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CONSUMING BITS: AN EXPLORATORY STUDY OF USER GOALS FOR VIRTUAL CONSUMPTION

Completed Research Paper

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Abstract

Virtual consumption, or consumption of virtual goods and property, has become a major economic activity in social virtual worlds such as Second Life. Given that virtual consumption has become an important part of everyday virtual life in social virtual worlds, understanding virtual consumption can be an essential aspect to understanding user behavior in those worlds. Despite its significance, little research has explicitly examined virtual consumption. Unsurprisingly, then, we know very little concerning the fundamental question of why users consume virtual property. The research study described in this paper is an initial examination of that question. For the study, we employed the laddering interview technique and means-end chain analysis, which produces users' goal structure in reference to a hierarchical system of interrelated goals. 93 participants were interviewed in Second Life for the study. The results show that virtual consumption widely penetrates into virtual life and make virtual experience much richer.

Keywords: Virtual consumption, social virtual worlds, means-end chain analysis

Introduction

Virtual world (VW) is the term commonly used to indicate a computer-simulated persistent spatial environment supporting synchronous communication among multiple users (Holmström and Jakobsson 2001; Jakobsson 2006). Since the first commercialized VW, *Ultima Online*, appeared in 1999, VWs have grown dramatically in number and size over the last decade as supporting technologies (e.g., virtual reality, broadband) have been advanced. Recently a new type of VW, stressing social interactions and the empowerment of users, has become popular. These environments are called *social virtual worlds* (SVWs). The high number of users reflects the popularity of SVWs. At February 2008, *Second Life*, the largest SVW, had over 12 million registered users (SLOG 2008). In contrast to gaming virtual worlds (GVWs), such as *World of Warcraft*, where users' activities are based on pre-defined themes produced by game designers, SVWs endow users with the ability to personalize their virtual experiences which induce diverse behaviors under minimum constraints (Juul 2005). SVWs offer their users an opportunity to determine their experiences in the worlds for themselves (Dreyfus 2008), and this autonomy makes these worlds places filled with diverse behaviors and activities such as socialization, education, and entertainment.

One of the predominant behaviors of users in SVWs is *virtual consumption*, or the in-world consumption (i.e., purchasing) of virtual property. Virtual consumption is supported mainly by two elements of SVWs: *user empowerment* and *in-world real-money trading* (RMT). SVW users can create virtual property, have property rights, and can buy and sell property. This type of environment has generated a flood of creative virtual goods and property which has stimulated the exponential growth of virtual consumption seen recently. RMT of virtual property is not new. Some GVW players began putting their virtual property on *eBay* in 1999 (Lehdonvirta 2005). However, while earlier forms of RMT were not supported by GVW operators and were performed outside of VWs, newer forms of RMT are supported by the operators of these worlds and the trading is conducted inside of SVWs. Over half of *Second Life* users have intentions to buy virtual property (Fetscherin and Lattemann 2007), and more than \$360M were spent in user-to-user trading of virtual property in SL in 2008 (Linden Lab 2009). Indeed, virtual consumption can be considered a usual and prevailing phenomenon in SVWs (Lehdonvirta 2005). Virtual consumption has led to an influx of real money into SVWs. This has increased the complexity of VWs in terms of technological factors (e.g., security) and governmental intervention (e.g., taxation) (Bray and Konsynski 2007; MacInnes 2004), which may ultimately have a key role in transforming SVWs. Virtual consumption, therefore, is an important factor in understanding SVWs.

The topic of virtual consumption has been studied in a very limited way as a part of research on the virtual economy. The current body of research on the virtual economy, including virtual consumption, focuses largely on legal aspects and economic analysis. One issue engaging researchers in this area is the issue of whether RMT should be regarded as real transactions in the legal sense (Lastowka and Hunter 2004). Some researchers have performed analyses of virtual properties using economic concepts including demand curves, price flexibility, or macroeconomic indicators (Castronova 2004). While legal and economic research is valuable in understanding the overall environment of the virtual economy, it rarely reflects the perspective of the economic subject, that is, users' understandings of virtual economy. Since social virtual worlds are essentially *social*, their success or failure depends on their ability to retain active users (Platoni 2008). Therefore it is important and meaningful to investigate the virtual economy from the users' standpoint, as much as from legal and macroeconomic perspectives. Although academic researchers recognize the importance of the users' perspectives on virtual economy (Guo and Barnes 2007; Lehdonvirta 2005; Sivan 2008), there is currently a void in user-perspective research related to the virtual economy, including the topic virtual consumption. Even the fundamental question of *why users consume virtual goods and property* remains unanswered. The study reported in this paper is an initial exploration of users' perspectives on virtual consumption, focusing specifically on the topic of *users' goals for virtual consumption*.

In order to gain an understanding of the users' goals related to the consumption of virtual goods and property in SVWs, we used means-end chain analysis (MECA), which is a method for eliciting individuals' goal structure (i.e., goals and their relations) for an object or an event (Olson and Reynolds 1983). Prior studies investigating users' goals in cyberspace produced sets of separate individual user goals (Ridings and Gefen 2004; Yee 2006) but offer little explanation about the relations among goals. This limitation may preclude the ability to draw a more comprehensive picture of user goals. To gain a more comprehensive understanding, goals need to be explained within a goal structure that includes a hierarchical system of interrelated goals (Pervin 1989). Accordingly, the current study attempts to clarify the goal structure of users engaged in virtual consumption in SVWs, beyond finding isolated goals. By employing MECA, we expect that this approach will provide richer information and offer more

nuanced understandings about user goals for virtual consumption in SVWs. The analysis was also judged beneficial to the purposes of this study in that it offers a methodological procedure verified by previous studies.

Theoretical Background

Virtual Economy

Virtual worlds typically have an economy-like system which simulates a real-world economy. This internal economic system of virtual world is called the ‘virtual economy’ (Castronova 2002; Bartle 2003). Similar to the real-world economy, a virtual economy consists mainly of *virtual property*, *virtual currency*, *virtual market*, and *participants* (Lehtiniemi 2008). Spatial-metaphorical characteristics of virtual worlds offer a setting for users to accept virtual property (e.g., land, clothes, cars) as intended objects rather than the underlying programming codes or scripts themselves. Virtual property indicates *rivalrous* and *persistent* virtual objects *interconnecting* users in VWs (Fairfield 2005). Virtual property owners have exclusive control of their property, which is persistent once created and is interconnected with other users. For example, if a user owns a house in a virtual world, the user has control over the house which persists as long as the VW operator considers him or her a valid user, and the virtual object may be experienced by others with the user’s permission.

