Flow Online: Lessons Learned and Future Prospects

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Abstract

Although the flow construct has been widely studied over the past decade in marketing and related fields, it has proven to be an elusive construct to measure and model. In this paper, we first examine two of the most important themes in flow research in the last decade: the conceptualization and measurement of flow in online environments and the marketing outcomes of flow. Second, while the unique characteristics of the Internet contributed to our belief that flow was an important construct for understanding consumer use of the Web in 1996, the environment of the Web itself has changed radically over the past decade. Thus, we consider the current context of the Internet for the role and application of the flow construct, as well as important related constructs that will be useful for understanding compelling experiences in the contemporary online environment.

Introduction

Over the past decade, marketers have been quite effective at developing an understanding of Web usage and the market potential of the Web. However, although marketers are beginning to gain an understanding of strategies to attract visitors to the wide range of commercial Web sites, less is known about the factors that make using the Web a compelling experience for its users, and of the key consumer behavior outcomes of this compelling experience.

A little over ten years ago, we proposed that commercial Web sites would benefit by facilitating what has been called the experience of "flow" (Hoffman and Novak 1996). We argued that the marketing objective during trial and usage of an online environment should be directed to providing "flow opportunities" where the consumer is completely engaged with his or her interaction with the computer. This paper was one of the earliest, if not first, to argue that the Internet was going to be an important marketing and communications phenomenon, was unique compared to traditional media and proposed one way to think about how consumers experience this new environment.

It is interesting to note that in 1996, our position that the Internet is something special - more than "just another marketing channel" – was met with a good deal of skepticism. Even five years later, for example, Coltman et.al. (2001) argued that "the promises of Internet-driven growth may actually be more hyperbole than substance," and that "there is no guarantee that pioneering firms like Amazon or eBay will be able to maintain their position as the market evolves." Despite this skepticism, the fact is that U.S. retail e-commerce sales, excluding travel, are expected to reach $131 billion in 2007, representing a 17.5% growth rate from the previous year, as compared to a 4.8%

increase in total U.S. retail sales (eMarketer 2007). Additionally, as of 2007, it is worth pointing out that eBay and Amazon remain the top two Internet retailing web sites (www.alexa.com, www.comscore.com). The Web appears to be living up to its potential as a retail environment, and early sites like eBay and Amazon that facilitate the flow experience continue to attract large numbers of customers.

Hoffman and Novak (1996) introduced the idea that the "customer experience" is very important in the Internet environment, and argued that focusing on the nature of what is special about the Internet would likely drive much of the innovative work in this area. One such special characteristic is that online consumer behavior is grounded in both goal-directed and non-directed motivations, and thus both need to be studied and modeled for the fullest account.

Many researchers built upon the conceptual model introduced in Hoffman and Novak (1996), and the companion empirical paper by Novak, Hoffman and Young (2000). In fact, Stremersch, Verniers and Verhoef (2007) identified the former as the most cited paper between 1990 and 2002, corrected for time, and the latter as the fourteenth most cited paper during that same period. Yet, although the flow construct as we conceptualized it has been the subject of considerable research for over 10 years, it has proven to be an elusive construct to define and use in practice. In this paper, we will review some of the highlights of that research stream and offer our thoughts on where the research is – and should – be going.

Briefly, flow was originally characterized by Csikszentmihalyi (1997) as an integration of the constructs of a clear goal, feedback, challenges matching skills, concentration, focus, control, loss of self-consciousness, transformation of time, and the

autotelic nature of an activity. People report experiencing flow in a wide variety of activities in daily life, including sports and games, shopping, dancing, performing surgery and playing computer games.

