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BUSINESS-TO-CONSUMER WEB SITE QUALITY AND WEB SHOPPERS' EMOTIONS: EXPLORING A RESEARCH MODEL

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Abstract

Based on the literature on consumer behavior, psychology, and information systems, this paper explores relationships between Web site quality, the cognitive appraisal of situational state (a key cognitive antecedent to emotions) and a set of positive and negative emotions. A theoretical model is tested on data collected from 215 different Web shopping episodes. Results show that when shopping on business-to-consumer Web sites for low-touch products (music CDs and movies in DVD format), customers felt emotions, namely liking, joy, pride, dislike, frustration, and fear. Even though the mean intensity levels of these emotions is low to moderate, for a substantial number of shoppers (near a third of the sample population) the emotions of liking and joy were felt intensely. Results also indicate that Web site quality, measured by several Web site design components, has a positive impact on the cognitive appraisal of situational state, operationalized as the satisfaction level of the overall online shopping experience. In turn, this appraisal affects all emotions felt by shoppers except fear. This study is particularly addressed to designers and managers of B2C Web sites as it invites them to consider Web shoppers' emotions while designing and developing their electronic platform.

Keywords: Web site quality, emotions, B2C, online shopping, cognitive appraisal

Introduction

Designers are overwhelmed with recommendations on how to design effective business-to-consumer Web sites. On Amazon.com alone, searching on the keywords "Web design" returns more than 3,000 results. However, even though literature on the subject is abundant and serves several needs, two major shortcomings need to be addressed. First, most of the design guidelines published are based on authors' personal opinions, expertise, and experiences. After more than a decade of Web development, only a few sets of guidelines are grounded on theoretical foundations (Geissler et al. 2001; Kim et al. 2002; Song and Zahedi 2001; Zhang and Von Dran 2000). As pointed out by Zhang and von Dran (2000), this scantiness creates uncertainties regarding the effectiveness of the design recommendations. Based on their examination of existing Web design checklists, Zhang and von Dran believe three uncertainties emerge: "(1) it is unclear whether there is an inclusive collection of design factors; (2) it is unclear if some of these factors are more useful than others, and (3) if they are sufficient to make users satisfied with Web sites" (p. 1253).

Second, Web site design recommendations often ignore the affective dispositions of online shoppers. Checklists and guidelines, even those that are user-oriented, do not prioritize the feelings or emotions that can occur during online shopping episodes, despite

important empirical findings on the crucial role played by shoppers' affective states on their behavior (Bagozzi et al. 1999; Turley and Milliman 2000). Also, knowledge from scientific research on emotions per se occurring in online shopping situations is scarce. Little is known on which emotions are susceptible to be felt during online shopping episodes, on the conditions leading to their emergence, and on their impact on behavior.

This paper addresses the two gaps mentioned above. It has three purposes. First, to discover which emotions among a set of six are experienced by Web customers during online shopping episodes; second, to reveal to designers of B2C Web sites the importance of emotions; and third, to substantiate the influence of Web site quality on emotions with the exploration of research-based concepts that have not yet been applied to online shopping environments.

The remainder of the paper is organized as follows: After a justification of the importance of emotions during online shopping episodes, we briefly examine some of the relevant literature regarding the concepts of Web design quality, cognitive appraisal, and emotions. Next, the research model and hypotheses are exposed, followed by an explanation of the research methodology undertaken. Research results are then presented and discussed. The last section concludes with some brief remarks, the research limitations, and prospects for future research.

Importance of Consumers' Affective States

In the marketing field, a considerable amount of research has shown that affect—the umbrella term for a set of specific mental processes including feelings, moods, and emotions—is an important concept that contributes to explaining several behaviors adopted by consumers. Using the stimulus–organism–response (S-O-R) paradigm (Mehrabian and Russell 1974) as a theoretical foundation, several studies have found empirical evidence supporting the relationships between pleasure (whether individuals perceive the environment as being enjoyable or not enjoyable) and several approach behaviors such as staying longer than expected in the store, purchase intentions, money spent in the store, impulse purchase, and affiliation with store's personnel (Baker et al 1992; Donovan and Rossiter 1982; Dubé et al. 1995; Sherman et al. 1997; Yalch and Spangenberg 2000). Those behaviors are particularly sought by merchants and conditions for their emergence are thus prioritized. As such, merchants have invested time and money on the atmosphere of stores in order to create an environment that incites the manifestation of positive affect.

In the information systems literature, several studies on system use in traditional and online environments came to a similar conclusion. Authors found that some affective states impact user behavior (Agarwal and Karahanna 2000; Davis et al. 1992; Johnson and Marakas 2000; Paré and Elam 1995; Venkatesh 2000). These same researchers have demonstrated, for example, that states of anxiety and enjoyment affect the use of an information system, even though the concept of affect has been operationalized by a limited number of dimensions.

