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RESEARCH ARTICLE

AFFECT IN WEB INTERFACES: A STUDY OF THE IMPACTS OF WEB PAGE VISUAL COMPLEXITY AND ORDER[1]

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Abstract

This research concentrates on visual complexity and order as central factors in the design of webpages that enhance users' positive emotional reactions and facilitate desirable psychological states and behaviors. Drawing on existing theories and empirical findings in the environmental psychology, human–computer interaction, and marketing research literatures, a research model is developed to explain the relationships among visual complexity and order design features of a webpage, induced emotional responses in users, and users' approach behaviors toward the website as moderated by users' metamotivational states. A laboratory experiment was conducted to test the model and its associated hypotheses. The results of the study suggested that a web user's initial emotional responses (i.e., pleasantness and arousal), evoked by the visual complexity and order design features of a webpage when first encountered, will have carry-over effects on subsequent approach behavior toward the website. The results also revealed how webpage visual complexity and order influence users' emotions and behaviors differently when users are in different metamotivational states. The salience and importance of webpage visual complexity and order for users' feelings of pleasantness were largely dependent on users' metamotivational states.

Keywords: Webpage visual design, webpage visual complexity, webpage order, emotional response, approach behavior

Introduction

During the past 20 years, designing for usability has been one of the primary foci of human–computer interaction (HCI) research, which provides guidelines for developing usable websites based on numerous studies of users' cognitive processes. In recent years, the affective aspects of user interface design (Dillon 2001; Norman 2003) have received increasing attention. This new perspective emphasizes the user's subjective experience with the interface. A human being's affective system is judgmental, assigning positive or negative valence to the environment (Norman 2002). Affect is, therefore, closely linked to attitudes, cognitions, and motivations. It influences and mediates specific aspects of interaction with a user interface.

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The appendices for this paper are located in the "Online Supplements" section of the *MIS Quarterly*'s website (http://www.misq.org).

As users are presented with a proliferation of choices of different websites on the Internet, they can move from one website to another effortlessly. Bucy (2000) argues that emotional responses may determine which interfaces (e.g., web sites) people choose to use as they seek pleasure or enjoyment beyond just task efficiency. This places emphasis on the visual design features of the webpage interface, and stresses the need for interfaces that promote engagement, pleasure, and delight rather than just functionality or ease-of-use (Marcus 2002; Wright et al. 2001).

This research recognizes the importance of emotional responses for webpage design and attempts to address how to design a webpage in a manner that enhances users' positive emotions so as to facilitate desirable psychological states and behaviors in users. We propose that webpage visual complexity and order are important design features that affect users' initial emotional responses toward a website (Lavie and Tractinsky 2004), which in turn influence the users' subsequent experience with the website (van der Heijden 2003). Numerous studies have attested to the significant effects of complexity and order on web qualities and user outcomes, such as perceived ease of use (Agarwal and Venkatesh 2002), communication effectiveness (Geissler et al. 2001), and user satisfaction (McKinney et al. 2002; Nadkarni and Gupta 2007; Palmer 2002; Stevenson et al. 2000). Webpage visual complexity and order are not only important usability factors (Parush et al. 1998), but they are also affective qualities capable of eliciting or affecting users' emotional responses to website (Lavie and Tractinsky 2004). However, few studies have investigated the emotional impacts of webpage visual complexity and order. In the literature on visual preference for built and natural environments, complexity and order are considered as two salient dimensions that capture distinctions among different environments and that have been shown to affect the feelings of arousal and pleasantness, which are the two key components of emotional responses (Berlyne 1971; Gilboa and Rafaeli 2003; Heath et al. 2000; Kaplan and Kaplan 1983; Nasar 1994, 1997).

Applying the findings of environmental studies to the website interface context, this research investigates web users' emotional reactions to different webpage designs with varying levels of visual complexity and order during users' initial encounters with the websites. It predicts that users' emotional responses influence their subsequent approach– avoidance behaviors toward a website, such as staying within a particular website and exploring the site deeper, or leaving the site and moving on to other sites. It has been shown that web user's approach tendency is highly related to the success of a website and leads to more time spent browsing, more varied products explored, a higher response to promotional incentives, and enhanced probability of purchasing (Menon and Kahn 2002; Tai and Fung 1997). By relating the visual complexity and order design features of webpages to web users' approach–avoidance behaviors through the mediating effects of users' emotional responses, this research provides a new perspective for website design theory and practice that emphasizes the importance of affective design for a website's success.

Furthermore, recognizing the complex, subjective nature of web users' emotional responses to a website, this research goes beyond objective web design features to incorporate characteristics of web users in relation to emotional responses. Drawing on the emotion and motivation literature, we propose that a web user's emotional response to a website is determined by an interaction of physical web design features and the user's metamotivational state. In the context of web browsing, a user's metamotivational state determines the extent to which he/she desires to seek stimulation from the website, which in turn affects the user's feeling of pleasantness/unpleasantness toward the visual complexity and order design features of the webpage. Therefore, another focus of this research is to examine the moderating effect of web users' metamotivational states on the influence of webpage visual complexity and order on users' emotional and behavioral responses.

According to Schwarz's "affect as information" framework, the halo effect of emotional response toward an object carries over to the evaluation of object characteristics and general attitude to the object (Schwarz 1986; see also Norman 2003; Rafaeli and Vilnai-Yavetz 2004; Vilnai-Yavetz and Rafaeli 2006). Considering the important role of emotional responses in determining which website users choose (Bucy 2000) and in affecting users' perceptions of website qualities, such as usability and trustworthiness (Basso et al. 2001; Porat et al. 2007; Tractinsky and Lowengart 2007), this research contributes to our knowledge of how to design a visually pleasant webpage to elicit positive emotional responses in web users. The findings of this research are of interest to managers and web designers because they provide guidelines for website presentation and customization to enhance user experience.

In the following sections, we first review relevant literature from environmental psychology, human emotions, and visual preference for external environments. Next, a research model of the relationships among the visual complexity and order design features of a webpage, the web user's emotional responses, and the user's subsequent behavior toward the website is developed. Following this, we describe the research methodology for the study, including sampling strategy, experimental procedure, and measurement. Data analysis and results are presented in the subsequent section. Finally, we conclude with a summary of the results, theoretical and practical implications of study, and directions for future research.

Theoretical Background and Research Model

The M-R Environmental Psychology Model

The environmental psychology model proposed by Mehrabian and Russell (1974) (the M-R model) is used as the framework in this study for understanding web users' emotional and behavioral responses to the visual complexity and order design features of a webpage. This framework has been widely used in marketing research to relate features of the retail environment to consumer behaviors through the mediating effects of induced emotional responses within the environment. The M-R model suggests that emotions function to mediate the effects of environmental stimuli on behavior. It assumes that people's emotions determine what they do and how they do it, and that people respond with different sets of emotions to different environments which, in turn, induces individuals to approach or avoid these environments. Approach–avoidance behavior is considered important for this study, because a web user's approach–avoidance tendency toward the website not only reflects the user's perception of the quality of the website, but also strongly predicts desired user behaviors pertaining to the measurement of the success of a website, such as customer satisfaction, total number of website hits, user's return rate or future patronage, etc. It has been found that web users' approach tendencies, such as willingness to stay with or explore the website, will lead to more time devoted to browsing, greater exploration of products, a higher response to promotional incentives, and enhanced probability of purchase (Menon and Kahn 2002; Tai and Fung 1997).

In recent years, the M-R model has been extended to the studies of e-tailing atmospherics. These studies demonstrated the effects of online store design characteristics (i.e., color, layout, navigation, graphics, aesthetics, etc.) on users' emotional responses and various approach–avoidance behaviors toward the store websites (Eroglu et al. 2003; Mummalaneni 2005; Porat et al. 2007; Richard 2005). The findings not only provided consistent support for the M-R model in the online environment, but also revealed the factors (i.e., involvement) that moderate the relationship between store website design features and users' emotional and behavioral responses (Eroglu et al. 2003).

In line with prior research, we consider the M-R model as an appropriate framework for this study. In order to apply the M-R model to the study of websites, we extend it by drawing on the literature on emotion, human–computer interaction, environmental psychology, visual preference for external environments, and psychological theories of motivation to develop a model of how the visual complexity and order design features of a webpage influence web users' emotional responses and subsequent approach–avoidance behaviors toward the website.

Visual Design Features of Webpage : Complexity and Order

While websites include a variety of emotion-eliciting stimuli, this research focuses on the webpage visual complexity and order design features due to their effects on the visual appeal of webpage and users' initial emotional responses toward the website. The visual properties of complexity and order have been heavily researched in the studies of visual preference for natural and built environments and found to be the prominent dimensions of environmental aesthetics evoking automatic human emotional response to the environment, such as pleasure and preference (Arnheim 1966; Birkhoff 1933; Kaplan and Kaplan 1983; Nasar 2000; Ngo and Byrne 2001). Arnheim (1966) defines order "as the degree and kind of lawfulness governing the relations among the parts of an entity" (p. 123) and complexity as "the multiplicity of the relationships among the parts" (p. 123). The order of an environment is related to the degree of organization of the environment, as reflected in the extent of coherence, congruity, legibility, and clarity it exhibits (Nasar 2000). Environmental complexity is related to visual richness, information rate, diversity, and variety of information in an environment (Nasar 2000).

Kaplan and Kaplan's (1983) preference framework, assuming an evolutionary perspective on aesthetic preferences, explains how visual complexity and order influence people's preference for the environment. It proposes two cognitive processes crucial to human survival—making sense and involvement—and suggests that there is a natural tendency in humans to prefer those environments that are most favorable for understanding (i.e., having coherence and legibility) and involvement (i.e., having complexity and mystery). In HCI research, Lavie and Tractinsky's (2004) study revealed that users' perceptions of website aesthetics consisted of two main dimensions: classic aesthetics and expressive aesthetics, which correspond to the properties of order and complexity. Classic aesthetics, similar to order, emphasizes orderly, clear, clean, and symmetrical design of a website; expressive aesthetics, reflecting the complexity quality, is highly related to visual richness, diversity, and complexity of the website. Both dimensions were found to positively influence the feeling of pleasure and usability.

Given the ample evidence and theories in environmental aesthetics and preference research (Arnheim 1966; Kaplan and Kaplan 1983; Nasar 2000) and HCI research (Lavie and Tractinsky 2004) that complexity and order are the prominent factors shaping aesthetic experience and eliciting automatic human emotional response, we propose webpage visual complexity and order as two important web design features that influence users' initial emotional responses toward a website.

While webpage visual complexity and order are not clearly defined in IS research, by extending the concepts of environmental complexity and order to the website context, we define webpage visual complexity and order as follows. Adopting Arnheim's definition of environmental complexity, we conceptualize webpage visual complexity as composed of two dimensions: (1) visual diversity, as measured by different types of elements (e.g., text, graphics, links) present in the webpage; and (2) visual richness, which refers to the detail of information present in a webpage as measured by the amount of text, number of graphics, and links and layout of a page (e.g., number of columns of information). These are consistent with webpage design elements suggested by Geissler et al. (2001) that influence user's perceived webpage complexity: the amount of text, the number of links and graphics on the page, and webpage length.

Similarly, using Arnheim's definition of environmental order, we define webpage order as the extent of lawfulness governing the relationships among different elements of a webpage. This definition suggests that webpage order is related to the logical organization, clarity, and coherence of webpage content and information. Logical organization of a webpage is associated with intuitiveness and understandability of the webpage organization. Webpage coherence can be achieved through creating congruity or harmony among elements of a webpage (e.g., grouping or aligning similar elements), while clarity can be enhanced by differentiating webpage elements (e.g., contrasting between different elements).

Emotions

In order to examine the effects of webpage visual complexity and order on a web user's emotional responses, it is necessary to consult the emotion literature to grasp the occurrence and interaction among the components of emotions involved in responses to stimuli such as web pages.