Virtual currency indicates a means of payment in the VW which is sanctioned by the VW operator. Virtual currency may have a visual form such as coins; it may be represented by points or numbers. Even though virtual currency is only dedicated to the VW, these currencies are traded with real money outside the VW, e.g., in *eBay* or virtual property trading markets. Some types of virtual currency can be officially exchanged with real money in SVWs, for example, Linden dollars in *Second Life*. As virtual currency becomes real money, the virtual economy has a blurred boundary with the real-world economy and, furthermore, has a more real-world like economy. Thus, virtual currency not only plays the role of a facilitator of transactions in VWs but also as a link to connect the virtual economy to the real-world economy (Shin 2008).

Virtual market is defined as a place where users exchange virtual property and services. Virtual markets are classified into two types: external virtual markets which exist outside the VW and are usually unsanctioned by the VW operator and internal virtual markets which exist inside the VW and are sanctioned by the VW operator. Because the VW operator provides virtual property to the users and does not allow user-to-user RMT of virtual property in the interior virtual market, users trade virtual property in the exterior virtual market, or ‘black’ virtual markets, so to speak, such as *eBay* or other websites which are dedicated to the trading of virtual property (Castronova 2001). For example, *Ultima Online* users began user-to-user RMT of virtual property on *eBay* in the late 1990s (Lehdonvirta 2005). Some SVWs such as *Second Life*, *Entropia Universe*, and *There* have both the role of virtual property and also support user-to-user RMT of virtual property in the interior virtual market. Such internalization of virtual market has spurred the rapid rise of the virtual economy.

Major participants in the virtual economy include SVW operators, governmental agencies, and users. SVW operators provide an environment for a particular virtual economy. They sanction virtual currency and provide secure systems for safe transactions. They also play the role of providers of virtual objects (e.g., *Hobbo*), and regulate virtual businesses (e.g., SL restrictions of gambling and sexual services). Despite the lack of direct involvement in the virtual economy, governmental agencies affect SVW operators’ decision-making regarding policies. For example, the European Union decided to tax user-to-user RMT of virtual objects and this decision will be reflected in SVW operators’ policies (Reuters *Second Life* 2007). While SVW operators and governmental agencies are involved in supporting and influencing the environment of the virtual economy, users are the subject of the virtual economy. Users are the most important participants in SVWs in that SVWs are principally user-oriented cyberspaces and the user base is a requisite for the survival of a social virtual world. From an economic point of view, users as vendors as well as consumers contribute greatly to the growth of a virtual economy. An overwhelming array of diverse property produced by users has filled up virtual markets. The virtual economy has boomed by virtue of users’ pursuit of values offered by virtual property. A recent commentary in *The New York Times Magazine* (Walker, 2009), reflects the way that this type of consumption is becoming more of a mainstream economic activity, observing that “With more of life lived online, spending on things that don’t exist seems more normal....Consuming things made of bits might sound weird, but actually it offers a lot of the same attractions that make people consume things made of atoms.” (p. 28)

Means-End Chain Analysis (MECA)

A goal is a desired outcome of an action (Locke and Latham 1990). Many researchers take the view that goals exist within a hierarchical system where a goal is located between its superordinate and subordinate goals, and furthermore, that each goal is a means to achieve its superordinate goal (Kruglanski et al. 2002; Newell and Simon 1972; Pervin 1989). A means-end chain analysis (MECA) stems from the idea of a hierarchical goal system. MECA posits that product or service attributes represent the means by which consumers achieve benefits and important personal values (i.e., ends) (Gutman 1982; Olson and Reynolds 1983). In other words, MECA is an approach for discovering the important meanings that consumers ascribe to a product or service's attributes (Voss et al. 2007). The analysis assumes that consumer knowledge is hierarchically organized by levels of abstraction (Reynolds et al. 1995), and focuses on a product or service's meanings at three levels of abstraction: attributes, consequences, and values. Attributes refer to a product or service's physical or observable properties; consequences are the benefits attained by the attributes; and values imply highly abstract motivation that guides usage behavior (Klenosky 2002). An attribute-consequence-value chain is usually expressed by a hierarchical map, which consists of nodes (i.e., attributes, consequences, and values) and relationships among them.

An alternative methodology for the traditional MECA approach involves calculation of the level of abstractness. Employing network theory (see Scott 1991), some studies calculate the abstractness of each element (concept) and use it to determine the position of the element in a hierarchical map instead of a strict specification of three levels of abstraction (i.e., attributes, consequences, and values) (Bagozzi and Dabholkar 1994; Pieters et al. 1995; Capozza et al. 2003). This revised method allows researchers to identify the relationships of elements without having to conduct additional work to classify elements into three levels. One critique of MECA is that an answer frequently does not correspond to the question (e.g., a consequence or value answer to the attribute question). Studies that employ network theory reduce this limitation because each element has a level according to its abstractness without any label (e.g., attribute). The current study uses this modified laddering technique.

MECA typically depends on a laddering interview technique, which has been used extensively in consumer research to understand consumers' preferences toward products or services (e.g., Klenosky 2002; Reynolds and Rochon 2001), and in organization research, which elucidates an organization's strategic values and decision-making structures (e.g., Peffers et al. 2003; van Rekom et al. 2006). To help respondents elicit lower or higher levels of abstractions for the concepts, the technique aims to understand the way in which the respondent sees the world (Reynolds and Gutman 1988). A laddering procedure typically includes three questions: the attribute question (What attribute makes the product (or service) attractive to you?), the consequence question (Why is the attribute important or desirable to you?), and the value question (Why is your response important?). In the first phase, the respondent is asked to supply the attributes of a product that affect his or her consumption decision. The respondent is then asked to explain what benefits he or she attains owing to the attributes. Finally, the respondent is asked to offer the reason why those benefits are important to him or her, namely, a justification stage. All responses are coded, and then a hierarchical map is finally produced by level of abstraction, that is, attributes → consequences → values.

