50.

Discussion

Components of Holistic VE and Influences on Perceptions of Value and Loyalty

We sought to extend extant literature by providing a measurement model and empirical evidence of holistic VE that integrates individual and communal experience, explained by four main concepts and twelve multidimensional variables. Although existing research has studied customer experiences in online and virtual environments extensively, and identified the key components of VE as flow, telepresence, interaction, personal relevance, and involvement (Faiola and Smyslova 2009; Kohler et al. 2010; Takatalo, Nyman and Laaksonen 2008), several variables related to customer VE have not been evaluated. Our findings correlate with prior research, but also offer strong evidence of hierarchical-order factors that culminate in consumers' holistic VE. Social presence and social capital drive the communal aspect. Because social presence provides a perceptual base for a virtual experience (Li, Daugherty and Biocca 2001), when users are more aware of others' presence and identify with the virtual community, they have more communal experiences. Similarly, social capital, in the form of reciprocity, civic virtue, and social trust, supports significant contributions in VWs, such as information sharing and mutual assistance (Huvila et al. 2010). Flow experience and situational involvement then generate and foster individual experience. These components constitute a significant cognitive state for online environments and virtual community experiences (Faiola and Smyslova 2009; Hoffman and Novak 2009; Huang 2006; Takatalo, Nyman and Laaksonen 2008). Flow and situational involvement also are consistent with a definition of VE as consisting of "vivid, involving, active, and affective psychological states occurring in an individual interacting with three-dimensional computer simulations" (Li, Daugherty and Biocca 2001, p. 27, p. 27). That is, enjoyment and involvement heighten

individual learning and increase virtual experience, leading to positive impact on individual attitudes and behaviors.

We also extend prior literature by proposing a new perspective on VWs as complex systems, viewed through the lens of activity theory. Activity theory allows us to consider VWs beyond the individual experience of one user. The notions of VW users as subjects, who complete value-creating activities such as transactions, information search, social interactions, etc in the SL community, in order to achieve desired outcomes – the principle components of activity theory –effectively illustrate VE and the values that result from participation in VWs. Previous research has called for such tangible evidence of activity theory and its application to human–computer interactions (2008; 1996; 2010; 1996). Activity theory offers us a valuable descriptive framework to present empirical evidence of a holistic VE and its possible outcomes for VWs.

In examining the influence of holistic VE on value perceptions and customer loyalty, we determined a positive influence on perceptions of social and economic value, as well as positive relationships between value perceptions and customer loyalty. The indirect effects indicate that communal experience contributes predominantly to social value. Economic value exerted a greater influence on customer loyalty in the real world, but social value had a greater influence on customer loyalty in the virtual world. Some consumers use VWs to escape from their real lives or as social spaces for self-expression and social interaction (Arakji and Lang 2008), so businesses that want to succeed in a virtual community should not simply replicate their real-world marketing communications . Rather, social interaction is a primary motivation for engaging in VWs, and most activities relate to socializing with others (Messinger et al. 2009), as evidenced by the stronger effect of VE on social values. Therefore, businesses need to

create a virtual community that facilitates communication and interaction among consumers, which can lead to greater social value perceptions and loyalty.

Managerial Implications

Our study shows that VWs are a powerful tool to create value for customers and loyalty in the real and virtual worlds for the firm. The different types of values for customers, and loyalty effects for the firm, differ significantly in what contributes to them. This phenomenon has long been established in the context of electronic commerce (Rayport and Sviokla 1995), but equally applies to VWs. Value creation in the virtual world follows different patterns to that in the real world, but they are also interrelated.

We found that communal and individual experiences are equally important in creating a holistic virtual experience. Consumers achieve positive, holistic VE if they can meet their needs (e.g., enjoyment, control, interest) through social interactions (e.g., co-presence, reciprocity, trust). Hence, firms should balance their resources to encourage an immersion in the 3-D environment (i.e., individual experience) as well as enhance social interactivity among customers (i.e., communal experience) (Cagnina and Poian 2009). This means VWs need to be appealing and relevant as well as social and fun. Flow experience (e.g., enjoyment) and situational involvement (e.g., curiosity and interest) are key components of individual experience. To enhance the individual experience, firms can engage customers with, for example, challenging activities and enjoyable mini-games built around interesting and relevant contents. Focusing only on creating individual experience, however, will not suffice in maintaining customers in the virtual storefront. It is the meaningful social interaction that enhances communal experience of the customers, enriched through social capital and a sense of social presence. VWs offer a range of communication media (e.g., visual, text, and audio) and tools. Firms can introduce these embedded social features to foster socialization, for

example by designing a virtual storefront with rich social interaction content, and activating virtual sales or customer service representatives to support customers or encourage them to generate contents.

Creating VE in an online environment requires more than traditional marketing communications. Businesses need to promote engagement by making brand-relevant contributions to the virtual community and creating opportunities for interaction through product co-creation and customization. Moreover, they should encourage virtual communities to form around their products and deepen customer relationships with their brand(s). Harvard Law School, for instance, uses VWs to host virtual classes and conferences, complete with rich learning materials for self-study and social interaction (Messinger et al. 2009).

Holistic VE is particularly powerful to increase customers' perceptions of social value, and to a lesser extent economic value. Both types of value differ in their relative contribution to outcomes for the firm; social value perception is a key driver of virtual loyalty, whereas economic value predominantly leads to higher loyalty in the real world. Firms can garner the maximum virtual loyalty effects from their VW activities by optimising the communal experience, because it contributes more to social value. For example, a firm can use VWs as an attractive space for simultaneously conveying enjoyment, fun and collaboration among diverse customers, and representing the brand image. For example, virtual training, research projects, or crowdsourcing activities allow geographically dispersed customers to learn, collaborate and socialise with each other in real-time, and offer cost savings compared to real-world meetings (Novak 2012).

We were able to establish that firms can generate loyalty in the virtual world independently from loyalty in the real world. Hence, in order to maintain customer loyalty,

balancing brand experience in both worlds is mandatory as no spill-over effects exist. However virtual loyalty has still got tangible benefits in the real world: loyalty in e-commerce has been found to increase word of mouth and willingness to pay (Srinivasan, Anderson and Ponnavolu 2002).

Further, firms can maximise loyalty effects by interconnecting virtual transactions with other customer touch points such as websites and the physical storefront. For example, a customer can visit a firm's virtual storefront to design a tailored product or service, e.g. a garment or personal computer, before being invited to visit the e-commerce or real store for to trial new products, or make actual purchases (Mennecke et al. 2007).

Regardless of the downwards trend of SL, our findings equally apply to firms' strategic use of any other interactive 3D platforms and VW components. As businesses incorporate social media, training simulation and gamification into their marketing strategy and implement VWs in their technological infrastructure, they may attain similar types of benefits. Especially social media, which shares social motives such as interaction, communication, social capital, and relationships with VWs (Novak 2012), is likely to show patterns of value creation that are comparable to our findings. When businesses understand the mechanisms that underlie people's engagement in VWs, which lead to holistic experiences and valuable outcomes, marketers can employ these potentially powerful tools more effectively.