Studies in both disciplines (marketing and information systems) have also shown that affective states can play the same role on the Web. Based on theoretical approaches derived from the consumer behavior literature (Mehrabian and Russell 1974) and the concept of flow (Csikszentmihalyi and Csikszentmihalyi 1988), several studies came to the conclusion that enjoyment is an antecedent to different behaviors such as the use of e-mail technologies (Trevino and Webster 1992), loyalty (Jarvenpaa and Todd 1997), Web use (Novak et al. 2000) and the intention to return on the Web site (Koufaris 2002). In a study of users of online banking services, Bhattacharjee (2001) demonstrated that satisfaction is the strongest predictor of continuance intention among a set of tested factors. Bhattacharjee measured satisfaction with four semantic differential adjective pairs related to affect: pleased/displeased, frustrated/contented, and terrible/delighted. Menon and Khan (2002) have shown that the level of arousal and pleasure consumers experience on the Web influence their later shopping behavior. Recently, Eroglu et al. (2003) demonstrated that the atmosphere of the Web site influenced different affective states during the shopping episode, which in turn influence shoppers' attitudes, their level of satisfaction, and their various approach/avoidance behaviors.

All of these studies have highlighted the importance of shoppers' affective states. However, as mentioned previously, these findings are generally ignored by Web designers and by those who propose guidelines to help them built more effective B2C Web sites.

Theoretical Background

Web Site Quality

With the increased popularity of the Web as a tool for shopping, several information systems scholars have explored the concept of Web site quality (Huizingh 2000; Johnson and Misic 1999; Liu and Arnett 2000; McKnight et al. 2002; Wan 2000). As is the

case with exploratory research, most of these efforts have focused on defining and operationalizing the concepts. With their Web benchmarking study, Johnson and Misić (1999) were among the first to attribute dimensions to Web site quality, namely functional and navigational issues (speed and ease of navigation), content and style (currency and presentation), and contact information. Other researchers, using different methodologies, came up with different sets of dimensions: content and design (Huizingh 2000); information and service quality, system use, playfulness, and system design quality (Liu and Arnett 2000); information, friendliness, responsiveness, and reliability (Wan 2000).

Extensive Web site quality measurement instruments have also been proposed. Two of these instruments are the WEBQUAL expanded model, comprised of 12 dimensions (Loiacono et al. 2000), and the perceived performance instrument (McKinney et al. 2002), composed of two dimensions: information quality (understandability, reliability, usefulness) and system quality (access, usability and navigation).

Even though the studies quoted above postulate that Web site quality is essential to Web site success, effectiveness, and customer satisfaction, the claims are not supported with empirical evidence. To date, efforts to assess quantitatively these relationships are limited. Roy et al. (2001) found a strong relationship between interface quality (measured by ease of navigation, consistency, learnability, perception, and user guidance or support) and each of the three dimensions of trust (ability, integrity, and benevolence). Also, McKnight et al. (2002) have identified a high correlation between Web site quality (measured with five design oriented items) and the variable trusting belief. They conclude that a high-quality Web site creates consumer beliefs that the vendor is not only competent, but also honest and benevolent.

Emotions and Emotions' Antecedents

Emotions are complex multidimensional phenomena. Since the days of Plato, Aristotle, and Epictetus, theories have been developed to understand them. Thanks to the works of emotion theorists such as Cornelius (1996) and Strongman (1996), five research traditions (or perspectives) have emerged, namely the evolutionary perspective, the physiological perspective, the cognitive perspective, the neurological perspective, and the social-constructivist perspective (for a description of the five major theoretical points of views representing contemporary research on the subject of emotional processes, see Cornelius 1996).

This paper adopts one of the major perspectives developed to understand how emotions are formed: the cognitive perspective. Three reasons justify our choice. First, this perspective is based on a solid research tradition emerging from the works of Arnold (1960) and further developed by researchers such as Lazarus (1991), Roseman (2001), and Smith and Ellsworth (1985). This considerable body of research demonstrates with empirical evidence that emotions are responses to the meaning of events and are associated with a person's goals and motivations (Cornelius 1996). Second, the cognitive perspective is appropriate for online shopping where information processing is important (Bagozzi et al. 1999). Third, since cognitive models have the advantage of specifying the antecedents (or referents) to emotions, they have predictive capability and can be used to elaborate research models (Nyer 1997).

One of the basic assumptions of the cognitive tradition is that emotions have specific referents. They come forth in response to appraisals one makes for something of relevance to one's well being. Accordingly, an emotion is considered as "a mental state of readiness that arises from appraisals of events or of one's thoughts" (Bagozzi et al. 1999, p. 184). This definition distinguishes emotions from other manifestations of affect, such as moods and feelings. Several theoretical frameworks have been proposed to try to understand what psychological processes (or appraisals) cause emotions such as joy, sorrow, pride, anger, and frustration (for literature reviews on the subject, see Cornelius 1996; Omdahl 1995). Essentially, the proposed frameworks are based on the belief, as described by Omdahl (1995, p. 42), "that assessments of situations are compiled to form appraisal configurations, and that configurations of appraisals lead to complete packages of emotional responses." Each conceptual framework tries to explain the differences among emotions with a minimal number of appraisals that are combined to form different configurations. For example, Smith and Lazarus (1993) believe six different appraisals explain anger, guilt, sadness, and fear/anxiety while Scherer (1997) uses eight appraisals to explain seven emotions (joy, fear, anger, sadness, disgust, shame, and guilt).

