Modeling the impact of internet atmospherics on surfer behavior

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Abstract

This paper examines the role of Internet atmospherics cues on the behavior of surfers and their impact on variables such as site attitudes, site involvement, exploratory behavior, pre-purchase and purchase intentions. Atmospherics cues are central (structure, organization, informativeness, effectiveness and navigational characteristics) and peripheral (entertainment). A conceptual model is developed based on a review of existing findings and tested with a large sample of consumers who responded to a questionnaire after navigating through an existing pharmaceutical web site. Structural equations modeling was used to test 10 major hypotheses. Among the key findings, all atmospherics cues were impacting the other constructs, with the central cues mostly affecting site involvement and exploratory behavior, while entertainment affected site involvement and site attitudes. These findings contribute to the theoretical and managerial understanding of the role of Internet atmospherics on the navigation behavior of visitors.

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1. Introduction

The Internet is growing in importance since the product is becoming more information-based and offers the opportunity to separate information about a product from the product itself (Brännback, 1997). For companies, the focus is shifting from creating websites to strategic aspects involving how to best use this medium. One important objective of firms on the Web remains effective communications with consumers. This emphasizes the importance of developing and testing systematic models of the Web as a communication tool.

This paper extends the literature by, first, proposing a new model of information-seeking in online retailing; second, following Eroglu et al. (2001), integrating research on Web site environmental cues.

2. Conceptual background

Turley and Milliman (2000) identified over 60 studies with relationships between store atmospherics and consumer behavior. Atmospherics influence consumer perceptions of retail products (Obermiller and Bitner, 1984), and store approach/avoidance behaviors such as consumers’ store patronage and spending (Donovan and Rossiter, 1982; Donovan et al., 1994).

Atmospherics are the “intentional control and structuring of environmental cues” or “conscious design of space to create certain buyer effects” (Kotler, 1973) Atmospheric cues may be more influential than other marketing inputs at the point of purchase (Baker et al., 1994) and impact purchase decisions more than the product itself (Kotler, 1973).

Web atmospherics are the “conscious designing of Web environments to create positive affect and/or cognitions in surfers in order to develop positive consumer responses” (Dailey, 2004). For Milliman and Fugate (1993), a Web atmospheric cue is comparable to a brick-and-mortar cue.
and is described as “any Web interface component within an individual’s perceptual field that stimulates one’s senses.”

Eroglu et al.’s (2001) typology divides Web atmospherics into two groups: (1) high task-relevant cues facilitate and enable the consumer’s shopping goal attainment; (2) low task-relevant cues are inconsequential to the completion of the shopping task. Unfortunately, researchers have not examined the impact of specific cues (e.g., colors, music), but have focused on very general cues lessening the probability of finding theories that explain their influence (Turley and Milliman, 2000).

Another theory, the Elaboration Likelihood Model (ELM), suggests that low-involvement subjects process information through the peripheral rather than the central route (Petty et al., 1983), relying more heavily on cues as opposed to detailed and elaborate product specific information. With the Internet, marketers use many cues (e.g., search engines, keywords) to attract and influence consumers (McGaughey and Mason, 1998).

Based on this conceptual background, we elaborate our conceptual model.

3. Conceptual model

Following Mehrabian and Russell (1974) and Donovan and Rossiter (1982), the model is divided into three parts: Stimuli, Organism and Outcomes. Eroglu et al. (2001) identified high and low task-relevant cues. Most Web atmospherics cues belong to the first category because the concern is to evaluate the impact of information content on the other variables. In the second, figured Website entertainment. These dimensions lead to the processing variables such as approach/avoidance behaviors, which are emotional responses, and exploratory behavior and site involvement categorized as cognitive variables. The main focus of the conceptual model (Fig. 1) is on these variables as applied to the Internet. To complete this model are outcomes such as pre-purchase and purchase intentions.

3.1. Internet atmospherics cues

Internet atmospherics cues are critical to site effectiveness since visitors decide which Web pages to browse, for how long, and how much information to acquire. For a better understanding of what constitutes high-quality Web content, six important factors are identified from the literature and described in turn.