Methodology

Data Collection

The target SVW for this study was *Second Life* which is the largest SVW. *Second Life* (SL) users have their own avatar representing themselves. SL users may also elaborate a personal avatar's face, hair, and body and clothe it. They can also create 3D objects (e.g., chair, building, waterfall) using basic shapes (e.g., squares, triangles, cubes) and chunks of code called script; additionally, they can perform virtual tasks with them or sell them to other members. Via personal avatars, users can enjoy synchronous chatting at the park or on the beach, dancing at night clubs, or taking a class.

Three approaches were used to recruit participants. First, we sent group leaders of a wide diversity of groups email which requested them to distribute our message soliciting participation in the study to their members. To participate, subjects made appointments with us by email or SL IM (Instant Message). Second, we directly recruited logged-in group members by SL IM. Lastly, we visited various SL places (e.g., beaches, parks, sandboxes) and directly solicited SL users who were in those places. Ninety-three SL users participated in a laddering interview and each participant received \$5 rewards in the forms of Linden dollars or PayPal, depending on their preference. The

participants were heterogeneous in demographics (see Table 1). Approximately the half of the participants were older than 34 years and had undergraduate or graduate degrees, indicating that *Second Life* is used by people of all ages and educational backgrounds. Over 30 percent of the participants had a premium membership which allows the members to have virtual territory in *Second Life*. The majority of the participants can be regarded as highly-attached users in that about 80 percent of the participants logged into *Second Life* almost daily and 72 percent of the participants purchased virtual goods at least once a week.

		Frequency	Percent			Frequency	Percent
Age	18-24	20	21.5	Tenure as a <i>Second Life</i> user	1 month or less	10	10.8
	25-34	26	28.0		2 to 6 months	20	21.5
	35-44	22	23.7		7 to 12 months	15	16.1
	45-54	17	18.3		1 year to 2 years	24	25.8
	55 or older	7	7.5		Longer than 2 years	23	24.7
	No answer	1	1.1		No answer	1	1.1
Gender	Male	39	41.9	Login frequency	Once a month	0	0.0
	Female	52	55.9		Once a week	2	2.2
	No answer	2	2.2		Several times a week	17	18.3
Education	High school	33	35.5		Almost daily	74	79.6
	Community college	15	16.1		No answer	0	0.0
	Undergraduate	17	18.3	SL purchase frequency	Never	3	3.2
	Graduate	26	27.9		Once a month	22	23.7
	No answer	2	2.2		Once a week	27	29.0
Type of account	Free	64	68.8		Several times a week	40	43.0
	Premium	29	31.2		No answer	1	1.1
	No answer	0	0.0				

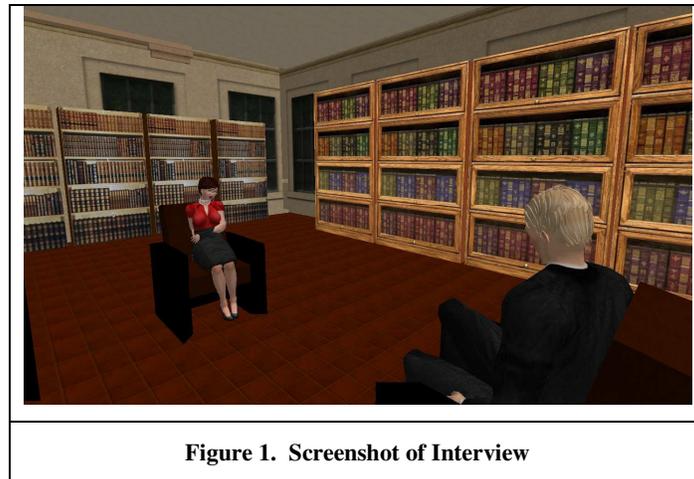


Figure 1. Screenshot of Interview

Laddering Interview

All interviews were performed in a comfortable place in SL where other avatars would not disturb the interview (see Figure 1). The participants were first asked to complete a web survey including demographic and supplemental questions, and then started the interview which was conducted by text chatting and took about 20 minutes on average. The interview consisted of three questions for a laddering analysis. Based on prior laddering research, we asked three open questions to probe SL users’ goals for virtual consumption: (1) *What kinds of virtual goods or property did you buy in Second Life? Could you give me three examples?*; (2) (first probing question) *Why did you*

buy this specific item? or Why do you use this specific item in Second Life?; (3) (second probing question) Why is this reason important to you? For example, an interviewee may answer virtual clothing, virtual accessories, and virtual house to the first question. Then, we asked the second question for each item (e.g., Why did you buy virtual clothing?) which was followed by final question (e.g., Why is that reason important to you?). Because this was a text-chat interview, we could capture and save the interview content.

	<i>Topics</i>	<i>Examples</i>
T1	Amusement	<ul style="list-style-type: none"> • It just enhances my enjoyment of the SL experience. • I get pleasure out of looking at them and some have inspired me.
T2	Better avatar appearance	<ul style="list-style-type: none"> • To present a professional appearance. • I thought most of the human avatar looked really terrible; I could be a squirrel here...I thought it would be cute and better than other humans.
T3	Business	<ul style="list-style-type: none"> • Manage and resell land in smaller pieces to other residents. • The building is a place for me to sell my goods.
T4	Creativity	<ul style="list-style-type: none"> • Building stuff is the creative aspect of SL. • This is a virtual world where the imaginative part is the most important one.
T5	Escapism	<ul style="list-style-type: none"> • I forget about my real life issues • When I am in SL, I let go of real life and truly get into the experience.
T6	Exploring (removed)	<ul style="list-style-type: none"> • I sometimes take friends on tours of <i>Second Life</i> on the ship. • I can just hop on a motorcycle and drive around.
T7	Fantasy	<ul style="list-style-type: none"> • My hair in real life is more unmanageable in real life than I care for. I can take off the constraint in SL. • In SL I have the freedom to do so in RL I do not.
T8	Knowledge acquisition	<ul style="list-style-type: none"> • It is useful for practicing skills like building. • Our sim members share common interests and they are very helpful. Advice on SL problems (like how to do something, or where to go to find something, or where a party is going to be, or where a contest is).
T9	Like shopping	<ul style="list-style-type: none"> • I like to shop. • I love walking into a store and every thing fits.
T10	My own place	<ul style="list-style-type: none"> • Just space and a bit of privacy. • I got tired of hanging out in clubs and public places and wanted a place to go and be able to do what I wanted and think and to have a place for me.
T11	Projection of real-world convention/activity	<ul style="list-style-type: none"> • In real life, we wear clothing. We treat SL similar to real life on many levels. • It is a spot that I and my real-world boyfriend can meet virtually.
T12	Decorative activity	<ul style="list-style-type: none"> • I enjoy beauty, I like to create avatars. • Enjoy interior decorating
T13	Realistic experience	<ul style="list-style-type: none"> • The clothes here seem very realistic • To me SL is not a game and it really is a life. It gives me a sense of being settled down.
T14	Relaxing	<ul style="list-style-type: none"> • Sense of peace • A place to hang out and relax... some of my friends and I used to get together and watch movies here.
T15	Role-playing	<ul style="list-style-type: none"> • I need them to fight when I roleplay • Since I lived in <i>Caledon</i> (a sim), I needed nice Victorian/steam punk style clothes.
T16	Self-esteem	<ul style="list-style-type: none"> • It does give you more attention. • Someone asks me where I got my hair, and then It just makes me feel good and I get complimented.
T17	Self-expression	<ul style="list-style-type: none"> • I've spent a lot of time customizing it. • This is an inner look to my inner personality what I want to look like.
T18	Socialization	<ul style="list-style-type: none"> • Spend time with friends and make parties. • People tend not to interact as quickly with someone in linden supplied clothing the word.
T19	Uniqueness	<ul style="list-style-type: none"> • Makes it more personal, unique. • It makes me stand out amid an ocean of other avatars.