Our research has emphasized flow in human-computer interaction, specifically interaction with the Web, and we observe that some people are more likely to reach a state of flow than others (Novak, Hoffman and Yung, 2000). Verbatim descriptions of the flow experience from Novak, Hoffman and Duhachek (2003) illustrate many of these characteristics for online activities. Here is an example of "experiential flow" reported by a user of Comic Chat:

> *I was chatting with people from around the world, but also just lurking. No serious discussions. And not with a special person that I cared about. More like 'where are you from?' 'what are you studying?' Not much deeper than that.*
>
> *I couldn't stop and go home. It became very late and still I couldn't make myself shut down the computer. I said to myself only a few more minutes, but the minutes became hours. I felt what was going on in the chat was very important even though nothing special really happened. I didn't want that world to disappear as it would if I had shut off the computer. All my other obligations like writing a paper didn't seem important. I didn't want it to be quiet.*
>
> *The feeling of being together with other people, a feeling of connection. Like it is a different world and the fear of not knowing what is going on when I was gone. Like in the way I do not want to leave early from a party, in fear of not knowing who will come and what will happen.*

An additional example from data collected by Novak, Hoffman and Duhacheck (2003) was from a consumer who experienced flow while searching for a book at Amazon.com. In this case, the activity began as goal-directed, but as often the case online, shifted into an experiential activity:

> *I was looking for a book that I could not remember the name of.*
>
> *I became totally lost. I forgot my original purpose multiple times and found myself just looking for books that sounded interesting.*

The easy links from one topic to another. The natural way in which the interface guided me to other areas of interest. It kept me going because it knew what I was interested in.

Our aims in this paper are twofold. First, we provide a brief and selective review that illuminates two of the most important themes in flow research in the last decade. These themes include 1) clarifications of the conceptual definition and scope of flow and 2) identification of the marketing outcomes of flow. Second, while the unique characteristics of the Internet contributed to our belief that flow was an important construct for understanding consumer use of the Web in 1996, the environment of the Web itself has changed radically over the past decade. We thus consider the current context of the Internet for the role and application of the flow construct, as well as important related constructs that will be useful for understanding compelling experiences in the contemporary online environment.

A Selective Literature Review

Conceptual Model and Validation

In a series of three papers (Hoffman and Novak 1996; Novak, Hoffman and Yung 2000; and Novak, Hoffman and Duhachek 2003) we introduced and validated a conceptual model of flow, and considered the flow construct from the perspective of both goal-directed as well as experiential activities. The key insight from Hoffman and Novak (1996) is a comprehensive conceptual model of the network navigation process for Web users. Central to this model is the concept of flow – the complete engagement with and immersion in an activity. This model provides insight into 1) what creates compelling

online experiences (i.e. congruence of skill and challenge, interactivity, vividness, and motivation); 2) the nature of a compelling flow experience (i.e., involvement, attention, telepresence, and flow), and 3) outcomes of this experience (i.e., increased learning, perceived behavioral control, exploratory mindset, and positive subjective experience).

Novak, Hoffman and Yung (2000) tested this theoretical model and produced a revised empirical model validating most of the relationships in Hoffman and Novak (1996). They demonstrated that the various constructs underlying the conceptual model could be measured and that the constructs related to each other in predicted ways. The authors also discovered that the various constructs changed in importance over time. Not surprisingly, skill and importance increased with Web experience. However, attention, challenge, telepresence, flow and exploratory behavior decreased. As people use the web longer and longer, they use it for skill-based, goal-directed purposes.

The distinction between goal-directed and experiential Web use was explored in more depth in Novak, Hoffman and Duhachek (2003). In the paper, the distinction was noted between goal-directed and experiential shopping behaviors, and it was demonstrated that flow occurs for both goal-directed and experiential activities. However, contrary to expectations, it was found that reported flow experiences were actually more prevalent among those who use the Web for goal-directed activities, rather than just for fun.