However, the framework proposed by Roseman et al. (1996) stands out since it explains a large set of emotions, several of which could be felt during shopping episodes. Bagozzi et al. (1999), in their literature review of emotions in marketing, believe that the framework proposed by Roseman et al. could become a useful tool for the investigation of emotions in the context of consumption behavior. The framework hypothesizes that a particular combination of cognitive appraisals (unexpectedness, situational state, motivational state, probability, agency, control potential, and problem source) determines which of the 17 emotions (surprise, hope, joy, relief, liking, pride, fear, sadness, distress, frustration, disgust, dislike, anger, contempt, regret, guilt,

		Positive emotions Motive-Consistent		Negative emotions Motive-Inconsistent			
Circumstance Caused		Appetitive	Aversive	Appetitive	Aversive		
Circumstance Caused	Unexpected	Surprise					
	Uncertain	Hope		Fear		Low Control Potential	
	Certain	Joy	Relief	Sadness	Distress		
	Uncertain	Hope		Frustration	Disgust	High Control Potential	
Other-Caused	Certain	Joy	Relief				
	Uncertain	Liking		Dislike		Low Control Potential	
	Certain						
	Uncertain			Anger	Contempt	High Control Potential	
Certain							
Self-Caused	Uncertain	Pride		Regret		Low Control Potential	
	Certain						
	Uncertain			Guilt	Shame	High Control Potential	
	Certain						
				Non-Characterological	Characterological		

Figure 1. Structure of the Emotion System
 (From Appraisal Determinants of Emotions: Constructing a More Accurate and Comprehensive Theory," I. J. Roseman, A. A. Antoniou, and P. E. Jose, *Cognition and Emotion* (10:3), 1996.)

or shame) will be experienced in a given situation (see Figure 1). For example, hope and pride, two positive emotions, are elicited by a different combination of appraisals. While they both have a situational appraisal that is motive-consistent, the agency appraisal differs. Hope is related to an event that is perceived as being caused by circumstances, while pride is linked to an event that is perceived as being caused by the actions of the person. Furthermore, the appraisal of probability (certain-uncertain) is an antecedent to the emotion of hope, but not pride.

To date, however, Roseman et al.'s complete framework has not been tested in a retail context even though it could help us to better understand the complex relationships between personal perceptions (appraisals) and emotions.

Research Model and Hypotheses

No empirical study has explored possible relationships between Web site quality, cognitive appraisals (emotions' antecedents), and emotions occurring during online shopping episodes. As such, our research model is comprised of the following three groups of variables: Web site quality, the cognitive appraisal of situational state, and six emotions (see Figure 2).

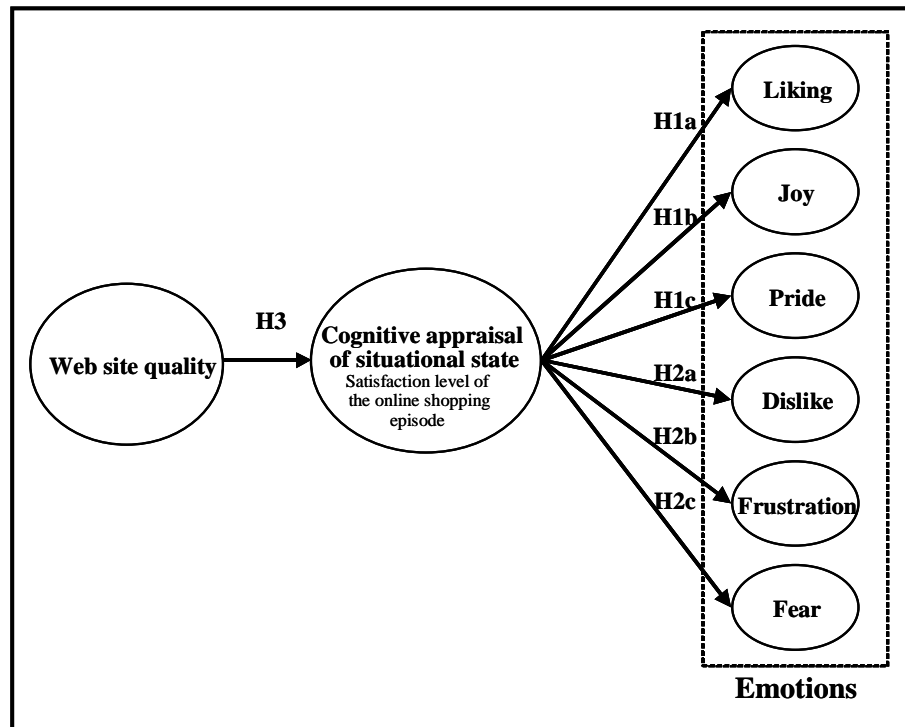


Figure 2. Research Model

The Cognitive Appraisal of Situational State and Emotions

As mentioned previously, emotions are determined by different combinations of cognitive appraisals of events (Roseman et al. 1996). However, to test the relationship between each combination of appraisals and their related emotions is beyond the scope of this paper. As such, we confine our research to the relationships between the appraisal of situational state and six emotions. This particular cognitive appraisal was chosen since it plays a crucial role in accounting for the distinction between positive and negative emotions (Roseman et al. 1996). The appraisal of situational state is defined as the perceptions of an event as being consistent or inconsistent with one's motives. For example, a Web shopper will feel negative emotions rather than positive ones when he is unable to find the information he seeks. We have limited our research to six emotions, namely liking, joy, pride, dislike, frustration and fear since these were, among the 17 emotions comprised in Roseman et al.'s framework, the only ones that were felt by Web shoppers during previous research.

