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# Effects of design factors on store image and expectation of merchandise quality in web-based stores

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#### Abstract

This study investigates two design factors of store atmosphere in relation to store image and consumers' expectations of merchandise quality for web-based stores. We address this purpose through the use of the Stimulus–Organism–Response (S–O–R) model on which five hypotheses were drawn based on research conducted with brick-and-mortar and web-based stores. In order to test the hypotheses, four treatment combination stimuli were developed by two types of storefront designs (thematic/non-thematic) and two types of information display (picture-based/text-based). A total of 307 college student questionnaires were analyzed. The findings provide a better understanding of consumer's behavior toward web-based stores. Experiment results suggest that, consumers reacted more positively to web-based stores using a thematic and picture-based/text-based) were positively related to a convenient store image and consumers' expectation of merchandise quality. In addition, there was a mediating effect of store image between store atmosphere and consumers' expectations of merchandise quality.

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### 1. Introduction

The atmospheric environment in a store includes various stimuli, such as color, sound, scent, taste, layout and space, which are important clues for buyers. Kotler (1973) was the first to use the term "atmosphere," while other researchers followed and defined and categorized the attributes of store atmosphere in brick-and-mortar stores (Baker, 1986; Belk, 1975; Berman and Evans, 1998; Turley and Milliman, 2000) and in web-based stores (Eroglu et al., 2003; Lohse and Spiller, 2003; Menon and Kahn, 2002; McKinney, 2004; Richard, 2005; Williams and Dargel, 2004). Previous research in brick-and-mortar stores and web-based stores revealed that store atmosphere influences consumers' perception of product quality (Chebat and Michon, 2003).

The focus here is on store atmosphere, in particular, within-store design factors that affect consumers' perception

of store image and consumers' expectation of merchandise quality. We propose that there are two design factors that define store atmosphere for web-based stores, i.e., storefront design and methods of information display. While most sensory stimuli are being used in brick-and-mortar stores, visual factors are the main tool to establish an atmospheric environment in web-based stores. Lohse and Spiller (2003) suggested that web pages play the role of window displays or store layouts in brick-and-mortar stores. Web-based stores present information with design attributes (graphic, visual icons, pictures, etc.) on their web pages, thus creating a store atmosphere, like the architecture of a storefront or merchandise layout in brick-andmortar window displays.

We note that there are two contrasting strategies in each storefront design and each method of information display in web-based stores. Like brick-and-mortar stores, we observe web-based stores with a thematic storefront design (e.g., levi.com) and web-based stores with a non-thematic

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storefront design (e.g., llbean.com). A thematic storefront design presents related products in a lifestyle-type atmosphere reflecting the store identity, while a non-thematic storefront design merely presents the brand name, product pictures and merchandise selection information. Information display in web-based stores is based on pictures or text, or the combination of pictures and text. Apparel webbased stores often provide merchandising information that includes garment care, color, construction, fabric, etc. using text, pictures or a combination of text and pictures.

Literature on brick-and-mortar stores reveals the effectiveness of store design with a theme and picture-based information cues (Gutman and Alden, 1985; Marsh, 1999). However, no empirical research to date has revealed the same effectiveness of the strategies in web-based environments. In web-based stores, pictures create a positive response from consumers (Geissler, 2001), however, too many images reduce the speed of presentation and screen transition that may negatively influence consumers' reaction in the web-based environment (Yang, 1994). Previous research in brick-and-mortar stores suggested store atmosphere had a positive influence on store image (Baker et al., 1994) and the expectation of merchandise quality (Mazurasky and Jacoby, 1985). However, these relationships between variables should be redefined in web-based stores because of its many unique features. Ernst and Young (1998) and Jarvenpaa and Todd (1997) suggest that the web-based environment emphasizes the importance of safety, convenience, and entertainment in store image.

While store atmosphere is considered a critical strategy in competitive markets for brick-and-mortar stores, studies of store atmosphere in web-based environments are meager despite the rapid development and growth of web-based stores and their sales volume. In 1998, 46 million consumers in America alone bought online, each spending on average \$350 a year (The Economist, 1997). In fact, in the 3 years that followed, Internet sales grew from \$5.0 billion (in 1998) to \$32.6 billion in 2001, which is a six-fold increase (ICSC Research Quarterly, 2002, p. 9). One research study predicted that annual online sales would reach \$230 billion by 2010 when the Y generation, most of which are collegeaged students, become a powerful purchasing group (Twenty Trends for 2010: Retailing in an age of uncertainty, 2003). As the number of women with higher education levels and jobs in technology increases (Fountain, 2000), this segment is making headway into the previously considered male-dominated market of on-line shopping (Burstein and Kline, 1995; Electronic Retailing, 1998).

The purpose of this research is to investigate effective ways of establishing store atmosphere in web-based environments with two contrasting strategies in storefront design (thematic/non-thematic) and methods of information display (picture-based/text-based) using two dependent variables, store image and consumers' expectation of merchandise quality. To address the purposes of our study, we begin by developing a theoretical framework and reviewing previous literature regarding store atmosphere, store image and consumers' expectation of merchandise quality. This review is followed by a discussion of the relationships between variables in order to develop testable hypotheses for an empirical study. The methodology of the study is followed by the presentation of the results and discussion. Finally we present the conclusions and implications, along with the limitations and recommendations for future studies.

