Web Interface and Consumers Buying Intention in E-Tailing: Results From an Online Experiment

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ABSTRACT
This article empirically tests the influence of perceived atmospheric elements of an e-commerce website on consumers’ emotional and behavioral responses. Virtual atmosphere is considered as a multi-dimensional construct integrating visual aesthetics, layout, and website social interactivity perception. The data was collected from a sample of Internet users who participated in an online survey. The main results show that all atmospheric factors have a positive impact on mood, which in turn strongly influence online purchase intentions. However, attitude toward the site was partially explained by atmospherics and did not impact purchase intentions.

INTRODUCTION
Online shopping over the Internet has witnessed unprecedented growth during the last decade. According to Internet World Stats the global online population of Internet users worldwide increased 225% between 2000 and 2007, reaching over 1.1 billion (Internet World Stats 2007). Furthermore, sales at e-commerce sites in 2006 reached $102.1 billion, a 24 percent increase over 2005 sales (Burns, 2007), showing that consumers are getting more and more comfortable making more transactions online and exhibit satisfaction with e-commerce surpassed that of offline retail by 11.6 percent, according to the American Customer Satisfaction Index (ClickZ network, 2007).

Even though for both marketing scholars and practitioners, the virtual marketplace represents an essential retailing channel (Hoffman et al., 1995; Chen and Wells, 1999; Yoo and Donthu, 2001), consumer usability issues are occasionally neglected by web designers, resulting in negative effects on consumer retention and loyalty. For example, a study by A. T. Kearney (2000) revealed that, due to poor web pages design, 82% of experienced online shoppers drop out their shopping process without completing the transaction. Researchers are then turning their attention toward understanding consumers’ reactions to shopping environments (Alba et al., 1997; Degeratu et al., 2000; Hoffman and Novak, 1996; Menon and Kahn, 2002). Whereas existing empirical research on web atmospherics is limited, most of the previous studies have focused on one aspect of interface stimuli (i.e. e-merchandising, colors, image sizes, structure…). The present research proposes to adapt Baker’s (1986) classification of store atmospheres (i.e. store sensory ambience, design layout and social factors) to the online shopping environment and will extend the web atmospheres literature by specifically addressing site design aesthetics, site layout navigability, and social interactivity. Based on S-O-R paradigm (Mehrabian and Russell, 1974; Donovan and Rossiter, 1982), a model is built and empirically tested. We expect that the web environmental factors will contribute to explain the online purchase intention of users through the effect of surfers’ mood states and their attitude toward the site. Results are then discussed, theoretical and practical implications will be presented.

THEORETICAL BACKGROUND AND MODEL DEVELOPMENT
Considerable retailing literature addresses how physical store cues affect buyer behavior (see Baker, Parasuraman, Grewal, and Voss (2002) and Turley and Millman (2000) for reviews of this literature). Similarly, various researches in e-tailing have, in general, identified that web surfers’ experience is one of the most important factors that influence consumer’s attitude and behavior toward e-commerce sites. A positive experience with a Web site is desirable as it can potentially lead to more frequent site visits, more focused attention to the product promoted by the site, or even online purchase of the product (Childers et al., 2001).

The retail store environment has been described as a bundle of cues that affect and shape consumer behavior. In Kotler’s (1973) seminal work on physical mortar-and-brick store atmospherics, store atmospheres are defined as the “intentional control and structuring of environmental cues” or “design of space to create certain buyer effects”. He proposed that atmospheric cues may impact purchase decisions more than the product itself and may be more influential than other marketing inputs at the point of purchase (Baker et al., 1994). Following the research tradition in store atmospherics, Dailey (2004) defines Web atmospherics as the “conscious designing of Web environments to create positive affect and/or cognitions in surfers in order to develop positive consumer responses”. Regardless the support given by this definition to the capacity of the web environmental stimuli to affect shopping behaviors, no specific typology of the atmospheric cues is provided.

Despite most cited Eroglu et al.’s (2001) high and low task relevant cues typology on Web atmospheres cues, no comprehensive classification of online store environment features has been proposed and empirically tested. In their exploratory study, Allagui and Msaad (2006) presented a conceptual framework including a taxonomy of web atmospheric cues. Following the recommendation of Eroglu et al. (2001), they identify three major dimensions similar to what has been done within the traditional retail store environment by Baker (1986): sensory ambient features, layout design and social interactivity. Recently, researchers have undertaken a corpus of work on web atmospherics, consisting in studying the impact of a single atmospheric feature on shopping outcomes. In the present study, we propose a holistic, wider classification of web environmental stimuli (Lemoine, 2003) and suggest that they can be related to either the site’s aesthetic design (Khakimdjanova and Park, 2005; Sutcliffe, Kurniawan and Shin, 2006), navigational structure (Dailey, 2004; Vrechopoulos et al., 2004; Griffith, 2005) or interactivity (Hoffman and Novak, 1996; Fortin and Dholakia, 2005).