Limitations and Directions for Research

Some limitations of this research relate to the generalizability of its findings. Although our aim was to determine the holistic VE of individual members in VWs, the study took place in an educational context, with university students who visited the island of a hardware manufacturer for several hours and then completed a questionnaire. The short

length of the visits could affect their value perceptions; respondents likely perceived the social value of interactions with other respondents as greater than economic value, because they had insufficient time to consider virtual products or services and no immediate intentions to purchase. Moreover, we excluded individual-level variables and customer segmentations that might affect our findings. Further research should also take the findings of this study to develop and test more comprehensive models of holistic VE; in particular, richer models should capture and explain differences in VE across different market segments. We collected data only from SL, which limits the generalizability of the findings further. Beyond the specific VW context of our study, further research could also examine whether the validity of the measures and our findings hold in other VWs (e.g., Habbo, Poptropica, and Weeworld). Finally, the virtual customer experience for this study involved a visit to a virtual hardware manufacturer, but important differences may exist across product and service categories. We thus hope additional studies will examine differences in customer experiences across virtual product and service categories in VWs or other integrated platforms, such as those for banking, consumer products, healthcare, educational institutions, fashion, or gaming and software. Such research may reveal that a holistic VE that produces perceived value and customer loyalty may varies across categories.

Conclusion

Using a VW for branding and marketing purposes holds the promise of value creation for both firms and customers. Our findings contribute to VE literature in several areas. First, we provide a conceptualization of the holistic virtual experience, as well as the relevant antecedents of virtual perceived value and customer loyalty. Studying holistic VEs in 3D environments can deepen our understanding of their individual and social drivers, leading to improved options for forthcoming 3D platform. Second, by investigating the relationship

between holistic VE and customer value, both economic and social, we also clarify the influences of customers' experience. Third, we draw a more detailed picture of the interaction between customers' perception of value and their loyalty toward brands in VWs, which suggests the potential transfer of VW value creation to the real world. Fourth, our model can be used to measure holistic VE and its influences on variables in related research efforts.

Virtual worlds offer realistic interactive and collaborative environments in which people gain individual experiences with virtual objects while also interacting with other individuals, groups, and businesses. Despite some disappointing returns on investments in VWs, VWs offer innovative channels and a range of opportunities, beyond traditional marketing models. In addition, VWs offer potential mergers with social networking in the forthcoming Web 3.0, such that marketers might rely on avatars to enhance their online interactions and connectedness. An in-depth understanding of VE in VWs thus has both social and economic implications that are highly relevant for Web 3.0.

References

(n.d.). "Experience." in Dictionary.com Unabridged ed.: Dictionary.com Unabridged. Retrieved November 06, 2013, from Dictionary.com website: http://dictionary.reference.com/browse/experience.

Anderson, RE and SS Srinivasan (2003). "E Satisfaction and E Loyalty: A Contingency Framework." *Psychology and Marketing* 20 (2), 123-38.

Animesh, Animesh, Alain Pinsonneault, Sung-Byung Yang, and Wonseok Oh (2011). "An Odyssey into Virtual Worlds: Exploring the Impacts of Technological and Spatial Environments on Intention to Purchase Virtual Products." *MIS Quarterly-Management Information Systems* 35 (3), 789.

Arakji, R.Y. and K.R. Lang (2008). "Avatar Business Value Analysis: A Method for the Evaluation of Business Value Creation in Virtual Commerce." *Journal of Electronic Commerce Research* 9 (3), 207-18.

Armstrong, A and J. Hagel, III (2000). "The Real Value of Online Communities." *Knowledge and communities*, 85-95.

Armstrong, Arthur and Johnn Hagel (1995). "Real Profits from Virtual Communities." *McKinsey Quarterly* 3, 127-41.

Au, Wagner James (2011). "How Many Second Life Residents Are in Their 20s? In 2008, They Were Roughly 40% of the Userbase." in http://nwn.blogs.com/nwn/2011/03/gen-y-demographics-in-second-life-43-.html.

Bailenson, J. N. and N. Yee (2006). "A Longitudinal Study of Task Performance, Head Movements, Subjective Report, Simulator Sickness, and Transformed Social Interaction in Collaborative Virtual Environments." *Presence: Teleoperators and Virtual Environments* 15 (6), 699-716.

Barnes, S. and A.D. Pressey (2011). "Who Needs Cyberspace? Examining Drivers of Needs in Second Life." *Internet Research* 21 (3), 2-2.

Barnes, Susan B (2008). "Understanding Social Media from the Media Ecological Perspective." *Mediated interpersonal communication*, 14-33.

Bartle, Richard A (2004). *Designing Virtual Worlds*. New Riders.

Becker, Jan-Michael, Kristina Klein, and Martin Wetzels (2012). "Hierarchical Latent Variable Models in Pls-Sem: Guidelines for Using Reflective-Formative Type Models." *Long Range Planning*.

Bente, Gary, Nicole C Krämer, and Felix Eschenburg (2008). "Is There Anybody out There." *Mediated interpersonal communication*, 131-57.

Bente, Gary, Sabine Ruggenberg, Nicole C. Kramer, and Felix Eschenburg (2008). "Avatar-Mediated Networking: Increasing Social Presence and Interpersonal Trust in Net-Based Collaborations." *Human Communication Research* 34, 287-318.

Bhandari, Humnath and Kumi Yasunobu (2009). "What Is Social Capital? A Comprehensive Review of the Concept." *Asian Journal of Social Science* 37, 480-510.

Bitner, MJ (1992). "Servicescapes: The Impact of Physical Surroundings on Customers and Employees." *The Journal of Marketing* 56 (2), 57-71.

Blanchard, Anita L and M Lynne Markus (2004). "The Experienced Sense of a Virtual Community: Characteristics and Processes." *ACM SIGMIS Database* 35 (1), 64-79.

Brakus, J Josko, Bernd H Schmitt, and Lia Zarantonello (2009). "Brand Experience: What Is It? How Is It Measured? Does It Affect Loyalty?" *Journal of Marketing* 73, 52-68.

Brodie, Roderick J, Ana Ilic, Biljana Juric, and Linda Hollebeek (2011). "Consumer Engagement in a Virtual Brand Community: An Exploratory Analysis." *Journal of Business Research*.

Cagnina, Maria Rosita and Michele Poian (2009). "Beyond E-Business Models: The Road to Virtual Worlds." *Electronic Commerce Research* 9 (1-2), 49-75.

Caspi, Avner and Ina Blau (2008). "Social Presence in Online Discussion Groups: Testing Three Conceptions and Their Relations to Perceived Learning " *Social Psychology of Education* 11 (3), 323-46.

Celsi, Richard L. and Jerry C. Olson (1988). "The Role of Involvement in Attention and Comprehension Processes." *The Journal of Consumer Research* 15 (2), 210-24.

Champely, S (2009). "Pwr: Basic Functions for Power Analysis. R Package Version 1.1. 1." in.

Chen, Feinian, Kenneth A Bollen, Pamela Paxton, Patrick J Curran, and James B Kirby (2001). "Improper Solutions in Structural Equation Models Causes, Consequences, and Strategies." *Sociological Methods & Research* 29 (4), 468-508.

Chin, W.W., B.L. Marcolin, and P.R. Newsted (2003). "A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study." *Information Systems Research* 14 (2), 189-217.

Chin, Wynne W (1998). "The Partial Least Squares Approach to Structural Equation Modeling." *Modern methods for business research* 295, 336.