The Flow Concept Remains Murky

One important stream of research is motivated by the ongoing lack of a clear conceptual definition of the flow construct. Novak, Hoffman and Yung (2000) and

Novak, Hoffman and Duhachek (2003) measure flow with a simple direct report three-item instrument, prefaced by a narrative description of flow. A number of researchers have employed this instrument directly or modifications of it (e.g., Choi, Kim and Kim 2007; Hsu and Lu 2003; Luna, Peracchio and de Juan 2002, 2003; Korzaan 2003; Sicilia, Ruiz, and Munuera 2005). Researchers working in this approach view flow as a unidimensional construct with a set of ancillary constructs that serve as antecedents and consequences of flow.

Other authors have incorporated some of the antecedents and consequences of flow directly into the flow construct, and have developed and utilized multi-dimensional definitions of flow. Pace's (2003) grounded theory of the flow experiences of Web users is notable in that it focuses on building rather than testing flow theory. Using semi-structured in-depth interviews, in which respondents were asked to discuss their flow experiences when using the Web in the context of information-seeking activities, categories in the data were identified and systematically coded, and relationships among these categories determined. The resulting concept map shows close agreement with the Hoffman and Novak models. Pace (2003) views flow as a multi-dimensional construct comprised of the joy of discovery, reduced awareness of surroundings, time distortion, merging of action and awareness, a sense of control, mental alertness, and telepresence. Some of these constructs are considered by Hoffman and Novak (1996) to be antecedents of flow (i.e., control, telepresence, and time distortion), while others are considered to be consequences (i.e. joy of discovery). However, Pace's qualitative methodology is not able to address the question of causality within the set of multi-dimensional constructs identified as comprising flow.

Agarwal and Karahanna (2000) placed flow in the broader context of cognitive absorption. Five dimensions, including temporal dissociation, focused immersion, heightened enjoyment, control and curiosity, were identified based upon overlap of definitions from a range of studies that have looked at flow. In their theoretical model, flow – conceptualized as cognitive absorption - leads to greater usefulness and perceived ease of use, which leads to behavioral intention to use. Their model incorporates the familiar Technology Acceptance Model (TAM), widely used to predict technology adoption. In the context of this model, cognitive absorption (flow) is a precursor of both perceived usefulness and perceived ease of use, two key components of the TAM. One limitation of this model, however, is that it does not illuminate where cognitive absorption comes from. However, the model has several important implications. First, as interfaces become richer and more appealing, the importance of interfaces that are more enjoyable themselves becomes greater predictors of intentions to buy. Second, cognitive absorption provides the user with a sense of being in command. The authors recommend that usability testing of websites include measures of cognitive absorption.

An important avenue for future research is the investigation of the causal structure of the set of constructs identified under the rubric of flow by researchers such as Pace (2003) and Agarwal and Karahanna (2000). While these authors broaden the conceptualization of flow, it is important to determine which of the additional components are truly part of flow, as opposed to its antecedents or consequences.

A review of additional research shows considerable and continuing disparity in how flow is measure in empirical research, with the problematic finding that no two researchers seem to measure flow in the same way. Some measures are based upon the

four-channel flow model defined by skill and challenge. Based upon this model, flow is entirely determined by the congruence of skill and challenge. Along these lines, Mathwick and Rigdon (2004) use cluster analysis to identify a "flow cluster" comprised of individuals with high Internet search skill and high navigational challenge of the search task. Alternatively, Shin (2006) and Pearce, Ainley and Howard (2005) define flow as a difference measure between skill and challenge.

Other researchers construct summed scales for flow, where the items in the summed scales correspond to constructs that are related to flow. This approach has the disadvantage that it blurs the distinction between the antecedents and consequences of flow. In this stream, Skadberg and Kimmell (2004) define flow in terms of time distortion and enjoyment, while Senecal, Gharbi and Nantel (2002) define flow as comprised of concentration, control, challenge and enjoyment. Jiang and Benbasat (2005) use an 11-item summed scale developed by Webster, Trevino and Ryan (1993), aggregating items measuring control, attention and enjoyment. Choi, Kim and Kim (2000) use a six-item scale for measuring flow while playing online games, comprised of two questions for intrinsic interest, two for curiosity, one for control and one for attention focus.

