DEVELOPING AND PROPOSING A CONCEPTUAL MODEL OF THE FLOW EXPERIENCE DURING ONLINE INFORMATION SEARCH

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Information search is an essential part of the consumer`s decision making process. The online medium offers new opportunities and challenges for information search activities (in and outside the marketing context). We are interested in the way human information experiences and behaviors are affected by this.
Very often online games and social web activities are perceived as challenging, engaging and enjoyable, while online information search is far below this evaluation. Our research proposal implies that using the online medium for information search may provoke enjoyable experiences through the flow state, which may in turn positively influence an individual`s exploratory information behavior and encourage his/her pro-active market behavior.
The present study sets out to improve the understanding of the online medium`s impact on human`s exploratory behavior. We hypothesize that the inclusion of the online flow experience in our research model will better explain exploratory information search behaviors. A 11-component conceptual framework is proposed to explain the manifestations of flow, its personal and technological determinants and its behavioral consequence in the context of online information search.
Our research has the primary purpose to present an integrated online flow model. Its secondary objective is to stimulate extended research in the area of informational behaviors in the digital age.
The paper is organized in three sections. In the first section we briefly report the analysis results of the most relevant online flow theory literature and, drawing on it, we are trying to identify variables and relationships among these. In the second part we propose a research model and use prior flow models to specify a range of testable hypothesis. Drawing on the conceptual model developed, the last section of our study presents the final conclusions and proposes further steps in evaluating the model`s validity. Future research directions include improving the model and hypotheses testing.
Keywords: flow experience of online search, structural and conceptual modeling, behavioral outcome
JEL classification: M30, M31, M39, D83, L86

1. Introduction

Flow helps anticipating users` behaviors in an indirect way. It supports prediction of some mental states that further influence behavioral patterns. We consider that expanding the body of work on online flow in the information search area may improve marketers understanding of informational behaviors in the digital age and provide inspiration for more efficient communication strategies. Investigating factors that facilitate flow experience in online information search is of both theoretical importance and practical relevance. An in-depth understanding of how consumers experience information gathering online is critical to marketing programs.
Our study sets out to create a better understanding of the factors affecting entering and maintaining a flow experience during online search. We posit that flow is important to the study of informational behaviors in the digital age because it serves as a key antecedent to a more exploratory mindset and thus to more consumer generated value. The article presents a summary of the reviewed literature and a new model which combines cognitive and design elements.

We propose that the levels of interactivity and usability of web platforms, as well as the innovativeness towards web 2.0. search applications and web literacy of the users or the state of being telepresent in the online medium are critical for entering a flow state during online information search and becoming more exploratory in one`s information behavior.

2. Theoretical Basis of the Conceptual Model Proposal

The research model proposed in the present study is an empirically based integrative conceptual one, built upon previous causal flow models (Figure 1).