# 2. Theoretical framework

A Stimulus-Organism-Response (S-O-R) model (Donovan and Rossiter, 1982; Mehrabian and Russell, 1974) has been widely adopted and tested in order to understand consumers' shopping behavior through the store environment. Eroglu et al. (2001) developed the theoretical model to describe how the web-based stores' environment influences consumers' emotional and cognitive states that then alter various aspects of shopping outcomes. They empirically tested their model and concluded that the atmospheric qualities of the store web site increased the level of shoppers' pleasure (Eroglu et al., 2003). One recent study proposed that atmospheric variables contributed to consumers' satisfaction on the Internet with different orientations toward shopping (McKinney, 2004). It was also found that some atmospheric variables (e.g. description of the product, graphic/photos/coupons) influenced satisfaction for all consumers, regardless of their shopping orientation.

This study focuses on consumers' reaction to how a webbased store is designed. While previous studies have examined online shoppers' attitude and satisfaction (Eroglu et al., 2003; McKinney, 2004), the current study highlights the store atmosphere, through the mediating effects of store image, which is the impact on consumers' merchandise expectation on the web environment. The S-O-R model will be used to examine the effects of design factors on store image and consumers' expectation of merchandise quality (Fig. 1). In our framework, Stimuli refers to variables that are used to create the web-based stores. Examination of design factors, storefront design and information display is the focus of this study. Organism is represented by affective and cognitive intermediary states and processes that moderate the relationship between the stimuli and response. Consumers' affective states would relate to an emotional sense, and the cognitive states would relate to a rational sense in the consumer decisionmaking process. This study will examine consumers' perception of store images, safety, convenience, and entertainment. The Response represents individuals' expression, and we will examine consumers' expectation of merchandise quality.

# 2.1. Store atmosphere

Kotler (1973) introduced the concept of store atmosphere, that is, the effort to design a physical store



Fig. 1. Theoretical framework.

environment that provides specific emotional effects in customers that encourages consumers' purchasing decision-making. Belk (1975) indicated that physical surrounding is one situational characteristic that stimulates consumer behavior within an environment. Creating store atmosphere is a competitive strategy used by retailers (Marsh, 1999) to influence consumer behavior, which in turn increases sales (Chebat and Michon, 2003). Massara (2003, p. 33) proposed, "an environment richer in ambientesthetic cues enhances the holistic and hinders the analytical responses of the subject."

Baker (1986) developed a typology categorizing the atmospheric store environmental elements into three groups; ambient factors, design factors, and social factors. Ambient factors are non-visual, background conditions of the store, including elements, such as music/sound, lighting, scent and temperature. Store design factors were classified into functional (store layout, display, comfort, and privacy) and esthetic (architecture, color, material, and style) elements (Marans and Spreckelmeyer, 1982). Using those elements, retailers create a store identity and encourage consumers' shopping activities. Also, store design is a way of presenting merchandise in a store to facilitate and stimulate consumers' purchasing behavior. Thus, store design has been called a silent salesman because it has been used in an attempt to attract and hold consumers' attention (Buttle, 1984). Social factors describe the people who are within the store environment that includes the number, type and behavior of salespeople and other customers. Similarly, Turley and Milliman (2000) used the term "human variable," regarding employees, space, and consumer characteristics and privacy, as the third category of store atmosphere.

Among the three categories, in web-based stores, the design factors are considered more influential than ambient and social factors in regard to consumers' reactions. Although web-based stores also use music/sound to attract consumers, visual settings are more obvious in establishing store atmosphere in web-based environments. Indeed, webbased stores use many visual design factors such as screen layout, information display, color, pictures or images, banner ads, size of characters and signage. Gap, Inc. has successfully managed to match the store atmosphere in its stores and on the web in order to maintain a consistent image through all its channels of distribution. In addition, the effects of social factors are not evident in web-based stores due to their use of impersonal transactions.

Lohse and Spiller (2003) presented many design factors when they compared environmental attributes in brickand-mortar stores to environmental attributes in webbased stores (e.g., store window displays vs. home page; store layout vs. screen depth, browse and search functions, indices, image maps; number of floors in the store vs. hierarchical levels of the store; and salesclerk service vs. product descriptions, information pages, gift services, search function, etc.).

The opening page of a web-based store takes on the role of window displays in brick-and-mortar stores. The first page of virtual stores delivers a first impression to consumers while window displays in brick-and-mortar stores deliver the first impression to consumers. Window displays create merchandise impressions and dispense information about merchandise offered for sale inside the store. Furthermore, window displays help to reach out and attract people from outside of the store to the merchandise offerings to be found inside and helps to provide a buying mood within the store. Surveys found that well-managed window displays in all types of retail stores invariably increase sales of the merchandise displayed (Cowee, 1951; Gould, 1951; Wilkenson et al., 1982). Lohse and Spiller (2003) noticed that screen design and layout is closely related to sales in web-based stores.

Thus, this study focuses on two design factors (storefront design and methods of information display) of store atmosphere in the opening page of web-based stores. Following, we will contrast the different strategies for planning storefront design and methods of information display.

# 2.2. Design factors: storefront design and methods of information display

A storefront design in a web-based store can be defined as a device to attract consumers in the same way as a window display in a brick-and-mortar store. We propose

that there are two types of storefront designs that must be distinguished; one is a thematic storefront design, and the other is a non-thematic storefront design.

