The Moderating Effect of Flow State on Web Site Effectiveness

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Abstract

This research aims to contribute[1] to a better understanding of web site effectiveness. Opposing results have been found in the literature on whether traditional models or specific models should be applied to the Internet. We propose that flow state should be included as a moderator in traditional advertising models when applied to the Internet. This variable has been considered very useful for describing people's interactions with computers. Results show that the central route to persuasion is stronger for consumers experiencing an intense flow state, whereas the peripheral route is stronger for consumers who experience a non-intense flow state.

Keywords: Dual mediation hypothesis, Internet, attitudes, flow state

Introduction

In recent years, the impact of the Internet on advertising has been very important and continues to grow in importance (Macias 2003; McMillan and Hwang 2002; Sheehan and Doherty 2001). Web sites represent the most durable communication activity on the Internet (Karson and Korganondar 2001). They allow consumers to control what information will be presented, in what order, and for how long (Bezjian-Avery, Calder, and Iacobucci, 1998), which requires the user to invest processing resources in managing the information flow (Ariely, 2000). The need to manage the information received, as well as make simultaneous decisions about controlling or responding to that information, raises several questions about the relationship between information processing and web site effectiveness.

Given that the Internet is a new medium to which traditional communication models may be applied (Hoffman and Novak, 1996; Stevenson, Bruner II, and Kumar, 2000), our goal is to examine the main variables that precede and contribute to the formation of attitudes and purchase intentions through a web site, proposing that flow state is an important moderator of how these variables interrelate. The paper is structured as follows. First, existing literature on advertising effectiveness and the Internet is reviewed. Based on this revision, hypotheses regarding the role of flow state are then formulated. Finally, the research methodology is summarized, followed by the testing of the hypotheses and a discussion of the results.
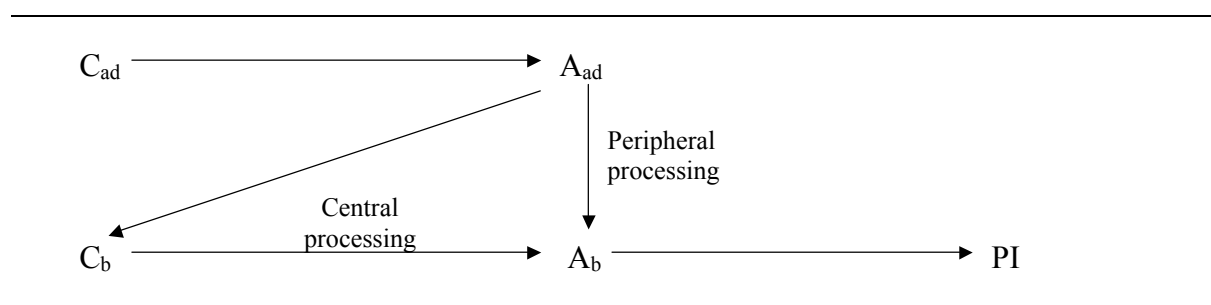
Traditional Advertising Models and the Internet

According to the classic Elaboration Likelihood Model (ELM), attitude formation occurs along two alternative routes (central and peripheral) depending on the cognitive effort

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engaged in by the individual (Petty, Cacioppo, and Schumann, 1983). Mackenzie, Lutz, and Belch (1986) explored the way in which attitude toward the ad (A_{ad}) mediates brand attitude (A_b) and purchase intention (PI) by explaining and testing four alternative models. All of these models represent the theoretical linkages among cognitions, attitudes and PI. They concluded that a Dual Mediation Hypothesis (DMH), which posits that A_{ad} influences A_b both directly and indirectly through brand cognitions (C_b), best explained the observed relationships. This model has been empirically validated by many other studies (Brown and Stayman, 1992; Homer, 1990; Lord, Lee, and Sauer, 1995; Mittal, 1990), and contributes to theory by showing how both persuasion routes can operate together. As showed in Figure 1, central processing is represented by the C_b-A_b link and peripheral processing is reflected by the A_{ad}-A_b link (Mackenzie, Lutz and Belch, 1986).