Results

Coding

For analysis, the responses from three questions were coded. One of the researchers coded the data using an open coding procedure in which codes were not predetermined but rather emerged from the data. This resulted in 49 detailed codes present in the data. In cases where the data contained more than one topic, multiple codes were assigned. For example, “A house is for changing my avatar’s clothing and for having parties with friends” was assigned two codes – *Privacy* and *Socialization*. A second coder, the other researcher, independently re-coded the data using the set of codes identified by the first coder. The two raters were in agreement on 469 of the 545 codes assigned (Cohen’s Kappa = 0.83), indicating an acceptable level of inter-rater reliability (Fleiss 1981). Inter-rater disagreements were then reconciled through discussion. Finally, associated codes were grouped into 19 topics (super-codes), as shown in Table 2.

In order to confirm theoretical saturation indicating that no more new code appears during data collection (Strauss and Corbin 1998), we checked the number of new codes with the passage of time. Theoretical saturation assumes that the more data are collected, the less new codes emerge and finally no new code emerge; that is, saturation. Thus, the cumulative number of new codes with the passage of time should not rise at a saturated point. Our data confirmed this (Figure 2); therefore, data collection was stopped at this point.

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9
	First 10 samples	Next 10 samples	The rest 13 samples						
Number of new codes	31	8	5	1	2	0	1	1	0
Cumulative	31	39	44	45	47	47	48	49	49

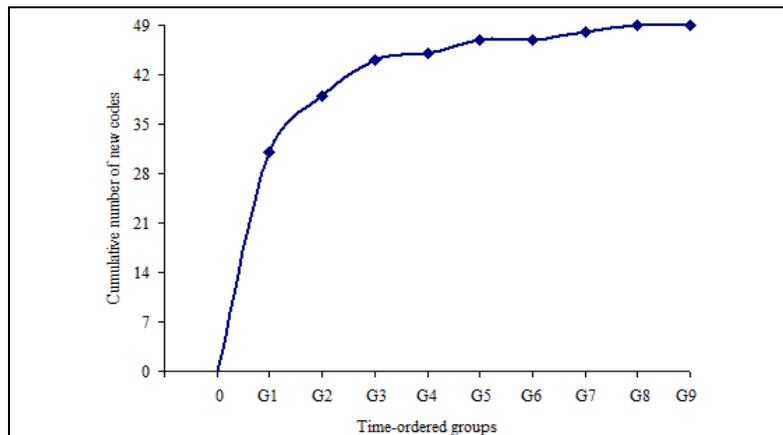


Figure 2. Cumulative Number of New Codes

Generating a Goal Structure

Responses to the three questions generated a means-end chain, or a ladder of meanings; that is, answers to the first question asking about what virtual property was purchased in SL became a starting point, and answers to the next probing question correspond to a means for answers to the last probing question. For example, if an interviewee responds *Clothing* to the first question; *Uniqueness* to the next question; and *Self-expression* to the last question,

then a hierarchical chain is created: *Clothing* → *Uniqueness* → *Self-expression*. All relations were summarized in an implication matrix which depicts the number of times each topic (code) leads to each other topic in the responses (Klenosky 2002). As can be seen in Table 4, each topic in the row leads to other topics in the column. For instance, T15 (*Role-playing*) led to T1 (*Amusement*) 9 times and T5 (*Escapism*) 5 times.

As stated previously, the current study employed an alternative method in analyzing laddering interviews, proposed by Bagozzi and Dabholkar (1994) and Pieters et al. (1995). Instead of classifying responses into three labels, this approach, which is based on network analysis (Scott 1991), produces a hierarchical structure by comparing the number of times each topic is mentioned as the means versus the end. The approach uses out-degrees and in-degrees in order to estimate abstractness of each element. Out-degrees of a particular topic refers to the number of times the topic serves as the source or origin (means) of linkages with other topics (i.e., the row sum of the element in an implication matrix), whereas in-degrees of the topic indicate the number of times the topic serves as the object or end of linkages with others (i.e., the column sum of the element in an implication matrix) (Pieters et al. 1995). Abstractness of an element is the ratio of in-degrees over in-degrees plus out-degrees of the element, and ranges from 0 to 1 (Pieters et al. 1995). Elements with high abstractness scores are regarded mainly as ends, while ones with low abstractness scores are thought of primarily as means. Based on this alternative approach, we created an implication matrix (see Table 4). Additionally, in order for informative analysis, this study calculated centrality of each element, which represents the degree to which the element has a central role in the structure (Knoke and Burt 1982). Centrality is calculated by dividing the ratio of in-degree plus out-degree of a particular element by the sum of all active cells in the implication matrix (the sum=281 in the current study).

The next step was to generate a hierarchical goal map according to the information in the implication matrix. In this stage, the important point was to determine what linkages were included in a hierarchical goal map. Because inclusion of all linkages could decrease a map's usefulness and informativeness, we did not embrace all linkages and decided to employ a cutoff level (Reynolds and Gutman 1988). Following Bagozzi and Dabholkar's (1994) method, we built Table 5 to choose a cutoff level and finally selected a cutoff of four, indicating that the included relations are counted at least four times. This cutoff level represented 23.9 % of the active cells, and 51.2 % of the active linkages, which corresponds to a measure of variance (Gengler and Reynolds 1995). According to the cutoff, T6 (*Exploring*) was excluded because they had no linkage to satisfy the cutoff criterion.