3.1.1. Navigational characteristics

The characteristics of products and sites encountered early in online browsing influence the visitors’ levels of arousal and pleasure, and therefore their responses. Menon and Kahn (2002) show that if starting experiences encountered by surfers in a simulated Internet shopping trip are high in pleasure, there is an influence on site attitudes and surfers engage in more arousing activities such as exploration and tendencies to examine new products. Navigational cues are important in creating or not impeding the experience of surfers (Hoffman and Novak, 1996; Novak et al., 2000), leading to formation of positive site attitudes (Eagly and Chaiken, 1993; Csikszentmihalyi, 1977). Finally, Lynch et al. (2001) show that site quality influences surfers’ probability of buying during the visit and returning to visit. Thus:

H1: When consumers surf the Web, navigational characteristics are positively related to: (a) site attitudes, (b) exploratory behavior, and (c) purchase intentions.

3.1.2. Structure

Huizingh (2000) reported four different navigational structures: a tree, a tree with a return-to-homepage button, a tree with horizontal links and an extensive network. Most sites have a simple structure. Since there is no prior finding, we surmise that the more complex the structure, the more surfers are involved with the site. Finally, it seems logical that for people who like scrolling and browsing throughout

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**STIMULUS**

**ONLINE ENVIRONMENTAL CUES**

- High Task Relevant
  - Navigational Characteristics
  - Informativeness
  - Information Content Effectiveness
  - Structure
  - Organization

- Low Task Relevant
  - Entertainment

**ORGANISM**

**COGNITIVE AND AFFECTIVE RESPONSES**

- Affect
  - Site Attitudes

- Cognition
  - Exploratory Behavior
  - Site involvement

**RESPONSES**

- Shopping Outcomes
  - * Involvement in Purchase Decisions
  - * Purchase Intentions

Fig. 1. Conceptual model.
various sites, the structure of the site is important and positively influences their exploratory behavior and purchase intentions. Thus:

**H2:** When consumers surf the Web, structure is positively related to: (a) site involvement, (b) exploratory behavior, and (c) purchase intentions.

### 3.1.3. Effectiveness of information content

Specific product information is most often available in a site. The perception of site content can be measured by how informative it is, if it provides detailed and specific information on products or other relevant topics (Huizingh, 2000). But one study found contrary results: the information content of Web pages, per se, does not appear to attract visitors (Dholakia and Rego, 1998).

**Site attitudes and purchase intentions.** In ELM, effectiveness of information content is a central cue which explains site attitudes, brand attitudes and is positively related to purchase intentions (De Pelsmacker et al., 1998).

**Site involvement.** Researchers noted that the Internet contained more information than other media, and is a highly involving medium (Novak et al., 2000). Thus, the measure of information content is considered as an indicator of site involvement (Yoon, 2000; Okasaki and Rivas, 2002). For utilitarian motives, surfers are involved in a site because of the information related to a product/service (Park and Young, 1986).

**Exploratory behavior.** Without prior findings, we surmise that when surfers find an interesting topic, effectiveness of information content induces them to scroll and browse to get the most complete and appropriate information about it. Thus:

**H3:** When consumers surf the Web, effectiveness of information content is positively related to: (a) site attitudes, (b) site involvement, (c) exploratory behavior, and (d) purchase intentions.

### 3.1.4. Informativeness

Informativeness focuses on the site as an interactive provider. “Intelligent, resourceful, knowledgeable” are adjectives that are used (Maddox, 1998; De Pelsmacker et al., 1998).

**Site attitudes.** For Chen and Wells (1999) ad attitude (A_{ad}) is a useful indicator of site value, but the unidimensionality of A_{ad} does not provide a complete explanation of consumers’ ad ratings (Pashupati, 1997). Chen and Wells (1999) and Chen et al. (2002) developed three scales (informativeness, organization and entertainment) that better correlate with and explain site attitudes. In the ELM, informativeness is a central cue that impacts attitudes, which influence purchase intentions (De Pelsmacker et al., 1998).

**Exploratory behavior.** Without prior findings, we surmise that informativeness influences surfers’ browsing and scrolling. Browsing is performed when surfers do not have a precise knowledge of available information and are not sure whether their requirements can be met or how these requirements may be reached. Thus:

**H4:** When consumers surf the Web, informativeness is: (a) positively related to site attitudes, and (b) negatively to exploratory behavior.