Figure 1
The DMH and the ELM

Several researchers (Cho, 1999; Jee and Lee, 2002; Rodgers, 2002; Rodgers and Thorson, 2000) have stated that when applied to the Internet environment, traditional advertising models need to be reformulated. The unique nature of this medium and its specific characteristics, of which the most representative is interactivity, are changing traditional assumptions about how advertising works (Hoffman and Novak, 1996; Rossiter and Bellman, 1999). Alternatively, it has also been suggested that traditional communication models may be directly applied to the Internet (Berthon, Pitt, and Watson, 1996; Bruner II and Kumar, 2000; Stevenson, Bruner II, and Kumar, 2000) on the basis that Internet web sites perform similar functions as ads do (Balabanis and Vassileiou 1999) and have been planned by the advertiser (Hwang, McMillan and Lee, 2003; Sheehan and Doherty, 2001).

Given that similarities with traditional advertising are more important than differences, and that new models have not shown a significant improvement in the explanation of web effectiveness as compared to traditional models (Macias 2003), we believe that the DMH and the ELM still provide a good background to explore the relationships between information processing and web site effectiveness. However, it is conceivable that the consideration of the specific characteristics and consequences derived from consumer interactions with this medium may improve traditional explanations.

The Moderating Effect of Flow State in Web Site Effectiveness

A number of researchers have suggested that flow is a useful way for describing people's interactions with computers (Csikszentmihalyi, 1990; Hoffman and Novak, 1996; Smith and Sivakumar, 2004; Trevino and Webster, 1992). Flow is defined as "an optimal experience, extremely enjoyable, with which the individual experiences an intrinsic interest and a sense of

time distortion during his/her engagement" (Chen, Wigand, and Nilan, 1999). While a flow state can be reached during engagement in numerous activities, including sports, writing, work, games, and hobbies (Novak, Hoffman and Yung, 2000), we focus on flow during consumer interaction with a web site. In this context, several researchers have established the validity of the flow construct in relation to computer-related activities (Ha and Chan-Olmsted, 2001; Nel *et al.*, 1999; Novak, Hoffman, and Yung, 2000). Flow state can be considered a continuous variable in that different levels of flow can occur, ranging from none to intense (Hoffman and Novak, 1996; Nel *et al.,* 1999; Trevino and Webster, 1992).

Hoffman and Novak (1996) suggest that the success of on-line marketers depends on their ability to create opportunities for consumers to experience flow. It has been demonstrated that consumers do experience flow while using the web (Novak, Hoffman and Yung, 2000). More specifically, Chen, Wigand and Nilan (1999) suggest that interactivity can facilitate the occurrence of flow. This happens because information interaction gives the consumer a high level of freedom and control (Wolfinbarger and Gilly, 2001).

To our knowledge, there is no hypothesized relationship regarding the influence of flow state on the relationship between information processing and web site effectiveness. However, flow experience has been shown to require high levels of concentration and involvement from individuals (Csikszentmihalyi, 1990; Hoffman and Novak, 1996). Therefore, an intense flow sensation during consumer navigation in a web site can been related to a state of maximum concentration and involvement during the visit.

According to the characteristics of an intense flow state, such as involvement and concentration, it is likely that individuals in such circumstances will process the information contained in the web site more thoroughly and more carefully than individuals who have not experienced an intense flow state. The latter group will likely prefer to process web site information via the peripheral route because of their lower levels of concentration during processing. Therefore, the intensity of the web site experience will influence the relationship between consumer information processing and web site effectiveness:

 H1: The flow state moderates the relationship between information processing and web site effectiveness:

  H1a: The central route to persuasion will be more relevant for individuals who report an intense flow state than for individuals who report a non-intense flow state.

  H1b: The peripheral route to persuasion will be less relevant for individuals who report an intense flow state than for individuals who report a non-intense flow state.