The hierarchical goal map in Figure 3 offers a graphical summary of the means-end structure pertinent to virtual consumption in a SVW. In the map, the topics are placed relative to their abstractness scores. Accordingly, the more abstract a topic, the higher it is located in the map. To avoid complexity of the map, linkages between virtual property and goals are separately shown in the lower part of Figure 3.

Table 4. Implication Matrix

Topics	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	Out -degrees
P1. Avatar clothing/accessories/animation	5	48					9		8		4	18	9	1	17	14	34	13	20	200
P2. Building tools/materials	2		2					1				19					1			25
P3. Gadgets/vehicles/musical tools	1		3			5	2			1		2	4			1	1	3		23
P4. Virtual real estate/furniture	3		6	2			3	1		14	2	25	3	8	1	3	5	16		92
P5. Weapons															4			1		5
T1. Amusement							2										2	1		5
T2. Better avatar appearance	3		2				5	1	2		1	1	1		2	8	4	3	1	34
T3. Business	2							1			2							1		6
T4. Creativity																				0
T5. Escapism																				0
T6. Exploring	3																			3
T7. Fantasy	2			1	3						2			2			2	1		13
T8. Knowledge acquisition			1																	1
T9. Liking shopping	4																	1		5
T10. My own place	2		1		2		3				2	1	2	5				5		23
T11. Projection of RL conventions/activity			1										1							2
T12. Decorative activity	9		6	5			6	2			4		1	2		1	13	3		52
T13. Realistic experience	4	2					2				1			5	1		2	1	1	19
T14. Relaxing	1				2		1	1							1		1	4		11
T15. Role-playing	9			3	5		4	4			2						1	4		32
T16. Self-esteem	1			1	1		3					1		1			2	4		14
T17. Self-expression	6	1			2		1	1				1	3	4		2		2	4	27
T18. Socialization	6	1					1	1		3	2	1	2	3		2				22
T19. Uniqueness													2				7	3		12
In-degrees	52	4	11	10	15	0	28	11	2	3	16	5	12	22	4	13	34	33	6	281
Abstractness	0.91	0.11	0.65	1.00	1.00	0.00	0.68	0.92	0.29	0.12	0.89	0.09	0.39	0.67	0.11	0.48	0.56	0.60	0.33	
Centrality	0.20	0.14	0.06	0.04	0.05	0.01	0.15	0.04	0.02	0.09	0.06	0.21	0.11	0.12	0.13	0.10	0.22	0.21	0.06	

* Out-degree: the number of times the topic serves as the source or origin (means) of linkages with other topics

* In-degree: the number of times the topic serves as the object or end of linkages with other topics

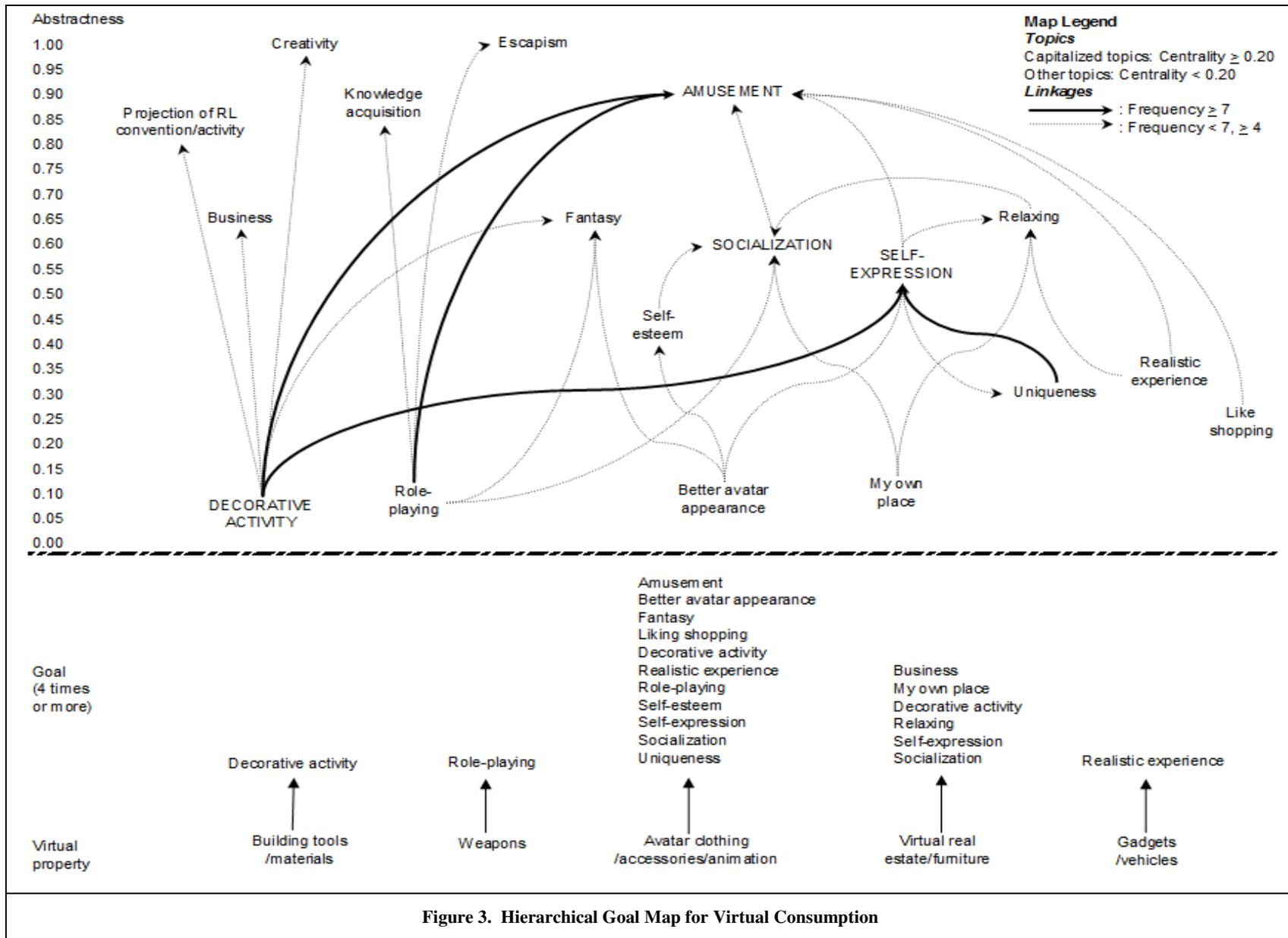
* Abstractness = (In-degrees) / (In-degrees + Out-degrees)