### 3.1.5. Organization

Organization induces surfers to follow the central route, according to ELM. It evaluates how well a website presents itself and how it tour-guides its surfers (Chen and Wells, 1999). A low score suggests that it poorly leads surfers to their destination. Poor organization is caused by too many links, layers or animations, causing surfers to develop lower site attitudes and involvement (Chen and Wells, 1999). Thus:

**H5:** When consumers surf the Web, organization is positively related to: (a) site attitudes, and (b) site involvement.

### 3.1.6. Entertainment

For McQuail (1983), the value of entertainment “rests in its capability to fulfill audience needs for escapism, diversion, aesthetic enjoyment or emotional release.” People scoring Web ads high in value develop favorable attitudes and high involvement with the information content of the site (Larkin, 1979). In ELM, peripheral cues may be attractive sources (here, entertainment value), humor, and visuals (Cho, 1999). For Stern (1990) and De Pelsmacker et al. (1998), consumers who consider an ad as entertaining, positively evaluate the brand and have intentions to purchase it. We surmise that entertainment has an effect on site attitudes and encourages more site exploration. Finally, site involvement based on value-expressive motives leads to affect because the site appeals emotionally or aesthetically to surfers (Park and Young, 1986). Thus:

**H6:** When consumers surf the Web, entertainment is positively related to: (a) site attitudes, (b) site involvement, (c) exploratory behavior, and (d) purchase intentions.

### 3.2. Processing variables

#### 3.2.1. Site attitudes

For Stevenson, Bruner and Kumar (2000) “attitude toward the Web site” is useful in understanding its impact on site value. For Jee and Lee (2002), Web sites reflect characteristics of traditional ads. Thus, site attitudes should lead to consequences identical to those found in attitude research (Lutz et al., 1983; Homer, 1990). Brown and Stayman (1992) found that ad attitudes influence brand attitudes and purchase intentions. Similarly, site attitudes have a positive impact on ad attitudes, brand attitudes and purchase intentions (Bruner and Kumar,
persuasion are the central route that requires “high effort scrutiny of attitude-relevant information,” and the peripheral route influenced by contextual factors and attitude change is determined by both processes (Petty and Cacioppo, 1981, 1986). Thus:

**H7**: When consumers surf the Web, their site attitudes are positively related to: (a) involvement in purchase decisions, and (b) purchase intentions.

### 3.2.2. Exploratory behavior

Exploratory behavior has “the sole function of changing the stimulus field” (Berlyne, 1963). Studies suggest a two-factor conceptualization: exploratory acquisition of products, and exploratory information seeking (Baumgartner and Steenkamp, 1996). Browsing is performed when surfers are unsure of available information, whether or how their requirements may be reached; and is general or purposeful. “Purposive” browsing occurs when surfers have specific requirements, whereas “general” browsing allows surfers to fine-tune knowledge of their requirements or to keep themselves up-to-date on the latest changes in a specific field (Rowley, 2000). Shoppers’ exploratory behavior, characterized by information-search or exploration through purchasing, positively influences their site attitudes. The more they explore the possibilities offered by the Web, the more they fine-tune their requirements and have a positive idea of the site visited, triggering approach behavior toward the site. Thus:

**H8**: When consumers surf the Web, exploratory behavior is positively related to: (a) site attitudes, (b) site involvement and (c) involvement in purchase decisions.

### 3.2.3. Site involvement

Involvement is important in audience processing of traditional advertising (Petty and Cacioppo, 1986) and is very important in Web advertising (Raman and Leckenby, 1998; Cho, 1999). Day et al. (1995) refer to involvement as a motivational state influenced by “a person’s perception of the object’s relevance based on inherent needs, values and interests.” However, with the internet, the relevant variable is *site* involvement, which taps a behavioral response, not a personality dimension. Highly site-involved surfers are prone to search for information in sites, and to explore new stimuli because of a higher need for environmental stimulation (Balabanis and Reynolds, 2001). For Yoo and Stout (2001), visitors with a high level of site involvement have more intentions to interact with a site, leading to extensive search and trials of interactive functions. Finally, highly site-involved people search for more information before purchasing, process relevant information in-depth, and use more criteria in their decisions than others (Leong, 1993; Maheswaran and Meyers-Levy, 1990). Highly site-involved customers more likely purchase online than others (Kwak et al., 2002). Therefore:

**H9**: When consumers surf the Web, site involvement is positively related to: (a) site attitudes, (b) involvement in purchase decisions, and (c) purchase intentions.