Choi, Dongseong and Jinwoo Kim (2004). "Why People Continue to Play Online Games: In Search of Critical Design Factors to Increase Customer Loyalty to Online Contents." *CyberPsychology & behavior* 7 (1), 11-24.

Choi, Duke Hyun, Jeoungkun Kim, and Soung Hie Kim (2007). "Erp Training with a Web-Based Electronic Learning System: The Flow Theory Perspective." *International Journal of Human-Computer Studies* 65 (3), 223-43.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. Lawrence Erlbaum.

Coleman, J. S. (1990). *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.

Cremorne, Lowell (2010). "2010 Virtual Worlds Predictions Review." http://www.metaversejournal.com/2010/12/21/2010-virtual-worlds-predictions-review/.

Cronin, J.J., M.K. Brady, and G.T.M. Hult (2000). "Assessing the Effects of Quality, Value, and Customer Satisfaction on Consumer Behavioral Intentions in Service Environments." *Journal of Retailing* 76 (2), 193-218.

Csikszentmihalyi, Mihaly (1977). *Beyond Boredom and Anxiety*. San Francisco: Jossey-Bass.

--- (1975). *Beyond Boredom and Anxiety: The Experience of Play in Work and Games*. San Francisco: Jossey-Bass.

--- (1990). *Flow: The Psychology of Optimal Experience*. New York: Harper & Row.

Csikszentmihalyi, Mihaly and Isabella Selega Csikszentmihalyi (1988). *Optimal Experience: Psychological Studies of Flow in Consciousness*. Cambridge: Cambridge University.

Csikszentmihalyi, Mihaly and Judith LeFevre (1989). "Optimal Experience in Work and Leisure." *Journal of Personality and Social Psychology* 56 (5), 815-22.

Cutler, R. (1995). "Distributed Presence and Community in Cyberspace." *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century* 3, 2, 12-32. http://jan.ucc.nau.edu/~ipct-j/1995/n2/cutler.txt.

Cyr, D., K. Hassanein, M. Head, and A. Ivanov (2007). "The Role of Social Presence in Establishing Loyalty in E-Service Environments." *Interacting with Computers* 19, 43-56.

Daugherty, Terry, Hairong Li, and Frank Biocca (2005). "Experiential E-Commerce: A Summary of Research Investigating the Impact of Virtual Experience on Consumer Learning." *Online Consumer Psychology: Understanding and Influencing Consumer Behavior in the Virtual World*, 457-89.

Davis, A., J. Murphy, D. Owens, D. Khazanchi, and I. Zigurs (2009). "Avatars, People, and Virtual Worlds: Foundations for Research in Metaverses." *Journal of the Association for Information Systems* 10 (2), 1.

Davis, Alanah, Deepak Khazanchi, John Murphy, Ilze Zigurs, and Dawn Owens (2009). "Avatars, People, and Virtual Worlds: Foundations for Research in Metaverses." *Journal of the Association for Information Systems* 10 (2), 90-117.

Dean, Elizabeth, Sarah Cook, Michael Keating, and Joe Murphy (2009). "Does This Avatar Make Me Look Fat? Obesity and Interviewing in Second Life." *Journal For Virtual Worlds Research* 2 (2).

Dey, Pritam (2007). "Impact of Secondlife (a Virtual World) on Business." 1-31. http://www.slideshare.net/pritamde/impactofsecondlifeonbusiness. Accessed 24 September 2010.

Dick, Alan S and Kunal Basu (1994). "Customer Loyalty: Toward an Integrated Conceptual Framework." *Journal of the academy of marketing science* 22 (2), 99-113.

Dictionary, Longman Exams (2007). in Stephen Bullon ed. England: Pearson Education Limited, 1833.

Diehl, William C and Esther Prins (2008). "Unintended Outcomes in Second Life: Intercultural Literacy and Cultural Identity in a Virtual World." *Language and Intercultural Communication* 8 (2), 101-18.

Dillman, Don A (2000). *Mail and Internet Surveys: The Tailored Design Method*. Wiley New York.

Dillon, William R, Ajith Kumar, and Narendra Mulani (1987). "Offending Estimates in Covariance Structure Analysis: Comments on the Causes of and Solutions to Heywood Cases." *Psychological Bulletin* 101 (1), 126.

Edelman, Susan (1997). "Curiosity and Exploration." http://www.csun.edu/~vcpsy00h/students/explore.htm. Accessed 28 May 2010.

Engeström, Yrjö, Reijo Miettinen, and Raija-Leena Punamäki (1999). *Perspectives on Activity Theory*. Cambridge University Press.

Faiola, Anthony and Olga Smyslova (2009). "Flow Experience in Second Life: The Impact of Telepresence on Human-Computer Interaction." *Online Communities*, 574-83.

Fiore, SG (2003). "Conceptualising an Experience Framework for Hci." *Human-computer interaction: theory and practice*, 331.

Fjeld, Morten, Kristina Lauche, Martin Bichsel, Fred Voorhorst, Helmut Krueger, and Matthias Rauterberg (2002). "Physical and Virtual Tools: Activity Theory Applied to the Design of Groupware." *Computer Supported Cooperative Work (CSCW)* 11 (1), 153-80.

Fornell, Claes and David F. Larcker (1981). "Evaluating Structural Equation Model with Unobservable Variables and Measurement Error." *Journal of Marketing Research* 18 (39-50).

Gamm, Gerald and Robert d. Putnam (1999). "The Growth of Voluntary Associations in America, 1840-1940." *Journal of Interdisciplinary History* 29 (4), 551-55.

Garrison, D. Randy, Terry Anderson, and Walter Archer (1999). "Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education." *The Internet and Higher Education* 2 (2-3), 87-105.

Gefen, D. and D. W. Straub (2003). "Managing User Trust in B2c E-Services." *E-Service Journal* 2 (2), 7-24.

Gerhard, Michael and David Moore (1998). "User Embodiments in Educational Cves: Towards Continuous Presence." in *International Conference on Network Entities (NETIES)*, Leeds, UK.

Gerhard, Michael, David Moore, and Dave Hobbs (2004). "Embodiment and Copresence in Collaborative Interfaces." *International Journal of Human-Computer Studies* 61, 453-80.

Ghani, Jawaid A. (1995). "Flow in Human Computer Interactions." Pp 291-311 in *Human Factors in Information Systems: Emerging Theoretical Bases*, Jane M. Carey (ed). New Jersey: Ablex Publishing Corp.

Ghani, Jawaid A. and Satish P. Deshpande (1994). "Task Characteristics and the Experience of Optimal Flow in Human-Computer Interaction." *Journal of Psychology* 128 (4), 381.

Goel, Lakshmi, Norman A Johnson, Iris Junglas, and Blake Ives (2011). "From Space to Place: Predicting Users' Intentions to Return to Virtual Worlds." *MIs Quarterly* 35 (3), 749-72.

Goel, Lakshmi, Norman Johnson, Iris Junglas, and Blake Ives (2013). "Predicting Users' Return to Virtual Worlds: A Social Perspective." *Information Systems Journal* 23 (1), 35-63.

Hair, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson (2010). *Multivariate Data Analysis: A Global Perspective*. Pearson Prentice Hall.