Some researchers view flow as a second-order construct comprised of a series of first-order constructs. Perhaps the most ambitious is the approach taken by Huang (2006) who viewed flow, situational involvement, and enduring involvement as three second order constructs variously related to eight first order constructs. Of the first order constructs, control, curiosity, enjoyment and interest were found to relate to flow, with enjoyment and interest also overlapping with enduring involvement, and curiosity and

interest overlapping with situational involvement. Similarly, Chou and Ting (2003) conceptualize flow as a higher order construct in structural model, but in this case comprised of an empathy factor (concentration and time distortion) and a discovery factor (playfulness and exploratory behavior). Huang (2003) also employs a structural model including four separate constructs for the flow experience – control, attention, curiosity, and interest. Sanchez-Franco (2006) uses a higher-order factor composed of enjoyment and concentration. Bridges and Florsheim (2007) employ a similar approach, defining "flow elements" consisting of telepresence, time distortion, skill, interactive speed, and importance. These flow elements are not directly modeled, but used individually to predict outcome measures.

Koufaris (2002) bypasses measuring flow altogether, instead measuring a set of five constructs related to flow (control, enjoyment, concentration, perceived usefulness and perceived ease of use). Similarly, Richard and Chandra (2005) test a model "based on the theory of flow" and measure interactivity, skill, challenge, involvement, and exploratory behavior – but not flow.

It may be an understatement to suggest that there is some lack of consistency in operational definitions of flow used by different researchers. This has been noted by Choi, Kim and Kim (2007), who stated, "the construct of flow is, however, too broad and ill-defined due to the numerous ways it has been operationalized, tested and applied." Such a wide range of operational definitions and measures may have the unfortunate consequence of hindering the systematic progression of empirical research on flow. At a minimum, future researchers contemplating measuring flow should consider adopting multiple measures of flow in their studies so that it will be possible to compare the impact

of alternate definitions on substantive results. Due to its ease of administration and popularity in flow research, we recommend that Novak, Hoffman and Yung's (2000) three-item global self report measure of flow be routinely administered as one basis for comparison.

Alternatively, one may conclude from the large number of researchers using a set of "flow elements" rather than an overall measure of flow that measurement of flow as a unidimensional construct is problematic, and it is more appropriate to separately measure the components of flow. In this case, attention turns to the conceptual model of flow comprised of these components. Our recommendation that Novak, Hoffman and Yung's (2000) three-item self report measure be included still holds, since it provides an overall measure of flow useful for determining the role of other constructs as antecedents or consequences of flow. We discuss flow antecedents in the next section.

Marketing Outcomes of Flow

Choi, Kim and Kim (2007) note that when studying flow in computer-mediated environments, "a framework of three stages including flow antecedents, flow experience, and flow consequences is generally agreed upon. Apart from the question addressed in the previous section of the manner in which flow is conceptualized and measured, one key distinction among various flow models is the set of antecedents and consequences of flow. Table 1 summarizes 20 articles presenting either conceptual or structural models of flow, from the perspective of antecedents, flow experience, and consequences.