A thematic storefront design reflects a store identity that will appeal to its customers by presenting related products in a lifestyle-type atmosphere. Many studies support the effect of the thematic store environment. The most powerful window display uses a story or a concept as a theme (Lee, 1951), and Berman and Evans (1998) suggested that a prestige store image is formed with a thematic display rather than a non-thematic or rack display. However, web designers have found that sophisticated front-page designs attract the attention of customers, as well as distract and even annoy some customers (Geissler, 2001). In addition some consumers experienced enjoyment, with the website while others experienced frustration (Jarvenpaa and Todd, 1997).

North Sails Catalog, a Seattle-based company selling apparel for the sailing lifestyle, had significantly increased its sales after it changed the cover page of its catalog. The new cover page featured men and women wearing sailing outfits enjoying themselves on a beautiful sail boat, thus illustrating a themed story with a lifestyle approach (Burke, 1998). Most designer brand web sites (Guess, Calvin Klein, Georgio Armani, etc.) and national brands (Nike and Levi's) have a thematic opening page that consists of lifestyle type pictures and the brand/store name or logo. The following are current web examples of this concept: calvinklein.com; guess.com; joeboxer.com; lee.com; levi. com; and nike.com.

Contrasting those companies that have designed stores with a theme, many specialty retail stores and discount retail stores, such as, Designer Outlet, Kmart, L.L. Bean, Talbots, etc., have non-thematic storefront designs. A nonthematic storefront design merely presents the brand name; product pictures and merchandise selection information. The following are examples of this concept: designeroutlet.com; eddiebauer.com; kmart.com; llbean.com; talbots. com; and walmart.com.

The second design factor under consideration in this study is method of information display. Information display is a device that presents merchandise and plays the role of displaying information within a brick-andmortar store. Retailers primarily use pictures or words to provide merchandise and service information. This research proposes two methods of information display in web-based stores, text-based information display and picture-based information display. In web-based stores, Geissler (2001) found that positive communication effectiveness is related to the number of images used on a web site. However, image downloading often takes time depending on the condition of the user's computer system, servers, image sizes, etc. Yang (1994) addressed the speed of presentation and screen transition as an important variable to web-based interactive advertisements.

We are investigating two contrasting strategies for each storefront design (thematic/non-thematic) and each method of information display (picture/text-based) in a web-based store atmosphere. Those strategies will be investigated as to their effectiveness in relationship to store image and consumers' expectation of merchandise quality.

# 2.3. Relationships between store image and design factors in store atmosphere

An image is an abstract picture of an object or idea in an individual's mind. Since Martineau (1958) stated that image is the personality of a retail store, many researchers have defined retail image based on consumer perceptions. Retailers manipulate consumer's total perception of the store's image in order to encourage purchasing behaviors. Since consumers perceive store image as a dynamic formation, a store image is changed after each exposure to the store environment. Some researchers suggested store image includes store atmosphere as a component (Lindquist, 1974; Zimmer and Golden, 1988) and others considered store image as a consequence of store atmosphere (Baker et al., 1994). This study, for the most part, follows the theoretical perspectives of Baker et al. (1994) and proposes that store atmosphere provides cues to consumers' inferences of store image. Our interest lies in the investigation of retail strategies that contribute to successful environments in web-based stores.

As related to web-based stores, Jarvenpaa and Todd's (1997) study and Ernst and Young's (1998) study suggest three aspects of store image that are concerned with consumers' perceptions of web-based stores, i.e., safety, convenience, and entertainment. Jarvenpaa and Todd studied consumers' reactions to shopping on the WWW and found that consumers were reluctant to reveal personal information and take risks with merchandise and money. Grewal et al. (2003) defined consumers' risk perception in the Internet retailing context. According to their description, a safe store image is the extent to which consumers are not troubled by risk with the products' function (failure in end use, durability, matchability, style stability and size), price (overpriced item), and transaction (a faulty item, handling/shipping charges and shipping uncertainties, security of privacy and personal information) when making a purchase at a web-based store.

The second factor, convenience is the most compelling factor to Internet shoppers (Jarvenpaa and Todd, 1997). In web-based environments, consumers may visit a store at any time in any place and compare products and prices easily. Thus, generally, consumers perceive that a webbased store will save them time and effort. However, Jarvenpaa and Todd reported 31 percent of respondents have negative feelings about merchandise assortment at web-based stores, and 44 percent of respondents have a hard time finding products in a web-based store. Wolfinbarger and Gilly (2003) revealed the most significant antecedent of positive consumer behavior is website design that serves consumers in finding what they want in an efficient way.

Finally, entertainment the third store image factor is described by consumer's enjoyment upon visiting a webbased store when purchasing or searching out products. A survey by Ernst and Young (1998) reported that Internet shopping is more convenient, fun and economical; also it has more choices than shopping through other distribution channels. Jarvenpaa and Todd (1997) name the entertainment variable "playfulness," which describes recreational or hedonic shopping activities. A recent study concluded that consumers expect more enjoyment in online environments than they do shopping in brick-and-mortar environments (Childers et al., 2001). Thus, shopping on the Internet provides cognitive and informational experiences as well as a hedonic consumption experiences (Menon and Kahn, 2002).