Adapted for a Web shopping context, the appraisal of situational state is conceptualized as the satisfaction level of the overall shopping experience (see the operationalization measures in Table 1). Our model posits that the appraisal of situational state is an antecedent to all studied emotions. When the situational state of the shopping episode is assessed favorably, the intensity of positive emotions increases. When the situational state of the shopping episode is assessed unfavorably, the intensity of negative emotions increases.

Hence, the first and second hypotheses are

H1: The more positively the situational state of the shopping episode is appraised, the higher the intensity of liking (H1a), joy (H1b), and pride (H1c).

H2: The more negatively the situational state of the shopping episode is appraised, the higher the intensity of dislike (H2a), frustration (H2b), and fear (H2c).

Table 1. Constructs, Items and Sources

Construct	Items	Sources
Web site quality	Overall, the Web site I was shopping on <ul style="list-style-type: none"> • Worked well technically • Visually resembled other sites I think highly of • Was simple to navigate • Provided easily the information I wanted • Clearly showed how I can contact or communicate with it (customer service, Webmaster, etc.) 	Adapted from McKnight et al. (2002).
Cognitive Appraisal (situational state)	Overall, the shopping experience on the Web site <ul style="list-style-type: none"> • Gave me the opportunity to accomplish the tasks required successfully • Was a good example of what is expected when I shop on the Web • Was satisfactory 	Adapted from Roseman et al. (1996).
Liking	During the shopping experience did you feel <ul style="list-style-type: none"> • Appreciation • Liking • Preferences 	Each emotion is assessed by a three-item set that originates from Shaver et al.'s (1987) cluster analysis of 135 emotion terms.
Joy	During the shopping experience did you feel <ul style="list-style-type: none"> • Pleasure • Enjoyment • Enthusiasm 	
Pride	During the shopping experience did you feel <ul style="list-style-type: none"> • Self-confidence • Pride • Self-praise 	
Dislike	During the shopping experience did you feel <ul style="list-style-type: none"> • Antipathy • Dislike • Aversion 	
Frustration	During the shopping experience did you feel <ul style="list-style-type: none"> • Frustrated • Prevented from getting what you wanted • Blocked from certain actions 	
Fear	During the shopping experience did you feel <ul style="list-style-type: none"> • Afraid • Frightened • Dismayed 	

Web Site Quality and the Cognitive Appraisal of Situational State

According to the S-O-R paradigm's assumptions and as shown by various studies on the atmosphere elements of a store, affective states of consumers are reactions to stimulus found in the environment (for a literature review on the subject, see Bitner 1992).

Eroglu et al. (2001) and Sautter et al. (2004) have argued that the S-O-R paradigm can also be applied in a Web environment. These researchers state that numerous elements such as information richness, visual aspects, color, background patterns, type styles, shopping agents, and online communities can act as stimuli during online shopping episodes. Several of these stimuli can be considered design elements associated to the concept of Web site quality. However, to this day, McKnight et al. (2002) are the only researchers that have demonstrated that Web site quality—a concept that comprises several design elements—is positively related to trusting beliefs.

Our research explores a similar relationship, the correlation between Web site quality and the cognitive appraisal of situational state. Hence, our model posits that Web site quality has a positive impact on this appraisal. As such, the third hypothesis is

H3: Web site quality positively affects the cognitive appraisal of situational state.

Research Methodology

Data Collection

All data were collected by means of a field survey. The participants were students at the Faculté d'administration de l'Université de Sherbrooke, a business administration school in the province of Quebec, Canada. As postulated by McKnight et al. (2002), our choice of population can be justified by the fact that students are good surrogates for the "real world" in shopping situations. Subjects were requested to go through a Web shopping episode. A predetermined Web site was assigned to each participant from the following online retail sites: Archambault.ca, Amazon.ca, Renaud-Bray.com, and Futureshop.ca. These four sites are the most popular online retail stores selling both music CDs and movies in DVD format in the province of Quebec. The shopping episode was divided into two specific steps. In order to develop some acquaintance with the Web site assigned to them, participants were first asked to shop for a specific retail good, a music CD (*La Vallée des Réputations* from Jean Leloup, a popular local singer) or a movie in DVD format (*Le Fabuleux Destin d'Amélie Poulin*, a popular French movie released in local theaters in 2000). Next, subjects were asked to shop for a product they would give to a friend or a family member. This specific task was chosen in order to closely simulate a real shopping experience during which customers can experience emotions. Immediately after the completion of these two steps, subjects were asked to promptly answer a questionnaire. Each participant received a sum of \$10 to compensate for their time shopping on the Web site and completing the questionnaire. A total of 226 questionnaires were collected. Due to incomplete data, 11 were eliminated.

Research Variables

The instruments to measure Web site quality and the cognitive appraisal of situational state were derived from McKnight et al. (2002) and Roseman et al. (1996) respectively. Each emotion was assessed by a three-item set that originates from Shaver et al.'s (1987) cluster analysis of emotion terms. A nine-point Likert scale (1 = not at all, 5 = moderately, and 9 = very much) was used to measure each item. Table 1 presents the instrument used to measure the research model's constructs.