Components and Determinants of Emotions

It is generally agreed that human emotional response has at least two components: arousal and valence[2] (Barrett 1998; Lang 1994; Reisenzein 1994; Russell 1989). Arousal is referred to as the nonspecific component of emotional response that reflects the intensity rather than the evaluative quality of affect (Whissel et al. 1986). It has been defined in a variety of ways in the literature, such as an elevated state of bodily function (Eysenck 1976), a response to increases in task complexity (Berlyne 1960), and being wide awake, alert, vigorous, excited, and full of pep (Thayer 1978, 1986). The common theme emerging from these definitions is the activation of the organism. Therefore, in this study, arousal is defined as the subjective experience of energy mobilization for psychological and motor activity (Russell and Barrett 1999). While arousal is a nondirectional component of emotional response, valence measures the direction of emotional response ranging from positive to negative (Russell 1980). It is a subjective feeling of pleasantness or unpleasantness (Barrett 1998).

Cognitive appraisal theories of emotions suggest that emotional valence is a result of cognitive appraisal (Lazarus 1982). Since arousal represents an undifferentiated physiological state, cognitive appraisal of the emotion-eliciting stimuli is necessary to provide an interpretation and explanation of felt arousal that enables conscious experience of a particular emotion (Frijda 1986; Lazarus 1982; Ortony et al. 1988). Studies have shown that primary cognitive appraisal pertaining to the processing of motivational congruence/incongruence determines the valence of emotion so as to distinguish between positively and negatively valenced emotional responses (Frijda 1986; Lazarus 1991). The appraisal of motivational congruence/incongruence is concerned with the relation of the stimulus to an individual's goals and motives. When the stimulus is assessed as helping to reach the goals or satisfy the motives of the individual, he/she will experience positively valenced emotion (i.e., pleasantness); however, negatively valenced emotion (i.e.,

[2]In addition to arousal and valence, some researchers also included dominance as a dimension of emotional response (Foxall and Greenley 1999; Mehrabian and Russell 1974). However, the relationship between dominance and approach–avoidance behavior remains unclear (Donovan and Rossiter 1982; Gilboa and Rafaeli 2003). In other studies, dominance was simply not measured, as it is believed to be an underlying dimension of cognition and perception rather than a component of emotional response (Donovan et al. 1994; Russell 1980; Russell and Pratt 1980). Since arousal and valence are found to adequately capture the range of appropriate emotional responses (Mehrabian and Russell 1974), dominance will not be considered in this study in order to obtain a parsimonious conceptualization of emotional response.

unpleasantness) is perceived when the stimulus is evaluated as hindering the attainment of the goals or fulfillment of the motives (Frijda 1986; Lazarus 1991). Therefore, we define emotional valence as the feeling of pleasantness/unpleasantness toward a stimulus as a result of motivational congruence/incongruence appraisal, which pertains to whether the stimulus is conducive or obstructive to reaching a user's goals or satisfying the user's relevant motives. For the purpose of this study, we consider the visual complexity and order design features of a webpage as the emotion-eliciting stimuli.

Dynamics among Components of Emotions

Arousal provides the basis for emotional response when a stimulus is detected, while the valence of the emotion depends on the person's interpretation of the felt arousal (Frijda 1986). Several theories have been proposed to relate arousal to emotional valence. Among them, reversal theory has received increasing attention (Apter 2001, 2003) due to its emphasis on the dynamic aspects of human experience and behavior. Reversal theory is an encompassing model of motivation and emotion, which provides a coherent and unifying account of emotion in a variety of areas (Apter 1991). Unlike other approaches that assume individual invariability in optimal arousal level (Hebb 1955), reversal theory is not limited by relatively narrow assumptions and attempts to capture different motivational possibilities of human behavior in a systematic manner (Apter 1995). It suggests a comprehensive way of considering different psychological needs and exploring how they might relate to human emotion and behavior. Due to its all-encompassing nature, we adopt reversal theory to examine the dynamics of emotions and the effects of arousal on emotional valence. Reversal theory proposes two different metamotivational states—telic versus paratelic states—in which changes in felt arousal are interpreted and experienced in opposite ways (Apter 1982). Contrary to the prior notion positing the moderate degree of arousal as a single optimal arousal level (Hebb 1955), reversal theory holds that both low and high levels of arousal can be pleasant, depending upon which metamotivational state is operative.

The telic (from the Greek *telos,* meaning goal) state is characterized as goal-oriented in which the ultimate goal of any ongoing activity is perceived as essential for the individual, and the activity itself is peripheral. In the telic state, a high level of arousal is experienced as unpleasant and associated with anxiety, because it is perceived as interfering with the achievement of the goal. However, a low level of arousal in this state is experienced as pleasant and described as relaxation. Therefore, individuals in the telic state are depicted as serious-minded, future-oriented, and arousal-avoidant (Apter 2001; Kerr 1997). In contrast to the anxiety-avoiding telic state, the paratelic state (from the Greek *para,* meaning beside) is related to excitement-seeking. This state is characterized as activity-orientation, where the goal of the activity is not important compared to the ongoing activity. People engage in the activity for its own sake (i.e., for the immediate enjoyment it can provide). In the paratelic state, a high level of arousal is experienced as pleasant because it is associated with excitement, whereas a low level of arousal is experienced as unpleasant and described as boredom. Thus, individuals in a paratelic state are characterized as playful, present-oriented, and arousal-seeking (Apter 2001; Kerr 1997).

Reversal theory has received considerable empirical support in sports motivation and emotion studies (Kerr 1985, 1987; Sarason 1980). More recently, reversal theory has been applied to examine the impact of arousal-inducing features in a store environment on the consumer's feeling of pleasure (Kaltcheva and Weitz 2006). The findings support reversal theory by demonstrating the interaction effect of consumer metamotivational state and arousal on pleasantness. Consistent with reversal theory, the arousal-inducing store environment decreases pleasantness for consumers in a telic state and increases pleasantness for consumers in a paratelic state (Kaltcheva and Weitz 2006).

Theoretical Model and Hypotheses

Numerous studies have been devoted to examining the influence of complexity and order on human emotions (Berlyne 1971; Gilboa and Rafaeli 2003; Heath et al. 2000; Nasar 1997). Synthesizing these findings within the framework of the M-R model and the emotional models just discussed, we can formulate a research model of how the visual complexity and order features of a webpage elicit different emotional responses and subsequent action readiness toward the website (See Figure 1). The details of the research model are explained below.

Relating Visual Complexity and Order Design Features of Webpage to Emotional Responses

Studies of environmental aesthetics and preference have investigated the influences of complexity and order on arousal. Complexity has been consistently shown to be positively related to arousal (Berlyne 1971; Gilboa and Rafaeli 2003; Heath et al. 2000; Nasar 1987, 1997). A high level of complexity provides diverse and numerous information cues

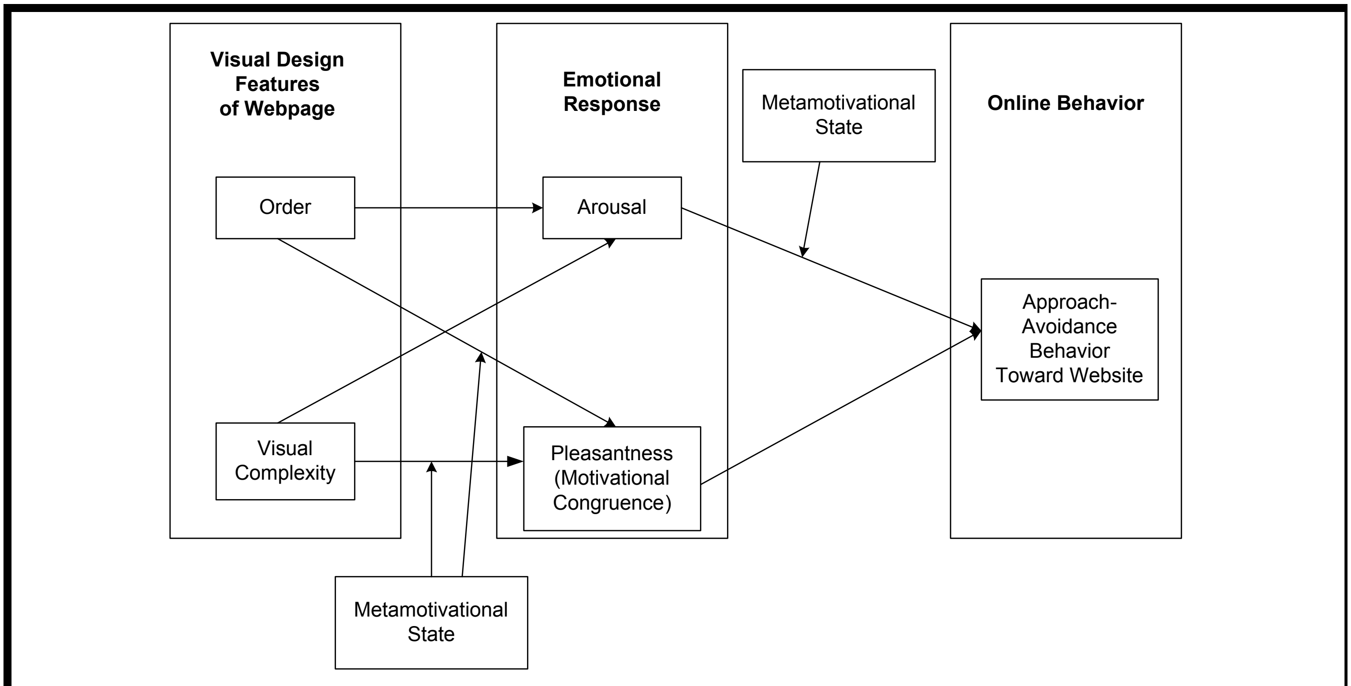

Figure 1. Research Model of Webpage Visual Complexity and Order, Emotional Responses, and Approach–Avoidance Behavior

that require considerable attention and time to view and comprehend. It thus serves as a source of stimulation and interest, which provoke more energy mobilization and higher levels of arousal in individuals. This finding is consistent with Kaplan and Kaplan's (1983) notion that the complexity present in the environment aids in the involvement process by invoking and maintaining the viewer's interest in the environment. Order, in contrast to complexity, has been found to bear a negative relationship to arousal (Gilboa and Rafaeli 2003; Nasar 1987, 1997; Nasar and Hong 1999). As the extent of order grows, it structures diversity, brings unity, coherence, and clarity to the environment, and reduces efforts required to comprehend the environment (Berlyne 1971; Kaplan and Kaplan 1983; Nasar 2000). A high level of order is hence arousal-reducing, as it reduces uncertainty and calls for less energy allocation to the stimulus. Therefore, based on the well-documented findings regarding the effects of complexity and order on arousal in the literature, we suggest that webpage visual complexity is positively associated with the web user's feeling of arousal while webpage order is negatively related to the user's arousal level. Thus, we propose hypotheses 1 and 2.

> Hypothesis 1. The level of webpage order negatively influences the user's feeling of arousal.

> Hypothesis 2. The level of webpage visual complexity positively influences the user's feeling of arousal.

Applying reversal theory, we draw on the distinction between telic and paratelic metamotivational states to characterize two distinct types of web activities: goal-oriented web search behaviors versus nondirected experiential web browsing activities. Web users in a telic state are usually engaged in purposeful activities directed by well-specified goals, such as searching for particular information or a specific product on the Internet. Web users in a paratelic state, on the other hand, undertake experiential web-browsing activities without any explicit goals, but rather for seeking enjoyment or entertainment. Web users engaged in purposeful online activities in a telic state place great emphasis on the efficiency of achieving their task/goal with a minimal expenditure of energy or effort. As a result, a highly arousing webpage (e.g., a webpage with high complexity and low order) will create unpleasant feelings due to its effects of decreasing task efficiency and increasing level of energy; while a low-arousal webpage (e.g., a webpage with low complexity and high order) will be experienced as pleasant because it mobilizes less energy and is conducive to higher efficiency. On the contrary, web users undertaking experiential web-browsing behaviors in a paratelic state will find a high-arousal webpage gratifying and pleasant as it satisfies the need for a rich, stimulating experience. However, a low-arousal webpage will be interpreted as unpleasant and boring due to its lack of stimulation.