Table 1 – Summary of Conceptual and Structural Models of Flow

Authors	Antecedents	Flow	Consequences
Agarwal and Karahanna (2000) *Structural model*	Playfulness, personal innovativeness	Higher-order construct of "cognitive absorption" (curiosity, control, temporal dissociation, focused immersion, heightened enjoyment)	Perceived usefulness, perceived ease-of-use, behavioral intention
Choi, Kim and Kim (2007) *Structural model*	Learner interface, interaction, instructor attitude toward students, instructor technical competence, content	Unidimenisonal flow	Attitude toward e-learning, learning outcomes
Chou and Ting (2003) *Structural model*	Repetitive behavior	Higher-order construct (empathy, discovery)	Addictive behavior, self-control disorder, obsession, goal confusion
Finneran and Zhang (2003) *Conceptual model*	Artifact, person (trait, state), task	Multi-dimensional construct (dimensions not specified)	None specified
Hoffman and Novak (1996) *Conceptual model*	Skill, challenge, interactivity, vividness, involvement, telepresence, focused attention	Unidimensional flow	Increased learning, perceived behavioral control, exploratory mindset, positive subjective experience
Hsu and Lu (2003) *Structural model*	Perceived ease of use	Unidimensional flow	Attitude toward playing online game, intention to play online game
Huang (2003) *Structural model*	Complexity, interactivity, novelty	Multi-dimensional construct (control, attention, curiosity, and interest)	Utilitarian and hedonic web performance
Huang (2006) *Structural model*	None specified	Three higher-order constructs: 1) Flow (control, curiosity, enjoyment, interest); 2) Situational Involvement (curiosity, interest, risk, attention focus, personal relevance); 3) Enduring Involvement (enjoyment, interest, personal relevance, self-relevance	None specified
Korzaan (2003) *Structural model*	None specified	Unidimensional flow	Exploratory behavior, attitude, intention to purchase
Koufaris (2002) *Structural model* *only these constructs had significant relationships	Product involvement*, skill*, search mechanisms*, challenge*	Not directly measured. Instead used control, shopping enjoyment*, concentration, perceived usefulness*, ease of use	Unplanned purchases, intention to return*

Luna, Perrachio and de Juan (2002) *Conceptual model*	Content characteristics, skill, challenge, perceived control, unambiguous demands, focused attention, attitude toward site	Unidimenisonal flow	Revisit intention, purchase intention, purchase
Luna, Perrachio and de Juan (2003) *Structural model*	Attention, challenge, interactivity, attitude toward site	Unidimensional flow	Purchase intention, revisit intention
Novak, Hoffman and Yung (2000) *Structural model*	Online tenure, skill, control, interactivity, challenge, arousal, importance, focused attention, telepresence, time distortion	Unidimenisonal flow	Exploratory behavior (via telepresence)
Pace (2003) *Conceptual model*	Curiosity, time urgency, goal, usability, skill, challenge, distractions, content interest, progress toward goal, attention focus.	Multi-dimensional construct (joy of discovery and learning, reduced awareness of surroundings, time distortion, merging of action and awareness, sense of control, mental alertness, telepresence)	None specified
Richard and Chandra (2004) *Structural model*	Reasons to visit, OSL, skill, challenge, interactivity, navigational cues, need for cognition, site involvement	Not directly measured	Exploratory behavior, attitude, prepurchase intention
Sanchez-Franco (2006) *Structural model*	Usefulness, ease of use	Higher order construct (enjoyment and concentration)	Attitude, intention, usage
Shin (2006) *Conceptual model*	Skill, challenge, concentration, goal, gender	Higher order construct (enjoyment, telepresence, focused attention, engagement, time distortion)	Achievement, satisfaction
Skadberg and Kimmel (2004) *Structural model*	Ease of use, speed, attractiveness, interactivity, skill, challenge	Higher-order construct (time distortion, enjoyment)	Learning about a place, change of attitude and behavior
Smith and Sivakumar (2004) *Conceptual model*	None specified	Flow characterized in terms of intensity and duration	Browsing, one-time purchase, repeat purchase (all moderated by risk, willingness to buy, self confidence, product characteristics, purchase occasion)
Woszcyznski, Roth and Segars (2002) *Conceptual model*	Openness to experience, OSL, cognitive spontaneity, emotional stability, computer anxiety	Flow state (internal) Playful behaviors (external)	User satisfaction, computer proficiency, personal innovativeness in IT

It is immediately apparent that, just as we observed with flow measurement, there is a great deal of inconsistency in the way flow is modeled. For example, Woszczynski, Roth and Segars (2002) develop a conceptual model in which flow is viewed as distinct from play – "flow is a psychological variable within the person that is not directly observable…the playful behavior, on the other hand, is what the person is actually doing and is externally observable." Despite this distinction, flow and play occupy identical positions in Woszcyznski, Roth, and Segar's conceptual model, with identical antecedents and consequences. These inconsistencies make it difficult to build on flow theory and may lead to ambiguity in how knowledge of the flow construct can be used improve online customer experience.