Data Analysis and Results

Descriptive Statistics

Out of 215 shopping episodes, 59 were conducted on Archambault.ca, 50 on Amazon.ca, 50 on Renaud-Bray.com and 46 on Futureshop.ca. The shopping episode of 96 percent of the participants lasted between 5 and 24 minutes. Of the 215 participants, 113 shopped for music CDs and 102 for movies (DVD format); 52 percent of the participants had never visited the B2C Web site assigned to them; only 6 percent of the subjects had visited their designated Web site more than six times the prior year; and 83 percent of participants were between 18 and 24 years old.

Table 2 demonstrates that Web site quality and the cognitive appraisal of situational state were evaluated favorably with means of 6.41 and 7.20 respectively. Table 2 also shows that Web shoppers did experience emotions while shopping for retail goods on the Web sites (means ranging from 2.06 to 5.39). Liking is the emotion with the highest intensity mean, followed by joy, fear, frustration, pride, and dislike. Even though the mean intensity level of each emotion is not situated at the upper end of the scale, analysis of the data reveals that a substantial portion of respondents felt some emotions strongly: 30 percent and 28 percent of respondents felt respectively the emotion of liking and joy at a higher than moderate intensity level (between 6 and 9 on the Likert scale).

Measurement Model

Table 3 presents results of the principal component analysis and the reliability analysis (columns 3 and 4 respectively). As predicted, all constructs' dimensions load on a single factor and loading factors exceed 0.56 (Varimax rotation for each emotion's dimensions). The Cronbach's alpha coefficients are all above the suggested level of 0.70 (Nunnally 1967).

Table 2. Descriptive Statistics

Construct	Mean	Standard Deviation	Variance
Web site quality	6.41	1.28	1.62
Cognitive appraisal of situational state	7.20	1.42	2.01
Liking	5.39	1.84	3.38
Joy	4.14	1.77	3.12
Pride	2.30	1.52	2.32
Dislike	2.06	1.60	2.57
Frustration	2.96	1.97	3.88
Fear	3.07	1.20	1.45

Table 3. Measurement Model Statistics

Construct	Number of items	Loadings (min-max)	Cronbach's Alpha	Composite reliability ^(a)	Variance-extracted ^(b)
Web site quality	5	0.56-0.90	0.80	0.82	0.49
Cognitive appraisal of the situational state	3	0.70-0.84	0.82	0.82	0.61
Liking	3	0.86-0.88	0.89	0.90	0.75
Joy	3	0.76-0.90	0.90	0.90	0.76
Pride	3	0.68-0.92	0.84	0.86	0.67
Dislike	3	0.88-0.92	0.92	0.92	0.79
Frustration	3	0.72-0.88	0.82	0.84	0.64
Fear	3	0.65-0.92	0.82	0.84	0.65

^(a) Measured with the Jöreskog $R\hat{h}o = \left(\sum_{i=1}^k \lambda_i \right)^2 / \left[\left(\sum_{i=1}^k \lambda_i \right)^2 + \sum_{i=1}^k (1 - \lambda_i^2) \right]$

^(b) Variance extracted = $\sum_{i=1}^k \lambda_i^2 / \left[\sum_{i=1}^k \lambda_i^2 + \sum_{i=1}^k (1 - \lambda_i^2) \right]$

As recommended by Hair et al. (1998), the assessment of the measurement model should be based on two additional tests: the composite reliability test and the variance-extracted test (Table 3, columns 5 and 6 respectively). The composite reliability test measures the internal consistency of the construct indicators and the variance-extracted test provides information on the overall amount of variance in the indicators. All exogenous and endogenous construct composite reliabilities exceed the suggested level of 0.70 (Table 3, column 5). The average variances extracted in constructs are all over 0.50—except for Web Site Quality at 0.49—(Table 3, column 6). Overall, these results indicate that convergent validity has been achieved.

Structural Model

The research model was analyzed with structural equation modeling (AMOS Graphics 4.0), a multivariate technique that tests at the same time the factor analysis and the hypotheses while providing information about the extent to which the model is supported by the data. The fit indices of the structural model are reported in Table 4. The normed χ^2 is 2.29, which is below 3.0 as recommended (Krause et al. 2000). RMSEA, at 0.08, is on the upper limit of the threshold (Hair et al. 1998). CFI at 0.89 and TLI at 0.88 can be practically considered on the limit, since Krause et al. propose a cut-off value of 0.90. The only measure that is noticeably below the recommended threshold is GFI at 0.81 (0 indicates a poor fit and 1.0 a perfect fit). The cut-off value

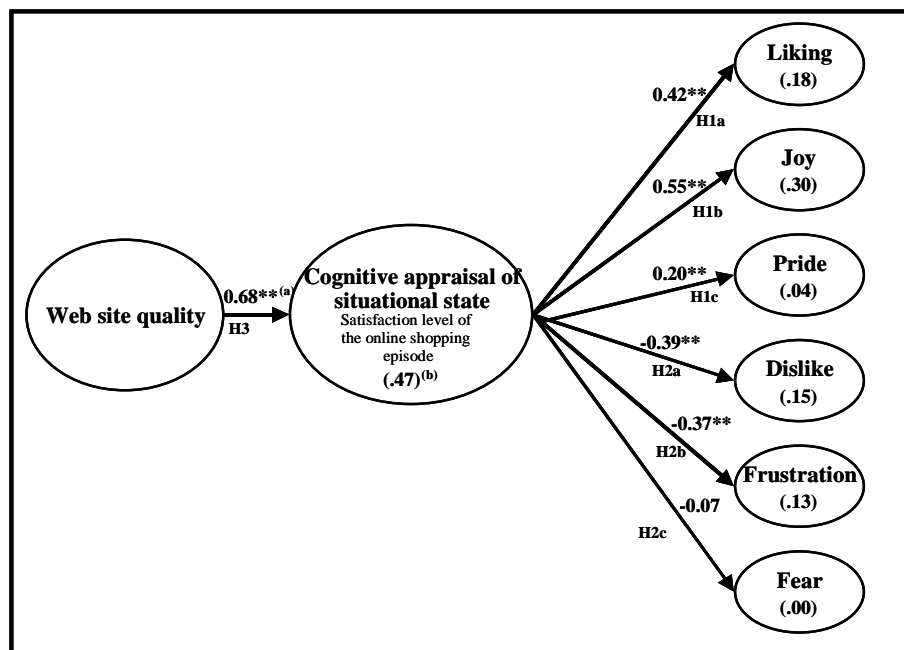
Table 4. Fit Indices for the Structural Model