Consistent with the notion of reversal theory, Nasar (1994, 1997) found that aesthetic preference is different among individuals, as each of them may seek different levels of arousal from the environment. The person who seeks high arousal tends to prefer complex and low order stimuli whereas the individual seeking lower arousal prefers less complex and more orderly environments (Nasar 1997). Nasar's findings, together with the effects of complexity and order on arousal and the association of telic/paratelic metamotivational states with opposite ways of interpreting arousal (Apter 1982), lead us to argue that, in a web browsing context, the user's metamotivational state moderates the influences of webpage visual complexity and order on his/her feeling of pleasantness. Webpage visual complexity will be positively related to pleasantness when web users are arousal-seeking in a paratelic state and negatively related to pleasantness when users are arousal-avoidant in a telic state. Conversely, webpage order will be negatively related to pleasantness for web users who are arousal-seeking and positively related to pleasantness when users seek low arousal. Therefore, we posit hypotheses 3 and 4.

> Hypothesis 3: A web user's metamotivational state moderates the effect of webpage order on the user's feeling of pleasantness.
>
> > Hypothesis 3a. The level of webpage order positively influences a user's pleasantness when the user is in a telic state.
> >
> > Hypothesis 3b. The level of webpage order negatively influences a user's pleasantness when the user is in a paratelic state.
>
> Hypothesis 4: A web user's metamotivational state moderates the effect of webpage visual complexity on the user's feeling of pleasantness.
>
> > Hypothesis 4a. The level of webpage visual complexity negatively influences a user's pleasantness when the user is in a telic state.[3]
> >
> > Hypothesis 4b. The level of webpage visual complexity positively influences a user's pleasantness when the user is in a paratelic state.

Approach–Avoidance Behaviors

The M-R model subsumes the functional view of emotions, which suggests that emotions provide individuals with the ability to respond to the changes in their surrounding environment by triggering different psychological situations and behaviors. According to Schwarz's (1986) notion of "feelings as information," positively valenced emotions inform individuals that the world is a safe place, one characterized by presence of positive outcomes or lack of threats to current goals; however, negatively valenced emotions tell the person that the current situation is problematic, characterized by a lack of positive outcomes or a threat of negative outcomes. To the extent that individuals are motivated to obtain positive outcomes and avoid negative outcomes, negatively valenced emotions cause avoidance behaviors, such as physical movement away from the stimuli; whereas positively valenced emotions induce approach actions, such as physical movement toward, staying with, and exploring the environment. There has been consistent evidence that emotional valence is a significant predictor of approach–avoidance behaviors, with positively valenced emotions (e.g., pleasantness) motivating approach tendency and negatively valenced emotions (e.g., unpleasantness) promoting avoidance behavior in a variety of environments, such as traditional retail environments and in an e-commerce website context (Frijda et al. 1989; Mehrabian and Russell 1974; Menon and Kahn 2002; Schwarz 1986).

Regarding the relationship between arousal and approach–avoidance behaviors, it is suggested that arousal will stimulate approach behaviors when it is experienced as pleasure, but that it will inhibit approach or motivate avoidance tendencies when felt as unpleasant (Mehrabian and Russell 1974). This notion is supported by Thayer's (1986) two-dimensional theory of activation/arousal. Thayer differentiates energetic arousal described in terms of energy, activity, and readiness from tense arousal that is associated with feelings of anxiety or fear. While energetic arousal prepares the body for movement and approach behavior, the tense arousal prepares the organism for avoidance and inhibition. According to Apter's (1982) reversal theory, the metamotivational state of an individual determines the interpretation (pleasantness/unpleasantness) of arousal. We thus suggest that high levels of arousal will prompt approach behaviors for those who are in a paratelic state, and low levels of arousal will motivate approach behaviors when individuals are in a telic state. The above analysis leads us to propose hypotheses 5 and 6.

[3]The negative relationship between webpage visual complexity and pleasantness holds true when the webpage has a sufficient complexity level to be functional.

Hypothesis 5. A web user's pleasantness elicited by a webpage's visual design features positively influences the user's approach tendency toward the website.

Hypothesis 6. A web user's metamotivational state moderates the relationship between the user's arousal and approach tendency toward the website.

Hypothesis 6a. When a website user is in a telic state, the feeling of arousal negatively influences the user's approach tendency toward the website.

Hypothesis 6b. When a website user is in a paratelic state, the feeling of arousal positively influences the user's approach tendency toward the website.

Research Method

To test the proposed research model, we conducted five pilot studies and a laboratory experiment. We manipulated the webpage stimuli by varying the levels of webpage visual complexity and order and measured subjects' emotional responses and approach–avoidance tendencies in response to the manipulations of webpage visual complexity and order under telic and paratelic metamotivational states.

Experimental Design and Procedure

Webpage Stimuli

To investigate how webpage visual complexity and order influenced users' responses under different metamotivational states, the webpage stimuli needed to (1) vary only in terms of webpage visual complexity and order, (2) have content and characteristics that evoke neutral affect in users, and (3) allow subjects to engage in either goal-oriented tasks (telic) or excitement/enjoyment-seeking activities (paratelic). The first criterion stems from the need to minimize differences among the stimuli that were not relevant to the interest of this research and to isolate the effects of webpage visual complexity and order as independent variables. The second criterion is necessary to minimize any preexisting response bias resulting from the confounding effects of website characteristics and contents on the subjects' emotions and behaviors. The third criterion is related to the need to engage subjects in a telic or paratelic state, which is examined as a moderator in this research. Following the abovementioned criteria, we conducted two pilot studies to select the appropriate website type and contents for the webpage stimuli. As a result, 12 versions of an online gift store's homepage were designed to vary at 4 levels of complexity and 3 levels of order. These 12 homepage stimuli, together with the descriptions of the processes for designing the homepage stimuli and validating the effectiveness of stimuli manipulation are presented in Appendix A.

Metamotivational State Manipulation

We developed two hypothetical scenarios, which respectively facilitate paratelic and telic metamotivational states in the subjects. The hypothetical scenarios described a fictional situation where an individual similar to the subjects visits a gift website for a birthday gift (telic state) or for enjoyment and fun (paratelic state). We conducted another pilot study to test the effectiveness of the hypothetical scenarios in inducing the subjects into the metamotivational states for which they are intended. As expected, the participants who read the telic scenarios scored significantly higher on the telic state measure (4.58) than those who read paratelic scenarios (2.86) ($t = 7.722$, $df = 40$, $p < 0.001$). The hypothetical scenarios are presented in the Appendix B.

Experimental Procedure

In the laboratory experiment, a sample of subjects who had not participated in the pilot studies was recruited. The experiment used a 4 (complexity) × 3 (order) × 2 (metamotivational state) between-subject design, producing a total of 24 treatments. Subjects were randomly assigned to each treatment. Before being exposed to the stimulus materials, subjects were instructed to read a hypothetical scenario designed to induce either a telic or paratelic metamotivational state. Following this, we measured the subjects' emotions and metamotivational states before they were exposed to the experimental stimuli. Next, subjects were asked to look at one of the 12 versions of the webpage stimuli on their computer screens. Each subject was randomly assigned to view only a single webpage. Subjects were asked to examine a webpage stimulus for an equal amount of time (20 seconds). To determine the appropriate time duration for subjects to view the webpage stimuli, we conducted a pilot study to experiment with three different time durations by allowing the subjects to look at the stimuli for 10 seconds, 15 seconds, and 20 seconds. The 20-second option was selected for the main experiment because it was rated as of appropriate duration, neither too long nor too short for the subjects to apprehend the stimuli. The subjects were told not to click on the links on the webpage. After 20 seconds, the webpage stimulus disappeared from the computer screen automatically, and on-screen instructions led the subjects to complete a questionnaire which asked them about the emotions they felt about the webpage and their degree of approach tendencies toward the entire website. Finally, at the end of the experiment, subjects rated their perceptions of webpage visual complexity and order, which were used for a manipulation check. In addition, the subjects' web experience (e.g., length and frequency of web usage) and knowledge of website design were captured as covariates to control for their influences on subjects' perceptions of the experimental stimuli.

Sample

The sample for the main study was composed of undergraduate students from a large university in the mid-south of the United States. They voluntarily participated in this study in exchange for extra course credit. We employed student subjects for three reasons. First, given the large sample size required for this study, students provided an accessible sample. Second, since students represent a large population of web users, their perceptions of, emotional responses to, and approach–avoidance behaviors toward webpages with varying visual complexity and order provided valuable insight into the research questions of this study. Third, there is little reason to believe that students' emotional response mechanisms differ from those of other groups of people, since human emotions are generally regarded as basic physiological and mental states that result from collecting sensory information and transmitting it to cognitive and behavioral systems (Panksepp 1992). A total of 467 students participated in the study, and 445 data points were useable; 22 data points were discarded due to missing data or failure to follow instructions.

The sample consisted of 255 females (57.30 percent) and 190 males (42.70 percent). The majority of the subjects were between 20 and 21 years old (83.82 percent); 67 percent of the subjects (301) spent 1 to 5 hours daily online; 77 percent of the subjects (345) had 6 to 10 years of experience in using the Internet.

Measurement

Our measurement instruments were developed by incorporating and adapting existing valid and reliable scales where appropriate. For the manipulation check of webpage visual complexity and order, we adapted Geissler et al.'s (2001) measure of perceived webpage complexity and developed a measure of webpage order based on a number of website usability studies (Agarwal and Venkatesh 2002; Palmer 2002; Shneiderman 1998). We also checked the metamotivational states of subjects by adapting O'Connell and Calhoun's (2001) telic/paratelic state instrument. Mehrabian and Russell's (1974) measures of pleasantness and arousal were adapted to measure pleasantness and arousal in this study. The measure of approach tendency was derived from Donovan and Rossiter's (1982) scales of approach–avoidance tendency and adapted to the website context. All scales are shown in Appendix C.

Analysis and Results

We conducted manipulation checks using ANOVA and t-tests, which demonstrated the effectiveness of our manipulations of webpage visual complexity, webpage order, and subjects' metamotivational states. A confirmatory factor analysis (CFA) was performed using maximum likelihood to assess the validity of the factor structure of the measures for arousal, pleasantness, approach tendency, perceived order, and perceived complexity. The five-factor model yielded a CFI of 0.98 and a SRMR of 0.039, indicating that the model fit well (Hu and Bentler 1999). All factor loadings were significant ($p < 0.001$) and ranged from 0.68 to 0.95. The composite reliability of each factor ranged from 0.81 to 0.98, demonstrating acceptable levels for factor reliability. Therefore, the psychometric properties of the instrument were valid and reliable. Appendix D presents the correlation matrices of the indicators, factor loadings, and item reliability for these variables. The items of each dependent variable were summed and averaged into a single score for the subsequent analyses. The means and standard deviations of the dependent variables for each treatment cell are also shown in Appendix D. The statistical power calculations were performed *ex ante* assuming an alpha of 0.05 and a medium effect size of 0.30. The results indicated adequate power (greater than 0.88) for the statistical analyses in this study.