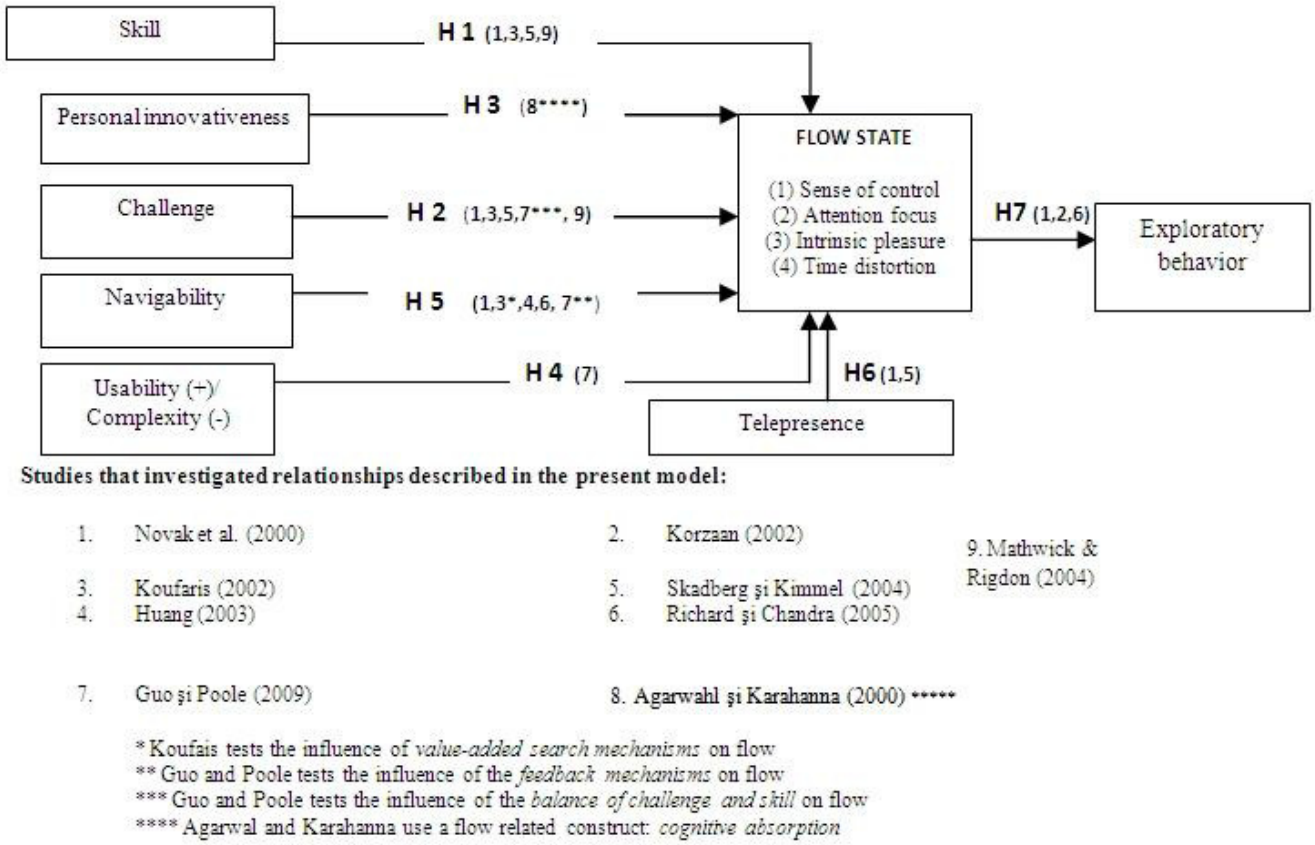

Figure 1 Theoretical foundations of the research model proposed
Source: developed by author

Hoffman and Novak (1996:57) defined online flow as "the state occurring during network navigation which is: 1) characterized by a seamless sequence of responses facilitated by machine interactivity, 2) intrinsically enjoyable, 3) accompanied by a loss of self-consciousness, and 4) self-reinforcing". They developed a conceptual model which considered *challenges*, *skills*, *focused attention*, *interactivity* and *telepresence* as flow state antecedents, while the complete list of flow consequences mentioned by them includes: *increased learning*, *perceived behavioral control*, *exploratory mind-set*, *positive subjective experience*. Flow itself is an one-dimensional construct in their view.

The initial conceptual model of Hoffman and Novak (1996) was further improved and tested by Novak et al. (1998; 2000). One of the main changes brought to the original Hoffman and Novak's model (1996) is that the new model (Novak et al., 2000) considers the construct of *control* as being an antecedent instead of a consequence. However, flow is also considered an one-dimensional construct, and is tested only in the context of general web usage.

All further major flow structural models indentified by our literature review are, more or less, built upon the pioneering work of Hoffman and Novak (1996). Koufaris (2002) uses the flow theory to investigate how emotional and cognitive responses to online shopping affect online

consumer behavior, especially their intention to return to an online shop and the probability to make spontaneous purchases. His model relates constructs from the flow theory with elements from the Technology Acceptance Model (Davis, 1989), such as *ease of use* and *perceived usefulness*, as well as other determinant factors for emotional and cognitive responses, for instance *product involvement* and *value-added search mechanisms*.
Huang (2000) uses a multi-dimensional structural model that proposes and tests *complexity* (represented by information load), *interactivity* (here, the level of information exchange) and *novelty* (new, unfamiliar, surprising events) as flow antecedents – that is as defining factors of commercially compelling websites. Skadberg and Kimmel (2004) empirically evaluate visitors` flow experience while browsing a website. Their flow operationalization is three-dimensional, including *time distortion*, *enjoyment* and *telepresence*. Guo and Poole (2009) test the complete structure of the flow model, as it was originally formulated, in an online shopping context. Their model posits that the impact of an informational technology`s features on flow would be mediated by the three preconditions of flow: *balance between challenge and skill*, *goal clarity* and *feedback mechanism*.