Statistic	Name	Threshold Guidelines	Observed Value
Normed χ^2	Normed Chi-square	Below 3.0	2.29
RMSEA	Root Mean Square Error of Approximation	Values between 0.05 and 0.08	0.08
CFI	Comparative Fit Index	Above 0.90	0.89
TLI	Tucker-Lewis Index	Above 0.90	0.88
GFI	Goodness-of-Fit Index	Above 0.90	0.81
AGFI	Adjusted Goodness-of-Fit Index	Above 0.80	0.77

recommended by Gefen et al. (2000) for this index is 0.90. However, this result is somewhat compensated by the fact the AGFI, at 0.77, is slightly below the cut-off value of 0.80 recommended by Gefen et al. At this point, it is also pertinent to note that Hair et al. do not fix any absolute threshold value for the GFI index. Overall, we consider fit indices to be acceptable and conclude the structural model fits reasonably the data.

Square multiple correlations are presented in Figure 3. Liking, joy, dislike, and frustration have R^2 values greater than 10 percent. Considering that emotions are complex phenomena, these values represent a good indication of the research model's effectiveness.

Figure 3 also shows that the more positively the situational state of the shopping episode is appraised, the higher the intensity of these positive emotions. Hence, H1a, H1b, and H1c are supported. Moreover, as predicted, results also show that the more negatively the situational state of the shopping episode is appraised, the higher the intensity of dislike and frustration. However, contrary to predictions, the situational state of the shopping episode does not significantly impact the emotion of fear. As such, H2a and H2b are supported while H2c is not. Finally, H3 is confirmed since results demonstrate that Web site quality positively affects the cognitive appraisal of situational state.



^(a) Coefficients of estimation and level of significance, where **p < 0.01

^(b) R^2 values of dependent construct

Figure 3. The Estimated Model

Conclusions, Limitations, and Future Research Avenues

A specific set of emotions—defined as mental states of readiness arising from cognitive appraisals—was explored in a context of online shopping. This study shows that six emotions, namely liking, joy, pride, dislike, frustration, and fear were felt by consumers during Web shopping episodes. While the mean intensity levels of these emotions was low to moderate, it is nonetheless important to note that for a substantial number of shoppers (near a third of the sample population) emotions such as liking and joy were felt at a higher than moderate intensity level. Only a small percentage of participants reported feeling no emotions at all. This finding could have important implications for the design of B2C Web sites. Also, as indicated previously, several studies have revealed the existence of a direct link between emotions and several consumption behaviors. Consequently, it seems appropriate to hypothesize that improving the positive emotions felt during B2C Web shopping episodes will lead to consumption behaviors that are sought relentlessly by online retailers (e.g., spending more time on the site, affiliation with online service personnel, purchasing, repeat visit, and loyalty).

This study also investigated the role of Web site quality, measured by several design components, on the cognitive appraisal of situational state, one of the crucial antecedents for emotions. The results demonstrate that Web site quality positively affects the cognitive appraisal of situational state. In turn, the more positive the online shopping experience is evaluated, the higher is the intensity of the emotions of liking, joy, and pride, while the more negative the online shopping experience is evaluated, the higher is the intensity of the emotions of dislike and frustration.

We believe this research brings three important contributions. First, it highlights results from previous research indicating that emotions are antecedents to several approach behaviors. Second, in addition to proposing contextual sets of measures for six emotions and for the cognitive appraisal of situational state, this research demonstrates that emotions are felt during online episodes and as such should be considered by Web designers during the development process. Third, this research shows for the first time, that Web site quality impacts a crucial antecedent for emotions.

There are six main limitations of this study. First, the use of students from a specific business school prevents the generalization of this study to the Web shopper population. Second, the selection of Web sites offering music CDs and movies in DVD format was limited to four, a procedure that also prevents generalization to the same category of Web sites. Third, the impact of involvement with the product, in this case the level of interest of participants toward music CDs or movies in DVD format, was not explored. Several studies have shown that involvement with the product affects internal responses and behavior (Koufaris 2002; Novak et al. 2000). Fourth, the study did not take into account several individual and environmental factors such as personality traits, motivation, culture, normative beliefs, and moods that may impact emotional and cognitive responses. Fifth, the construct of Web site quality is operationalized by a relatively small number of items. Its complexity and multidimensionality are thus not fully addressed. Sixth, the study did not require participants to engage in an open-ended description of their thoughts and it could be argued that the appraisal of situational state might not have occurred before the creation of emotions.