Hypotheses Testing: Effects of Webpage Visual Complexity and Order on Emotional Responses

We conducted a MANCOVA test on the measures of arousal and pleasantness using pre-experiment emotional responses as covariates. The results revealed significant treatment effects ($p<0.05$), and hence further ANCOVA tests were conducted on arousal and pleasantness separately. We set the significance level at 0.025 (0.05/2) to control for Type I error inflation arising from multiple tests. The ANCOVA on pleasantness suggested that metamotivational state moderated the effects of webpage visual complexity and order on pleasantness. We further investigated the moderating effects of metamotivational state by conducting ANCOVAs on pleasantness respectively for the telic and paratelic treatment groups. Along with the ANCOVA tests, a total of 15 repeated planned contrasts were performed comparing the scores on arousal and pleasantness between each consecutive pair of the treatment conditions of webpage order and webpage visual complexity. We set the significance level at 0.0033 (0.05/15) for the planned contrasts. Tables 1 and 2 present the results of these repeated contrasts.

Effects on Arousal

The results of the repeated contrasts (see Table 1) of webpage order on arousal suggested a negative effect of webpage order on arousal: the subjects exposed to the web pages with lower levels of order reported greater levels of arousal than those who browsed the web pages with higher levels of order (mean difference (OR-L1 versus OR-L2) = 0.830, $p < 0.0033$; mean difference (OR-L2 versus OR-L3) = 0.310, $p < 0.0033$). This provided support for Hypothesis 1.

The repeated contrasts of webpage visual complexity on arousal (see Table 2) revealed a positive effect of webpage visual complexity on arousal: the subjects reported the web pages with higher levels of complexity as more arousing and stimulating than the web pages with lower levels of complexity (mean difference (CM-L1 versus CM-L2) = –0.695, $p < 0.0033$; mean difference (CM-L2 versus CM-L3) = –0.313, $p < 0.0033$; mean difference (CM-L3 vs. CM-L4) = –0.492, $p < 0.0033$). Therefore, Hypothesis 2 was supported.

Effects on Pleasantness

Telic Condition. The ANCOVA on pleasantness under the telic condition yielded significant results for the main effects and the interaction effect of webpage order and webpage visual complexity on pleasantness. While significant, the magnitude of the interaction effect (η^2 = .150) was much smaller than that of the main effect of webpage order (η^2 = .528), but close to the magnitude of the main effect of webpage visual complexity (η^2= .099). Therefore the main effect of webpage order may still represent a simple effect of order; however the main effect of complexity may not be representative of a simple effect of complexity (see Figure 2).

The repeated contrasts (see Table 1) of webpage order on pleasantness under the telic condition revealed a positive effect of the webpage order manipulation levels on subjects' pleasantness when the subjects were in a telic state: the subjects who browsed the web pages with higher levels of order felt higher levels of pleasantness toward the website than those given the web pages with the lower levels of order (mean difference (OR-L1 versus OR-L2) = –1.335, $p < 0.0033$; mean difference (OR-L2 versus OR-L3) = –0.280, $p = 0.015$). While the mean score of pleasantness changed in the same direction as suggested by Hypotheses 3a, the mean difference between the level-2 order and level-3 order treatments was not significant at the level of 0.0033. Therefore, Hypothesis 3a was partially supported.

In contrast to Hypothesis 4a, the repeated contrasts of webpage visual complexity on pleasantness under the telic condition revealed a curvilinear instead of a negative linear trend of the effect of webpage visual complexity (mean difference (CM-L1 versus CM-L2) = 0.107, $p = 0.41$; mean difference (CM-L2 versus CM-L3) = –0.277, $p = 0.037$; mean difference (CM-L3 versus CM-L4) = 0.611, $p < 0.0033$) (see Table 2). Therefore, Hypotheses 4a was rejected.

Paratelic Condition. Regarding the ANCOVA results on pleasantness under the paratelic condition, the main effect of webpage visual complexity and the complexity–order interaction effect were found significant for pleasantness, while the main effect of webpage order was not significant. Since the magnitude of the interaction effect (η^2 = .135) was much smaller than that of the main effect of webpage visual complexity (η^2 = .374), this may largely represent the simple effect of complexity (see Figure 3).

For the repeated contrasts of webpage order on pleasantness under the paratelic condition, the mean score of pleasantness did not change in the hypothesized direction as the webpage order level increased (mean difference (OR-L1 versis OR-L2) = –0.145, $p = 0.230$; mean difference (OR-L2 versis OR-L3) = 0.280, $p = 0.023$) (see Table 1). This result, together with the nonsignificant F statistic of the main effect of webpage order on pleasantness ($F_{2, 207} = 2.623$, $p = 0.075$) under the paratelic condition, led us to reject Hypothesis 3b.

The repeated contrasts of webpage visual complexity on pleasantness under the paratelic condition indicated that the mean score of pleasantness increased in the hypothesized direction as levels of webpage visual complexity increased (mean difference (CM-L1 versus CM-L2) = –0.996, $p < 0.0033$; mean difference (CM-L2 versus CM-L3) = –0.250, $p = 0.076$; mean difference (CM-L3 versus CM-L4) = –0.180, $p = 0.207$) (see Table 2). However, the mean difference of

Table 1. Results of Repeated Contrasts of Webpage Order Manipulation Levels

Repeated Contrasts of Webpage Order Manipulations	Statistics	Dependent Variables		
			Pleasantness	
		Arousal	Telic	Paratelic
Level-1 Order versus Level-2 Order	Contrast Estimate	0.830*	–1.335*	–0.145
	Std. Error	0.073	0.113	0.121
Level-2 Order versus Level-3 Order	Contrast Estimate	0.310*	–0.280	0.280
	Std. Error	0.074	0.114	0.123

*$p \leq 0.0033$

Table 2. Results of Repeated Contrasts of Webpage Visual Complexity Manipulation Levels

Repeated Contrast of Webpage Visual Complexity Manipulations	Statistics	Dependent Variables		
			Pleasantness	
		Arousal	Telic	Paratelic
Level-1 Complexity versus Level-2 Complexity	Contrast Estimate	–0.695*	0.107	–0.996*
	Std. Error	0.084	0.130	0.138
Level-2 Complexity versus Level-3 Complexity	Contrast Estimate	–0.313*	-0.277	-0.250
	Std. Error	0.085	0.132	0.140
Level-3 Complexity versus Level-4 Complexity	Contrast Estimate	–0.492*	0.611*	–0.180
	Std. Error	0.086	0.133	0.142

*$p \leq 0.0033$

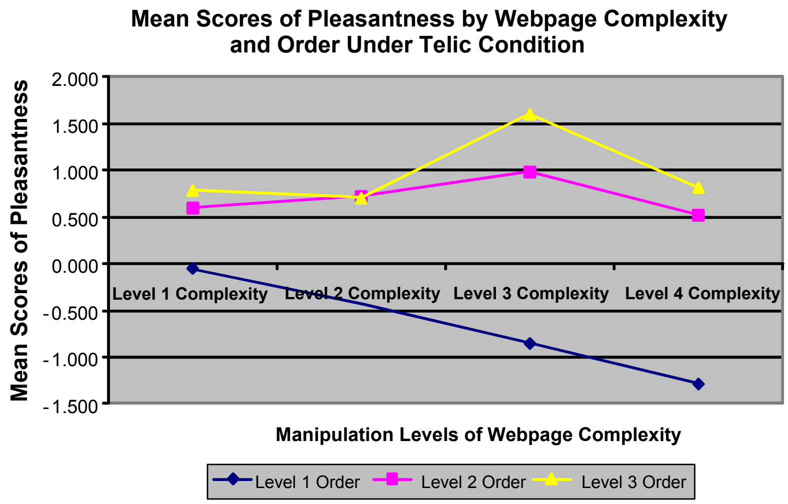

Figure 2. Relationship between Pleasantness and Webpage Visual Complexity and Order for the Telic Condition

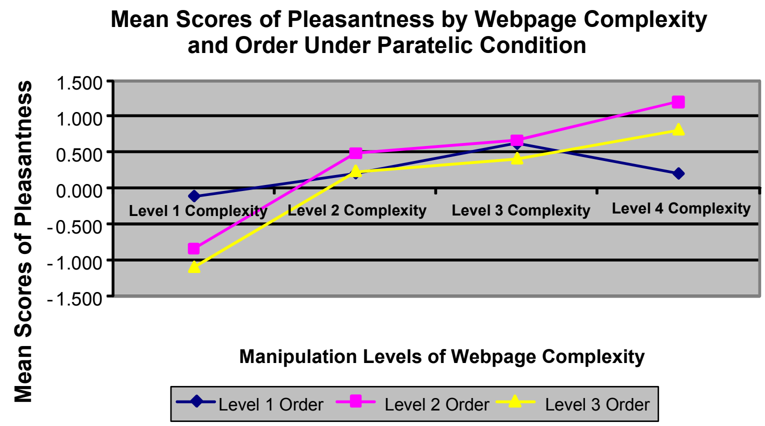

Figure 3. Relationship between Pleasantness and Webpage Visual Complexity and Order for the Paratelic Condition

pleasantness was found significant at the 0.0033 level only between the level-1 complexity and level-2 complexity treatments. In addition, as shown in Figure 3, while there were positive effects of webpage visual complexity at the level-2 and level-3 order treatments, an inverted U-shaped curvilinear relationship seemed to hold between webpage visual complexity and pleasantness at the level-1 order treatment. All of these results suggest that Hypothesis 4b was only partially supported.

Hypotheses Testing: Carry-Over Effects of Emotional Responses on Approach–Avoidance Behaviors

Pleasantness and Approach Tendency

Pearson correlation coefficients were computed among the scores of the response variables (arousal, pleasantness, and approach tendency), and are presented in Table 3. The subjects' pleasantness toward the web page was found to be significantly positively correlated with the subjects' approach tendency toward the website. This provided support for Hypothesis 5.

Arousal and Approach Tendency

In order to assess the moderation effects of the subjects' metamotivational state on the relationships between their arousal and approach tendency (Hypothesis 6), we examined Pearson's correlation coefficients among the response variables for telic and paratelic groups of subjects respectively (see Table 4). The results suggested that when the subjects were in a telic state, the scores of arousal were negatively related to the subjects' approach tendency (correlation = –0.462, $p < 0.001$), however, when the subjects were in a paratelic state, their arousal became positively related to approach tendency (correlation = 0.371, $p < 0.001$). This is consistent with Hypotheses 6a and 6b.

A summary of all the outcomes of hypotheses testing is presented in Table 5.

Additional Analysis: Mediation Effect of Emotional Responses

The M-R model posits that the influence of the environmental quality on an individual's approach–avoidance behavior to the environment is mediated by induced emotional responses (Mehrabian and Russell 1974). To investigate the mediation effects of emotional responses on the relationships between webpage order and complexity and approach tendency, two sets of multiple regressions were conducted respectively for the telic and paratelic groups according to Baron and Kenny's (1986) four criteria for establishing mediation relationships. Before running the regressions, orthogonal polynomial coding was used to transform the variable of webpage order and complexity manipulation into the five variables that respectively represent the linear (OR^1) and quadratic effects (OR^2) of webpage order and the linear (CM^1), quadratic (CM^2) and cubic effects (CM^3) of webpage visual complexity. Baron and Kenny's criteria for mediation effect include the following: First, the relationship between the independent variables—webpage order (OR^1 and OR^2) and complexity (CM^1,

Table 3. Correlation Matrix of the Response Variables

	Arousal	Pleasantness	Approach Tendency
Arousal	1	–	–
Pleasantness	–0.071	1	–
Approach Tendency	–0.097*	0.887**	1

*p < 0.05
**p < 0.01

Table 4. Correlation Matrices of the Response Variables for the Telic and Paratelic Scenarios

	Arousal		Pleasantness		Approach Tendency	
	Telic	Paratelic	Telic	Paratelic	Telic	Paratelic
Arousal	1	1	–	–	–	–
Pleasantness	–.619*	.602*	1	1	–	–
Approach Tendency	–.462*	.371*	.910*	.858*	1	1

*p < 0.01

Table 5. Summary of Results

Hypotheses	Tests	Results
H1: Webpage order (+) ➔ arousal (–)	ANCOVA & Repeated Contrasts	Supported
H2: Webpage visual complexity (+) ➔ arousal (+)	ANCOVA & Repeated Contrasts	Supported
H3a: Telic condition: Webpage order (+) ➔ pleasantness (+)	ANCOVA & Repeated Contrasts	Partially Supported
H3b: Paratelic condition: Webpage order (+) ➔ pleasantness (–)	ANCOVA & Repeated Contrasts	Rejected
H4a: Telic condition: Webpage visual complexity (+) ➔ pleasantness (–)	ANCOVA & Repeated Contrasts	Rejected
H4b: Paratelic condition: Webpage visual complexity (+) ➔ pleasantness (+)	ANCOVA & Repeated Contrasts	Partially Supported
H5: Pleasantness (+) ➔ approach tendency (+)	Correlational Coefficient	Supported
H6a: Telic condition: Arousal (+) ➔ approach tendency (–)	Correlational Coefficient	Supported
H6b: Paratelic condition: Arousal (+) ➔ approach tendency (+)	Correlational Coefficient	Supported

CM^2, and CM^3) and the dependent variable—approach tendency (AP) should be significant. Second, the relationship between the independent variables (OR^1, OR^2, CM^1, CM^2, and CM^3) and the mediating variables—arousal (AS) and pleasantness (PL)—should be significant. Third, the relationship between the mediating variables (AS and PL) and the dependent variable (AP) should be significant. Finally, the significant relationship between the independent variables (OR^1, OR^2, CM^1, CM^2, and CM^3) and dependent variable (AP) should become nonsignificant or weaker after controlling for the mediator.