Setting aside these ambiguities, it is nevertheless possible to draw some consistent conclusions about the marketing consequences of the online flow experience. We originally conceptualized that flow would lead to positive outcomes such as increased learning, perceived behavioral control, exploratory mindset and positive subjective experience (Hoffman and Novak 1996). Subsequent empirical work found support for increased exploratory behavior, linked through increased telepresence and time distortion (Novak, Hoffman and Yung 2000).

Conceptually, flow is hypothesized to impact key marketing variables, including online browsing behavior, purchase, and repeat purchase (Dailey 2004; Hoffman and Novak 1996; Smith and Sivakumar 2004). Researchers have provided empirical support for predictions that flow positively influences online shopping attitudes (Korzaan 2003), online purchase intentions (Korzaan 2003; Luna, Peracchio and de Juan 2002; 2003;

Richard and Chandra 2005), online purchase (Bridges and Florsheim 2007), and revisit intent (Koufaris 2002; Luna, Peracchio and de Juan 2002; 2003).

Consumers who experience flow online also learn more about the content on the site and are more likely to take action (Skadberg and Kimmel 2003). Not surprisingly, Web and brand attitudes are also positively influenced by a flow state (Mathwick and Rigdon 2004). Both the hedonic and utilitarian components of Web site performance are impacted by flow experiences (Huang 2003), and flow influences the hedonic value of online shopping experiences (Senecal, et.al. 2002).

More recently, researchers have begun to turn their attention to the impact of the simulated shopping experience on flow and its outcomes (see, for example, Bhatt 2004). We believe that investigating how marketers may enhance consumer experience of virtual products may be particularly fruitful, considering the widespread deployment of broadband and the dramatic growth in online shopping in the last five years.

Jiang and Benbasat (2005) find that virtual control of products online (through visual and functional control) enhances the perceived diagnosticity of products which in turn enhances online flow experiences. Virtual reality simulations of physical products has been shown in to create telepresence, a component of flow (Hoffman and Novak 1996) that can enhance product knowledge, attitudes and intentions and decrease perceptions of risk (Suh and Chang 2006).

Online Flow in Virtual Worlds

In 1996, the commercial Web was new, and the potential for consumers to experience flow in this emerging environment, different in many ways from the physical world, captivated early Internet researchers. While Hoffman and Novak (1996), Novak,

Hoffman and Yung (2000), Pace (2004) and Richard and Chandra (2005) examined online flow in the broad context of general Web use, other researchers have argued for looking at online flow in more situation-specific conditions. Bridges and Florsheim (2007), Korzaan (2003) and Smith and Sivakumar (2004), for example, investigated flow during the process of online shopping. At a finer level, flow has been examined during specific Web activities (Chen, Wigand and Nilan 1999; Novak, Hoffman and Duhachek 2003), during online games (Chou and Ting 2003; Hsu and Lu 2003; Rau, Peng and Yang 2006), Wan and Chiou 2006), in online chat rooms (Shoham 2004), in electronic learning systems (Choi, Kim and Kim 2007; Pearce, Ainley and Howard 2004), and while visiting specific Web sites (Luna, Peracchio and de Juan 2002, 2003; Sicilia, Ruiz and Munuera 2005; Skadberg and Kimmel 2004) or online stores (Jiang and Benbasat 2005; Koufaris 2002)

An important question is if we are to study flow in the context of specific Web sites is which Web sites are best for such inquiry? MacManus (2006) notes that 10 domains accounted for 40% of all Internet page-views in November 2006. Myspace alone accounted for 16% of all page-views. Web sites on this top ten list (including myspace, yahoo, ebay, facebook, and craigslist) would be excellent candidates for the study of flow due to the extensive amount of time consumers spend at these sites.