3. Design Methodology of Conceptual Model

In this section we will present a detailed picture of the empirical background of each hypothesis proposed and will reveal the methodology of building our research model. Drawing on a thorough flow literature review we have categorized flow factors into flow antecedents, flow dimensions and flow consequences.
In the reviewed articles we have identified some major antecedents of a holistic flow experience (Table 1). These include the *skills* necessary to overcome online *challenges* – as well as the challenges themselves, which need to go beyond the average daily level (Novak et al., 2000; Koufaris, 2002; Skadberg and Kimmel, 2004; Guo and Poole, 2009). Important technological antecedents of flow in the online medium tested by the reviewed empirical studies are: *interactivity* (Novak et al., 2000; Koufaris, 2002; Huang, 2003; Skadberg and Kimmel, 2004; Guo and Poole, 2009), *complexity* (Huang, 2003; Guo and Poole, 2009) and *telepresence* (Novak et al., 2000; Skadberg and Kimmel, 2004). Another category of online flow predictors (or of the similar state of *cognitive absorption*) identified by the literature review are the personal factors – others beside *skills* (Finneran & Zhang, 2005; Moore & Chipp, 2005; Li & Browne, 2006), from which we have selected the user`*s innovativeness towards information technologies* (Agarwal and Karahanna, 2000).
In developing our research model we have opted for a multi-dimensional flow conceptualization, as suggested by the some of the reviewed empirical studies (Koufaris, 2002; Pace, 2003; Huang, 2003; Skadberg and Kimmel, 2004; Guo and Poole, 2009). *Attention focus*/*concentration* (Koufaris, 2002; Huang, 2003; Li and Browne, 2006; Guo and Poole, 2009) and *control* (Koufaris, 2002; Huang, 2003; Li and Browne, 2006; Guo and Poole, 2009) are fundamental flow dimensions. While in a flow state, people do not have any room in their minds for any distractions, worries or irrelevant thoughts. They also feel a sense of control over their actions, which drives away concerns about failure. A flow activity is also a *self-contained activity* defined by intrinsic pleasure (Koufaris, 2002; Skadberg and Kimmel, 2004; Li and Browne, 2006; Guo and Poole, 2009). Another commonly reported dimension of the flow experience (Skadberg and Kimmel, 2004; Li and Browne, 2006; Guo and Poole, 2009) is *time distortion* (also called *transformation of time* or *temporal dissociation*). A distorted sense of time makes time appear to pass very slowly or very rapidly compared to an ordinary experience.
A particular consequence of the flow experience of online search is of special interest to this study: exploratory informational behavior patterns. Several studies explore the connection between flow and exploratory behavior (Novak et al., 2000; Korzaan, 2003; Richard & Chandra,

2005). The theoretical underpinnings of exploratory behavior in these studies involve needing, seeking and processing information as an activity for its own sake.

Table 1
Antecedents of flow in the reviewed empirical studies

Studies	**Factors determining a flow state**	**Proposed/Validated relations to flow**
Novak et al. (2000) **Contexts of study**: general web usage	skill/control interactivity (speed) challenge/arousal focused attention telepresence/time distortion	+/+ +/+ +/+ +/0 +/+
Huang (2003) **Contexts of study:** general web usage	complexity interactivity novelty	-/0 +/+ +/+
Koufaris (2002)* **Contexts of study**: online shopping on a selected web site	skills product involvement challenges value-added search mechanisms	+/+ +/+ +/+ +/+
* statistically significant relations exist only between antecedents and one of the flow dimensions (*shopping enjoyment*)		
Skadberg & Kimmel (2004) **Contexts of study**: browsing a tourism related web site	skill (visitor`s knowledge of the web site topic) attractiveness interactivity telepresence challenge (information in the web site)	+/0 +/+ +/+ +/0
Li & Browne (2006) **Contexts of study:** general web usage	need for cognition mood	+/+ +/+
Guo & Poole (2009) **Contexts of study**: online shopping on multiple web sites	web site complexity (direct influence) web site complexity (direct influence) goal clarity congruence between skills and challenges feedback mechanisms	-/- -/- +/0 +/+ +/+
Agarwal & Karahanna (2000)* **Contexts of study:** general web usage	personal innovativeness in the domain of information technology computer playfulness	+/+ +/+
* this study uses the construct of *cognitive absorption*, a construct similar to the of flow		

Note: += positive relationship; – =negative relationship; 0= statistically non-significant relationship.
Source: developed by author

H1: The perceived level of online search skills is positively related to the intensity of the flow experience during online information search activities.
H2: The perceived level of challenges is positively related to the flow state intensity during online information search activities.
Novak et al. (2000) and Koufaris (2002) confirmed the positive relationship between the level of skills and the flow intensity, as well as between the level of perceived challenge and the flow state (Table 1). However, flow itself has different operationalizations in the two studies. While in Novak et al`s (2000) research it is conceived as a one-dimensional construct, Koufaris (2002) measures flow indirectly through a set of related concepts (control, pleasure, concentration,

usefulness, ease of use). In Skadberg and Kimmel`s study (2004) only the hypothesized positive relationship between pleasure and flow was validated, while time distortion`s (the second flow dimension) relationship to flow proved statistically non-significant (Table 1). Guo and Poole`s (2009) empirical tests also confirmed a positive influence of the balance between challenge and skill, and the feedback mechanism on flow in an online shopping context. Flow itself was measured through the constructs of concentration, merging of action and awareness, time distortion, loss of self-consciousness and autotelic experience.