The results of the regression models for the telic and paratelic groups, respectively, are presented in Tables 6 and 7. The results of regression model (1) in Table 6 indicate that the independent variables OR^1, OR^2, CM^2, and CM^3 were significant predictors of the dependent variable of AP. Regression models (2) and (3) revealed the significant effects of the independent variables of OR^1, OR^2, and CM^1 on the mediating variable of AS, and the significant effects of the independent variables of OR^1, OR^2, CM^1, CM^2 and CM^3 on the mediating variable of PL. According to the results of regression model (4), the mediating variables of AS and PL were significant predictors of the dependent variable of AP. Finally, in model (5) the dependent variable AP was regressed on its significant predictors yielded by the previous four regression models: the mediators of ASL and PL and the independent variables of OR^1, OR^2, CM^2, and CM^3. Contrary to our expectation, the

Table 6. Multiple Regression Models for the Mediating Effects of Emotional Responses for the Telic Condition

Multiple Regression		1	2	3	4	5
Beta						
Dependent Variables		AP	AS	PL	AP	AP
Independent Variables	OR^1	0.637***	–0.501***	0.629***	–	0.165****
	OR^2	–0.223***	0.144***	–0.239***	–	–0.035
	CM^1	0.005	0.580***	–0.121*	–	–
	CM^2	–0.163***	–0.034	–0.101*	–	–0.066**
	CM^3	–0.165***	0.069	–0.121*	–	–0.069**
	AS	–	–	–	0.163***	0.178***
	PL	–	–	–	1.011***	0.892***
F Value		46.648***	64.962***	42.937***	604.203***	234.710***
DF		5/219	5/219	5/219	2/222	6/218
R Square		0.516	0.597	0.495	0.845	0.866

*p < 0.05
**p < 0.01
***p < 0.001

Table 7. Multiple Regression Models for the Mediating Effects of Emotional Responses for the Paratelic Condition

Multiple Regression		1	2	3	4	5
Beta						
Dependent Variables		AP	AS	PL	AP	AP
Independent Variables	OR^1	0.163**	–0.460***	–0.067	–	0.167***
	OR^2	–0.216***	0.112*	–0.104	–	–0.113***
	CM^1	0.486***	0.553***	0.531***	–	0.090*
	CM^2	–0.210***	–0.085	–0.206***	–	–0.040
	CM^3	0.019	0.052	0.078	–	–
	AS	–	–	–	–0.228***	–0.116*
	PL	–	–	–	0.995***	0.868***
F Value		24.302***	47.488***	22.618***	361.296***	150.673***
DF		5/214	5/214	5/214	2/217	6/213
R Square		0.362	0.526	0.346	0.769	0.809

*p < 0.05
**p < 0.01
***p < 0.001

results of the regression model (5) showed that the effects of independent variables—OR^1, CM^2, and CM^3—on the dependent variable were still significant even after controlling for the effects of the mediators. While still significant, however, the absolute values of beta coefficients for each of the independent variables were close to zero, and the effect of OR^2 became insignificant. These results led us to infer a partial rather than a full mediation effect of emotional responses on the influences of webpage visual complexity and order on approach tendency in the telic condition.

As shown in Table 7, regression model (1), estimated using the paratelic group data, revealed the significant effects of the independent variables—OR^1, OR^2, CM^1, and CM^2—on the dependent variable of AP. The results of regression models (2) and (3) indicate the significant effects of the independent variables of OR^1, OR^2, and CM^1 on the mediator of AS, and the significant effects of the independent variables of CM^1 and CM^2 on the mediator of PL. Regression model (4) revealed that the mediators of AS and PL were significant predictors of the dependent variable of AP. Finally, regression model (5) was estimated regressing the dependent variable of AP on the independent variables OR^1, OR^2, CM^1, and CM^2 and the mediators of AS and PL, which were shown to be significant predictors of AP by the previous regression models. In contrast to our prediction of a full mediation effect, the results of regression model (5) showed that the effects of independent variables OR^1, OR^2, and CM^1 on the dependent variable still remained significant after controlling for the effects of the mediators. Nevertheless, since the beta coefficient value for CM^1 decreased substantially from 0.486 to 0.09 and the effect of CM^2 became insignificant, there existed a partial mediation effect of emotional responses on the relationship between webpage visual complexity and approach tendency in the paratelic condition.

Discussion and Conclusion

The results of the experiment generally confirmed the proposition that a web user's initial emotional responses (i.e., pleasantness and arousal) evoked by the visual complexity and order design features of a webpage he/she first encounters will have carry-over effects on his/her subsequent approach behavior toward the website. The major findings of this study can be summarized as follows:

First, this study applied and largely supported the hypotheses drawn from prior research on environmental aesthetics and preference to the study of the emotional impacts of webpage visual complexity and order design features. In line with the findings of prior research regarding the effects of environmental order and complexity on arousal, the results of this study indicated that webpage order has a negative relationship with the user's arousal (Hypothesis 1), while webpage visual complexity bears a positive relationship with the user's arousal (Hypothesis 2). Furthermore, the results for Hypotheses 3a and 4b suggested a positive relationship between webpage order and web user's pleasantness in the telic condition and a positive relationship between webpage visual complexity and user's pleasantness in the paratelic condition.

Second, the results for Hypotheses 5 and 6 provided support for the carry-over effects of the emotional responses elicited by the webpage on the approach tendency toward the website. The pleasantness was shown to have positive effects on the approach behavior. Consistent with reversal theory, arousal was found to bear a positive or a negative relationship with the approach tendency depending on the web user's metamotivational state.

Third, the supplementary analyses suggested a partial mediation effect of emotional responses. In the telic condition, the elicited emotional responses were found to partially mediate the effects of webpage visual complexity and order on approach tendency, as the absolute values of beta coefficients diminished noticeably with the addition of arousal and pleasantness in the regression equation (see Table 6). In the paratelic condition, the substantial reduction in the effect of webpage visual complexity on approach tendency after controlling for the effects of arousal and pleasantness (see Table 7) indicated a partial mediation effect of emotional responses on the relationship between webpage visual complexity and approach tendency.

Although these findings did not provide full support for the M-R model's mediation effect of emotional response, the presence of partial mediation instead of full mediation effect seems to indicate the existence of some non-emotional process underlying the direct influences of webpage visual complexity and order on approach tendency. This process could be concerned with cognitive evaluation of website usability, which exists in addition to the emotional processes relating webpage visual complexity and order to approach tendency through the effects of emotional responses. Prior usability research considers the order and complexity design features important for system usability (e.g., ease of use) (Agarwal and Venkatesh 2002). Some studies show that simple and well-organized websites are easy to use and effective in achieving user tasks (Agarwal and Venkatesh 2002; Shneideman 1998), which in turn lead to high behavioral intentions to use the websites (Davis et al. 1989). Therefore, webpage visual complexity and order design features may have a direct influence on approach behavior, unmediated by emotional responses.

Fourth, another significant finding of this study is the presence of significant moderation effects of users' metamotivational states on their feeling of pleasantness and subsequent approach tendency toward the website. In the experiment, those subjects who were induced into a paratelic metamotivational state felt more pleasantness and exhibited greater approach tendency in response to the webpage stimuli eliciting higher levels of arousal than to the web pages that evoked lower levels of arousal. Conversely, those subjects who were brought into a telic metamotivational state experienced more pleasantness and exhibited higher approach tendency in response to the low-arousal webpage stimuli than to the high-arousal webpages.

One interesting finding related to this is the identification of the most salient or important visual design feature of a webpage in determining the web users' emotional responses and motivating their approach–avoidance behaviors toward the website. The results for Hypotheses 3a, 3b, 4a, and 4b suggested that the salience/importance of webpage order and complexity to web users' pleasantness was largely dependent on the web users' metamotivational states. For web users in a telic state, who are usually motivated by a clearly defined goal and who emphasize the process of comprehending the website, webpage order seemed to elicit users' pleasantness and to motivate their approach tendency, due to its critical role in aiding sensemaking. However, webpage visual complexity is perceived as less important/salient because it promotes involvement and interest rather than understanding. Conversely, when in a paratelic state, webpage visual complexity seems to be a more important design feature than webpage order in evoking pleasantness and promoting approach tendencies due to the important role of complexity in satisfying users' needs for stimulation and arousal.

Finally, the results of this study also revealed how webpage visual complexity interacted with webpage order to influence the user's feeling of pleasantness. The webpage with a moderate complexity level (level-3 complexity) and a high order level (level-3 order) was experienced as the most pleasant when the web user was in the telic state (see Figure 2); conversely, the webpage with a high level of complexity (level-4) and a moderate level of order (level-2 order) elicited the most pleasure for the user in a paratelic state (see Figure 3). This finding is consistent with Kaplan and Kaplan's (1983) contention that the preferred environment tends to be high in at least one of the qualities from preference framework (both complexity and order). Arnheim (1966) has argued that order and complexity cannot exist without each other: Order is needed for individuals to deal with high complexity as "complexity without order produces confusion" (p. 124), and some level of complexity is necessary to bring interest to high order "as order without complexity causes boredom" (p. 124).

When an individual is in a telic state, in which low arousal is preferred and the process of sense-making is important, higher degrees of order are preferred and felt as pleasant. As a result of the interaction between order and complexity, high order combined with moderate complexity may produce the most pleasure in a telic condition because moderate complexity will increase interest level and at the same time high order can structure complexity and alleviate the arousal caused by complexity.

On the contrary, in a paratelic state, when high arousal is desirable and involvement is important, people will prefer high complexity, which is experienced as pleasure. Since moderate order can reduce confusion and provide understanding without decreasing interest level when it is combined with high complexity (Berlyne 1971), a combination of moderate order and high complexity will elicit the most pleasure in a paratelic condition. Corroborated by the existing literature, the findings regarding the interaction effects of webpage visual complexity and order provide suggestions on how to best balance the levels of order and complexity in the design of webpage to elicit the highest pleasure in the users under different metamotivational states.

The contribution of the research is both theoretical and practical. The major theoretical contribution of this study is the development of a research model of how a webpage's visual complexity and order design features can influence the web users' emotional responses and their subsequent behaviors toward the website. It advances knowledge of the role of a user's initial emotional experience with a webpage in shaping his/her subsequent online behaviors toward the website. Second, in this model, we explore how webpage visual complexity and order influence users' emotions and behaviors differently when users are under different metamotivational states. This provides valuable insights into the subjective nature of users' emotional responses toward the website, which involve the interaction between physical webpage design features and user characteristics.

