EVALUATING TOTAL CONSUMER INVOLVEMENT WITH ONLINE INFORMATION-SEEKING: A FLOW STUDY

Alina Lazoc, Dina Maria Luț

Abstract: *The construct of flow reflects a holistic experience in task involvement, a mental state characterized by deep concentration, enjoyment and no concerns about losing control or feeling under pressure. In the present research we have set out to investigate the probability of total emotional-cognitive involvement during the act of online information-seeking. We posit that flow is important to the study of informational behaviors in the digital age because it may serve as a key antecedent to more consumer generated value. Our belief is 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, co-creative 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 seeking online is critical to marketing programs. Our research investigates the flow potential of online information-seeking activities, and we have therefore developed and validated a context-specific flow measurement instrument. Each flow dimension has been evaluated separately and the overall measurement has been then calculated as a simple arithmetic mean of the four sub-scales. The analysis of scales reliability and validity revealed positive results and the significance level between the four flow factors confirmed the existence of a superior construct. Descriptive statistical analysis showed a moderate flow potential of information-seeking activities, with time distortion being the most pronounced dimension and focused attention the least evident one.*

Keywords: *consumer involvement in information-seeking, enjoyment, control, attention focus, time distortion*

1. Literature review

In this section we review some of the constructs more frequently associated with flow in empirical studies[1], discuss the relationships between them and their various operationalizations. The most common flow measure and the central dimension of the online optimal

1 Most studies do not include all dimensions of flow initially suggested by Cszikszentmihalyi (1975, 1990) – the originator of the flow theory in social sciences.

experience is (*intrinsic) enjoyment*. Most authors (Koufaris, 2002; Skadberg and Kimmel, 2004; Li and Browne, 2006; Guo and Poole, 2009) define flow activity as a self-contained activity. *Attention focus* (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 also 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. 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.

Intrinsic enjoyment has been operationalized in the context of online shopping both as *shopping enjoyment* (Koufaris, 2002) and as *autotelic experience* (Guo and Poole, 2009). Koufaris tested enjoyment as predictor of both *intention to return* and *unplanned purchases* of consumers, but only the influence on the return intention was statistically confirmed. These results show that "online consumers are not purely utilitarian, valuing only efficiency in shopping, but they can also enjoy shopping online enough to make them return." (Koufaris, 2002:217) Guo and Poole (2009) describe *autotelic experience* as an experience which is intrinsically rewarding. Their empirical test results however show that autotelic experience had one of the weakest relations with the flow construct from the six dimensions considered.

However, enjoyment is often replaced in flow models by alternative constructs which describe the inner drive to get deeply involved in a task. Li and Browne (2006), for example, use *curiosity* as a flow dimension instead of enjoyment, considering it a more useful construct for investigating individual differences in online experiences. They define curiosity as "an intrinsic motivation, (that) reflects a desire for information and a passion for learning" (Li and Browne, 2006:12). Huang (2003), also considers *curiosity* aroused during interaction an essential flow dimension, explaining that "users gain excitement and pleasure from seeking out new things" (Huang, 2003:429) and defining flow a "subjective human and computer-mediated interaction experience, representing the user's perception of interaction with a site as playful and exploratory" (Huang, 2006:434)

Concentration on the task also represents a major indicator of the flow state. Koufaris (2002) considers *concentration/attention focus* a significant correlate and measure of flow and he studies it in the context

of online shopping activities. He suggests that concentration – understood as the absence of interruptions/distractions – can be critical for an optimal shopping experience. However, the empirical tests performed by him didn't reveal any significant impact of concentration on the shopping experience or the shopping behaviors determined by it. The *concentration/attention focus* used and validated (a Cronbach's Alpha of 0.91) by Koufaris (2002) contained the following four items adapted from *Ghani et al*. (1991):

(1) *I was absorbed intensely in the activity*,
(2) *My attention was focused on the activity*.
(3) *I concentrated fully on the activity*.
(4) *I was deeply engrossed in the activity.*

Li and Browne (2006:12) consider *focused attention* as the "experience in which an individual's total attention is engaged by his current activity" and they test it as a separate variable (not as a dimension of an overall flow experience) in relation to mood and the need for cognition. Huang (2003) defines *attention focus* as the degree to which the user's attention is focused on the interaction with the web and considers it a major flow component. Results of confirmatory factor analysis revealed this component explains 60.6% of the total variance (more than any of the other flow dimensions tested). In his flow scale (validated with a 0.82 reliability score) he uses three statements for evaluating attention focus by completing answers on a seven-point Lickert scale:

(1) *When navigating this website, I thought about other things.*
(2) *When navigating this website, I was aware of distractions.*
(3) *When navigating this website, I was totally absorbed in what I was doing.*

Lack of awareness of time passing quickly is an important element in Csikszentmihalyi's (1975) original description of flow. Several structural models have tested this factor as a flow dimension/flow constituent. Skadberg and Kimmel's (2004) research includes *time distortion* in their two-dimensional flow measure (alongside *enjoyment*). The model fitting process confirmed *time distortion* as a strong indicator of flow (the path coefficient had a magnitude of 0.7255), that is as one of the measurement variables for flow in the context of web site browsing. Guo and Poole's (2009) model introduced *transformation of time* as a first-order factor corresponding to one of the six dimensions of flow. They tested it as a flow indicator, not as a flow constituent. However, in the context of their study (an online shopping context), *transformation of time* proved a weaker relation (0.323) with the flow construct than did the other five dimensions (*perceived control* – 0.927; *mergence of action and*

awareness – 0.806; *concentration* – 0.773; *transcendence of self* – 0.639; *autotelic experience* – 0.543)[2].

The attempts to operationalize control as a flow dimension include Koufaris' (2002), Huang`s (2003), Li and Browne`s (2006) and Guo and Poole`s (2009) structural models (Table 1). Huang (2003:429) speaks about "a sense of control over the computer interaction". Li and Browne (2006) define *control* as the individual's perception of the fact that they have the responsibility of an activity or of an environment. Guo and Poole (2009) proved that, in an online shopping context, flow is featured primarily through control. Control proved strong relationships (above 0.60 as suggested by Bagozzi and Yi, 1988) both to the flow dimension called *concentration* (0.69) and to the underlying flow construct (0.927).

Table 1
Operationalization of perceived control in the reviewed studies

Study	**Operationalization of perceived control**	**Model relationships**
Koufaris (2002)	(1) *I felt confused*. (2) *I felt calm*. (3) *I felt in control*. (4) *I felt frustrated*.	tested separately in relation to other flow dimensions, and to flow preconditions and outcomes
Huang (2003)	(1) *When navigating this website, I felt in control.* (2) *I felt that I had no control over my interaction with the web.* (3) *The website allowed me to control the computer interaction*.	tested as overall flow state factor accounted for 52.5% of the total variance of flow intensity
Guo and Poole (2009)	(1) *I felt in control of what I was doing.* (2) *I felt like I could control what I was doing.* (3) *I had a feeling of total control*. (4) *I felt in control of my action*.	tested as dimension of flow as second-order factor statistically proven strong relation to the underlying flow construct with a p value of 0.927
Li and Browne (2006)	(1) *When using the web I feel in control.* (2) *I feel that I have no control over my interaction with the web.* (3) *The web allows me to control my computer interaction.*	tested separately in relation to other flow dimensions and to personal flow preconditions

Source: developed by the authors

2 The structural model was estimated by AMOS 6.0. package.

The multitude of flow dimensions revealed by the flow literature review shows that flow is both a cognitive and an affective state of consciousness. On the one side, individuals experiencing flow are highly concentrated and in control of the action. This functional aspect explains why people are highly committed to tasks lacking external rewards. On the other hand, online searchers in a flow state find their informational task intrinsically enjoyable and liberated from time pressure.

2. Research methodology

2.1 Sampling plan and data collection strategy

We chose to adopt the non-probability convenience sampling method (e-mail list and Facebook profiles of acquaintances), and we used the procedure of questionnaire self-administration. The plan that we have conceived to collect data includes the creation of a survey which contains four questions regarding the flow state experienced during information-seeking tasks and five questions related to background variables such as age, education or professional status.

Participants in this investigation were approached by placing invitations on several Facebook profiles (with the approval of owners) and by e-mailing invitations to personal contacts, requesting them to forward the link to the online questionnaire. The content included a brief explanation of the subject of the research and a personalized request for support in the distribution of the questionnaire (emotional request, chain request). The questionnaire was applied as an online form, publicly available for one week.