### 3.3. Outcomes

#### 3.3.1. Involvement in purchase decisions

Involvement in purchase decisions precedes purchase intentions. Gore et al. (1994) reported that people highly involved in purchase decisions must recognize the problem, search actively for information, evaluate the alternatives by spending time to search for the best choice and purchase, whereas people lowly involved in purchase decisions neither do extensive information search nor evaluations of alternatives. Customers engage in ongoing information collection without specific needs (Bloch et al., 1986); value-added information is interesting and helpful. Access to information can improve consumer decisions, be an incentive for people to shop online (Jarvenpaa and Todd, 1997) and have an effect on online decisions (Ranganathan and Ganapathy, 2002). Thus:

**H10**: When consumers surf the Web, involvement in purchase decisions is positively related to purchase intentions.

#### 3.3.2. Purchase intentions

In hierarchy-of-effects models, purchase is the ultimate stage and it takes place long after exposure to ad messages. However, with the Internet, purchase might take place either at the same time as exposure to ad messages or within a short time because shoppers can request information instantly and directly via the Internet (Cho, 1999).

The final model that will be used to test the 10 hypotheses is provided in Fig. 2.

### 4. Data and methodology

The model is tested with a pharmaceutical site. Healthcare is one sector where the Internet has become an invaluable communication tool. Healthcare ranks as the fourth most popular topic on the Web; among women and seniors, health sites are the second most popular destination (Bellman et al., 1999). The data were collected from the homepage of an OTC drug from one of the largest, pharmaceutical companies in North America. A Web-based methodology minimizes biases of ad testing methods and is based on an experimental method that is clear and unobtrusive to respondents. Answers that reflected their viewing behavior on the site after they did their surfing activities were measured. It was designed to test the effectiveness of environmental cues on
purchase behavior and implemented on the Web itself. Participants were Web surfers engaged in their own activities. This method does not suffer from lack of external validity as content is viewed in its actual form, by viewers, and within the appropriate site environment. Thus, the methodology provided instantaneous measures of site environmental cues effectiveness.

The questionnaire was a structured, non-disguised instrument, with closed-ended questions measuring respondents’ agreement/disagreement on a five-point Likert scale, except for site involvement which used a five-point semantic differential scale. It contained the variables in Fig. 2. Having been studied previously, a pool of existing items was available. The appropriate measures for each concept were selected from the literature and adapted. “Navigational characteristics” (CHPS; Bell and Tang, 1998) had 11 items. “Organization” (ORG), “Entertainment” (ENT) and “Informativeness” (INFO) of the site (Chen and Wells, 1999), contained 2, 4 and 3 items. “Structure” (STR) and “Effectiveness of the information content” (EFF) of the site (Bell and Tang, 1998) had 5 and 10 items. “Site Attitudes” (ATTI; Eighmey, 1997) had 10 items. “Exploratory behavior” (EXPB; Novak and Hoffman, 1997, 2000) had 8 items. “Involvement in purchase decisions” (PPURI; Gore et al., 1994) for nonprescription drugs had 7 items. Purchase intentions (PURI) had one indicator.

5. Results

5.1. Exploratory factor analysis (EFA)

EFA determines how observed variables are linked to their underlying factors. Since constructs could have items loading on more than one factor, the minimal number of factors were identified. Analysis of the scales resulted in deleting items presenting poor psychometric properties or changes in Cronbach alphas. After deletion, each construct was unidimensional and factorially distinct, all items used to operationalize a construct loaded on one factor. The percentage of variance varied between 53.6% for PPURI and 88.4% for ORG (Table 1). EFA provided 10 factors with eigenvalues greater than 1.0, with each item having a loading greater than 0.4. For Nunnally (1967), acceptable Cronbach’s α start at x=0.69 or greater than 0.70, indicating good reliability.