However, researchers interested in studying flow may wish to divert their attention beyond traditional Web sites toward a variety of new emerging areas in online human-computer interaction. A recent paper by Takatalo, Nyman and Laaksonen (2007) looks at flow in virtual environments, using an immersive environment where users were surrounded by screens measuring 3 by 3 meters onto which stereoscopic images were

projected and viewed through stereo glasses. While this sort of scenario is quite a number of years away from anything approaching widespread adoption, the rapid explosion of Web-based virtual worlds (e.g. Second Life, There.com, Active Worlds, The Sims Online) presents an exciting and accessible fertile environment for the study of flow. In fact, if we were beginning our study of Web-based flow today, in 2007, we may very likely have chosen virtual worlds rather than Web navigation as the application for our conceptual model.

Virtual worlds possess a number of unique features that make them a particularly compelling environment for the study of flow. We note that as compared to visits to Web sites and online stores, flow will occur with much greater regularity, predictability, intensity, and for extended duration in virtual worlds, facilitating its study. Consider Second Life, arguably the best current exemplar of a virtual world due to the complexity and sophistication of its virtual social and economic environment. In examining flow in virtual worlds such as Second Life, there are a number of ways in which our original conceptual model (Hoffman and Novak 1996) could be augmented.

First, there is a social context to virtual worlds (e.g. Bargh, McKenna and Fitzsimons 2002; McKenna, Green and Gleason 2002; Yee et. al, in press) which is not incorporated in current conceptual models of flow during Web usage. While Web-based stores have been described as a "warehouse" where the people are missing, there are currently upwards of 40,000 simultaneous users in Second Life at any given time, and social shopping for virtual products in virtual stores is a popular activity. Second, the extent and variety of interactivity in virtual worlds is well beyond that of consumer interaction with commercial Web sites; besides social interaction with others, there is

interaction with one's own avatar to define one's physical form, interaction with virtual objects (e.g., clothing, pets, furniture, and buildings), navigational interaction through realistic 3D environments, and interaction through constructing the world itself. The various forms of interaction often occur simultaneously. Third, due to the virtual representation of physical places which provide a powerful and often affectively-laden background context to these interactions, the construct of sense of place (e.g. Manzo 2005; Sherry 2000) could appropriately be incorporated as an antecedent of flow. Fourth, given the constant need to manipulate virtual objects, the construct of the need for touch (Peck and Childers 2003a, 2003b) would be expected to be an important antecedent of flow in virtual worlds. Finally, we note that there is a significant learning curve to Second Life which accentuates the role of skill and challenge; skill acquisition and the seeking out of new challenges is a dynamic process which evolves over long periods of time in developing mastery in a virtual world, and the feedback role of flow in motivating the consumer to develop greater skills and seek greater challenges is a particularly important topic of study. In traditional Web use, experiential usage has been found to shift to goal-directed usage over time (e.g. Novak, Hoffman and Yung 2000). In virtual worlds, the experiential "ramp-up" period will be highly extended, offering a longer time frame to study the impact of flow on consumer learning in computer-mediated environments.

Concluding Observations From the Virtual Field

In a little over a decade, the consumer Internet has evolved from a few directories and online storefronts into a vast, sophisticated network of information stores that

millions of people interact with on a regular basis. For many people, the Internet has become so integrated into their daily routines that it has become indispensable (Hoffman, Novak and Venkatesh 2004). As the Internet matures, it has moved from a static, rigid mechanism for data access into an operating system that seamlessly connects applications – and people – across the global network. The basic infrastructure for online commerce was originally in the form of static sites which has only recently evolved to include limited dynamic content and interactivity.