Literature both on brick-and-mortar stores and on webbased retail stores suggests possible relationships between design factors of store atmosphere and three dimensions of store image in web-based stores. Both a thematic storefront design and a picture-based information display commonly emphasize visual components through pictures, graphics, icons, and logos. Those visual settings especially appeal to young consumers who depend on visual icons as an external support (Gutman and Alden, 1985) and frequently shop in web-based stores (Twenty Trends for 2010: Retailing in an age of uncertainty, 2003).

Visual consumers perceive less risk from merchandise in a store with pictures that reflect the store or merchandise identity (Mazurasky and Jacoby, 1985). Pictures rather than text appear to make consumers feel the store has an easy-to-shop environment (Eckman et al., 1990; Gutman and Alden, 1985; Marsh, 1999; Mazurasky and Jacoby, 1985) and creates a more favorable, convenient shopping environment as compared to using only words to highlight the store or merchandise characteristics (Marsh, 1999). Visual settings stimulate shoppers who seek enjoyable experiences while shopping. Bellenger and Korgaonker (1980) found that consumers, who enjoy spending time shopping, tend to be information-seekers who consider store design an important factor in shopping. In addition, Ohanian and Tashchian (1992) noted that recreational shoppers are interested in pleasant physical facilities as an important aspect of their shopping behavior.

On the other hand, a brick-and-mortar store displays visual information throughout the store that shows fabrics and colors to help guide customers (Marsh, 1999) making the shopping environment more comfortable and enjoyable (Gutman and Alden, 1985). Likewise, according to a web design research study, well-designed web sites lead to consumer playfulness (Liu, 1997), and the number of pictures has a positive relationship with consumers' perception of store interactivity, which has the potential to bring an entertaining store image to the consumer (Geissler, 2001). These considerations lead to the formation of the following hypotheses.

**Hypothesis 1.** Consumers will perceive a safer store image from a web-based store that is designed with a thematic

storefront and a picture-based information display than they will from a web-based store that is designed with a non-thematic storefront design and a text-based information display.

**Hypothesis 2.** Consumers will perceive a more convenient store image from a web-based store that is designed with a thematic storefront and a picture-based information display than they will from a web-based store that is designed with a non-thematic storefront design and a text-based information display.

**Hypothesis 3.** Consumers will perceive a more entertaining store image from a web-based store that is designed with a thematic storefront and a picture-based information display than they will from a web-based store that is designed with a non-thematic storefront design and a text-based information display.

# 2.4. Relationship between consumers' expectation of merchandise quality and design factors in store atmosphere

Consumers' expectation is a standard or belief regarding the performance of an object. Under certain conditions, consumers use their expectations as guidelines against which with they evaluate the quality of products. Previous research has shown that expectations and confirmation of expectations are important determinants of satisfaction (Oliver, 1980) as well as the key determinants of future consumer purchasing decisions (Curry and Riesz, 1988; Mazurasky and Jacoby, 1985; Prakash, 1984). Meeting expectations results in favorable consumers' purchasing decisions and satisfaction.

Generally, it has been found that store atmosphere influences the perception of the merchandise quality (Darden and Schwinghammer, 1985; Olshavsky, 1985). Mazurasky and Jacoby (1985) found that consumers perceive high levels of merchandise quality in brick-andmortar stores designed with art that reflects the store or merchandise identity. Mazurasky and Jacoby also found that pictures of stores' interior were second only to brand name in being the most heavily accessed of several cues from which consumers can evaluate merchandise quality. Others suggested a thematic store design creates a positive emotion that is connected to the perception of a higher level of merchandise quality, as well as service quality (Baker et al., 1994).

Visual information about clothing (e.g., style, color and fabric) encourages consumers to try on clothing items and to make a purchase (Eckman et al., 1990). Liu (1997) found that certain design factors of web sites lead customers to have favorable attitudes toward merchandise quality on the site. Similarities were found in these studies of brick-and-mortar stores and web-based stores. Therefore, we hypothesized the next relationship between store atmosphere and consumers' expectation of merchandise quality.

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**Hypothesis 4.** Consumers will expect higher quality merchandise from a web-based store that is designed with a thematic storefront and a picture-based information display than they will from a web-based store that is designed with a non-thematic storefront design and a text-based information display.

# 2.5. Mediating role of store image between store atmosphere and consumers' expectation of merchandise quality

Literature on brick-and-mortar stores revealed that store atmosphere influences consumers' expectation of merchandise quality and store image (Baker et al., 1994; Shostack, 1987; Ward et al., 1992). Also, there are direct relationships between store image and consumers' expectation of merchandise quality. Store image influences the consumer's price perception by modifying consumers' expectation of quality (Heisey, 1990), and thus store image acts as a surrogate for quality (Olshavsky, 1985). Therefore, we assume that store atmosphere affects consumers' expectation of merchandise quality directly and indirectly through store image in web-environments. This rationale leads to the formation of our last hypothesis.

**Hypothesis 5.** Store image will mediate the relationship between store atmosphere and consumers' expectation of merchandise quality.

# 3. Methodology

# 3.1. Research design

This study was conducted as a factorial experiment in which two design factors of store atmosphere, storefront design and method of information display, were manipulated. Four treatment combinations provided for two strategies of storefront design (thematic/non-thematic) and two methods of information display (picture-based/ text-based) in a between-subject design. The independent variables are both the storefront design and method of information display.