5.2. Confirmatory factor analysis (CFA)

CFA confirmed the measurement model (Byrne, 1994). The Lagrange Multiplier test identified a few covariances, which were taken into account. The 10-factor structure was confirmed with a first-order CFA. Estimation of the CFA model generated a χ², comparative fit indices (CFI) and standardized root mean-square error of approximation (RMSEA) of 611.91 (df=446, χ²/df=1.372), 0.976 and 0.038. According to Hu and Bentler’s (1999), the model demonstrated a good fit ( Baumgartner and Homburg, 1996). For Fornell and Larcker (1981), convergent validity is established if average variance extracted (AVE) accounts for 0.50 or more of total variance. In Table 2, except for involvement in purchase decisions, AVE varies from 0.53 (exploratory behavior) to 0.77 (organization). Convergent validity was confirmed for all constructs, except involvement in purchase decisions. Discriminant validity is the degree to which measures of different constructs are unique from each other. It is established if AVE is larger than the squared correlation coefficients between factors (Fornell and Larcker, 1981). This criterion was met across all pairs of factors.
5.3. Full structural model

The results show strong support for the full structural model with CFI=0.976 and RMSEA=0.039. The average off-diagonal value of the standardized residual matrix was 0.046. As per Hu and Bentler’s (1999), the fit of this model is judged acceptable.

Following Byrne (1994), we tested the significance of individual parameters. The results of factor loadings, and the test statistics indicate that all loadings are significant. Finally, we analyzed the path coefficients representing the hypothesized relationships between the various constructs. Table 3 and Fig. 2 provide the standardized values of the regression coefficients and relate the paths to the original ten constructs.

### Table 1
Exploratory factor analysis

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>% of variance</th>
<th>Factor loadings</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigational cues</td>
<td>It is easy to use.</td>
<td>67.2</td>
<td>0.734</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>Navigational problems are limited.</td>
<td></td>
<td>0.777</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There are good search agents to find information.</td>
<td></td>
<td>0.864</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easy keywords to find information are used.</td>
<td></td>
<td>0.809</td>
<td></td>
</tr>
<tr>
<td>Structure</td>
<td>The structure is well-organized.</td>
<td>76.2</td>
<td>0.800</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>It allows a great overview of its structure.</td>
<td></td>
<td>0.818</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The structure is straightforward.</td>
<td></td>
<td>0.775</td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>Confusing site*</td>
<td>88.4</td>
<td>0.886</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>Irritating site*</td>
<td></td>
<td>0.886</td>
<td></td>
</tr>
<tr>
<td>Entertainment</td>
<td>Exciting site</td>
<td>76.2</td>
<td>0.769</td>
<td>0.84</td>
</tr>
<tr>
<td></td>
<td>Imaginative site</td>
<td></td>
<td>0.758</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entertaining site</td>
<td></td>
<td>0.825</td>
<td></td>
</tr>
<tr>
<td>Informativeness</td>
<td>Informative site</td>
<td>80.5</td>
<td>0.866</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>Useful site</td>
<td></td>
<td>0.858</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Resourceful site</td>
<td></td>
<td>0.721</td>
<td></td>
</tr>
<tr>
<td>Information content effectiveness</td>
<td>Information is accurate.</td>
<td>69.3</td>
<td>0.719</td>
<td>0.78</td>
</tr>
<tr>
<td></td>
<td>Information is up-to-date.</td>
<td></td>
<td>0.846</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Product information is complete.</td>
<td></td>
<td>0.692</td>
<td></td>
</tr>
<tr>
<td>Site attitudes</td>
<td>The web site makes it very easy for me to build a relationship with the company.</td>
<td>63.3</td>
<td>0.691</td>
<td>0.85</td>
</tr>
<tr>
<td></td>
<td>Surfing this Web site is an excellent way for me to spend my time.</td>
<td></td>
<td>0.690</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I was smiling while I was exploring this Web site.</td>
<td></td>
<td>0.762</td>
<td></td>
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<tr>
<td></td>
<td>I was part of a like-minded group of people while using this Web site.</td>
<td></td>
<td>0.744</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This Web site was a playful experience.</td>
<td></td>
<td>0.787</td>
<td></td>
</tr>
<tr>
<td>Exploratory behavior</td>
<td>When I hear about a new Web site, I'm always eager to check it out.</td>
<td>76.6</td>
<td>0.826</td>
<td>0.69</td>
</tr>
<tr>
<td>Site involvement</td>
<td>I like to browse the Web and find out about the latest sites.</td>
<td>72.7</td>
<td>0.782</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>Unimportant/Important… to me</td>
<td></td>
<td>0.810</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not worth/Worth… remembering</td>
<td></td>
<td>0.811</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Irrelevant/Relevant… to my needs</td>
<td></td>
<td>0.814</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not worth/Worth… paying attention to</td>
<td></td>
<td>0.810</td>
<td></td>
</tr>
<tr>
<td>Involvement in purchase decisions</td>
<td>It takes a very long time to decide before buying drugs.</td>
<td>53.6</td>
<td>0.709</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>I get as much information as possible before purchasing a drug.</td>
<td></td>
<td>0.715</td>
<td></td>
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<td></td>
<td>I always compare product characteristics among brands of a specific drug.</td>
<td></td>
<td>0.734</td>
<td></td>
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<tr>
<td>Purchase intentions</td>
<td>Before looking at this site, I was interested in reading about the needed drug.</td>
<td>849.6</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Definitely not willing/Extremely willing… to buy</td>
<td></td>
<td>0.849</td>
<td></td>
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</tbody>
</table>