Methodology

A personal computer was selected for the product in this experiment, as it is a product in high demand by the target individuals (Meyers-Levy and Peracchio, 1992). In addition, the web is dominated by product categories where some form of interaction is needed, such as with computers and audio or video equipment, because the nature of these products allows marketers to exploit the information-driven nature of the web (Hwang, McMillan and Lee, 2003).

The web site was specifically developed for this experiment and was based on actual computer web sites. Instead of developing a full web site for a computer manufacturer, a simplified web site was created, focusing on just one product, a personal computer. We did

not use a brand name to avoid a potential bias in study subjects. The web site contained information about the processor, the memory, Internet connection, technical assistance, and product guarantee. It was comprised of six pages connected by hyperlinks, thus offering the possibility to interact with the message, as the subjects could select the order in which they saw the information contained on the web site.

A convenience sample of students was recruited for this study from different undergraduate classes; 196 students participated in exchange for extra course credit. Sessions were held in a laboratory fitted with personal computers for the experiment. First, students visited the web site and interacted with it at their own pace. After web site exposure, subjects completed the flow state measure. We directly measured flow in the present study with a two-item scale following a narrative description of flow (Chen, Wigand and Nilan, 1999; Novak, Hoffman and Yung, 2000). The two items selected were "Yes, I am sure I have experienced flow state - No, I have not experienced it" and "It was a very intense sensation - It was a non-intense sensation". Next, they reported all the thoughts that came to their minds while they were on the web site. We operationalized web site/product cognitions as the positive minus negative web site/product related thoughts (Krishnamurthy and Sivaraman, 2002; Mackenzie, Lutz, and Belch, 1986). A few minutes later, subjects responded to questions related to their attitudes and PI. These variables were obtained using traditional scales (Bruner II and Kumar, 2000; Stevenson, Bruner II, and Kumar, 2000). Attitude toward the web site (A_{ws}) was measured by asking subjects to indicate their overall evaluations of the web site (positive/negative, good/bad, pleasant/unpleasant, and favorable/unfavorable). Attitude toward the product (referred to as A_b, to keep the parallelism with Mackenzie, Lutz, and Belch's models even though we did not use a brand name) was assessed with another seven-point differential scale (attractive/unattractive, I like it/I do not like it, it is good/bad, it is agreeable/disagreeable). Finally, a three-item scale (unlikely/likely, improbable/probable, impossible/possible) was used to measure PI (Zhang, 1996). All the measures, except for the processing variables, were obtained using seven-point semantic differential scales.

Confirmatory factor analysis was used to evaluate the reliability and validity of the constructs measured with more than one indicator (flow, A_{ws}, A_b, and PI). A completely standardized solution produced by the maximum likelihood method (Jöreskog and Sörbom, 1996) showed that all indicators loaded highly on their corresponding factors, supporting the independence of the constructs and providing strong empirical evidence of their validity. Overall fit statistics of the measurement model ($\chi^2(59) = 165.42$) were as follows: CFI = .90 and RMSEA = .09. In addition, for each construct (flow, A_{ws}, A_b, and PI) the scale composite reliability (.89, .86, .84, and .74, respectively) and the average variance extracted (.80, .60, .57, and .50 respectively) were satisfactory (Fornell and Larker, 1981). In summary, the selected items resulted in reliable and valid measures for the four constructs.

Major Results

In the first stage of the analysis, the main effects included in the DMH were tested. Next, the influence of the moderating variable on the relationship between information processing and web site effectiveness was analyzed using multi-group LISREL. A median split was conducted to separate participants into intense (I) and non-intense (NI) flow state groups based on a summed measure. The resulting mean composite flow state scores (M_I=4.53 and M_{NI}=1.81) were significantly different between the two groups (t=26.15, p<.01), containing 98 subjects each.