The dependent variables were three store images (safety, convenience, and entertainment) and consumers' expectation of merchandise quality. These two dependent variables were measured on a seven-point Likert-type scale (7 strongly agree; 1—strongly disagree) asking the respondent to indicate their level of agreement to the statement for a particular web site created for this study. Safety measures include consumers' perceived functional and financial risks, and privacy issues. Convenience measures include consumers' perceptions that the store makes shopping easy and saves time and effort. Entertainment measures reflect an "enjoyable shopping experience" in a store. The merchandise quality variable involved quality of fabric, design and construction of the clothing item.

Certain factors related to store image might obscure the effects of the store atmosphere variables we wish to

manipulate. Consumer characteristics were based on previous research studies already mentioned in the literature review. These variables included various consumer characteristics (gender, age, major in college and identity of the decision-maker for purchasing clothing), the capability of the consumer's computer and situational characteristics. By using a computer laboratory at a major university, the capability of the computers, especially the speed of screen transition, was controlled. The speed of presentation and screen transition is very important to consumers' behavior with computer technology (Yang, 1994). In order to control the situational characteristics of the user, before starting the hands-on shopping experience, subjects received an instruction sheet explaining the task. The instructions asked the user to plan to purchase a pair of khaki pants for their use as casual campus wear. Khaki pants were chosen as the item for our experiment because they are a popular clothing item without age limitation for both men and women.

# 3.2. Development of stimuli

A thematic web site reflects lifestyle or brand identity with pictures and the brand/store name or logo, while a non-thematic storefront design simply presents a brand name, product pictures, and merchandise selection information. In our study, we created two experimental storefront designs for a web-based store, a thematic and a non-thematic web page (see Figs. 2 and 3).

The familiarity of brand and store name influences consumers' perceptions of store image as well as their perceptions of the quality of merchandise (Stokes, 1985; Wu and Petroshius, 1987). In order to avoid halo effects of price (Heisey, 1990; Sproles and Kendall, 1986) and familiarity of brand/store name, price information and brand name were not presented and a fictitious store name was used in the experimental storefront designs.

As a device for presenting merchandise and product information, current web-based stores employ a text-based information display or a picture-based information display, or a combination of these two approaches. This study compared the two methods of information display, textand picture-based. We selected garment care, color, construction, fabric, size and silhouette, which are often provided by apparel web-based stores as merchandise information cues.

Focus groups were conducted to develop store design factors. In this procedure, 12 subjects were shown 14 storefronts designs of existing web-based stores and were asked to describe the characteristics of the store. The thematic storefront design consisted of one picture, which includes a group of students wearing casual clothing, along with a store logo with the fictitious store name, College Life as shown in Fig. 2. The non-thematic storefront design consisted of a picture of merchandise, directories of the merchandise selection and a store logo with the fictitious store name, College Life, as shown in Fig. 3.

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Fig. 2. Thematic storefront design.



Fig. 3. Non-thematic storefront design.

In order to develop text and pictorial information displays, five apparel design experts and 12 college students were questioned. Five apparel design experts responded to open-ended questions, asking them to describe three pictures of colors (khaki, olive green, and black), one fabric picture (100% cotton), four construction pictures (belt loop and side pocket, fly front, waistband closure, and back pocket), and one silhouette picture. Twelve college students, who were not majoring in apparel design or merchandising were shown these nine pictures and were asked to describe them. With this procedure, apparel construction terms, which were provided by the five design experts, were changed into text that consumers could understand as shown in Fig. 4.

# 3.3. Subjects and procedure

The measurement and stimuli were refined from a pilot study with 14 subjects. The subjects for this study consisted of students enrolled in nine courses at a university. University-aged students are a major consumer group in the online market (Twenty Trends for 2010: Retailing in an age of uncertainty, 2003) and are members of the Y generation that were born between 1977 and 1994 (Generation Y and future of mall retailing, 2002). Nine instructors were contacted to participate, students voluntarily participated in the experiment, and each subject (student) was randomly assigned to one of four treatments by the factorial between-subject design.

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	Text-Based Information	Picture-Based Information
Fly Front	College Life Fly Front Khakis with four buttons fly front closure	Fly Front
Waistband & Closure	Collige Life Band Button with metallic hook & eye closure	Waist Band Closure
Belt Loop & Side Pocket	College Life Belt Loop d Side Side Pocket Top stitched inscam side pocket	College Life Side Pocket
Back Pocket	College Life Back Top stitched single welt pocket With button tab closure	Back
Fabric	College Life 100% Durable cotton twill fabric Cotton	College Life Tobric 100% Cotton

Fig. 4. Methods of information display.

We did not use a random sample to select the courses from which we drew our student population; we used a convenience sample of courses because we needed classrooms that were already equipped with computers. We selected courses that were taught in the business college because we felt these students were using computers in their classes and that they were possibly more comfortable with online shopping. Therefore these students did not represent a cross section of students based on college major. However, according to the University statistics, the students in this study were representative of the age and gender of students in this University.