* Reversed scale.

### Table 2
Convergent and discriminant validity

<table>
<thead>
<tr>
<th>ORG</th>
<th>ENT</th>
<th>STR</th>
<th>INFO</th>
<th>EFF</th>
<th>CHPS</th>
<th>SINV</th>
<th>PPURI</th>
<th>ATTI</th>
<th>EXPB</th>
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<tr>
<td>0.77</td>
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Diagonal entries show index of the average variance extracted. Entries below diagonal represent squared correlation coefficients.
hypotheses. Nine out of twenty seven subsections of hypotheses have non-significant paths. All the others are significant with t-tests varying from 1.52 to 6.11.

6. Test of hypotheses

We briefly discuss support for individual hypotheses. The results are mostly supported for the set of Hypotheses 1 related to navigational characteristics. There is a significantly positive relationship with purchase intentions (H1c: \( p<0.05 \)). It is significantly related to exploratory behavior (H1b), when a one-sided t-test is used \( t=1.69, p<0.05 \). H1a, related to site attitudes, is not supported.

We found partial support for the set of Hypotheses 2 related to site structure. H2a and H2b are not supported (no link with site involvement or exploratory behavior). However, a positive path with purchase intentions was found (H2c: \( p<0.05 \)).

The set of Hypotheses 3 related to information content effectiveness is mostly supported. H3a, its effect on site attitudes, is not supported. H3b, its effect on site involvement is marginally significant with a one sided-test \( t=1.52, p<0.1 \). H3c and H3d are supported: we found significant effects on exploratory behavior \( (p<0.001) \) and purchase intentions \( (p<0.05) \).

H4a and H4b are partly supported with significant negative links between informativeness and site attitudes \((r=-1.65, p<0.1)\) and site involvement \((r=-1.95, p<0.05)\).

Concerning organization of the Web site, H5a was supported as we found a significant link with site involvement \((p<0.05)\), whereas H5b was not.

Hypothesis 6 is supported. There is a significant relationship between entertainment and site attitudes \((H6a: p<0.001)\), site involvement \((H6b: p<0.001)\), and exploratory behavior \((H6c: p<0.01)\). There is a significant link with purchase intentions \((H6d)\) with a one sided-test \((r=1.76, p<0.05)\).

For Hypothesis 7, contrary to previous findings, we found no relationships between site attitudes and involvement in purchase decisions \((H7a)\) or purchase intentions \((H7b)\).

Support for Hypotheses 8 is mixed. Surfers’ exploratory behavior is significantly linked to site attitudes \((H8a: p<0.05)\), whereas there is no significant link with site involvement \((H8b)\) and involvement in purchase decisions \((H8c)\).

Hypothesis 9 related to site involvement is supported. There are significant \((all \ p<0.001)\) links with site attitudes \((H9a)\), involvement in purchase decisions \((H9b)\), and purchase intentions \((H9c)\).

For H10, surfers’ involvement in purchase decisions is negatively related to purchase intentions \((r=-1.64, p<0.1)\).