Huang's (2003) analysis of the impact of Web attributes and flow experience on consumer's perceptions of Website performance show that interactivity is a key aspect of improving consumer's evaluations of a Web site. Huang suggests that interactivity can be increased by designing Web sites that are "active, responsive, interactive, participatory, dynamic and demonstrable" and form an "online community." Although as recently as two years ago, it was difficult to find Web sites that met this definition of interactivity, the recent advent of so-called Web 2.0 applications such as RSS, Flash, Ajax, and the various widgets consumers can install to enhance their Web experiences are moving the Web – and individual sites - much closer to this kind of true interactivity. The Web is currently evolving very rapidly into an operating system that facilitates sharing and participation, as the popularity of social networking and social shopping sites illustrates. The seamless connection of Web 2.0 applications (i.e. geographic mapping) and services (i.e. photo-sharing) has been referred to as the "mash-up" or the "Lego phase" with parts that connect (Markoff 2006). What is important from the marketing perspective is that in this phase of the evolution of the Internet, consumers control the applications that make up the core of Web 2.0 sites. If in the early Web, "Web 1.0,"

consumers were required to follow relatively inflexible paths and existing navigational structures, the key feature of the new Web, "Web 2.0," is that consumers control their online navigational experiences and have much more freedom to do the things they are interested in doing. The Web is becoming less about individual Web sites and more about Web-based applications and environments that can be installed by consumers and used wherever – and whenever – they see fit. As the examples below suggest, the role of the flow construct in creating compelling Web 2.0 experiences may need careful and close examination.

As social networks give rise to "social marketplaces," social influence will be a powerful contributing factor to purchase decisions. These processes are worthy of careful examination by consumer behavior researchers. Individual consumers, particularly younger ones, may be expected to rely on a kind of "collective wisdom" to help them find what they are looking for and may give more weight to these kinds of consensus recommendations than expert advice or manufacturer testimonials. This kind of user-generated content is important, and deserves careful examination, because social networks can be expected to elevate word-of-mouth when consumers in those networks have known reputations and are trusted.

Marketing scholars may also fruitfully explore how user-generated content will impact brands, especially through activities like videopinions and co-creation activities. Web 2.0 technologies are supporting the emergence of online brand ambassadors that share their brand experiences with the friends in their social networks and help spread the word about their favorite (and disliked) brands. This is leading to a phenomenon where content exists and has meaning only when it is linked to other content.

We also see two types of tailored marketing competing – a "do it for me" personalization in which content is tailored to a particular consumer based on her previous online behavior and a "I'll do it for myself" customization where consumers modify the content to suit their own tastes. The presumptive advantage of personalization is reduced customer effort, but this comes at the cost of restricting consumers' options. Customization has the advantage of being easier for marketers to implement and benefits consumer control motives, but personalization may play a strong role in the future as information increasingly taxes consumers' abilities to process and integrate it in meaningful ways.

Déjà vu All Over Again

Almost as it was nearly a decade ago, we are again in the midst of exponential growth trends in technology that are resulting in new digital applications on an ongoing basis. These applications are having a profound effect on computer-mediated environments and are opening the door to a host of exciting new research opportunities for marketing and consumer behavior scholars. We believe that the online experience is a consumption event in and of itself and, for many consumers, may be much more interesting than traditional company Web sites. Web shopping today generates flow under only the most limited of conditions. It seems clear that the challenges the Web presents need to be increased for the flow-prone. Existing empirical results support the idea that those who experience flow seek, at a minimum, ease of use in Web shopping. It may be the case that for some consumers under some conditions a compelling online experience may offer an alternative to seeking the lowest price. Research has established

that flow produces positive attitudes and leads to numerous positive marketing outcomes, but much remains unaddressed. We hope this paper may offer some small stimulation on where to look next.

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