The web-based store shopping experience was simulated, using computers in a computer lab. Subjects were instructed to read an instructional page that included the task (plan to purchase a pair of khaki pants for campus wear) and procedure (how to navigate through the webbased store). In order to control the social surroundings, the subjects were instructed to put themselves in the customers' place and not to talk with anyone during the experiment. After experiencing the assigned store, subjects were asked to complete a self-administrated questionnaire that contained the study measurement.

# 4. Results and discussion

# 4.1. Factor analysis and reliability test for measurements

Principal axis factor analysis with a promax rotation was used to reduce the number of dependent variable items. To

determine whether factor analysis was appropriate for these items, the Kaiser-Meyer-Olin (KMO) measure of sampling adequacy and Bartlett's test of Sphericity were

Table 1 Factor analysis

Factors and items	Eigenvalue	Factor loadings	α
Factor 1: merchandise quality Pants offered at this store are of high quality in its construction	3.302	.84	.90
Pants offered at this store are of		.83	
high quality Pants offered at this store are of high quality in its design		.78	
Pants offered at this store are made of high quality fabric		.66	
Pants offered at this store would meet my expectations <i>Source</i> : Jarvenpaa and Todd (1997), Baker et al. (1994),		.65	
Researcher Measured by 7-point Likert Scale			
Factor 2: entertainment Shopping at this store allows me	2.398	.82	.95
Shopping at this store is very appealing		.78	
Shopping at this store would be an enjoyable experience		.78	
Factor 3: convenience This store makes shopping easy This store saves my shopping time This store makes me reduce my shopping effort	2.260	.84 .78 .66	.85
Factor 4: safety	1.470	74	70
The process of shopping at this store jeopardizes my privacy <sup>a</sup> <i>Source:</i> Forsythe (1991) Measured by 7-point Likert Scale		.74	./0

<sup>a</sup>Reverse coding.

## Table 2

The effect of design factors on store images

used. These measurements were deemed appropriate because the KMO was .866 and the Barlett's test of sphericity was significant (p = .000).

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Results showed that four factors contributed 72% of the total variance. All factors had eigen values greater than 1.00 and Cronbach's  $\alpha$  values ranging from .70 to .95, which are acceptable (Nunnally, 1978). Table 1 shows the measurements that loaded on each factor, the total variance, and the reliability measures. Factors were labeled (1) merchandise quality, (2) entertainment, (3) convenience, and (4) safety.

# 4.2. Description of the sample

A total of 331 students participated in the experiment. According to Goldsmith (2002) student consumers represent the younger end of the market for on-line buying and are an appropriate sample in marketing related studies. Twenty-four of the questionnaires were incomplete and deemed unusable, and thus were dropped from data analysis. This resulted in a final sample of 307 respondents. Approximately 60 percent of the respondents were female. The majority of the sample was between 20 and 22 years old. Slightly more than one-half of the respondents (54.7%) were majoring in Human Sciences, with the remaining respondents majoring in Business.

# 4.3. The effect of thematic/non-thematic storefront designs and picture-based/text-based information displays on store image

A  $2 \times 2$  ANOVA was performed to test Hypothesis 1, 2 and 3 as shown in Table 2. To test the relationships between variables the interaction of the independent variables (storefront design and methods of information display) on the dependent variables (safety, convenience, and entertainment) was analyzed. Once this analysis was conducted and the relationships were insignificant then the main effect was analyzed. The general results fully supported Hypothesis 1 and 3 and partially supported Hypothesis 2.

Source	Store images						
	Safety (H1)		Convenience (H2)		Entertainment (H3)		
	df	<i>F</i> -value	df	<i>F</i> -value	df	<i>F</i> -value	
Model Main effects	3	12.69***	3	4.76**	3	19.62***	
Storefront design (SD)	1	9.41**	1	3.82	1	10.24**	
Information display (ID)	1	13.06***	1	6.60*	1	36.42**	
2-way interaction SD × ID	1	12.39***	1	2.61	1	3.90*	

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001.

There was a significant interaction of storefront design (SD) and method of information display (ID) on safety [F (1, 248) = 12.39, p = .000] and entertainment [F (1, 286) = 3.90, p = .049]. When a store provided picture-based information, the thematic storefront design was more effective for a safe (picture-based information: thematic M = 10.23, non-thematic M = 7.75; text-based information: thematic M = 7.76, non-thematic M = 7.93) and entertaining store image (picture-based information: thematic M = 13.44, non-thematic M = 12.75; text-based information: thematic M = 11.16, non-thematic M = 8.24).

The interaction of the two design factors on convenience was not significant [F(1, 293) = 2.61, p = .108]. In the main effect of the two design factors on convenience, the influence of the method of information display was significant [F(1, 293) = 6.60, p = .011], while the influence of the storefront design was not significant [F(1, 293) =3.82, p = .052]. When a store provided picture-based information, consumers perceived a more convenient store image than a store that provided only text-based information (picture-based information: M = 15.55; text-based information: M = 14.15).

The overall results were consistent with study results in brick-and-mortar and web-based retail stores. Some researchers have suggested that a thematic and picturebased store design creates a safe and entertaining shopping environment (Gutman and Alden, 1985; Marsh, 1999; Mazurasky and Jacoby, 1985). Previous research also suggested that design factors in stores increase consumers' perceptions of favorable and convenient shopping in brickand-mortar contexts (Eckman et al., 1990; Gutman and Alden, 1985; Marsh, 1999; Mazurasky and Jacoby, 1985). The results also indicate that convenience in web-based stores is related only to the method of information display, not to storefront designs. This finding provides important information to web-store designers. Sophisticated storefront designs may initially attract a consumer, however it has been found that at the same time it distracts consumers (Geissler, 2001; Jarvenpaa and Todd, 1997).