Hair, Joseph F., Marko Sarstedt, Christian M Ringle, and Jeannette A Mena (2012). "An Assessment of the Use of Partial Least Squares Structural Equation Modeling in Marketing Research." *Journal of the Academy of Marketing Science* 40 (3), 414-33.

Hamari, Juho and Jonna Koivisto (2013). "Social Motivations to Use Gamification: An Empirical Study of Gamifying Exercise." in *Proceedings of the 21st European Conference on Information Systems, Utrecht, Netherlands*.

Harris, Lloyd C. and Mark M. H. Goode (2004). "The Four Levels of Loyalty and the Pivotal Role of Trust: A Study of Online Service Dynamics." *Journal of Retailing* 80 (2), 139-58.

Hars, A. and S. Ou (2002). "Working for Free? Motivations for Participating in Open-Source Projects." *International Journal of Electronic Commerce* 6, 25-40.

Harwood, Tracy (2012). "Emergence of Gamified Commerce: Turning Virtual to Real." *Journal of Electronic Commerce in Organizations (JECO)* 10 (2), 16-39.

Hassenzahl, Marc and Noam Tractinsky (2006). "User Experience-a Research Agenda." *Behaviour & Information Technology* 25 (2), 91-97.

Hassouneh, Diana and Malaika Brengman (2013). "A Motivation-Based Typology of Social Virtual World Users." *Computers in Human Behavior*.

Haythornthwaite, Caroline (2007). "Social Networks and Online Community." *The Oxford handbook of Internet psychology*, 121-37.

Heeter, Carrie (1992). "Being There: The Subjective Experience of Presence." *Presence: Teleoperators and Virtual Environments* 1 (2), 262-71.

Hemp, P. (2006). "Avatar-Based Marketing." *Harvard business review* 84 (6), 48-56.

Hendaoui, Adel and Moez Limayem (2008). "Understanding Consumer Virtual Shopping Behavior in 3d Virtual Worlds: A Theoretical and Empirical Investigation." in *Twenty Ninth International Conference on Information Systems*, Paris 2008, 1-14.

Henseler, Jorg, Christian M. Ringle, and Rudolf R. Sinkovics (2009). "The Use of Partial Least Squares Path Modeling in International Marketing." *Advances in International Marketing* 20, 277-319.

Hoffman, Donna L. and Thomas P. Novak (2009). "Flow Onine: Lessons Learned and Future Prospects." *Journal of Interactive Marketing* 23, 23-34.

--- (1996). "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations." *Journal of Marketing* 60 (3), 50.

Hoyer, Wayne D. and Deborah J. Maclnnis (2008). *Consumer Behavior*. South-Western, Cengage Learning.

Huang, Ming-Hui (2003). "Designing Website Attributes to Induce Experiential Encounters." *Computers in Human Behavior* 19 (4), 425-42.

--- (2006). "Flow, Enduring, and Situational Involvement in the Web Environment: A Tripartite Second-Order Examination." *Psychology and Marketing* 23 (5), 383-411.

Hulland, J (1999). "Use of Partial Least Squares (Pls) in Strategic Management Research: A Review of Four Recent Studies." *Strategic Management Journal* 20 (2), 195-204.

Hunt, Shelby D, Richard D Sparkman Jr, and James B Wilcox (1982). "The Pretest in Survey Research: Issues and Preliminary Findings." *Journal of Marketing Research*, 269-73.

Hunt, SM and J Hilton (1975). *Individual Development and Social Experience*. Allen & Unwin.

Huotari, Kai and Juho Hamari (2012). "Defining Gamification: A Service Marketing Perspective." in *Proceeding of the 16th International Academic MindTrek Conference*: ACM, 17-22.

Huvila, I., K. Holmberg, S. Ek, and G. Widén-Wulff (2010). "Social Capital in Second Life." *Online Information Review* 34 (2), 295-316.

Hwang, Ha Sung and SungBok Park (2007). "Being Together: User's Subjective Experience of Social Presence in Cmc Environments." *Human-computer Interaction*, 844-53.

Iacobucci, D., N. Saldanha, and X. Deng (2007). "A Meditation on Mediation: Evidence That Structural Equations Models Perform Better Than Regressions." *Journal of Consumer Psychology* 17 (2), 139.

Jeandrain, Anne-Cécile (2001). "Consumer Reactions in a Realistic Virtual Shop: Influence on Buying Style." *Journal of Interactive Advertising* 2 (1), 2-9.

Johnson, Michael D, Andreas Herrmann, and Frank Huber (2006). "The Evolution of Loyalty Intentions." *Journal of Marketing*, 122-32.

Jonassen, David H and Lucia Rohrer-Murphy (1999). "Activity Theory as a Framework for Designing Constructivist Learning Environments." *Educational Technology Research and Development* 47 (1), 61-79.

Kaptelinin, Victor (1996). "Activity Theory: Implications for Human-Computer Interaction." *Context and consciousness: Activity theory and human-computer interaction*, 103-16.

Kashdan, Todd B., Paul Rose, and Frank D. Fincham (2004). "Curiosity and Exploration: Facilitating Positive Subjective Experiences and Personal Growth Opportunities." *Journal of Personality Assessment* 82 (3), 291-305.

Kim, Moon-Koo, Myeong-Cheol Park, and Dong-Heon Jeong (2004). "The Effects of Customer Satisfaction and Switching Barrier on Customer Loyalty in Korean Mobile Telecommunication Services." *Telecommunications policy* 28 (2), 145-59.

Kim, Woo Gon, Chang Lee, and Stephen J Hiemstra (2004). "Effects of an Online Virtual Community on Customer Loyalty and Travel Product Purchases." *Tourism management* 25 (3), 343-55.

Kingsley, Jan and Charles Wankel (2009). "Introduction." Pp 1-9 in *Higher Education in Virtual Worlds*, Charles Wankel and Jan Kingsley (eds): Emerald Group Publishing Limited.

Koh, Joon, Young-Gul Kim, and Young-Gul Kim (2003). "Sense of Virtual Community: A Conceptual Framework and Empirical Validation." *International Journal of Electronic Commerce* 8 (2), 75-94.

Kohler, Thomas, Johann Fueller, Daniel Stieger, and Kurt Matzler (2010). "Avatar-Based Innovation: Consequences of the Virtual Co-Creation Experience." in *The 43rd Hawaii International Conference on System Sciences - 2010*, Fueller Johann, Stieger Daniel and Matzler Kurt eds., 1-11.

Korzaan, Melinda L. (2003). "Going with the Flow: Predicting Online Purchase Intentions." *The Journal of Computer Information Systems* 43 (4), 25-31.

Koufaris, Marios (2002). "Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior." *Information Systems Research* 13 (2), 205.

Koufaris, Marios, Ajit Kambil, and Priscilla Ann LaBarbera (2002). "Consumer Behavior in Web-Based Commerce: An Empirical Study." *International Journal of Electronic Commerce* 6, 115-38.

Kuntze, Ronald, Theresa R Crudele, Daniel Reynolds, and Erika Matulich (2013). "The Rise and Fall of Virtual Reality Retailing in Second Life: An Avatar's Perspective." *Journal of Management and Marketing Research* 13.