Third, the current study suggests a new perspective on website design, which transcends and complements the traditional focus on design for usability. Our research draws attention to the presence of emotions in human computer interaction. Previous studies employing the technology acceptance model to predict and explain website adoption have emphasized cognitions (e.g., perceived usefulness, perceived ease of use, perceived risks, etc.) without paying attention to user emotions. While a focus on cognition might be appropriate for an organizational context where technology adoption is mandatory, it does not provide sufficient explanation for technology adoption in the consumer contexts in which users are free to adopt or reject technology based on how they feel rather than just how they think. The results of this research demonstrate the centrality of user emotions to website utilization.

Fourth, our research also suggests the applicability of emotional responses to information system evaluation. Human emotions involve automatic processing of stimuli in relation to our organic needs (e.g., arousal-seeking or arousal-avoiding) LeDoux 1996; Zajonc 1980) and motivate basic approach or withdrawal tendencies (Lang 1995). While the traditional technology acceptance model deals with the ability of technology to satisfy user need for productivity or task performance at the workplace, emotional responses, being automatic and judgmental, can be utilized to evaluate systems that strive to meet the needs of users in any context (positively valenced responses indicate met needs, and negatively valenced responses suggest unmet needs).

Finally, our research further goes beyond the technology acceptance model (TAM) by incorporating a wider range of sensory or experiential factors associated with website user experience. TAM is primarily technology centered, concentrating on the technology mediating user experience rather than the user experience itself. The environmental psychology model captures user experience by exploring users' emotional responses to the sensory variables of systems. This research shows that webpage visual complexity and order, and possibly other web design features, can be applied to guide website interface design that evokes positive emotional responses and promotes desirable user behaviors.

As for practical contribution, the outcome of this research will be of interest to managers and web designers. A better understanding of the relationship between the design features of a website interface and users' emotions can help managers create web pages that elicit desired emotions and, subsequently, desired behaviors. This research provides significant implications for website presentation and customization and helps the managers to understand the importance of the emotional impact of a user's initial encounter with a website and how it can affect his/her subsequent behavior. The results of this study can also assist managers in their decisions to customize their website designs based on the metamotivational states of their online visitors. Managers can infer their customers' metamotivational state by their offerings of products or services, records of customers' web browsing behaviors, and time of the day (morning versus evening), day of the week (weekdays versus weekends), and time of the year (holiday versus non-holiday seasons) (Kaltcheva and Weitz 2006). For example, a website that offers an online tax service would expect its customers to have a telic motive while a website providing online games is often visited by customers who are in a paratelic state.

Customers' metamotivational state may also vary from time to time (Kaltcheva and Weitz 2006). Customers may be more telicly motivated on weekdays and more paratelically oriented on weekends and holidays. Even within the same day, customers may be more telic in the morning than in the evening. The company can also determine a particular customer's metamotivational dominance, whether he/she tends to be telic or paratelic, by analyzing the clickstream data collected on the mouse-clicks and paths he/she made through the website. After determining which metamotivational state customers are likely to be in, companies can customize the website homepage each customer sees by incorporating the design features consistent with the customer's metamotivational state, for instance, high complexity and moderate order for telicly motivated customers, and high order and moderate complexity for paratelically motivated customers. Finally, the findings concerning users' responses toward webpage visual complexity and order design features also provide implications and guidelines for web designers to develop visually attractive and pleasant websites.

Several limitations should be considered when interpreting the results of this study. First, the data were collected from a sample of students, which may restrict the applicability of the results to other populations. However, since students are e-commerce web users, and our webpage stimuli and hypothetical scenarios were designed to induce the subjects into the experience of browsing the stimuli presented to them, the use of a student sample should not present a serious threat to the validity of this study. Second, the single web site category introduced some limitations. We only used one web site category, and this may or may not meet the expectations or requirements of all subjects for an Internet environment. While restricting data collection to only one type of website category can increase the accuracy of results, using only a single website category for the experiment may also limit the generalizability of the results to other website categories.

Third, we used static rather than dynamic webpage stimuli in this study. Not allowing the subjects to click on any links on the webpage stimuli as they would do in a natural Internet environment may adversely influence the subjects' emotional responses and approach tendency.

Finally, our treatment of webpage visual complexity was not exhaustive of all the factors influencing webpage visual complexity, nor did it include all possible combinations of different levels of the manipulated factors. Drawing on the existing literature (Geissler 2001), we identified the number of links, number of graphics, and amount of text as webpage design factors that may influence webpage visual complexity and did extensive pilot testing to verify the effectiveness of our treatment of webpage visual complexity through manipulating different levels of the these factors. Since the purpose of our study was to investigate the influences of webpage visual complexity on user's emotional responses, our manipulation of webpage visual complexity, although not exhaustive of all complexity levels, still yielded significant effects on the subjects' perceptions of webpage complexity and emotional responses and hence is considered sufficient for the purpose of this study. Our study also provides examples of web pages at different complexity levels and provides a general framework that companies can draw on to test their web pages to ensure they fit within an appropriate range of complexity.

This study opens a variety of avenues for future research. While the current study mainly draws on self-report measurements, future research can employ observational techniques to measure the subjects' emotional and behavior responses. Measures of galvanic skin response, eye tracking, and functional MRI are promising approaches for examining the dynamics between the specific web design features and the web user's physiological arousal. Computer capture tools can observe all of the movements (such as mouse clicks) of a web user on a website and afford the ability to measure subjects' actual online behavior. Future research could use our treatment of webpage visual complexity as a starting point for developing metrics of webpage visual complexity. More extensive studies are needed to test the effects of different combinations of text, links, graphics, and additional design factors on perceptions of webpage visual complexity. Other important directions for future research would include (1) investigating the effects of other design features (e.g., novelty, interactivity, personalization) of website interface on web users' emotional responses and (2) examining other carry-over effects of users' emotional responses toward websites (e.g., persuasion, customer loyalty, trust, purchase intention, etc.).

In conclusion, this study is the beginning of a stream of research based on investigating the effects of IS user interface design features on users' emotional responses. As computers and information systems become increasingly distributed and pervasive in all aspects of human life, this stream of research is urgently needed.

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RESEARCH ARTICLE

AFFECT IN WEB INTERFACES: A STUDY OF THE IMPACTS OF WEB PAGE VISUAL COMPLEXITY AND ORDER

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Appendix A

Experimental Stimuli

We conducted two pilot studies to select the appropriate e-commerce website type and contents for the homepage stimuli. The purpose of Pilot Study 1 was to select a website category with which subjects are not familiar, for which they show neither liking nor disliking, but have some interests in browsing. Unfamiliarity with the website was required because familiarity with a certain category of website may influence perceived complexity of (Radocy and Boyle 1988) and liking for the webpage stimuli (Bornstein 1989; Zajonc 2000). We needed a website for which subjects showed neither liking nor disliking so that the manipulation of webpage stimuli in the experiment could be assumed to be the major influence on their reported emotional responses and approach tendencies. To have some degree of interest in browsing the website is necessary for subjects to engage in experiential web-browsing activities with the webpage stimuli. Based on the results of Pilot Study 1, we selected the gifts website as the context for the experimental stimuli. Then, we conducted Pilot Study 2 to identify appropriate gift items to be included in the webpage stimuli. Thirteen gift items, which were shown to elicit neutral affect in the subjects and to be of some interest to the subjects for browsing or purchase, were selected for the website.

Utilizing Geissler et al.'s (2001) findings regarding the influence of amount of text, number of links, and number of graphics on user's perceived complexity of webpage, we designed four levels of complexity (complexity increases from level 1 to level 4) into the experimental stimuli by manipulating the number of links, number of graphics, and amount of text (see Table A1).

We also manipulated webpage order at three levels (order increases from level 1 to level 3) by arranging the layout of webpage elements. According to our definition of order, webpage order is related to the logical organization, coherence, and clarity of webpage content. We used logical organization as a starting point for our design of webpage stimuli at lower and higher levels of order, since logical organization is the most fundamental component upon which coherence and clarity are built. upon. Three levels of webpage order were operationalized and designed into the webpage stimuli through the following steps:

Table A1. Manipulation of Webpage Visual Complexity

	Level 1 Complexity	Level 2 Complexity	Level 3 Complexity	Level 4 Complexity
Number of Links	12	16	33	54
Number of Graphics	2	4	8	14
Number of Text	33	40	57	118

First, we identified the webpage elements to be included in the webpage stimuli that are designed at a certain level of complexity.

Second, we determined the logical position of each webpage element in the web space in order to make them obviously identifiable or easily recognizable by users. This was achieved by arranging the placement of webpage elements in the web space following the conventions of website design. A user generally draws on his/her memory of past experience with websites as a reference when navigating websites. Therefore, we operationalized logical organization by conforming to the conventional guidelines for arranging the positions of different webpage elements in relation to each other in the web space. For instance, to comply with the habit of browsing a webpage from top to bottom and left to right, we (1) placed the company name in the most prominent webpage location, the top left corner, (2) put the primary navigation bar on the top of webpage just to the right of company name, (3) positioned the content navigation menu on the left of webpage below the company name, and (4) placed the content area in the center of webpage to the right of content navigation menu and below the primary navigation bar. The webpage stimuli designed at this stage were labeled as Level 2 Order, which served as basis for the design of other two levels of order: Level 1 Order and Level 3 Order.

Third, we designed Level 1 Order by using free-form layout of webpage elements, each of which was displaced from its logical position so as to attain a low level of order without any sense of logical organization.

Fourth, Level 3 Order was built on the Level 2 Order by applying the alignment and grouping design tools to associate similar or related elements and differentiate unrelated elements.

To test the effectiveness of our manipulation of webpage visual complexity and order, we performed Pilot Study 3, in which two independent samples of subjects were recruited. One sample was assigned to rank order the webpage stimuli according to their paired similarities, and the other sample rated each webpage on its degree of complexity and order as well as their preference for it under telic and paratelic meta-motivational states. The MDS (multidimensional scaling) results of Pilot Study 3 demonstrated the effectiveness of our manipulations of webpage visual complexity and order as factors accounting for the perceptual similarity/dissimilarity among the webpage stimuli and influencing the perceived complexity and order of the stimuli as well as subjects' preference for them.

The 12 homepage stimuli are presented below.