# 4.4. The effect of thematic/non-thematic storefront designs and picture-based/text-based information displays on consumers' expectation of merchandise quality

In order to study the relationship between the two design factors of the store atmosphere (storefront design and method of information display) and consumers' expectation of merchandise quality, Hypothesis 4 was tested using a  $2 \times 2$  ANOVA as shown in Table 3. The interaction of the two design factors and main effects of each design factor was investigated and the results partially supported Hypothesis 4.

The interaction of storefront design (SD) and method of information display (ID) had no significant effect on consumers' expectations of merchandise quality [F(1, 242) = .11, p = .739]. In the main effect on consumers' expectations of merchandise quality, only the method of information

Table 3

The effect of design factors on consumers' expectation of merchandise quality

Source	Consumers' expectation of merchandise quality (H4)			
	df	<i>F</i> -value		
Model	3	24.87***		
Main effects				
Storefront design (SD)	1	.69		
Information display (ID)	1	70.20***		
2-way interaction SD × ID	1	.11		

\*\*\**p* <.001.

display showed a significant result [F (1, 242) = 70.22, p = .000]. The means for consumers' expectation of merchandise quality indicated that the higher scores were with picture-based information (a thematic storefront design: M = 22.13; A non-thematic storefront design: M = 21.45) rather than with text-based information (a thematic storefront design: M = 17.14; a non-thematic storefront design: M = 17.13).

This result is consistent with Mazurasky and Jacoby's (1985) study that compared the effects of two display methods, one with pictures and one with text in a brickand-mortar store. The previous research found that consumers perceived high-quality merchandise in a store using displays and signage that were designed with pictures. The result of this study supports the effectiveness of picture-based display in a web-based environment. Also, this result is supported by a study that found that visual information about clothing (e.g., style, color, fabric) encourages consumers to try on the clothing items and to make a purchase (Eckman et al., 1990). However, the effect of the storefront design on consumers' expectations of merchandise quality was not statistically significant. Rather, it appears consumers' expectation of merchandise quality is formed through picture-based information displays for web-based environments.

# 4.5. The mediating effect of store image between store atmosphere and consumers' expectation of merchandise quality

Using a  $2 \times 2$  ANOVA, the mediating effect of store images between store atmosphere (storefront design and method of information display) and consumers' expectation of merchandise quality was tested (refer to Table 3). Procedures suggested by Baron and Kenny (1986) and Hastak and Olson (1989) were followed to assess whether store images mediated the effect of store atmosphere on merchandise quality (Table 4).

For the first step of the procedure, the relationship between store atmosphere and three measures of store image were analyzed as shown in Table 2. The next

procedure presented the effect of the store atmosphere on the consumers' expectation of merchandise quality. The results indicated that the effect of the storefront design was not significant, and only the method of information display significantly influenced consumers' expectation of merchandise quality [F(1, 202) = 35.75, p = .000]. In the last procedure, the effects of the three measures of store image on consumers' expectation of merchandise quality were eliminated when the mediators were treated as covariates. Significant covariate effects of a convenient [F(1, 202)] = 7.46, p = .007] and an entertaining [F (1, 202) = 18.19, p = .000] store image were found for consumers' expectation of merchandise quality. The safety store image was not significantly involved in the relationship. Finally, regression analysis confirmed the effects of store image on consumers' expectations of merchandise quality as shown in Table 5. The result showed that as the favorability of the store image increases, consumers' expectations of merchandise quality are enhanced (entertainment:  $\beta = .42$ , t = 5.71, p = .000; convenience:  $\beta = .15$ , t = 2.36, p = .019).

The results partially supported Hypothesis 5. Generally, the results of this study show that only methods of information display, not storefront design, affect consumers' expectation of merchandise quality when mediated by an entertaining and a convenient store image. Safety did not contribute to the mediating role of store image. Additionally, this result supported the relationship between

#### Table 4

Factorial	analysis	of	covariance	for	college	students'	expectation	of
merchand	ise quality	у						

Source	SS	DF	MS	<i>F</i> -value
Model	3220.17	6	536.70	29.31***
Covariate				
Safety	25.09	1	25.09	1.37
Convenience	136.57	1	136.57	7.46**
Entertainment	333.20	1	333.20	18.19***
Main effect				
Storefront Design (SD)	2.79	1	2.79	.15
Information Display (ID)	654.68	1	654.68	35.75***
2-way interaction				
$SD \times ID$	3.16	1	3.11	
Error	3699.43	202	18.31	

\*\**p* < .01; \*\*\**p* < .001.

### Table 5

Regression analysis: merchandise quality with store images

Source	В	SE B	β	t
Constant Entertainment Convenience	13.51 .51 .28	1.25 .09 .12	.42 .15	10.77*** 5.71*** 2.36*

*Note:*  $R^2 = .37$ , adjusted  $R^2 = .37$  (F = 39.717, p = .000). \*p < .05; \*\*\*p < .001. store image and the perception of merchandise quality, which is consistent with previous studies (Heisey, 1990; Olshavsky, 1985) that regarded store image as an antecedent of quality.