The security and operativity of storing questions and answer variants is ensured by the use of the MySQL database engine. At the end of the information collection stage, the database is exported to SPSS 19 (in a format accepted by this program, the *comma separated file*), maintaining the initially decided data matrix.

2.2 Research instrument: development and validation strategies

In the present paper we are opting for an overall measurement of the flow. Four dimensions of online information search have been identified based on an overlap of definitions from a range of studies investigating online flow and considered adequate to define the flow state experienced during an online information-seeking activity: *sense of control*, *focused attention*, *intrinsic pleasure* and *time distortion*.

As online search is permanently endangered by the risk of getting disoriented or sidetracked (especially by poor interface design), we

consider that an essential symptom of flow states during online information search is the feeling of being able to minimize this risk. We call this flow dimension *sense of control*. In the reviewed literature, conceptions regarding control measurement are extremely varied and they often include both elements describing user characteristics and elements related to the system`s capacity to respond to users' initiatives (or to transfer initiative). To measure the sense of control in the context of online information search we have used a short variant of Guo and Poole's (2009) scale, tested by them in the context of online shopping (α alpha=0.90).

Feeling able to avoid distractions[3] also enhances concentration, another flow state characteristic. Most often it is possible to attend to more than one stimulus at the same time (during an information-seeking activity, people are often simultaneously listening to music or having a chat with friends). However, each task consumes a certain amount of mental resources. Allocating more resources to other tasks (including those related to interface disfunctionalities) may diminish the performance of the information-seeking process. The ability to perform two tasks at the same time without interferences requires that the tasks do not use the same perceptual resources (such is the case of listening to music while performing an information-seeking task). In our research, we have used Guo and Poole's measure (2009) for *focused attention* (α alpha=0.90) and we have extended it with Huang's items (2003) from his *attention focus* scale (α alpha=0.82). We named the resulted scale *focused attention*.

When the information-seeking task requires a great amount of mental resources, it also leaves less of these directed towards the experience of time. The *time distortion* scale entirely uses Guo and Pool`s (2009) scale called *transformation of time*, that has proven consistent reliability (α alpha=0.92) in the context of online shopping. Beyond control and concentration, a search task sustained by proper search skills and challenging web tools and contents can be also extremely entertaining and self-motivating, making time pass quicker than ordinary. Moreover, information-seeking is not only results-oriented, but also self-motivating considering the great amount of novelty and surprise involved by web-supported information. To measure intrinsic enjoyment dimension of online information search we have created a scale that combines items from Koufaris's (2002) *enjoyment* scale (α alpha= 0.81) and from Guo and Poole`s (2009) *autotelic experience* scale (α alpha= 0.91).

3 External stimuli that are irrelevant to the task at hand are commonly known as distractions.

Upon the analysis of scales reliability and validity, the first step of the research methodology consists of checking the scale´s uni-dimensionality by factor analysis. Factor analysis encompasses a wide range of statistical techniques used to represent a set of variables in concordance to a lower number of hypothetical variables, called *factors*. First, we use the *Kaiser-Meyer-Olkin* index to compare the dimensions of the observed correlation coefficients with the dimensions of partial correlation coefficients. When lower values are obtained by the *Bartlett's Test of Sphericity* a strong correlation between data is confirmed and, by this, the presence of one or more common factors motivating the application of a factor reduction procedure.

Our choice for factor analysis technique is the principal components analysis (PCA) whose purpose is to reduce the number of initially used variables, taking into consideration a low number of representative variables. After applying the PCA, we interpret the series of results: communality, total explained variance, component matrix and rotated component matrix.

Communality is that part of a variable´s variance explained by the structure of a factor. Minimal values of the common character of certain variables indicate that those variables are not well represented by the applied factorial model. We only retain items with values over 0.4. The first factor analysis specific information is provided by the *Total Variance Explained* table. Using the PCA, a certain number of principal components are generated, the so-called factors, some of which fulfill the selection criterion (own values ≥ 1).