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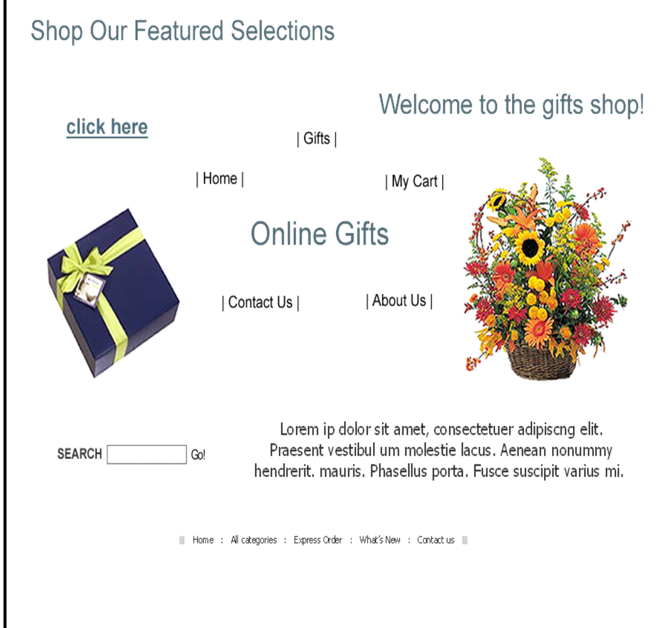
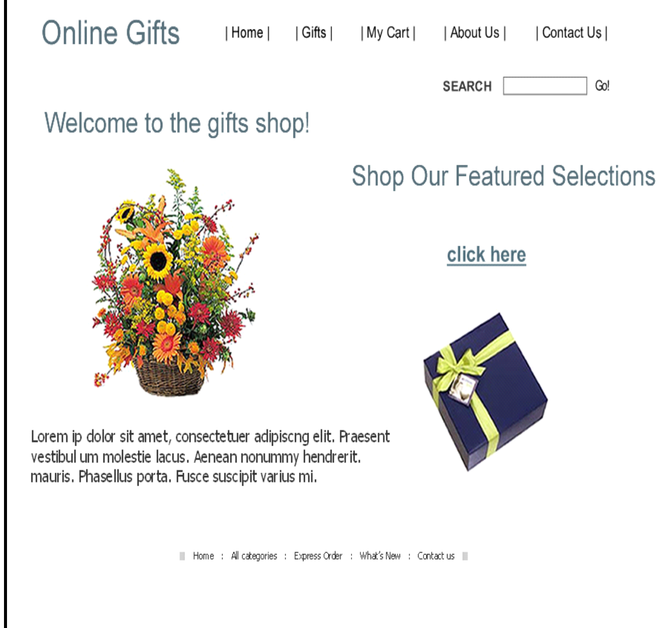
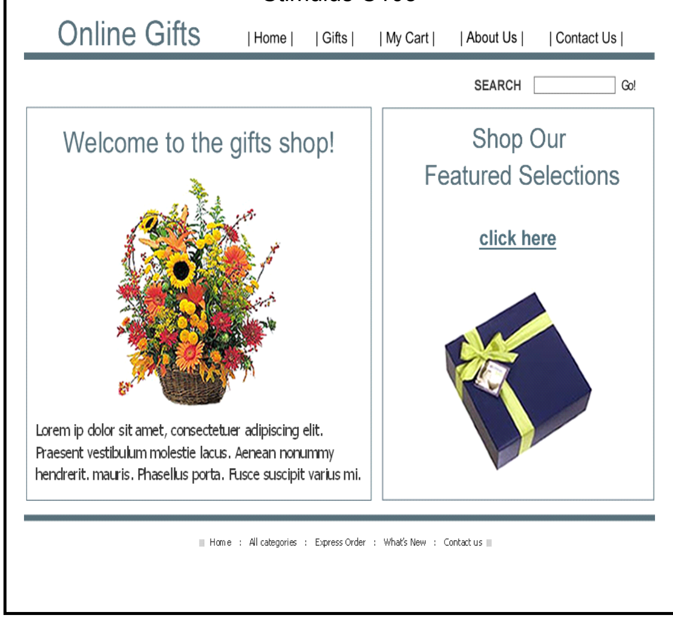
Stimulus C101



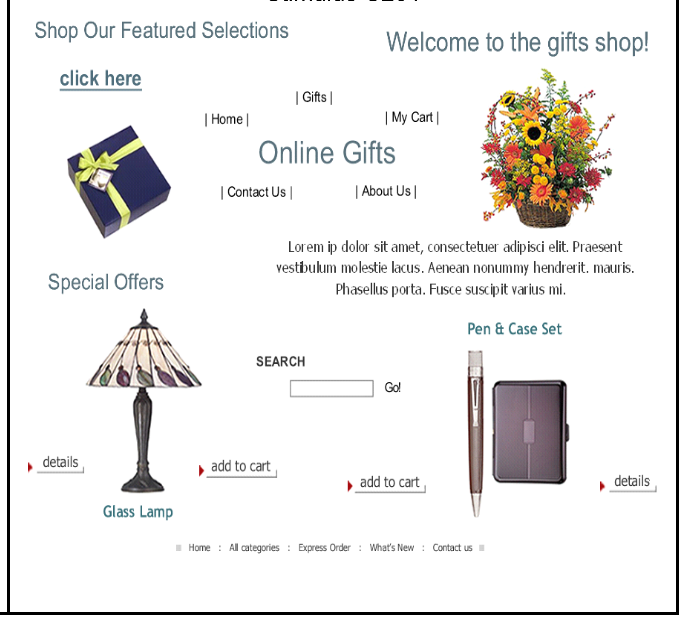
Stimulus C102



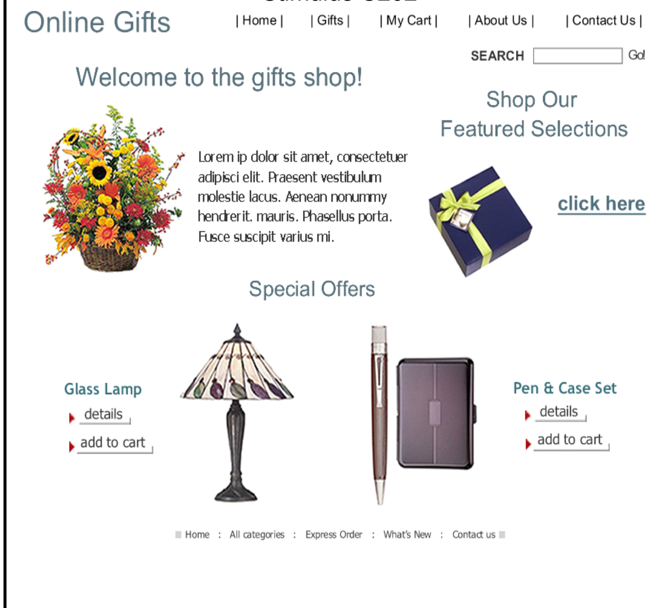
Stimulus C103



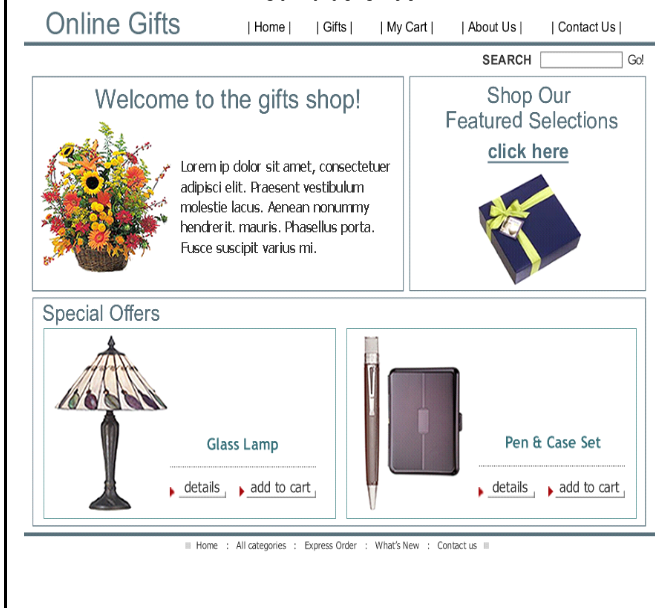
Stimulus C201



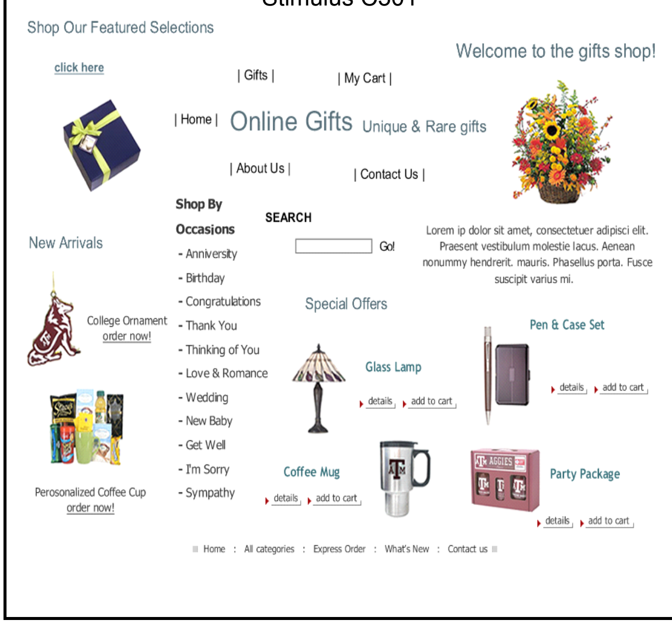
Stimulus C202



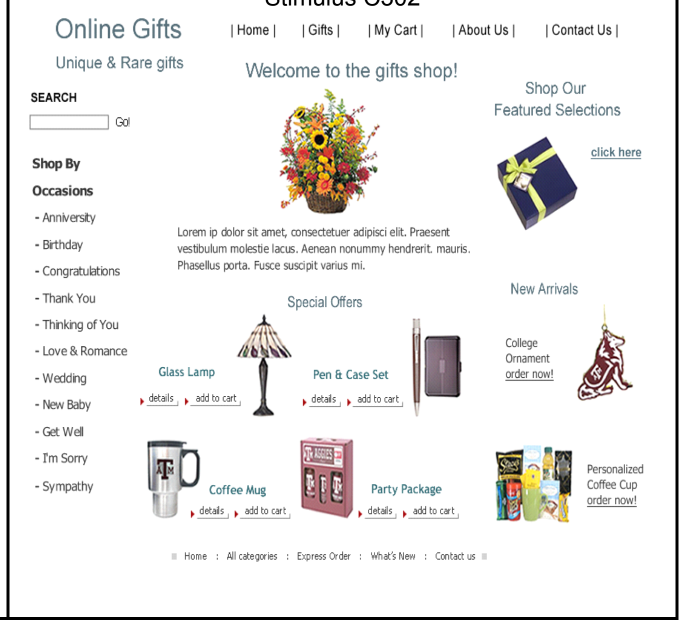
Stimulus C203



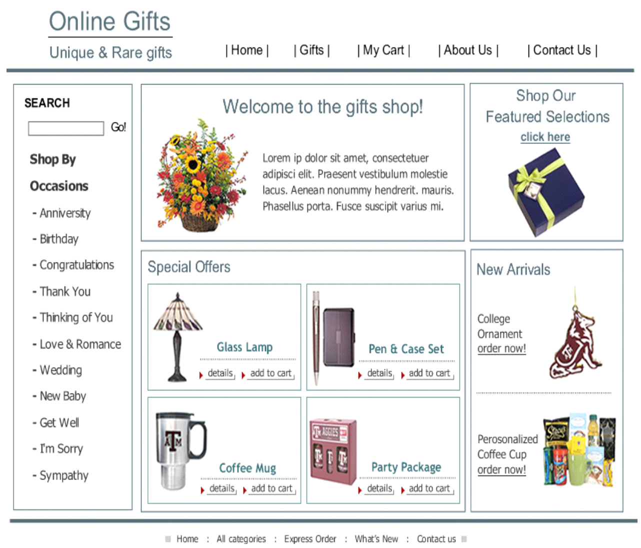
Stimulus C301



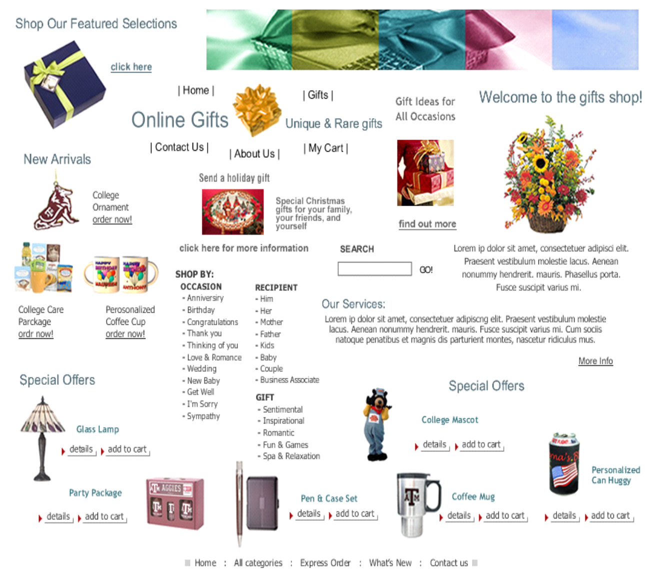
Stimulus C302



Stimulus C303



Stimulus C401



Stimulus C402

Stimulus C403

Appendix B

Scenarios for Induction of Telic and Paratelic States

Scenario for Induction of Telic State

One of your friends' birthday is just around the corner. You want to buy a gift for him/her, but you don't have a lot of time to shop around. You plan to spend 10 to 20 minutes. So, you think of going to a gift website on the Internet to buy a birthday gift for your friend. In order to quickly find a gift for your friend online, you turn on the computer, open Internet Explorer, and go to the Google search engine. You search for gift websites by typing in "gifts" in the keywords space. You click on the first website link in the resulting list. As the website homepage loads on your computer screen, you start looking through the webpage.