Web visual Aesthetics:
The aesthetic dimension of web atmosphere basically concerns the site’s visual appeal (Lavie and Tractinsky, 2004) and relates to the use of colors, fonts, graphics, images, videos, animation, java applets. Steuer (1992)’s work seems to suggest that navigation design of a Web site alone could not bring out positive experience. It has been reported in many design guidelines how a site’s aesthetic elements, for example, color, symmetry, shape, space, depth of field, dynamic media, and match mood (see Sutcliffe, Kurniawan and Shin, 2006) can be manipulated to make a site attractive.

It has been reported that the images, text and colors used on a Web site can convey certain meanings to the viewer (Brett et al., 2005). Physiological tests have shown that warm colors, such as red and yellow, are arousing, whereas cooler colors, such as blue and
green, are soothing. Drèze and Zafryden (1997) carried out research into the effects of color in web design and displays. However, aesthetic considerations may contradict some of the task-motivated guidelines because the design objective is to please the user and capture the attention rather than deliver information effectively. Design guidelines for aesthetics are difficult to formalize since judgment of aesthetic quality suffers from considerable individual differences.

**Webpage Layout and Navigation Cues:**

Among all the elements of a website, navigation design of a Web site is recognized as one of the important ones to determine the success of a Web site (Dailey, 2004). Navigation design is generally referred to as navigation cues or devices (e.g., a list of links) which allow users to move to a desired section and view pages of interest. When these navigation devices are salient and clear enough to help users’ cognitive processing of their movement in cyberspace, users are more likely to achieve optimal experience toward their surfing goals. On the other hand, if these devices are ambiguous and not user-friendly, the users are more likely to get lost in the cyberspace and as a consequence experience anxious through the Web navigation. Lohse and Spiller (1999) find that e-commerce layout characteristics have an impact on site traffic and sales while Burke (2002) states that these characteristics directly affect willingness to purchase online. Navigational layout in designing virtual stores becomes then a key element of maintaining customers on the website and helping them achieve their shopping tasks.

**Social Interactivity:**

Huang (2003) relates interactivity to the more “active” or “interactive” qualities of the online medium, and concerns the extent of information exchange between a web site and its user. He identified seven different types of interactivity (responsiveness, individualisation, navigability, reciprocity, synchronicity, participation and demonstrability) that could have an effect on consumer attitudes and behaviors in different ways. Social presence represents the degree to which a medium conveys the perceived presence of communicating participants in the two-way exchange, either between humans or between human and machine. This is also termed telepresence in Hoffman and Novak’s (1996) model of network navigation. Interactivity is likely to create feelings of social presence for the user through the availability of open channels allowing for two-way communication. It includes control, exchange of roles, and mutual discourse. Studies that have manipulated the level of interactivity suggest that interactivity has direct impact on involvement and arousal (Fortin and Dholakia, 2005). Reeves and Nass (1996) noted that static human images, photographs and speech can help to attract users and persuade them to buy goods by being polite and praising their choices. Likewise interactive animations of people, e.g., talking heads or full body avatars, have an attractive effect since the site ascribes human-like visual cues and increase the social warmth of the website (Hassanein and Head, 2006). Steuer (1992) made similar argument that certain website features can bring out more human experience, rather than technological interactions. Such online experience mimic real world experience, therefore is defined as virtual reality.

**Effect on Mood States and Attitude toward the web site:**

Stevenson et al. (2000) showed that attitude toward the site (ATS) is a useful construct in understanding the impact of a web site on shopping behaviors. Three factors account for determining attitude toward web sites: entertainment, informativeness, and organization (Chen and Wells, 1999; Chen et al., 2002). Considering web sites look like and reflect the characteristics of traditional retail settings, attitude toward the web site should therefore lead to consequences identical to those found in attitude research. Design rules of a commercial Web site emphasize important issues such as ease of navigation, interactivity and multimedia elements to develop its visual attractiveness and then consumers’ attitude toward the site. Mood is defined as “a type of affective state which is transient and particular to a specific time and situation” (Jeon, 1990, p.24 cited by Park et al, 2005). Gardner (1985) described mood as a phenomenological property of an affective state that an individual subjectively perceives. In relation to a pleasurable shopping experience created by store environment, studies have shown that a positive mood could be increased by exposure to a visual display (e.g., a moving object, prominent image size, distinct color) and result in greater intention to purchase (Spies et al, 1997). We expect then that well structured store layout and prominent store display using colorful signs and store lights as well as the existence of interactive elements on the website can positively stimulate consumers’ mood.