Based on these results, we propose that high levels of search skills and search challenges (such as finding the right keyword or recognizing relevant results) determine high levels of flow during online search. We anticipate that, when information search is challenging and the online searcher is knowledgeable about using information and information technologies, he is likely to enter a mental state characterized by deep concentration, enjoyment and no concerns about losing control or feeling under pressure.

H3: The level of personal innovativeness towards online search tools positively influences the flow state intensity during online search.

Innovativeness in the domain of information technology is conceptualized (Agarwal and Karahanna, 2000:677) as "an individual trait reflecting a willingness to try out any new technology." Based on this definition, Agarwal and Karahanna (2000) posited that the users` beliefs about, or their perceptions of information technologies have a relevant impact on their technology usage behaviors. In their study they have validated the anticipated relationship between personal innovativeness and the flow like state of cognitive absorption. Innovativeness explained 42% of the variance in the respondents` involvement state with technology.

Based on these results we have formulated our own research hypothesis. We build on the premise that the higher the level of innovativeness (openness) towards the online search tools, the more intense the flow state experienced by the user during a web session. Willingness to try out new web search solutions can enhance users` emotional and cognitive involvement in information search activities.

H4: The level of web usability positively influences the flow state intensity during online information search.

H5: The level of online interactivity positively influences the flow state intensity during an information search activity on the web.

A series of studies regarding online flow support the importance of web page design elements as antecedents of the flow state (Huang, 2003; Guo and Poole; Koufaris). Novak et al. (2000) confirmed a statistically significant relationship between the *speed of interaction* and flow. Huang (2003) tested web site *complexity*`s and *interactivity*`s influence on flow. The validation of their hypotheses revealed the fact that users' *attention* (a fundamental flow dimension) is distracted by the complexity of the web site and that interactivity is a key factor in creating hedonic flow experiences.

Unlike their predecessors (Novak et al., 2000; Skadberg and Kimmel, 2004; Huang, 2003), Guo and Poole (2009) underlined that the effects of the *site complexity* on the flow state are mediated by pre-conditions of the flow state, that is, by the *balance of challenge and skill, the clarity of goals* and the *feedback mechanism.* However, the results of their empirical study only confirmed the positive relationship between the *balance of skill and challenge,* and the *feedback mechanism* – on one side – and the flow state, on the other. The research also validated the effect of the web site complexity on flow through strong negative correlations with all the three of its pre-conditions and proved the superiority of indirect influence over direct influence.

Based on the multiple results presented, we posit that the degree of interactivity of the online search interfaces and the usability level of the online informational medium enhance flow experiences during online search. High levels of usability correspond to reduced levels of complexity.

H6: The telepresence state induced by search interfaces is positively related to a flow experience during online information search.

Novak et al. (2000) tested the positive relationship between telepresence and flow during online activities with relevant results. Through a model fitting process, Skadberg & Kimmel`s empirical study (2004) identified telepresence as a flow dimension, rather than a flow antecedent. Even if early flow studies and models developed in the 90s and in the year 2000 couldn't imagine telepresence appearing during online search (as compared to online games, for example), we consider that the latest social and video search instruments online facilitate complete online telepresence during information search. Based on this argument we have formulated our sixth hypothesis.

H7: The intensity of online flow is positively related to the level of exploratory informational behavior.

Hoffman and Novak (1996) were the first to hypothesize a positive relationship between the flexibility o a hypermedia environment and the consumers` exploratory behavior, a hypothesis later successfully tested by Novak et al. (2000). Based on this and further empirical findings (Korzaan, 2003; Richard and Chandra, 2005; Huang, 2006) that validated exploratory behavior as a consequence of flow in online contexts, we suggest that individuals deeply involved in online information search activities will exhibit more exploratory informational search behaviors. Exploratory information behavior is one of the exploratory behavior`s dimensions – alongside of exploratory buying behavior.

4. Conclusions and future research directions

The conceptual model we have developed in the present study owes an important debt to previous models of flow conceptualized in the context of human-computer interaction, but it is unique in specifically representing information experiences in the new hyper-interactive online medium conventionally called *web 2.0*. Our literature review proved that the various constructs used in flow models changed in importance over time (especially those representing technological factors) and that this fact requires a permanent re-evaluation of theoretical constructs used in connection to web technologies.

The individual components of the model need to be further investigated and empirically tested. The overall approach will be a field study using a survey methodology for data collection. A quantitative measure of the model`s constructs will be adopted by developing questionnaires, along with a reliability check of the different underlying factors. Subsequently, a testing of the hypotheses is needed to demonstrate complete validation of the instrumentation.

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