Scenario for Induction of Paratelic State

It is shortly after noon on a Saturday. You're surfing on the Internet at home. You're not looking for anything specific online. Instead, you're taking your time browsing various websites and checking out some fun stuff. All you want to do is to spend several enjoyable hours online by yourself. As you're browsing the Internet looking for fun and enjoyment, a banner advertisement for a gift website attracts your attention. You want to visit the website and see if you can find some interesting stuff for your friends. You click on the banner, which opens another IE window. As the website homepage loads on your computer screen, you start browsing through the webpage.

Appendix C

Instrumental Scales

Arousal (–3 = significantly, –2 = quite, –1 = slightly, 0 = neither, 1 = slightly, 2 = quite, 3 = significantly)
- The webpage makes me feel stimulated/relaxed (R).
- The webpage makes me feel calm/excited.
- The webpage makes me feel frenzied/sluggish (R).
- The webpage makes me feel unaroused/aroused.
- The webpage makes me feel jittery/dull (R).
- The webpage makes me feel wide-awake/sleepy.

Pleasantness (–3 = significantly, –2 = quite, –1 = slightly, 0 = neither, 1 = slightly, 2 = quite, 3 = significantly)
- The webpage makes me feel happy/unhappy (R).
- The webpage makes me feel annoyed/pleased.
- The webpage makes me feel satisfied/unsatisfied (R).
- The webpage makes me feel melancholic/contented.
- The webpage makes me feel hopeful/despairing(R).
- The webpage makes me feel uncomfortable/comfortable.

Approach–Avoidance Tendency (7 = strongly agree, 6 = agree, 5 = somewhat agree, 4 = neutral, 3 = somewhat disagree, 2 = disagree, 1 = strongly disagree):
- I would enjoy visiting this website.
- I like to spend much time browsing this website.
- I would try to leave this website as soon as possible (reversed).
- I would avoid getting back to this website after I have left it (reversed).
- I want to avoid exploring or investigating this website (reversed).
- I like this website.
- I would avoid any unplanned activity in this website.
- I would be satisfied with this website.
- I would have a positive attitude toward this website.

Table D1. Correlation Matrix of the Indicators of Pleasantness, Arousal, Perceived Order, and Perceived Complexity

	Plst1	Plst2	Plst3	Plst4	Plst5	Plst6	Arsl1	Arsl2	Arsl3	Arsl4	Arsl5	Arsl6	Ordr1	Ordr2	Ordr3	Ordr4	Ordr5	Cmplx1	Cmplx2	Cmplx3
Plst1	1																			
Plst2	0.66	1																		
Plst3	0.61	0.75	1																	
Plst4	0.57	0.68	0.62	1																
Plst5	0.60	0.72	0.68	0.63	1															
Plst6	0.47	0.61	0.58	0.58	0.61	1														
Arsl1	-0.03	-0.15	-0.08	-0.10	-0.10	-0.15	1													
Arsl2	-0.01	-0.09	-0.03	-0.05	-0.07	-0.09	0.70	1												
Arsl3	0.00	-0.07	0.00	0.01	-0.04	-0.08	0.61	0.63	1											
Arsl4	0.00	-0.03	0.02	0.00	-0.05	0.03	0.52	0.59	0.61	1										
Arsl5	0.00	-0.09	-0.03	0.02	-0.07	-0.09	0.54	0.61	0.71	0.63	1									
Arsl6	-0.01	-0.08	-0.04	0.01	-0.05	-0.08	0.49	0.54	0.55	0.54	0.58	1								
Ordr1	0.16	0.30	0.33	0.25	0.26	0.36	-0.33	-0.28	-0.19	-0.15	-0.25	-0.22	1							
Ordr2	0.10	0.21	0.28	0.17	0.20	0.29	-0.26	-0.24	-0.19	-0.14	-0.23	-0.18	0.75	1						
Ordr3	0.15	0.28	0.30	0.22	0.22	0.32	-0.31	-0.26	-0.23	-0.16	-0.27	-0.21	0.81	0.79	1					
Ordr4	0.15	0.27	0.29	0.21	0.25	0.31	-0.34	-0.32	-0.24	-0.20	-0.26	-0.24	0.78	0.75	0.80	1				
Ordr5	0.16	0.33	0.32	0.24	0.28	0.34	-0.30	-0.24	-0.21	-0.18	-0.23	-0.19	0.76	0.72	0.84	0.80	1			
Cmplx1	-0.12	-0.18	-0.11	-0.13	-0.13	-0.24	0.48	0.44	0.43	0.39	0.41	0.37	-0.49	-0.42	-0.57	-0.54	-0.59	1		
Cmplx2	-0.07	-0.10	-0.04	-0.06	-0.08	-0.22	0.42	0.39	0.40	0.38	0.39	0.36	-0.52	-0.42	-0.55	-0.57	-0.53	0.76	1	
Cmplx3	-0.09	-0.13	-0.11	-0.11	-0.13	-0.24	0.43	0.36	0.40	0.34	0.38	0.35	-0.55	-0.41	-0.56	-0.56	-0.55	0.77	0.82	1

Table D2. Correlation Matrix of the Indicators of Perceived Order, Perceived Complexity, and Approach Tendency

	APB1	APB2	APB3	APB4	APB5	APB6	APB7	APB8	APB9	Ordr1	Ordr2	Ordr3	Ordr4	Ordr5	Cmplx1	Cmplx2	Cmplx3
APB1	1																
APB2	0.91	1															
APB3	0.89	0.85	1														
APB4	0.88	0.84	0.93	1													
APB5	0.86	0.82	0.88	0.92	1												
APB6	0.89	0.87	0.87	0.87	0.84	1											
APB7	0.80	0.78	0.81	0.80	0.78	0.80	1										
APB8	0.91	0.89	0.88	0.88	0.86	0.88	0.81	1									
APB9	0.90	0.88	0.88	0.87	0.85	0.86	0.78	0.96	1								
Ordr1	0.45	0.43	0.41	0.41	0.42	0.43	0.41	0.43	0.43	1							
Ordr2	0.39	0.39	0.35	0.36	0.35	0.38	0.36	0.39	0.39	0.75	1						
Ordr3	0.44	0.42	0.40	0.41	0.39	0.42	0.40	0.43	0.42	0.81	0.79	1					
Ordr4	0.43	0.41	0.36	0.37	0.37	0.40	0.42	0.40	0.38	0.78	0.75	0.80	1				
Ordr5	0.48	0.45	0.43	0.41	0.39	0.46	0.45	0.44	0.44	0.76	0.72	0.84	0.80	1			
Cmplx1	-0.23	-0.20	-0.22	-0.24	-0.22	-0.23	-0.23	-0.24	-0.22	-0.49	-0.42	-0.57	-0.54	-0.59	1		
Cmplx2	-0.16	-0.14	-0.13	-0.15	-0.15	-0.13	-0.15	-0.15	-0.14	-0.52	-0.42	-0.55	-0.57	-0.53	0.76	1	
Cmplx3	-0.20	-0.18	-0.19	-0.21	-0.20	-0.19	-0.20	-0.21	-0.20	-0.55	-0.41	-0.56	-0.56	-0.55	0.77	0.82	1

Table D3. Factor Loadings and Item Reliability

Constructs and Their Indicators	Factor Loading	T Value	SE	Composite Reliability
Arousal				0.92
Arsl1	0.75	17.81	0.053	
Arsl2	0.80	19.46	0.050	
Arsl3	0.82	20.47	0.044	
Arsl4	0.75	17.82	0.052	
Arsl5	0.81	19.91	0.046	
Arsl6	0.69	15.91	0.050	
Pleasantness				0.93
Plst1	0.72	17.30	0.046	
Plst2	0.88	23.28	0.048	
Plst3	0.83	21.18	0.050	
Plst4	0.78	19.27	0.046	
Plst5	0.82	20.92	0.048	
Plst6	0.72	17.24	0.051	
Approach/Avoidance Behavior				0.98
Apb1	0.95	27.05	0.060	
Apb2	0.92	25.62	0.060	
Apb3	0.94	26.46	0.060	
Apb4	0.94	26.44	0.059	
Apb5	0.92	25.25	0.060	
Apb6	0.93	25.78	0.061	
Apb7	0.85	22.37	0.061	
Apb8	0.96	27.22	0.060	
Apb9	0.95	26.69	0.061	
Perceived Order				0.91
Ordr1	0.87	23.04	0.062	
Ordr2	0.84	21.46	0.060	
Ordr3	0.93	25.60	0.062	
Ordr4	0.88	23.56	0.059	
Ordr5	0.89	23.99	0.067	
Perceived Complexity				0.81
Cmplx1	0.85	21.99	0.069	
Cmplx2	0.90	23.85	0.063	
Cmplx3	0.90	24.05	0.065	

Table D4. Cell Descriptive Statistics for Dependent Variables

Treatment			Arousal		Pleasantness		Approach Tendency	
			Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Level 1 OR	Level 1 CM	Telic	-0.44	0.60	-0.06	0.74	1.82	0.63
		Paratelic	-0.18	0.75	-0.11	0.43	1.58	0.37
	Level 2 CM	Telic	0.51	0.72	-0.43	0.86	2.09	1.00
		Paratelic	0.58	0.52	0.21	0.50	2.98	1.12
	Level 3 CM	Telic	1.11	0.87	-0.85	0.80	1.94	0.74
		Paratelic	0.89	0.55	0.62	0.72	3.59	1.49
	Level 4 CM	Telic	1.33	0.66	-1.28	0.65	1.32	0.22
		Paratelic	1.06	0.36	0.21	0.95	2.59	1.40
Level 2 OR	Level 1 CM	Telic	-1.15	0.62	0.60	0.71	3.63	1.48
		Paratelic	-0.99	0.72	-0.83	1.08	2.24	1.00
	Level 2 CM	Telic	-0.52	0.55	0.72	0.67	3.85	1.25
		Paratelic	-0.46	0.41	0.49	0.27	3.67	0.51
	Level 3 CM	Telic	-0.02	0.54	0.98	0.74	4.52	1.49
		Paratelic	0.28	0.87	0.67	0.78	4.03	1.43
	Level 4 CM	Telic	0.48	0.57	0.52	0.74	3.58	1.39
		Paratelic	0.58	0.45	1.20	0.85	4.67	1.73
Level 3 OR	Level 1 CM	Telic	-1.16	0.52	0.78	0.61	4.16	1.25
		Paratelic	-1.19	1.10	-1.10	1.18	2.02	0.84
	Level 2 CM	Telic	-0.68	0.59	0.70	0.68	3.81	1.36
		Paratelic	-0.39	0.54	0.24	0.31	3.08	0.63
	Level 3 CM	Telic	-0.81	0.49	1.60	0.52	5.62	0.70
		Paratelic	-0.47	0.37	0.41	0.66	3.77	1.32
	Level 4 CM	Telic	0.20	0.65	0.82	0.64	4.06	1.47
		Paratelic	0.21	0.61	0.81	0.51	4.28	1.18