**Purchase intention in Internet shopping:**

Consumers normally form attitudes that influence purchase intention to buy products online when they use the Internet. Therefore, Internet usage and attitudes towards products online become strong predictors of the intention to purchase products online. Individual affective states (i.e. pleasure and arousal) were found to affect shoppers’ behaviors (Menon and Khan, 2002). Mood states are present in virtually every shopping encounter (Park et al, 2005); hence we expect that positive mood states affected by pleasant web environment will increase the surfers’ online shopping intention.

**Research Model:**

Based on the literature cited and following Mehrabian and Russell (1974) S-O-R framework, the research model was constructed (figure 1). Navigational website structure, visual aesthetics, and social presence directly impact attitude toward the site and mood states which in turn affects purchase intentions. The hypothesized interrelationships between the model constructs are depicted by the arrows, which show that the stimuli variables have a positive impact on attitude toward the site as well as mood states, which in turn positively affects purchase intention.

**METHOD**

**Survey, sample selection and characteristics:**

Data for the study was collected through an online survey. A website selling music CDs and movie DVDs was especially built for the purpose of this research and hosted online under the URL www.mediamestore.com. Two considerations have guided the selection of the product within this study: first, the product had to be readily available on the e-commerce market and second, appropriate to use by respondents.

A database containing seven hundred fifty valid email addresses was used to recruit participants to the study. Subjects were asked to navigate on the website and to fill out an online questionnaire including the measurement instruments of the model constructs. Only interested Internet users took part of the study as no lottery was organized for individuals who responded to the questionnaire. Downes-Le Guin et al (2002) demonstrated that incentives yield a modest gain in response rates and in cost efficiency for Internet surveys. Yet, reliability of answers was assessed through the experiment duration: a software calculating the exact time of web navigation for every respondent was included to the site’s back
office (administrator’s interface). Respondents who spent less than
ten minutes on the website were judged to be unable to provide valid
answers to the survey questions.

A total of 171 valid questionnaires were considered for the
data analysis. The sample consisted in 85 males and 86 females.
Approximately 92% of the subjects were adults aged between 20
and 35 and averaged 4 hours of net surfing per week. About 60% of
the respondents had purchased products over the Internet.

Site design:
Color choices, fonts, and global product images were inspired
from three major real websites selling music and movies online.
Navigational layout of the site was based on a tree hierarchical
structure (Griffith, 2005) incorporating site map index and a search
engine. A conversational virtual agent named cybelle was added to
the interface and increased the “social warmth” of the site (Hassanein
and Head, 2006). The programmed virtual agent could answer
questions about product availability and interact with visitors by
showing different facial expressions (smile, disappointment, shy-
ness…).

Instruments:
Variable measurement scales were adapted from existing
valid instruments. They are described in Table 1.

RESULTS

Factor analysis (Table 2):
An exploratory factor analysis (EFA) was conducted to find out
how the model constructs were linked to their underlying
factors. The psychometric properties of the items composing the
research scales were analyzed. Items with factor contribution under
.4 were deleted. Each construct proved then to be unidimensional
and factorially distinct and explained variance was valued at 90% for
purchase Intentions and around 60% for the other model
variables. Before conducting the test of the structural model, first-
order confirmatory factor analysis (CFA) was used to test the
measurement model. The 6-factor structure obtained by the EFA
was confirmed. Items contribution was satisfying (in average
superior to .7) and only one item was deleted by CFA (i.e. item 6 of
ATS scale). Construct reliability analysis was determined by
Cronbach α and Joreskog Ω coefficients. All coefficients were
found to be greater than the acceptable value of .6 which indicates
high reliability.

Full structural model:
We used structural equations modeling (SEM) to test relation-
ships between the model variables. SEM can help to improve
torical testing and development in the model of Attitude toward
the Internet retailer (Cheong and Leckenby, 2004). Overall, the
results show support for the full structural model fit with a GFI,
relative χ² and CFI values of 0.94, 3.5 and 0.92, respectively. Path
coefficients and t values representing the hypothesized relations-
ships between the model variables are indicated below (Table 3).

Results show that web aesthetics perception affects the sur-
fers’ mood states, as well as perceived website social interactivity.
Layout had a weak but positive impact on mood and was signifi-
cantly related to Attitude toward the site. However, neither web
aesthetics perception nor social interactivity were found to be
related to Attitude toward the site. Web environment stimuli had an
indirect positive impact on online purchase intention through the
effect of mood, as mood was found strongly related to purchase
intention. However, the relationship between ATS and website
purchase intention was not significant. Overall, five out of eight
hypothesized links were validated in this study.