The *Component Matrix* provides the list of variables and their contribution to the load of each selected factor, in terms of correlation. The data in this table refer to the initial factor solution and allow us to draw the final conclusions regarding the structure of factors for the analyzed variables. We retain the items with a factorial load greater than 0.5 in each construct. For the remaining items we check the reliability of the measurement scale, the acceptance of its psychometric properties. The main purpose of reliability tests is to purify scales and to ensure that the used items measure the same construct. One of the statistical indicators frequently used to check similitudes between items of a scale is the *Cronbach´s alpha*. We also use the *Cronbach´s alpha* coefficient to evaluate the internal consistency of the scales included in the questionnaire, considering all the theoretically argumented items. It is generally considered (Nunnally, 1978) that, in order to be reliable, a scale must reach a *Cronbach´s alpha* value as close to 1 as possible, the level of 0.7 being accepted as a threshold by most researchers. Nevertheless, retaining a scale with a *Cronbach´s alpha* of at least 0.5 may occur,

provided the respective scale is improved prior to being reused in a novel research context (Bruner et al., 2001).

3. Empirical results

3.1. Purification of the measurement instrument

One of the fundamental conditions a measurement instrument must fulfill in a rigorous marketing research is to be reliable and consistent. These qualities become manifest when each of the items composing the instrument correlate to the additive result of all items (global score). Nevertheless, items often do not work as expected. Confusion or imprecision may occur regarding respondents' understanding (i.e. items may be perceived as too basic or, on the contrary, too hard to understand).

The first stage in the analysis of measurement scales used in the present research consisted of checking uni-dimensionality by factor analysis techniques. The high values obtained for all model constructs upon the *KMO* and *Barlett* tests (Table 2) justified the use of the factor reduction method for all the four scales, showing that variables are influenced by the extracted factors.

For factor extraction we used the factor analysis of the main components, and the rotation type, considering that an independence relationship is established between the analyzed dimensions (meaning there is no correlation between them), we used the Varimax rotation. The value of *communalities* show the percent of the results dispersion explainable by the common action of the retained factors, and the results obtained indicate a good representation of the used factorial models.

Table 2
Results of the KMO and Barlett tests

Scale	KMO test	Barlett test
Focused attention scale	0,619	179,879; Sig=0,000
Intrinsic enjoyment scale	0.892	1308.116; Sig=0.000
Time distortion scale	0.696	351.408; Sig=0.000
Control scale	0,500	51.993; Sig=0.000

Source: developed by the authors

The second stage was retaining items using the variable saturation degree in each retained factor as an indicator (*factorial load*). The final stage consisted of measuring the internal consistency of scales for the items retained following factor analysis. The values obtained for the

Cronbach's alpha coefficient following these measurements, for all the four scales, ranged between 0.576 and 0.906, indicating a sufficient level of reliability.

We further present in detail the results obtained by analysis of the main components and by internal consistency assessment of the 4 scales used in this research. Factor analysis reveals the common variance of the two items in the *sense of control* scale, and its reliability was measured by the Cronbach's alpha indicator and recorded a relatively low value of 0.576, which may still be considered as acceptable due to the low number of items. The internal consistency level recommends refining the present scale before reusing it in other research contexts.

The factor analysis for *focused attention* revealed the existence of two dimensions of the used construct, which, together, explain 62.4% of the value of the analysed variance. In order to facilitate the reading of the identified factors, we rotated them (three times) by the Varimax method. The first factor is composed of the *I am completely focused* (0.843), *I also think of other topics* (0.731) and *My attention is entirely focused on the search* (0.797) items. We denominated this factor *focused attention*. The second identified factor (denominated *distraction)* is composed of the *It is no effort for me to focus on what is happening* (-0.745) and *I am aware of the factors distracting my attention from the search* (0.709). It may be thus observed that, following factor analysis, the initial composition of the scale substantially changed. The calculated Cronbach's alpha value for the two identified factors justified eliminating the second dimension of the construct and exclusively considering the first factor. No additional elimination of items brings significant improvements to the proposed scale.

Variance, explained in the case of *intrinsic enjoyment* scale by the two factors identified through factor analysis, is distributed as follows: the first factor (*autotelic experience*), 60.55% and the second factor (*enjoyment*), 12.58%. By the (three times) rotated factorial solution two factors may be distinguished (Table 3.6) with a componence entirely corresponding to the initial structure of the proposed scale. No significant changes occur when any item is eliminated from the scale as identified by factor analysis.