Future research avenues are numerous. First, the emotion of fear should be further investigated since our research findings indicate there is no relationship between an unsatisfactory online shopping experience and this specific emotion. Second, further exploration of the Roseman, Antoniou, and Jose's (1996) framework could lead to interesting findings. For example, as stated earlier, other cognitive appraisals have been identified as being possibly applicable to online shopping. The inclusion of those appraisals (e.g., motivational state, control potential, and probability) can perhaps contribute to higher fit values between the research model and data. Third, the study of other types of products, particularly those with a higher value perceived by the customers (e.g., travel tickets, cars, banking services), could also be undertaken. Fourth, researchers should attempt to identify which emotions are experienced by Web shoppers during each phase of their buying process (e.g., information search, product selection, payment, and settlement). Finally, as suggested by Eroglu, Machleit, and Davis (2003), measuring the influence of various Web site atmosphere cues (e.g., the identification of specific interface design characteristics or Web site design characteristics) on various emotions and their antecedents appears to us as another promising avenue.

References

- Agarwal, R., and Karahanna, E. "Time Flies When You're Having Fun: Cognitive Absorption and Beliefs About Information Technology Usage," *MIS Quarterly* (24:4), 2000, pp. 665-694.
- Arnold, M. B. *Emotion and Personality, Vol. 1., Psychological Aspects*, Columbia University Press, New York, 1960.
- Baker, J., Levy, M., and Grewal, D. "An Experimental Approach to Making Retail Store Environmental Decisions," *Journal of Retailing* (68), 1992, pp. 445-458.

- Bagozzi, R. P., Gopinath, M., and Nyer, P. U. "The Role of Emotions in Marketing," *Journal of the Academy of Marketing Science* (27:2), 1999, pp. 184-206.
- Bhattacharjee, A. "Understanding Information Systems Continuance: An Expectation Confirmation Model," *MIS Quarterly* (25:3), 2001, pp. 351-370.
- Bitner, M. J. "Servicescapes: The Impact of Physical Surroundings on Customers and Employees," *Journal of Marketing* (56), April 1992, pp. 57-71.
- Cornelius, R. *The Science of Emotion: Research and Tradition in the Psychology of Emotion*, Prentice Hall, Englewood Cliffs, NJ, 1996.
- Csikszentmihalyi, M., and Csikszentmihalyi, I. S. *Optimal Experience: Psychological Studies of Flow in Consciousness*, Cambridge University Press, Cambridge, England, 1988.
- Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology* (22:4), 1992, pp. 1111-1132.
- Donovan, R. J., and Rossiter, J. R. "Store Atmosphere: An Environmental Psychology Approach," *Journal of Retailing* (58:1), 1982, pp. 34-57.
- Dubé, L., Chebat, J.-C., and Morin, S. "The Effects of Background Music on Consumers' Desire to Affiliate in Buyer-Seller Interactions," *Psychology & Marketing* 12, 1995, pp. 305-319.
- Eroglu, S. A., Machleit, K. A., and Davis L. M. "Atmospheric Qualities of Online Retailing: A Conceptual Model and Implications," *Journal of Business Research* (54:2), 2001, pp. 177-184.
- Eroglu, S. A., Machleit, K. A., and Davis L. M. "Empirical Testing of a Model of Online Store Atmospherics and Shopper Responses," *Psychology and Marketing* (20:2), February 2003, pp. 139-150.
- Gefen, D., Straub, D., and Boudreau, M. "Structural Equation Modeling and Regression: Guidelines for Research Practice," *Communications of the AIS* (4:7), 2000, pp. 41-79.
- Geissler, G., Zinkhan, G., and Watson, R. T. "Web Home Page Complexity and Communication Effectiveness," *Journal of the Association for Information Systems* (2:2), 2001, pp. 1-44.
- Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. *Multivariate Data Analysis* (5th ed.), Prentice Hall, Englewood Cliffs, NJ, 1998.
- Huizingh, E. "The Content and Design of Web Sites," *Information and Management* (37:3), 2000, pp. 123-134.
- Jarvenpaa, S., and Todd, P. A. "Consumer Reactions to Electronic Shopping on the World Wide Web," *International Journal of Electronic Commerce* (1:2), 1997, pp. 59-88.
- Johnson, K. L., and Mistic, M. M. "Benchmarking: A Tool for Web Site Evaluation and Improvement," *Internet Research* (9:5), 1999.
- Johnson, R. D., and Marakas, G. M. "Research Report: The Role of Behavioral Modeling in Computer Skills Acquisition-Toward Refinement of the Model," *Information Systems Research* (11:4), 2000, pp. 402-417.
- Kim, J., Lee, J., Han, K., and Lee, M. "Businesses as Buildings: Metrics for the Architectural Quality of Internet Businesses," *Information Systems Research* (13:3), 2002, pp. 239-254.
- Koufaris, M. "Applying the Technological Acceptance Model and Flow Theory to Online Consumer Behavior," *Information Systems Research* (13:2), 2002, pp. 205-223.
- Krause, D. R., Scannell, T. V., and Calantone, R. J. "A Structural Analysis of the Effectiveness of Buying Firms' Strategies to Improve Supplier Performance," *Decision Sciences Journal* (31:1), 2000, pp. 33-55.
- Lazarus, R. S. *Emotion and Adaptation*, Oxford University Press, New York, 1991.
- Loiacono, E. T., Watson, R. T., and Goodhue, D. L. "WebQual: A Website Quality Instrument," Working Paper 2000-126-0, University of Georgia, 2000.
- McKinney, V., Yoon, K., and Zahedi, F. M. "The Measurement of Web-Customer Satisfaction: An Expectation and Disconfirmation Approach," *Information Systems Research* (13:3), 2002, pp. 296-315.
- McKnight, D. H., Choudhury, V., and Kacmar, C. "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research* (13:3), 2002, pp. 334-361.
- Mehrabian, A., and Russell, J. A. *An Approach to Environmental Psychology*, MIT Press, Cambridge, MA, 1974.
- Menon, S., and Kahn, B. "Cross-Category Effects of Induced Arousal and Pleasure on the Internet Shopping Experience," *Journal of Retailing* (78:1), 2002, pp. 31-40.
- Novak, T. P., Hoffman, D. L., and Yung, Y. F. "Measuring the Customer Experience in Online Environments: A Structural Modeling Approach," *Marketing Science* (19:1), 2000, pp. 22-42.
- Nunnally, J. C. *Psychometric Theory*, Harper Business, New York, 1967.
- Nyer, P. U. "A Study of the Relationships between Cognitive Appraisals and Consumption," *Marketing Science* (25:4), 1997, pp. 296-304.
- Omdahl, B. L. *Cognitive Appraisal, Emotion and Empathy*, Lawrence Erlbaum Associates, Mahwah, NJ, 1995.