* Centrality = (In-degree + Out-degree) / the sum of all active cells

* We regard all virtual property as initial origins; thus, virtual property has no in-degree value

Table 5. Statistics for Determining a Cutoff Level

Cutoff level	Number of active cells in the implication matrix	Percentage of active cells at or above the cutoff level (%)	Number of active linkages in the implication matrix	Percentage of active linkages at or above the cutoff level (%)
1	109	100.0	281	100.0
2	68	62.3	240	85.4
3	38	34.9	180	64.1
4	26	23.9	144	51.2
5	15	13.8	100	35.6



Discussion

Means-end chain analysis was an effective approach to clarify users' goal structure for virtual consumption in SVWs. The analysis is summarized in the hierarchical goal map, which provides an easy-to-read but rich understanding of users' goal structure for virtual consumption. The results show that *Amusement*, *Decorative activity*, *Self-expression*, and *Socialization* are the predominant goals for virtual consumption in this SVW in terms of centrality of the topics. Also, the four goals correspond to 49.3 percent of all linkages in implication matrix (Table 4). *Avatar clothing/accessories/animation* and *Virtual estate/furniture* jointly correspond to 85 percent of virtual property mentioned in implication matrix (Table 4). They are also important means which are connected to 17 goals of 19. The key findings are summarized below:

- *Decorative activity*, which is supported by three categories of virtual property (*Building tools/materials*, *Avatar clothing/accessories/animation*, and *Virtual estate/furniture*), leads to many of the upper goals. First, *Decorative activity* is a crucial means to achieve two central goals for virtual consumption: *Amusement* and *Self-expression*. The strong association with *Amusement* implies that decorating or creating virtual objects is highly intrinsically motivated. In other words, intrinsic motivation, or *Amusement*, promotes users' *Decorative activity* which needs virtual property such as building tools or avatar accessories. This finding is in line with hedonic consumption theory (Campbell 1992) which posits that consumption may involve the pursuit of pleasure, and particularly considering a hedonic aspect of SVWs, the theory may be a compelling framework for understanding virtual consumption in SVWs.
- *Decorative activity* may aim at *Self-expression* which subsequently leads to *Amusement*. Virtual property for *Decorative activity* enables users to present themselves, and thus, virtual consumption serves to generate a self through the images and styles conveyed by virtual property and furthermore self-expression produces pleasure. *Self-expression* is also an upper goal of *Uniqueness*. Real-world consumption is sometimes motivated by human desire to make an individual distinctive from the crowd (Veblen 1899). Similarly, to others an avatar may be just one of them without distinctive clothing or accessories in SVWs, and users therefore consume diverse kinds of virtual property to attain their uniqueness and originality. Ultimately, considering that virtual property supports *Decorative activity* and the pursuit of *Uniqueness*, and the both enable users to achieve the goal *Self-expression*, virtual consumption can be regarded as 'self extension' (Belk 1988).
- *Decorative activity* reflects real-world conventions or activities (*Projection of real-world convention/activity*). Many users explicitly mention that a SVW is a separate world from their real life; sometimes real-world conventions or relationships are reflected in virtual life and this projection induces virtual consumption. For example, one user said that because an empty virtual house depresses people as does an undecorated real house in the real world she decorates her house with furniture or sculptures in a SVW; and another user mentioned that she dresses up to meet her real-world boy friend who is remote from her place in the real world. Accordingly, virtual consumption may be anchored in the real world to a degree. Additionally, some users build virtual objects for sale and also decorate their stores to better attract users; and users' decorative activities stimulate their creativity and enact fantasy experiences.
- *Role-playing* is not only another stimulus for consumption of virtual property, particularly *Weapons* and *Avatar clothing/accessories/animations*, but is also used for various consumption ends including *Amusement*, *Socialization*, *Fantasy*, *Escapism*, and *Knowledge acquisition*. Following the rules of a role-playing community makes users have challenging assignments which may eventually produce enjoyment. *Role-playing* also provides users with opportunities for meeting different sorts of people, enabling their imagination to 'come true', and temporarily take them away from real-world problems. In addition, role-playing community members can be informants who provide other members with useful information in their virtual life.
- Users may accomplish some consumption ends, such as *Self-esteem*, *Self-expression*, and *Fantasy*, through the feeling of a *Better avatar appearance*. When users feel that their avatars look nice, they have confidence in the self that ultimately has an encouraging role in social interaction or *Socialization*. Also, several interview participants stated that they recognize newbies (i.e., newcomers) in SVWs, depending on avatar appearance, and avoid interaction with newbies. This idea implies that *Better avatar appearance* may function as a ritual which separates separate *us* from *them* (Tajfel and Turner 1986), and eventually be a means for social inclusion. *Better avatar appearance* can also be a means for expressing the self and making dreams come true, for example to resemble a famous movie star.

- Virtual real estate offers *My own place* which an owner can control for *Socialization* and *Relaxing*. Popular places where lots of avatars come together not only have usually a lag problem such as slow-motion avatars, but may also meet hooligans. Having virtual real estate under their control can be an alternative to solve these problems and may be a place where users have social events such as parties. Additionally, users can make own virtual real estate a comfortable place for *Relaxing*. In many cases, because users relax with their friends in virtual real estate, *Relaxing* has an association with *Socialization*.
- In addition, virtual consumption carries the feeling of a *Realistic experience* which induces *Amusement*. Delicately imitated virtual clothes or vehicles give users real-like feelings and further arouse a sense of the virtual world (e.g., as one user declared “To me, SL is not a game, and it really is a life. It gives me a sense of being settled down”). Finally, virtual consumption meets a need for virtual shopping (*Like shopping*) which leads to *Amusement*, implying that some users enjoy shopping itself for *Amusement* as do some people in the real world.