Kurki, Suvi, Virpi Kristiina Tuunainen, and Anssi Oorni (2007). "Consumer Value in Electronic Retailing: A Laboratory Experiment in Buying Cloths." http://is2.lse.ac.uk/asp/aspecis/20070093.pdf. Accessed 27 May 2010.

Kuutti, Kari (1996). "Activity Theory as a Potential Framework for Human-Computer Interaction Research." *Context and consciousness: Activity theory and human-computer interaction*, 17-44.

KZero (2013). "Virtual Worlds/Mmos: Universe Chart for Q3 2013." in.

Li, H., T. Daugherty, and F. Biocca (2001). "Characteristics of Virtual Experience in Electronic Commerce: A Protocol Analysis." *Journal of Interactive Marketing* 15 (3), 13-30.

Lynch, PD, RJ Kent, and SS Srinivasan (2001). "The Global Internet Shopper: Evidence from Shopping Tasks in Twelve Countries." *Journal of Advertising Research* 41 (3), 15-24.

Mathwick, Charla, C. Wiertz, and Ko de Ruyter (2008). "Social Capital Production in a Virtual P3 Community." *Journal of Consumer Research* 34 (6), 832-49.

Mathwick, Charla, Caroline Wiertz, and Ko De Ruyter (2008). "Social Capital Production in a Virtual P3 Community." *Journal of Consumer Research* 34 (6), 832.

McMillan, D. W. and D. M. Chavis (1986). "Sense of Community: A Definition and Theory." *Journal of Community Psychology* 14 (1), 6-23.

Mennecke, Brian, Edward Roche, David Bray, Benn Konsynski, John Lester, Michael Rowe, and Anthony Townsend (2007). "Second Life and Other Virtual Worlds: A Roadmap for Research." in *28th International Conference on Information Systems (ICIS)*.

Messinger, P.R., E. Stroulia, K. Lyons, M. Bone, R.H. Niu, K. Smirnov, and S. Perelgut (2009). "Virtual Worlds--Past, Present, and Future: New Directions in Social Computing." *Decision Support Systems* 47 (3), 204-28.

Meyer, Christopher and Andre Schwager (2007). "Understanding Customer Experience." *Harvard business review* 85 (2), 116.

Mittal, Vikas and Wagner A Kamakura (2001). "Satisfaction, Repurchase Intent, and Repurchase Behavior: Investigating the Moderating Effect of Customer Characteristics." *Journal of marketing research*, 131-42.

Mittal, Vikas, Pankaj Kumar, and Michael Tsiros (1999). "Attribute-Level Performance, Satisfaction, and Behavioral Intentions over Time: A Consumption-System Approach." *The Journal of Marketing*, 88-101.

Moorman, Christine, Gerald Zaltman, and Rohit Deshpande (1992). "Relationships between Providers and Users of Market Research: The Dynamics of Trust within and between Organizations." *Journal of Marketing Research* 29 (August), 314-28.

Morrison, Scott (2009). "A Second Chance for Second Life." *Wall Street Journal. Retrieved from http://online. wsj. com/article/SB125064110693841789. html*.

Nino, Tateru (2011). "Cnn to Close Second Life Island, Can't Justify the Time and Effort of in-World Meetings." http://dwellonit.taterunino.net/2011/03/23/cnn-to-close-second-life-island-cant-justify-the-time-and-effort-of-in-world-meetings/. Accessed 7 April 2012.

Novak, Thomas P (2012). "Quality of Virtual Life." *TRANSFORMATIVE CONSUMER RESEARCH FOR PERSONAL AND COLLECTIVE WELL-BEING, David Glen Mick, Simone Pettigrew, Cornelia Pechmann, Julie Ozanne, eds., New York: Taylor and Francis*.

--- (2009). "Quality of Virtual Life (Qovl)." *D. Mick, S. Pettigrew, C. Pechmann, and J. Ozanne, J.(Eds.), Transformative consumer research for personal and collective well being: Reviews and frontiers. Retrieved December* 1.

Novak, Thomas P., Donna L. Hoffman, and Adam Duhachek (2003). "The Influence of Goal-Directed and Experiential Activities on Online Flow Experiences." *Journal of Consumer Psychology* 13 (1/2), 3-16.

Novak, Thomas P., Donna L. Hoffman, and Yiu-Fai Yung (2000). "Measuring the Customer Experience in Online Environments: A Structural Modeling Approach." *Marketing Science* 19 (1), 22.

--- (1998). "Measuring the Flow Construct in Online Environments: A Structural Modeling Approach." L.L. Thurstone Psychometric Laboratory, Working paper, University of North Carolina, Chapel Hill.

Nowak, Kristine and Frank Biocca (1999). "I Think There Is Someone Else Here with Me!: The Role of the Virtual Body in the Sensation of Co-Presence with Other Humans and Artificial Intelligences in Advanced Virtual Environments." in *Proceedings of the 3rd International Cognitive Technology Conference. San Francisco, CA*.

Organ, D. W. (1988). *Organizational Citizenship Behavior: The Good Soldier Syndrome*. Lexington, MA: Lexington Books.

Paxton, Pamela (1999). "Is Social Capital Declining in the United States? A Multiple Indicator Assessment." *American Journal of Sociology* 105 (July), 88-127.

Podsakoff, Philip M, Scott B MacKenzie, Jeong-Yeon Lee, and Nathan P Podsakoff (2003). "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies." *Journal of applied psychology* 88 (5), 879.

Podsakoff, Philip M. and Scott B. Mackenzie (1994). "Organizational Citizenship Behavior and Sales Unit Effectiveness." *Journal of Marketing Research* 31, 351-63.

Prahalad, C.K. and V. Ramaswamy (2003). *The Future of Competition: Co-Creating Value with Customers*. Boston HBS Press.

Privette, Gayle (1983). "Peak Experience, Peak Performance, and Flow: A Comparative Analysis of Positive Human Experiences." *Journal of Personality and Social Psychology* 45 (6), 1361-68.

Privette, Gayle and Charles M. Bundrick (1987). "Measurement of Experience: Construct and Content Validity of the Experience Questionnaire." *Perceptual and Motor Skills* 65, 315-32.

Rayport, Jeffrey F and John J Sviokla (1995). "Exploiting the Virtual Value Chain." *Harvard Business Review* 73 (6), 75-&.

Reeves, Byron and J Leighton Read (2009). *Total Engagement: How Games and Virtual Worlds Are Changing the Way People Work and Businesses Compete*. Harvard Business Press.

Reisberger, Philip, Tobias Reisberger, and Susanne Strahringer (2008). "Measuring Success of Commerce Systems in Virtual Worlds." http://www.virtualgoods.org/2008/117_VirtualGoods2008Book.pdf. Accessed May 24, 2010.

Rheingold, Howard (1993). *The Virtual Community: Homesteading on the Electronic Frontier*. MIT Press.

Ringle, Christian, Sven Wende, and Alexander Will (2005). "Smartpls Version 2.0 M2." *Hamburg, Germany: Institute for Operations Management and Organization at the University of Hamburg*.

Rothaermel, Frank T. and Stephen Sugiyama (2001). "Virtual Internet Communities and Commercial Success: Individual and Community-Level Theory Grounded in the Atypical Case of Timezone.Com." *Journal of Management* 27, 297-312.