- Paré, G., and Elam, J. J. "Discretionary Use of Personal Computers by Knowledge Workers: Testing of a Social Psychology Theoretical Model," *Behavior and Information Technology* (14:4), 1995, pp. 215-228.
- Roseman, I. J. "A Model of Appraisal in the Emotion System: Integrating Theory, Research and Applications," in *Appraisal Processes in Emotion: Theory, Method and Research*, K. R. Scherer, A. Schorr, and T. Johnstone (Eds.), Oxford University Press, Oxford, England, 2001, pp. 68-91.
- Roseman, I. J., Antoniou, A. A., and Jose, P. E. "Appraisal Determinants of Emotions: Constructing a More Accurate and Comprehensive Theory," *Cognition and Emotion* (10:3), 1996, pp. 241-277.
- Roy, M. C., Dewit, O., and Aubert, B. A. "The Impact of Interface Quality on Trust in Web Retailers," *Cahier du GreSI*, 01-05, April 2001.
- Sautter, P., Hyman, M. R., and Lukosius, V. "E-tail Atmospherics: A Critique of the Literature and Model Extension," *Journal of Electronic Commerce Research* (5:1), 2004, pp. 14-24.
- Scherer, K. R. "Profiles of Emotion-Antecedent Appraisal: Testing Theoretical Predictions Across Cultures," *Cognition and Emotion* (11:2), 1997, pp. 113-150.
- Shaver, P., Schwartz, J., Kirson, D., and O'Connor, C. "Emotion Knowledge: Further Exploration of a Prototype Approach," *Journal of Personality and Social Psychology* 52, 1987, pp. 1061-1086.
- Sherman, E., Mathur, A., and Smith, R. "Store Environment and Consumer Purchase Behavior: Mediating Role of Consumer Emotions," *Psychology & Marketing* (14:4), 1997, pp. 361-377.
- Smith, C. A., and Ellsworth, P. C. "Patterns of Cognitive Appraisal in Emotion," *Journal of Personality and Social Psychology* 48, 1985, pp. 813-838.
- Smith, C. A., and Lazarus, R. S. "Appraisals Components, Core Relational Themes and Emotions," *Cognition and Emotion* 7, 1993, pp. 233-269.
- Song, J., and Zahedi, F. M. "Web Design in E-Commerce: a Theory and Empirical Analysis," in *Proceedings of the 22nd International Conference on Information Systems*, V. Storey, S. Sarkar, and J. I. DeGross, New Orleans, 2001, pp. 205-219.
- Strongman, K. T. *The Psychology of Emotion* (4th ed.), Wiley, Chichester, England, 1996.
- Trevino, L. K., and Webster, J. "Flow in Computer-Mediated Communication: Electronic Mail and Voice Mail Evaluation and Impacts," *Communication Research* (19:5), 1992, pp. 539-573.
- Turley, L. W., and Milliman, R. E. "Atmospheric Effect on Shopping Behavior: A Review of the Experimental Evidence," *Journal of Business Research* (49:2), 2000, pp. 193-211.
- Venkatesh, V. "Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation and Emotion Into the Technology Acceptance Model," *Information Systems Research* (11:4), 2000, pp. 342-365.
- Wan, H. A. "Opportunities to Enhance a Commercial Website," *Information and Management* (38:1), 2000, pp. 15-21.
- Yalch, R. F., and Spangenberg, E. R. "The Effects of Music in a Retail Setting on Real and Perceived Shopping Timer," *Journal of Business Research* (49), 2000, pp. 139-147.
- Zhang, P., and von Dran, G. M. "Satisfiers and Dissatisfiers: A Two-Factor Model for Website Design and Evaluation," *Journal of the American Society for Information Science* (51:14), 2000, pp. 1253-1268.