Overall, the findings show that virtual consumption is comprehensively involved in virtual life in SVWs as consumption is vital in the real world. This point has a significant implication that virtual consumption is common experience rather than optional behavior in SVWs; thus, researchers and practitioners need to know users’ virtual consumption phenomenon for a better understanding of users’ behavior in SVWs.

Implications

This study has several implications for theory and practice. The most important theoretical contribution of the study is its informative merits. As the first motivational investigation of virtual consumption, the study provides fundamental knowledge about virtual consumption. Because of its newness, virtual consumption has not been well conceptualized, and even basic questions such as users’ reasons for virtual consumption are unanswered. The study begins to provide this kind of foundational knowledge through an initial understanding of why users consume virtual property. It also suggests potential theoretical frameworks for future research on virtual consumption (e.g., theories of hedonic consumption (Campbell 1992), theories of social identity (Tajfel and Turner 1986), theories of the extended self (Belk 1988)), and an ontological argument of virtual social practices (Brey 2003). Second, the study serves as a reminder to IS researchers about the importance of the topic by confirming that virtual consumption is widely associated with diverse activities and values in SVWs. Researchers attempting to understand the behavior of SVW users should bear in mind that virtual consumption is an important component of their virtual life. Underestimation of virtual consumption as merely habitual activities could leave an important element missing in understanding user behavior. Lastly, the study makes a contribution by introducing means-end chain analysis which can be fruitful in developing richer understandings of users’ goals for social cyberspaces. In prior studies that examined users’ goals for social cyberspaces, such as virtual communities (Ridings and Gefen 2004) and gaming virtual worlds (Yee 2006), goals are identified, but without any explanation of relations among them. The means-end chain analysis used in this study offers a richer explanation of user goals by presenting the hierarchical goal map, which consists of separate goals and their relations.

The study also has implications for SVW service providers. First, the findings remind service providers of the importance of security. Although the intention of service providers is to follow the principle of *laissez-faire* in SVWs, the study highlights the importance of ongoing efforts to develop and maintain secure systems for user-to-user transactions and ownership of virtual property. As virtual consumption has become deeply associated with the majority of the activities in SVWs, user-to-user transactions have increased and users’ possession of virtual property has become universal. As a result, risk from hacking and scams has increased and service providers’ interventions have been required to maintain a peaceful virtual market. If safe transactions and possession of goods are not guaranteed, then users will be reluctant to engage in economic activities (i.e., little user demand and production), with a steep downslide of the virtual economy. Moreover, users’ distrust towards a secure virtual life may increase their ontological vulnerability and ultimately weaken their attachment to the world. Another implication of the study for service providers is the need to raise the clarity of different aspects of the SVW marketplace. For example, several users pointed out the ambiguity of prices. One extreme case is the situation where some users sell virtual property which they got for free elsewhere and the buyer could also have acquired for no cost. This type of information asymmetry may distort the virtual market and create a distrustful virtual society, which is a barrier to user retention. To enhance market clarity, service providers might add price comparison systems and user review systems on sellers, an approach that has been demonstrated workable in B2C e-commerce. Finally, the goal structure analysis shows the importance of avatar clothing, accessories and animation in satisfying many of the users’ higher

level goals. Service providers, then, might collaborate with fashion brands and provide branded fashion to enhance the attractiveness of the application and user experience.

Limitations and Future Research

This study has the following three limitations. First, the study's samples may be biased in that we recruited participants during three weeks, and so, the majority of the participants were users who frequently log into *Second Life*. However, because over 80 percent of users drop out within two months of registering (Platoni 2008), practically it was difficult to include those transient users in our samples. The other potential bias with our data is that because the participants voluntarily responded to the survey our results may be based towards highly-motivated users. Accordingly, the study has a limitation in fully generalizing the findings. Second, the study deals with only one SVW. Thus, the findings of the study should be re-examined on other SVWs, which have different environments, in future research. Furthermore, in order for further understanding, future research needs to compare the findings to virtual consumption in other cyberspaces, such as gaming virtual worlds, conventional virtual communities, social networking services, or weblogs. Finally, this study did not control variance caused by culture, which may function as a crucial variable in fully understanding SVW users' goals for virtual consumption. *Second Life* is a worldwide cyberspace and the users come from various countries. Cultural considerations can thus be a prominent aspect in future research on virtual consumption in cyberspaces.

References

- Bagozzi, R. P., and Dabholkar, P. A. "Consumer Recycling Goals and their Effect on Decisions to Recycle: A Means-End Chain Analysis," *Psychology & Marketing* (11), 1994, pp 313-340.
- Bartle, R. *Designing Virtual Worlds*, New Riders Press, Indianapolis, IN, 2003.
- Belk, R. W. "Possessions and the Extended Self," *Journal of Consumer Research* (15), 1988, pp 139-168.
- Bray, D. A., and Konsynski, B. "Virtual Worlds: Multi-Disciplinary Research Opportunities," *The DATA BASE for Advances in Information Systems* (38: 4), 2007, pp 17-25.
- Campbell, C. "The Desire for the New: Its Nature and Social Location as Presented in Theories of Fashion and Modern Consumerism," in: *Consuming Technologies: Media and Information in Domestic Spaces*, R. Silverstone and E. Hirsch (eds.), Routledge, London, 1992, pp 48-64.
- Capozza, D., Falvo, R., Robusto, E., and Orlando, A. "Beliefs about Internet: Methods of Elicitation and Measurement," *Papers on Social Representations* (12), 2003, pp 1.1-1.14.
- Castronova, E. "On Virtual Economies," CESifo Working Paper Series (No. 752), in: <http://ssrn.com/abstract=338500>, 2002.
- Castronova, E. "Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier," CESifo Working Paper Series (No. 618), in: <http://papers.ssrn.com/abstract=294828>, 2001.
- Castronova, E. *Synthetic Worlds*, The University of Chicago Press, Chicago, IL, 2004.
- Dreyfus, H. L. *Faking It*, California Magazine, March/April, 2008, pp 51-54.
- Fetscherin, M., and Lattemann, C. "User Acceptance of Virtual Worlds: An Explorative Study about Second Life," in: <http://www.fetscherin.com/UserAcceptanceVirtualWorlds.htm>, June, 2007.
- Fleiss, J. L. *Statistical Methods for Rates and Proportions*, John Wiley & Sons, New York, 1981.
- Guo, Y., and Barnes, S. "Why People Buy Virtual Items in Virtual Worlds with Real Money," *The DATA BASE for Advances in Information Systems* (38:4), 2007, pp. 69-76.
- Gutman, J. "A Means-End Model Based on Consumer Categorization Processes," *Journal of Marketing* (46), 1982, pp 60-72.
- Holmström, H., and Jakobsson, M. "Using Models in Virtual World Design," *Proceedings of the Hawaii International Conference on System Sciences – 41 (HICSS-41)*, Big Island, HI, 2001.
- Jakobsson, M., *Virtual Worlds and Social Interaction Design*, unpublished doctoral dissertation, Umeå University, Sweden, 2006.
- Juul, J. *Half-Real: Video Games between Real Rules and Factional Worlds*, MIT Press, Cambridge, MA, 2005.
- Klenosky, D. B. "The "Pull" of Tourism Destinations: A Means-End Investigation," *Journal of Travel Research* (40), 2002, pp 385-395.
- Knoke, D., and Burt, R. S. "Prominence," in: *Applied Network Analysis*, R. S. Burt and M. J. Minor (eds.), Sage Publications, Beverly Hills, CA, 1982, pp 195-222.
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, M. R., Chun, W. Y., and Sleeth-Keppler, D. "A Theory of Goal Systems," *Advances in Experimental Social Psychology* (34), 2002, pp 331-379.