Rovai, Alfred P. (2002). "Building Sense of Community at a Distance." *The International Review of Research in Open and Distance Learning* 3, 1. http://www.irrodl.org/index.php/irrodl/article/viewArticle/79/152. Accessed May 22, 2010.

Sanchez, G., L. Trinchera, and G. Russolillo (2013). "Package 'Plspm': Tools for Partial Least Square Path Modeling (Pls-Pm), Version 0.4.1, R Cran.".

Schubert, T., F. Friedmann, and H. Regenbrecht (2001). "The Experience of Presence: Factor Analytic Insights." *Presence-Teleoperators and Virtual Environments* 10 (3), 266-81.

SecondLife (2010). "Economic Statistics." http://secondlife.com/statistics/economy-data.php. Accessed May 15, 2010.

Serbmongkolchai, Vorapong and Xiao Chen (2008). "V-Business Model in Virtual World." Department of Infomatics, Lund University.

Shapiro, Samuel S and RS Francia (1972). "An Approximate Analysis of Variance Test for Normality." *Journal of the American Statistical Association* 67 (337), 215-16.

Sharma, Neeru and Paul G Patterson (2000). "Switching Costs, Alternative Attractiveness and Experience as Moderators of Relationship Commitment in Professional, Consumer Services." *International Journal of Service Industry Management* 11 (5), 470-90.

Sheth, J.N., B.I. Newman, and B.L. Gross (1991). "Why We Buy What We Buy: A Theory of Consumption Values." *Journal of Business Research* 22 (2), 159-70.

Shin, Dong Hee (2009). "The Evaluation of User Experience of the Virtual World in Relation to Extrinsic and Intrinsic Motivation." *International Journal of Human-Computer Interaction* 25 (6), 530-53.

Shrout, P.E. and N. Bolger (2002). "Mediation in Experimental and Nonexperimental Studies: New Procedures and Recommendations." *Psychological methods* 7 (4), 422.

Slater, M., A. Sadagic, M. Usoh, and R. Schroeder (2000). "Small-Group Behaviour in a Virtual and Real Environment: A Comparative Study." *Presence: Teleoperators and Virtual Environments* 9 (1), 37-51.

Smyslova, Olga V. and Alexander E. Voiskounsky (2009). "Usability Studies: To Meet or Not to Meet Intrinsic Motivation." *PsychNology Journal* 7 (3), 303-24.

Sorom, T (2010). "The Year in Virtual Goods by the Numbers." *Retrieved from techcrunch. com: http://techcrunch. com/2010/12/31/the-year-in-virtual-goods-by-the-numbers*.

Spaulding, Trent J (2010). "How Can Virtual Communities Create Value for Business?" *Electronic Commerce Research and Applications* 9 (1), 38-49.

Srinivasan, Srini S., Rolph Anderson, and Kishore Ponnavolu (2002). "Customer Loyalty in E-Commerce: An Exploration of Its Antecedents and Consequences." *Journal of Retailing* 78 (1), 41-50.

Steinkuehler, Constance A (2006). "Massively Multiplayer Online Video Gaming as Participation in a Discourse." *Mind, Culture, and Activity* 13 (1), 38-52.

Steuer, Jonathan (1992). "Defining Virtual Reality: Dimensions Determining Telepresence." *Journal of communication* 42 (Autumn), 73-93.

Takatalo, Jari, Gote Nyman, and Leif Laaksonen (2008). "Components of Human Experience in Virtual Environments." *Computers in Human Behavior* 24, 1-15.

Team, RDevelopmentCore "R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria, 2007." in: ISBN 3-900051-07-0.

Tenenhaus, Michel, Vincenzo Esposito Vinzi, Yves-Marie Chatelin, and Carlo Lauro (2005). "Pls Path Modeling." *Computational statistics & data analysis* 48 (1), 159-205.

Teng, Ching-I (2010). "Customization, Immersion Satisfaction, and Online Gamer Loyalty." *Computers in Human Behavior* 26 (6), 1547-54.

tVPN (2008). "A Virtual Worlds Primer." *The Virtual Policy Network*. www.virtualpolicy.net/_Downloads/Documents/tVPN-VW_Primer-V1Q308.pdf.

VanDick, Rolf, Michael W. Grojean, Oliver Christ, and Jan Wieseke (2006). "Identity and the Extra Mile: Relationships between Organizational Identification and Organizational Citizenship Behaviour." *British Journal of Management* 17, 283-301.

Verhoef, Peter C., Katherine N. Lemon, A. Parasuraman, Anne Roggeveen, Michael Tsiros, and Leonard A. Schlesinger (2009). "Customer Experience Creation: Determinants, Dynamics and Management Strategies." *Journal of Retailing* 85 (1), 31-41.

Vygotskiĭ, Lev Semenovich and Michael Cole (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard university press.

Wasko, Molly, Robin Teigland, Dorothy Leidner, and Sirkka Jarvenpaa (2011). "Stepping into the Internet: New Ventures in Virtual Worlds." *MIS Quarterly* 35 (3), 645-52.

Waterworth, Eva L. and John A. Waterworth (2001). "Focus, Locus, and Sensus: The Three Dimensions of Virtual Experience." *CyberPsychology & Behavior* 4 (2), 203-13.

Webster, Jane, Linda Klebe Trevino, and Lisa Ryan (1993). "The Dimensionality and Correlates of Flow in Human-Computer Interactions." *Computers in Human Behavior* 9 (4), 411-26.

Westheimer, J. and J. Kahne (1993). "Building School Communities: An Experience-Based Model." *Phi Delta Kappan* 75 (4), 324-28.

Wetzels, Martin, G. Odekerken-Schroder, and C. Van Oppen (2009). "Using Pls Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration." *Management Information Systems Quarterly* 33 (1), 11.

Yang, Zhilin and Robin T Peterson (2004). "Customer Perceived Value, Satisfaction, and Loyalty: The Role of Switching Costs." *Psychology & Marketing* 21 (10), 799-822.

Yee, Nick (2006). "Motivations for Play in Online Games." *CyberPsychology & Behavior* 9 (6), 772-75.

Yoo, Y. and M. Alavi (2001). "Media and Group Cohesion: Relative Influences on Social Presence, Task Participation, and Group Consensus." *MIS Quarterly* 25 (3), 371-90.

Yung, Yiu-Fai, David Thissen, and Lori D McLeod (1999). "On the Relationship between the Higher-Order Factor Model and the Hierarchical Factor Model." *Psychometrika* 64 (2), 113-28.

Zeithaml, V. A., L. L. Berry, and A. Parasuraman (1996). "The Behavioral Consequences of Service Quality." *Journal of Marketing* 60, 31-46.

Zeithaml, Valarie A, Leonard L Berry, and Ananthanarayanan Parasuraman (1996). "The Behavioral Consequences of Service Quality." *The Journal of Marketing*, 31-46.