Table 1 gives the results of the model shown in Figure 1. The model's fit is as follows: $\chi^2(62)=172.17$, p<.01; AGFI=.82; GFI=.88; CFI=.89; RMSEA=.09; RMSR=.07; NNFI=.86. Results show that all parameters representing the main effects are significant at the 5% level. Thus, findings from the main effects support the DMH. Next, in order to test the moderating effect of flow state, a model that imposes equality constraints on the three parameters relating A_b, C_b, and A_{ws} across subgroups and a general model that allows all of these parameters to vary freely across subgroups, were compared. Results demonstrate that flow state has a significant moderating impact in the relationship between information processing and web site effectiveness ($\chi^2=16.45$; $df=3$; p<.01).

More specifically, the results prove a significant moderating impact for two of the three effects. Inspection of the corresponding parameter estimates indicates support for our hypotheses. Results confirm that the central route to persuasion is stronger for consumers who reported an intense flow state, compared to those who reported a non-intense flow state. The opposite is true for the peripheral route to persuasion, which is stronger for consumers who experienced a non-intense flow state than for those who experienced an intense flow (see Table 1).

Table 1
Standardized Model Estimates: Main Effects and Results of Multi-group Analysis

Relationship	Main Effects	I group	NI group	χ^2 ($DF=1$)
C_{ws} - A_{ws}	.47*	-	-	-
A_{ws} - C_b**	.15*	.28*	.09	2.05
A_{ws} - A_b (peripheral route)	.28*	.03	.45*	5.90*
C_b - A_b (central route)	.19*	.43*	.07	4.51*
A_b - PI	.52*	-	-	-

(*) p< .05
(**) This path was also analyzed to check whether flow state had a significant effect on the support of the DMH.

Discussion and Conclusions

This study makes a significant contribution to the marketing literature by proposing a model of web site effectiveness based on traditional advertising, and by providing insights into the role of flow state on web site effectiveness. Regarding our first contribution, our results support previous work suggesting that traditional communication models can be directly applied to the Internet in explaining advertising effectiveness. Results obtained confirm previous research relating A_{ws}, A_b and PI (Stevenson et al., 2000; Balabanis & Vassileiou, 1999). However, the flow of effects could not be stated with certainty in those studies. Therefore, Stevenson et al. (2000) called for further research examining those effects with more rigorous methods, such as structural equation modeling. We have accordingly demonstrated that the DMH widely adopted by researchers in traditional advertising is also appropriate for explaining web site communication effectiveness. The effectiveness variables (attitudes and PI) are explained by web site and product cognitions. The results of this study provide a detailed look at how information processing and effectiveness interrelate in web site environments.

Finally, this study contributes to the literature by demonstrating that the importance of the central and the peripheral route to persuasion is dependent on how is the intensity of the flow state experience. Specifically, consumers who experience an intense flow state while surfing a web site are more concentrated and involved in processing. These individuals process more thoroughly, and are characterized by central processing. However, subjects who do not experience an intense flow state process exclusively under the peripheral route. For those individuals, therefore, aspects related to web site characteristics and design are more important.

These results have important implications for managers. In accordance with our conclusions, we reaffirm that companies should use web sites for building and improving brand attitudes and purchase intentions. In addition, the consumer flow experience can also be valuable for marketers as they can influence consumers' opportunities to experience flow. Web site attributes can thus be used by managers not only to aid consumers in making decisions, but also as tools to enhance online visit processing and enjoyment.

A potential limitation of the study's design is that the web site developed may have lacked the actual level of interactivity of some web sites. As this study probably did not replicate such high level of interactivity, our conclusions may be restricted to low or medium levels of interactivity. Such interactivity levels are very common among small and medium enterprises, partly because of financial constraints (O'Keefe et al. 1998) as well as the low level of importance accorded to web sites by such companies (Hwang et al. 2003). Most large companies, however, have also been slow to adopt the use of interactive options (Cho and Leckenby 1997). Thus, despite its importance in web management, the effective use of interactivity still remains a challenge in many companies (Huang 2003).

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