DISCUSSION AND IMPLICATIONS
Attracting and retaining customers on merchant websites with
enhanced web design is a key element of successful e-tailers’
strategy. The present study provides empirical support that the use
web atmospheric cues has a positive impact on users’ affective and behavioral responses.

The compilation of atmospheric variables examined in this study have not been proposed by previous researchers in the context of Internet shopping, and sustain the contribution of visual ambient design, e-store layout and web social factors in explaining online shopping intentions through the mediated effect of individuals’ mood states.
The theoretical implications of this research take several forms. It demonstrates the validity of the S-O-R framework in predicting Internet surfers’ shopping outcomes and confirms relationships found in previous research (Eroglu et al, 2001; Park et al, 2005), since affective responses to virtual store environment were strongly related to purchase intention from the e-store. However, while roughly validating the stimulus-organism-response paradigm in the online shopping context, the results are mixed regarding the mediating role of attitude towards the site. In line with Richard and Chandra (2005), the attitude toward the site construct did not impact that intention and was explained only by the layout characteristics of the website. This reveals that customers’ shopping behavior is facilitated by being able to reach any place in the store directly (e.g. Hierarchical Tree structure), either from the home page or from any other place in the e-store, which positively impact affective states and attitude toward the web site.

The use of visual artistic schemes and presence of an embodied conversational agent on the website were only positively related to mood states felt while navigating on the website. Following Menon and Kahn (2002), we find that these atmospheric variables contribute to a pleasant e-shopping experience traducing global positive feelings.

Strategic exploitation of the present study’s findings by virtual retailers should contribute to the development of more effective and consumer-friendly shopping site interfaces. Web designers should focus on entertaining aspects of e-shopping in order to generate positive mood states, which will increase their purchase intention. The use of interactive elements such as a conversational agent would not only help the customers in finding products on the website, but also make it more appealing and “socially warm”. This result was also found by Wang et al (2007) underlining the relationship between the presence of an avatar on the interface of a merchant website and affective reactions of its users. Thus, those elements can be an added value to the e-tailer for both functional and recreational aspects as while shopping on the Internet, customers would undertake similar activities that they do in the real shopping environment.

Considering the IS literature on web usability, we posit that effective co-operation between different disciplines (HCI, marketing, retailing, etc.) will constitute the key for designing effective virtual shopping environments (Vrechopoulos et al, 2004) by incorporating some web atmospheric cues.

The limitations related to our study would draw some future research directions. The first is related to the survey nature of the research. Studies that experimentally manipulate virtual store environments would clearly capture more effect of web atmosphere on consumer emotions and behaviors. Websites with different level of aesthetic perception, layout, and social interactivity can be used to evaluate the shopping outcomes of Internet users. Besides, it would be interesting to know if the three atmospheric categories of variables interact and have a common impact on consumers, as well as incorporating individual and situational variables (involvement, atmospheric responsiveness, shopper motivation) that could moderate the model relationships (Sautter et al, 2004).

Future research could also focus on other product types or services to increase external validity of the research model. Such research may reveal that e-store environmental stimuli affect consumer buying behavior differently through product nature.

**REFERENCES**


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**TABLE 3**

Standardized Coefficients and Fit Statistics for the Overall Model

<table>
<thead>
<tr>
<th>Path</th>
<th>Loadings (t values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web aesthetics</td>
<td>Mood (0.39 (2.83))</td>
</tr>
<tr>
<td>Web aesthetics</td>
<td>Mood (0.34 (2.13))</td>
</tr>
<tr>
<td>Structural layout</td>
<td>Mood (0.13 (1.97))</td>
</tr>
<tr>
<td>Social Interactivity</td>
<td>Mood (0.45 (3.20))</td>
</tr>
<tr>
<td>Attitude Toward the Site</td>
<td>N.S. (0.97)</td>
</tr>
<tr>
<td>Mood</td>
<td>Website Purchase Intention (0.48 (3.38))</td>
</tr>
</tbody>
</table>

**Fit Statistics**

- $\chi^2$ / d.f.: 682.96 (P=0.0) / 198
- GFI: 0.94
- CFI: 0.92
- RMSEA: 0.082
- NFI: 0.95
- NNFI: 0.96


Lohse, Gerald and Spiller, Peter. 1999. “Internet retail store design: how the user interface influences traffic and sales.” *Journal of Computer Mediated Communication* 5 (2)