Appendix: Construct and Scale Items

Construct [source]	Factor loading	Reliability
HOLISTIC VIRTUAL EXPERIENCE		
INDIVIDUAL EXPERIENCE	**0.81**	**0.93**
Flow Experience	**0.88**	**0.92**
Control (1993)	**0.87**	**0.92**
• When navigating this virtual island, I feel like I am in charge.	0.93	
• I feel that I have control over my interactions on this virtual island.	0.84	
• This island helps me manage my product/service needs.	0.92	
Enjoyment (1995)	**0.79**	**0.90**
• I enjoy visiting this virtual island for its own sake aside from any products or services I may eventually purchase.	0.90	
• I visit this virtual island because I think it is fun.	0.91	
• I visit this virtual island because it fascinates me.	Omitted	
Attention Focus (1993)	**0.88**	**0.94**
• When visiting this island, I do not think about other things.	0.94	
• When visiting this island, I am focused on what I am doing.	0.88	
• When navigating this island, I am totally absorbed in what I am doing.	0.92	
Situational Involvement	**0.86**	**0.91**
Personal Relevance (2008)	**0.84**	**0.91**
• Visiting this virtual island is important to me.	0.85	
• Visiting this virtual island is relevant for me.	0.91	
• This existence of this island means a lot to me.	0.86	
Curiosity (1993)	**0.80**	**0.92**
• Visiting this island excites my curiosity.	0.91	
• Interacting with other customers makes me curious.	0.93	
• Navigating the island arouses my imagination.	Omitted	
Interest (1993)	**0.88**	**0.94**
• I find it intriguing to visit this island.	0.88	
• One can say visiting this island interests me a lot.	0.92	
• This virtual island has caught on to me	0.94	
COMMUNAL EXPERIENCE	**0.86**	**0.93**
Social Presence	**0.92**	**0.93**
Sense of Self-Presence (2001)	**0.84**	**0.92**
• On this island I have a sense of "being there."	0.88	
• Somehow I feel that this virtual environment surrounds me.	0.92	
• I have a sense of acting within this virtual place, rather than operating something from outside.	0.87	
Sense of Co-presence (2006)	**0.89**	**0.93**
• I perceive that I am in the presence of others on this virtual island.	0.93	
• I felt that others are watching me and are aware of my presence.	0.87	
• Other customers and sales associates appear to be sentient (conscious and alive) to me.	0.85	
• I perceive other avatars as representatives of other people.	0.84	
Sense of Identification (2006)	**0.81**	**0.90**
• I identify with other avatars on this virtual island.	0.91	
• My avatar is like other avatars on this virtual island.	0.86	
• This island is a reflection of who I am.	0.84	
Social Capital	**0.85**	**0.91**
Civic Virtue (2008)	**0.87**	**0.93**
• I assist fellow customers in finding solutions to their problems.	0.93	
• I want to work together with others to improve the virtual island experience.	0.84	
• I keep up with the latest technical developments in order to make useful contributions to this virtual island.	0.93	

Construct [source]	Factor loading	Reliability
Reciprocity (2008)	**0.79**	**0.92**
• When I receive help, I feel it is only right to give back and help others.	0.91	
• Patrons should return favors when others are in need.	0.93	
Social Trust (2008)	**0.83**	**0.90**
• I trust others presenting on the island to know things I don't know.	0.84	
• I would base decisions on advice I received from others.	0.90	
• Visitors to this island have high integrity.	0.87	
CUSTOMER PERCEIVED VALUE		
Economic Value (2007)		**0.91**
• I find the products on this virtual island economically valuable.	0.89	
• I am happy with the prices on this virtual island.	0.88	
• This virtual island offers unique value.	0.85	
Social Value (2008)		**0.89**
• I think of the patrons of this virtual island as my extended circle of friends.	0.88	
• Visiting this virtual island provides a source of camaraderie for me.	0.82	
• I rely on the personal support I get from others on this island.	0.85	
CUSTOMER LOYALTY		
Loyalty 2nd Life (in virtual world) (1996)		**0.90**
• I will try new services that are provided on this virtual island.	0.90	
• I will recommend other people to patronize this virtual island.	0.88	
• I will say positive things to other people about this island.	0.85	
Loyalty 1st world (1996)		**0.89**
• I will encourage other people to do more business with this company.	0.87	
• I will do more business with this company.	0.86	
• I consider this company my first choice to shop for buying future products and services.	0.83	

Table 1: Customer and User Experience Research in Real and Virtual Worlds

	Similarities between Real World and Virtual World Experiences	Unique Characteristics of Real world Experiences	Unique Characteristics of Virtual World Experiences
Individual experience	- Encompasses every aspect of a firm's offering, and is an internal and subjective response (Meyer and Schwager 2007).Individuals' real-world experience can influence how they behave in the virtual-world (Novak 2009; Dean et al. 2009). - Service interface (e.g., technology) one determinant of customer experience (Verhoef et al. 2009). - The experience can be cognitive, affective, and physical (Verhoef et al. 2009). - Brand experience via product and service experience (Brakus, Schmitt and Zarantonello 2009).	- Consumption experience (Brakus, Schmitt and Zarantonello 2009). - Individual experience is the knowledge and skills gained from what an individual has observed, encountered, or undergone (n.d.).	- Immersion in 3-D virtualization goes beyond traditional real-world lives (Novak 2009; Jeandrain 2001). - Compelling online experience through flow (Novak, Hoffman and Yung 2000). - All aspects of how people use an interactive product (Hassenzahl and Tractinsky 2006). - Intrinsic (e.g., Flow and enjoyment) and extrinsic motivation (e.g., personal relevance and involvement) drive engagement and VW experience (Shin 2009; Huang 2006).
Communal experience	- Communal experience involves social presence (referring to a sense of "being together in an environment" with another) and social capital (representing networks and relationship quality that emerge from collective interactions among individuals) (Paxton 1999; Hwang and Park 2007). - Socializations involves sharing, advocating, altruism, social interaction, two-way communication, and building short/long term relationships (e.g., connection and emotional bonds) with others (Brodie et al. 2011; Haythornthwaite 2007). - Social experience part of overall customer experience (Verhoef et al. 2009).	- A unique source of socialization, especially face-to-face communication and interaction (Bente, Krämer and Eschenburg 2008; Barnes 2008).	- Socialization is a key motivation to use the VW (Hassouneh and Brengman 2013). - Unique sources of socialization (Blanchard and Markus 2004) via wide variety of a rich communication environment, and immersion in a virtual community. - Social presence (e.g., co-presence and self-presence) is driven by avatar and vividness of 3-D visualization used in VW (Nowak and Biocca 1999; Bente et al. 2008; Steuer 1992).
Social value	Sense of friendship from interacting with others (Charla Mathwick, C. Wiertz and Ko de Ruyter 2008).	- A physical product can enhance social self-concept (Sheth, Newman and Gross 1991).	- Driven by avatar representation and multiplicity of social cues (e.g., facial expressions and gestures of avatar in VW) (A. Davis et al. 2009). - Ability to create (or share) content, info, and knowledge with others in real time with rich communication tools (e.g., text chat, voice manipulation, personal message).