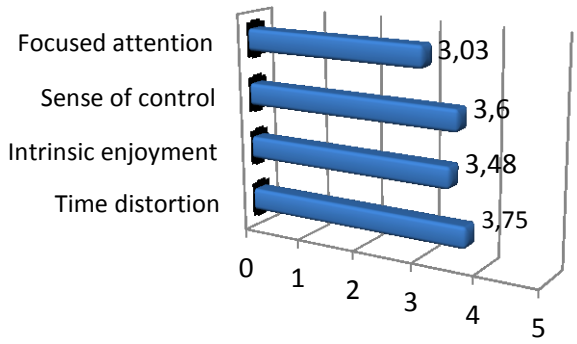
Factor analysis for the *time distortion scale* indicates the existence of a single factor in the data structure, explaining 75.6% of the total variance. The calculated Cronbach's alpha value (0.832) shows a high level of reliability for the three items scale, which cannot be improved by the reduction of any item.

The significance level between the four flow factors (Pearson correlation results ranging from 0.212 to 0.484) confirmed the existence of a superior construct.

3.2. Descriptive statistical results

A total of 356 subjects responded to over 95% of the questions included in the questionnaire, of whom 109 (30.6%) men and 240 (67,4%) women. The collected data show that most respondents are aged between 18 and 35 years (79.8%), are presently not married (64.6%), have a high education level (82.1%) and are preponderantly active in the fields of education (36.5%) and services (26.1%).

The collected data (Figure 1) reveal *time distortion* as the most accentuated (3.75) flow state dimension during online information-seeking tasks, followed by the *sense of control* (3.60), *intrinsic enjoyment* (3.48) and *focused attention* (3.03). Although our respondents only partially focus on the information-seeking tasks they are performing, these give them the feeling of accomplishing something on their own and the feeling of something intrinsically motivating.



Source: developed by the authors

Figure 1. Mean scores for each flow dimension

While performing online information-seeking tasks, most respondents are under the impression that time passes much easier (61.8%). An important part of those interviewed (58.7%) feel that time flies and 41.8% actually report losing track of it. Half of the respondents in our investigation are not worried about losing control upon their task and feel in control when performing a search. However only 48.9% of them appreciate they are in total control of such an action. Online information-seeking actions are perceived as intrinsically interesting (77.8%), enjoyable (53.1%), fun (44.4%), exciting (43%) and fully rewarding (31.8%). An important part of the respondents really enjoyed

the experience of online information seeking (26.4%), while still another part declared to have loved the feeling of their performance, implicitly wanting to capture it again (39%). Regarding attention focus upon the information-seeking task, just 47.5% consider that their attention is entirely focused on the search and only 24.7% state they manage to achieve total focus. The majority of them also think of other topics during a search (54.2%).

4. Conclusions and future research agenda

The empirical results of our study have confirmed a moderate involvement potential of online information-seeking activities. Respondents felt in good, but not in total control of their search actions. They managed to allocate good attention to the search tasks, however they didn`t manage to avoid distractions and they simultaneously performed other operations. The information-seeking process entertained them, but didn`t constitute a strong intrinsic motivation. An finally, the most intense flow dimension in the context of information-seeking proved to be the distorted sense of time, most respondents being unaware of time passage during an online information-seeking activity.

However, a major methodological drawback of our present research consists in the fact that we asked subjects to generally and retroactively evaluate their online information-seeking experiences rather than their experiences with a particular search topic or a particular background (commercial or otherwise). Further research could evaluate the flow state potential of specific online information seeking tasks.

Another drawback of our study is the use of an aggregate measure of flow, in which each of the four factors identified by previous research have an equal contribution to the flow state. We therefore suggest a future evaluation of each factor`s contribution to flow in information-seeking contexts.

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Notes on the authors

ALINA LAZOC is lecturer in Consumer Behavior and Public Relations at the "Dimitrie Cantemir" Christian University in Timisoara. She holds a PhD in Marketing since 2011. Her research interests focus on the areas of experience marketing, consumer behaviors in the digital age and corporate communication strategies.

DINA MARIA LUȚ is Associate Professor in Management and Human Resource Management, at "Dimitrie Cantemir" Christian University in Timisoara. She holds a PhD in Management since 2008. Her research interests focus on the areas of management in the context of knowledge-based economy, management and leadership within Romanian organizations.