Overall, the results are encouraging, with full or partial support for several sets of hypotheses. This study was exploratory as no specific information was available on many paths. However, two-thirds of the proposed individual relationships were supported, and the model fitted the data very well.

7. Interpretation and discussion of findings

The most interesting findings relate to effectiveness of information content. This central cue impacts site involvement \((Yoon, 2000)\), exploratory behavior and purchase intentions \((Okasaki and Rivas, 2002)\). Indirectly, it is positively related to site attitudes, with exploratory behavior mediating this relationship. First, we infer that when information content is effective, surfers are more engaged in in-depth information search. Surfers exerted cognitive efforts and used the central route, according to ELM. They became keener to search for information (exploratory behavior), affecting positively their attitudes, without being involved or to intend and purchase the OTC drug: they may be labeled information seekers. Site involvement had an impact on pre-purchase and purchase intentions. But of more interest is that site
involvement is highly related to approach attitudes. Normally, highly involved surfers are attracted by product aspects (information content effectiveness), whereas lowly involved ones focus on peripheral stimuli (entertainment) or some of the site’s characteristics (organization). We infer that highly involved surfers develop positive site attitudes leading to behavior such as repeat visits to collect up-to-date information. Obviously, this carries significant theoretical and managerial implications. Site involvement has a positive impact on involvement in purchase decisions. The more involved surfers are, the more they search for information before purchase, process relevant information in depth and use more criteria in their purchase decisions than others. Moreover, internet-involved consumers more likely purchase online than those with low-levels of site involvement.

Informativeness had a negative relationship with site attitudes. Even though there is updated, accurate and/or complete information, surfers who considered the site as informative, useful, and/or resourceful liked it less than those who did not, inducing the development of avoidance attitudes. Central cues such as effectiveness of information content and informativeness impact exploratory behavior. When the information presented suited visitors and is accurate, complete and up-to-date (content), they scroll and browse in order to gather more information. However, when the site is useful or resourceful to them (informativeness), this relationship is negative, which means that, as expected, informativeness reduced the extent of browsing. According to ELM, these variables make surfers follow the central route, exerting some cognitive efforts.

We found that efficient navigational characteristics help develop exploratory behavior (Menon and Kahn, 2002). When the site is easy to use, with few navigational problems and good search agents, surfers spend more time investigating the site, developing positive site attitudes (Baronas and Louis, 1988; Eagly and Chaiken, 1993).

Although structure is a central cue, it is not related to behavioral variables, which might due to the variance being explained by other central cues. The simple or complex level of structure does not influence browsing or scrolling, contrary to our hypothesis. Surfers do not exert additional cognitive effort to collect information because the structure is more complex. However, it is a central cue which could participate in the development of purchase intentions.

Finally, when the site is confusing or irritating, in addition to other central cues, surfers become less involved in its visit because the organization does help them satisfy their information needs, they are likely to develop avoidance behavior and leave the site.

However, surfers who did not give much attention to contents are attracted by visuals, giving them the opportunity to pursue the visit because of the entertainment value of the site. Visitors, who are affected by the visuals, elaborate affective reaction and follow the peripheral route. When a site is entertaining, surfers develop more arousal and/or pleasure early in online browsing, becoming more involved in the site (Park and Young, 1986) and keener to search for information (exploratory behavior), affecting positively their attitudes. In this situation, we consider these visitors as browsers. Their behavior is experiential, they ask for recreational activity and nonlinear and rather ongoing research (Novak et al., 2003), contrary to information-seekers. Moreover, entertainment is directly linked to purchase intentions, confirming the impulse buying found by Novak et al. (2003).

Whether or not surfers look for information, both goal-directed and experiential behaviors are involving (Schlosser, 2003). When the site matches the surfers’ goals, they engage in cognitive elaboration and develop favorable attitudes (Schlosser, 2003).

Our results do not support prior findings that site attitudes have a positive effect on involvement in purchase decisions (Shim et al., 2001). Also, we did not find a relationship between site attitudes and purchase intentions, whereas prior research did (Stevenson et al., 2000; Notani, 1997). We infer that surfers’ goals were purely for entertainment or information search rather than intending to purchase.