Economic value	Economic (or functional) value refers to value for money (Sheth, Newman and Gross 1991).	Customers can evaluate performance and quality of physical product that reflects value for money (Sheth, Newman and Gross 1991).	- An ability to connect real economic value (real money) with virtual currency. - Transaction-oriented VWs (e.g., Second Life) focus on buying and selling products or services (Armstrong and Hagel 2000).
Customer loyalty	Loyalty behaviours: repurchases, revisits, positive word of mouth, new product or service trial, and relationship commitment (Johnson, Herrmann and Huber 2006; Mittal and Kamakura 2001; Srinivasan, Anderson and Ponnavolu 2002; Valarie A Zeithaml, Leonard L Berry and Ananthanarayanan Parasuraman 1996; Sharma and Patterson 2000).	- Loyalty drivers: trust (Harris and Goode 2004), satisfaction (Cronin, Brady and Hult 2000; Mittal, Kumar and Tsiros 1999), service quality (Valarie A Zeithaml, Leonard L Berry and Ananthanarayanan Parasuraman 1996; Kim, Park and Jeong 2004), switching cost (Kim, Park and Jeong 2004), and customer-perceived value (Yang and Peterson 2004; Mittal, Kumar and Tsiros 1999).	- Loyalty drivers: trust (Spaulding 2010), sense of virtual community (Kim, Lee and Hiemstra 2004; Srinivasan, Anderson and Ponnavolu 2002), personal and social interaction (Choi and Kim 2004), social awareness and perception (Goel et al. 2013), social capital (Charla Mathwick, C. Wiertz and Ko de Ruyter 2008), customization (Srinivasan, Anderson and Ponnavolu 2002; Teng 2010), and flow experience (Goel et al. 2013; Novak, Hoffman and Yung 2000).

Table 2: Variable Reliability and Validity

Variables	Composite Reliability	AVE	R Square
Measurement Model: Second-order			
Social Presence	0.93	0.55	0.84
Social Capital	0.91	0.56	0.72
Flow Experience	0.92	0.60	0.77
Situational Involvement	0.91	0.57	0.74
Measurement Model: Third-order			
Communal Experience	0.93	0.44	0.75
Individual Experience	0.93	0.44	0.66
Measurement Model:Forth-order			
Virtual Experience	0.94	0.31	0.00
Substantive Model			
Economic Value	0.91	0.76	0.14
Social Value	0.89	0.72	0.32
Lolyalty in virtual world	0.90	0.76	0.35
Lolyalty in real world	0.89	0.73	0.36

Table 3: Construct Intercorrelations

	1	2	3	4	5	6	7	8	9	10	11
1 Communal Experience	**0.66**										
2 Economic Value	0.31	**0.87**									
3 Flow Experience	0.37	0.28	**0.77**								
4 Individual Experience	0.41	0.32	0.88	**0.66**							
5 Loyalty in real world	0.37	0.53	0.29	0.32	**0.85**						
6 Loyalty in virtual world	0.33	0.44	0.23	0.31	0.35	**0.87**					
7 Situational Involvement	0.34	0.28	0.50	0.86	0.26	0.31	**0.75**				
8 Social Capital	0.85	0.25	0.28	0.30	0.33	0.26	0.24	**0.75**			
9 Social Presence	0.92	0.29	0.37	0.41	0.32	0.33	0.34	0.57	**0.74**		
10 Social Value	0.51	0.33	0.36	0.44	0.44	0.51	0.40	0.42	0.47	**0.85**	
11 Virtual Experience	0.86	0.38	0.72	0.81	0.41	0.39	0.69	0.70	0.82	0.56	**0.56**

Notes:

(1) n = 344

(2) The square root of the average variance extracted (AVE) is on the diagonal.

(3) Communal and individual experience are third-order construct

(4) Holistic virtual experience is forth-order construct

Figure 1: Hierarchical Model of Holistic VE

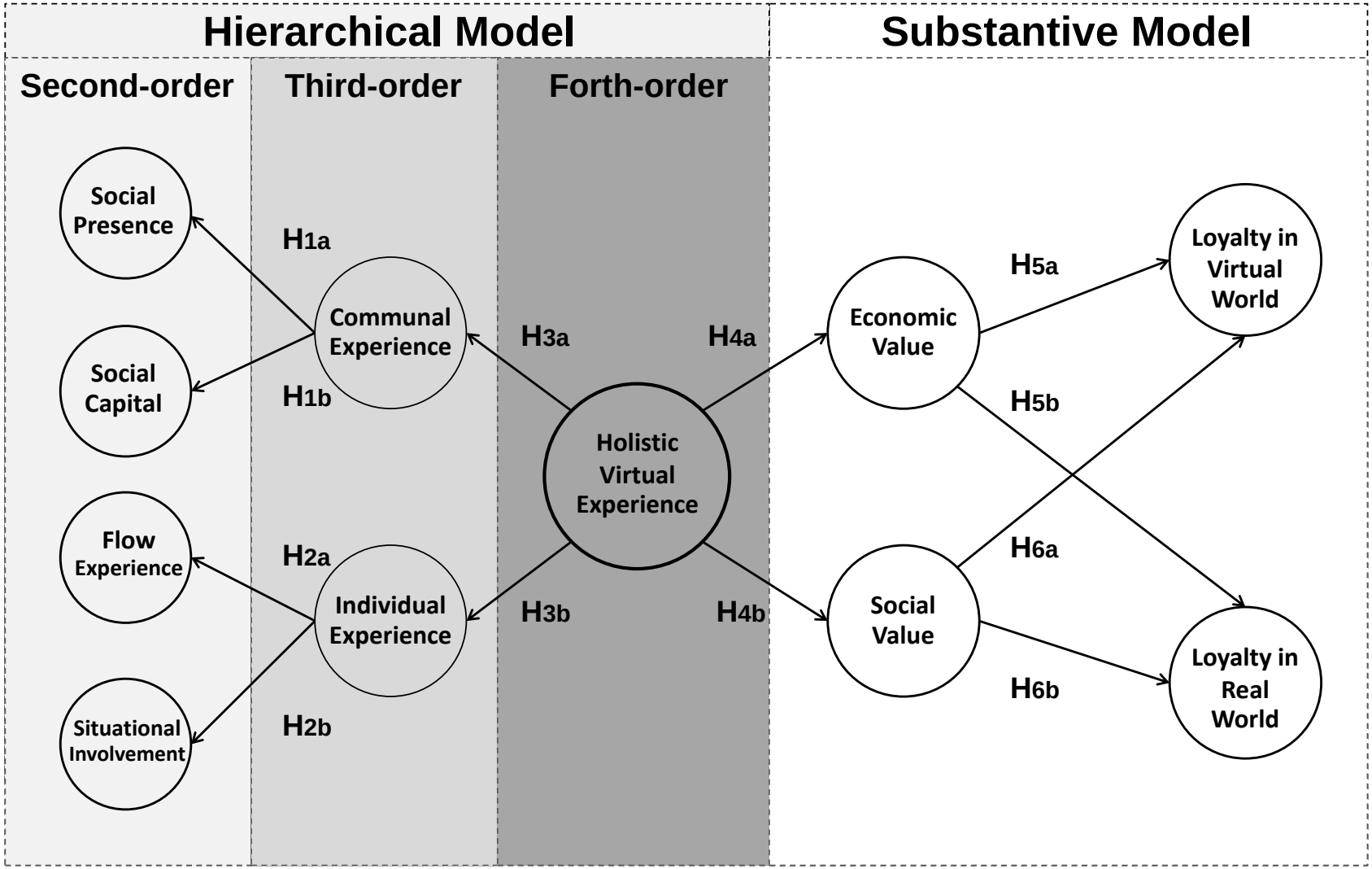

Figure 2: Path Coefficients