- Lastowka, F. G., and Hunter, D. "The Laws of the Virtual Worlds," *California Law Review* (92:1), 2004, pp 3–73.
- Lehdonvirta, V. "Real-Money Trade of Virtual Assets: New Strategies for Virtual World Operators," *Proceedings of Future Play*, Michigan State University, MI, 2005.
- Lehtiniemi, T. *Macroeconomic Indicators in a Virtual Economy*, unpublished MSc thesis, University of Helsinki, Finland, in: <https://oa.doria.fi/bitstream/handle/10024/37870/macroeco.pdf>, 2008.
- Linden Lab. "Linden Lab Goes Shopping, Buys Virtual Goods Marketplaces to Integrate Web Shopping with Second Life," in: http://lindenlab.com/pressroom/releases/01_20_09, January 20, 2009.
- Linden Lab. "Linden Lab Goes Shopping, Buys Virtual Goods Marketplaces to Integrate Web Shopping with Second Life," in: http://lindenlab.com/pressroom/releases/01_20_09, January 20, 2009.
- Locke, E. A., and Latham, G. P. *A Theory of Goal Setting and Task Performance*, Prentice Hall, Englewood Cliffs, NJ, 1990.
- MacInnes, I. "The Implications of Property Rights in Virtual World Business Models," *Proceedings of the Americas Conference of Information Systems (AMCIS)*, New York, 2004.
- Newell, A., and Simon, H. *Human Problem Solving*, Prentice-Hall, Englewood Cliffs, NJ, 1972.
- Olson, J. C., and Reynolds, T. J. "Understanding Consumers' Cognitive Structures: Implications for Marketing Strategy," in: *Advertising and Consumer Psychology*, L. Percy and A. G. Woodside (eds.), Lexington Books, Lexington, MA, 1983, pp 51-57.
- Peffer, K., Gengler, C. E., and Tuunanen, T. "Extending Critical Success Factors Methodology to Facilitate Broadly Participative Information Systems Planning," *Journal of Management Information Systems* (20), 2003, pp 51-85.
- Pervin, L. A. *Goal Concepts in Personality and Social Psychology*, Lawrence Erlbaum. Hillsdale, NJ, 1989.
- Pieters, R., Baumgartner, H., and Allen, D. "A Means-End Chain Approach to Consumer Goal Structures," *International Journal of Research in Marketing* (12), 1995, pp 227-244.
- Platoni, K. "Will Second Life Survive?" *California Magazine*, March/April 2008, pp. 53.
- Reuters Second Life. "European Residents Angry, but Not Leaving, over VAT," in: <http://secondlife.reuters.com/stories/2007/10/02/european-residents-angry-but-not-leaving-over-vat>, October 2, 2007.
- Reynolds, T. J., and Gutman, J. "Laddering Theory, Method, Analysis, and Interpretation," *Journal of Advertising Research* (28), 1988, pp 11-31.
- Reynolds, T. J., and Rochon, J. P. "Consumer Segmentation based on Cognitive Orientations: The ChemLawn Case," in *Understanding Consumer Decision Making? The Means-End Approach to Marketing and Advertising Strategy*, T. J. Reynolds and J. C. Olson (eds.), Lawrence Erlbaum, Mahwah, NJ, 2001, pp 283-298.
- Ridings, C. M., and Gefen, D. "Virtual Community Attraction: Why People Hang out Online," *Journal of Computer-Mediated Communication* (10), 2004, Article 4.
- Scott, J. *Social Network Analysis: A Handbook*, Sage Publications, London, 1991.
- Shin, D-H. "Understanding Purchasing Behaviors in a Virtual Economy: Consumer Behavior Involving Virtual Currency in Web 2.0 Communities," *Interacting with Computers* (20:4-5), 2008, pp 433-446.
- Sivan, Y. "3D3C Real Virtual Worlds Defined: The Immense Potential of Merging 3D, Community, Creation, and Commerce," *Journal of Virtual Worlds Research* (1:1), in: <http://journals.tdl.org/jvwr/article/view/278/234>, 2008.
- SLOG. "Second Life Statistics: 22-Feb-2008," in: <http://secondslog.blogspot.com/2008/02/second-life-statistics-22-feb-2008.html>, February 22, 2008.
- Tajfel, H., and Turner, J. C. "The Social Identity Theory of Inter-group Behavior," in: *Psychology of Intergroup Relations*, S. Worchel and L. W. Austin (eds.), Nelson-Hall, Chicago, 1986.
- van Rekom, J., van Riel, C. B. M., and Wierenga, B. "A Methodology for Assessing Organizational Core Values," *Journal of Management Studies* (43), 2006, pp 175-202.
- Veblen, T. *The Theory of the Leisure Class: An Economic Study of Institutions*, Macmillan, New York, 1899.
- Voss, R., Gruber, T., and Szmigin, I. "Service Quality in Higher Education: The Role of Student Expectations," *Journal of Business Research* (60), 2007, pp 949-959.
- Walker, R. "Immaterialism," *The New York Times Magazine*, May 9, 2009, pp 28.
- Yee, N. "Motivations of Play in Online Games," *CyberPsychology & Behavior* (9), 2006, pp 772-775.