Without the benefit of prior findings, we did not find significant links between surfers’ exploratory behavior and both site involvement and involvement in purchase decisions. However, we found a significant path between exploratory behavior and site attitudes. The more surfers scroll and browse, the more they like information about the topic, producing approach behavior.

The path between involvement in purchase decisions and purchase intentions is marginally significant and negative. It is reasonable for a visitor to be involved in the search for information, and after collecting more information postponing their intentions to buy the product.

8. Theoretical and managerial implications

Our goal was to examine the impact of Internet atmospherics on surfer behavior. These findings provide behavioral scientists a better understanding of Internet surfer behavior.

The theoretical implications take several forms. First, it confirmed several relationships discussed in prior literature, such as: (1) navigational cues positively influencing purchase intentions (Lynch et al., 2001); before developing intentions, surfers navigate through the site or find more information via other channels; (2) a direct link between site involvement and purchase intentions (Kwak et al., 2002); (3) site involvement and attitudes display a significant relationship (Yoo and Stout, 2001).

Also, Bruner and Kumar (2000) found that site attitudes impact purchase intentions. But Kwak et al. (2002) found that online ad attitude did not impact Internet purchase. Our results supported Kwak et al. (2002), with site attitudes not
affecting involvement in purchase decisions and purchase intentions. De Pelsmacker et al. (1998) reported a significant link between effectiveness of information content and site attitudes, whereas, in our study, it is mediated by exploratory behavior.

More importantly, we tested relationships that were never studied previously: impact of structure, effectiveness of information content, and informativeness on exploratory behavior; structure and involvement in purchase decisions on purchase intentions; exploratory behavior on site involvement and involvement in purchase decisions; and attitude on involvement in purchase decisions.

Finally, our study tested the ELM (Petty and Cacioppo, 1986) in an Internet context. All high task-relevant atmospherics cues were found to have an impact, with the main flow going to exploratory behavior, which affected site attitudes, while in parallel they also impacted purchase intentions. This complex pattern indicates the use of the central route by information seekers. The low task-relevant cue, entertainment, had the strongest impact on site attitudes (directly and through site involvement), reflecting the use of the peripheral route by browsers/entertainment seekers; interestingly, entertainment had a secondary impact on exploratory behavior and purchase intentions, reflecting the need for some entertainment by information seekers.

This research provides marketers with insights into variables that influence consumers’ purchase intentions for an OTC drug when they use the Internet to seek and collect information. The findings indicate what types of navigational cues, which kinds of structure and effective information content are more likely to involve surfers in seeking product-related information from the Internet.

Given the early positioning of information search in the decision process, if marketers can identify which consumer segments rely on navigational characteristics, information content and structure of the site or on entertainment, how to decrease the difficulty of navigating their site, and how to build a site with a structure and information convenient and appealing to their needs, they can better tailor their communication strategies. Their behavior could positively change, with more exploratory behavior, approach behavior and site involvement, ending in purchase.

Marketers should study emotions of surfers when they first visit a website as these may affect their behavior. When a marketer builds sites for tasks such as purchasing, registering, doing something that asks for an immediate reaction, deeper browsing or exploration not required or not desired, the web site could be designed with arousing stimuli. If the site is arousing, consumers are more likely to complete their tasks and less likely to search for other stimulation or browse other sites. If marketers want their visitors to stay longer, browse and explore different links, they might create pleasing, enjoyable stimuli to encourage browsing and impulse buying (Menon and Kahn, 2002).

9. Limitations and future research

The study is not without limitations. Empirical surveys on the Internet may be questioned on external validity, more so since respondents surfed one site and were students with Internet experience. The addition of emotions might have helped explain some paths found non-significant or through indirect paths.

Some other areas for future research can be suggested: measure and add attitude toward the brand to have a link with involvement in purchase decisions and purchase intentions; add trust and experience as they influence attitudes and purchase intentions; use metrics for evaluating environmental cues such as stickiness (average time per visit, frequency and recency) (Bhat et al., 2002). Knowing how consumers consider an OTC drug (search or experience product) will help in further testing ELM in a web context. Moreover, this model could be applied to other products necessitating information seeking. Finally, longitudinal studies could trace the evolution and adaptation of consumer behavior when technological developments are brought into navigational characteristics, adding visual and audio capabilities and improving the quality of the information found on the Web.

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