# 5. Conclusions and implications

A supposition of this study is that store atmosphere impacts a store's image and consumers' expectation of merchandise quality in a store, whether in a web-based store, or a brick-and-mortar store. This research adopted a S–O–R model and investigated two design factors (storefront design and method of information display) in the store atmosphere of a web environment and compared the effectiveness of two strategies of each storefront design (thematic/non-thematic) and method of information display (picture-based/text-based) in relation to store image and consumers' expectations of merchandise quality. This research design is based on five hypotheses drawn on brickand-mortar and web-based contexts.

This empirical study generally suggested that a thematic and picture-based store environment is a more effective way to develop a safe and entertaining store image than a non-thematic and text-based store environment for webbased stores. Also, this research indicated that the method of information display was a more effective way of delivering a store image that was convenient for consumers to use and that fulfilled the consumers' expectation of higher merchandise quality.

Consumers perceive that they will save time/effort and obtain higher-quality merchandise through the use of information displays for web-based stores (especially picture-based information displays) with no preference to the storefront designs. In addition, consumers perceive a safe and entertaining web-based store image that reflects higher-quality merchandise when the store has a thematic storefront design and picture-based information displays. Finally, consumers feel that shopping at a web-based store is more convenient and they expect higher-quality merchandise with pictorial elements in the information displays.

Our goal was to examine two design factors of store atmosphere in relation to store image and consumers' expectation of merchandise quality for web-based stores. These findings provide researchers with a better understanding of consumers' behavior toward web-based stores. This research incorporated the concept of the S–O–R framework to understand consumers' perceptions of store images and consumers' expectation of merchandise quality. This supports the findings of many researchers who have found that store image and consumers' expectations affect consumers' purchasing intentions. The Stimulus was represented by design factors that were atmospheric variables. Consumers' perceptions of store image represented the Organism. Finally the Response was represented by consumers' expectations of merchandise quality.

Stimulus is conceptualized as an influence that arouses an individual's mind, and is the factor that affects the

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Organism's stage, represented by the affective and cognitive states. Also, Organism is moderated by the relationship between the Stimulus and an individual's response. Atmospheric variables affect consumers' perceptions of store image in web-based stores. The affective and cognitive states (consumers' perception of store image) affect consumers' responses (consumers' expectation of merchandise quality) to web-based stores. These results imply that retailers of web-based stores need to develop a store atmosphere, which will pay off in terms of consumers' perception of a safe, convenient and entertaining store image with a higher level of merchandise quality. We found that web-based retailers should present their store image and merchandise carefully through their choice of graphics and themes to match the needs and wants of their target consumers. Pictures rather than text is one way that retailers can develop a store image that the consumer feels is safer and more entertaining. On the other hand, the speed of screen transition is a critical factor for online shoppers (Yang, 1994), and many images on screen may take time for downloading depending on the users' computer systems, communication methods, servers or image sizes. Retailers should be able to manage image size and servers to provide fast downloading of a thematic and pictorial design on the screen. Furthermore, since consumers' expectations influence not only purchasing decisions but also satisfaction, retailers need to know the best ways of presenting accurate and pleasing information about their merchandise to consumers.

# 6. Limitations and recommendations for future studies

Limitations of this study include using only one university's students in a convenience sample as opposed to a random sample, thus limiting the generalizability of the results. Previous studies show that the Internet population includes consumers of different ages, income levels, and education. However, the respondents in this study were college students who tended to have nearly the same background of education and age and thus not representative of all Gen Y consumers. And since data were collected from respondents who assume that they are planning to purchase a pair of Khaki pants at a web-based store, the fact that only one product was chosen from webbased stores also limits the generalization of this study. Future studies should focus on a varied population as measured by age and education and multiple product categories and/or different types of web-based stores.

Respondents knew that the store was fictitious and they were in a laboratory setting, engaging in contrived tasks under the watchful eye of the researcher. Thus, these unnatural settings might have influenced some of the responses (Hantula, 2005). In addition, respondent's shopping experiences were not motivated internally therefore our results about a safe store image are likely reflected the laboratory setting (Menon and Kahn, 2002). The following alternatives are recommended for future studies: (1) an experimental study on web-based stores where respondents do not know that the store is fictitious; and (2) a case study using existing web-based stores.

Store image and consumer expectation research are found to affect consumers' purchasing intentions. This model should be extended to include consumers' purchasing decision processes as well. Also the model should to be tested with other aspects of store atmosphere, including ambient factors and situational characteristics. Another area of interest is developing the sub-dimensions of store image for web-based stores.

## References

- Baker, J., 1986. The role of the environment in marketing services: the consumer perspective. In: Cepeil, J.A., et al. (Eds.), The Services Challenge: Integrating for Competitive Advantage. American Marketing Association, Chicago, IL, pp. 79–84.
- Baker, J., Grewal, D., Parasuraman, A., 1994. The influence of store environment on quality inference and store image. Journal of Academy of Marketing Science 22, 328–339.
- Baron, R.H., Kenny, D.A., 1986. The moderator-mediator variable distinction is social psychological research: conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology 51, 1173–1182.
- Belk, R.W., 1975. Situational variables and consumer behavior. Journal of Consumer Research 2, 157–164.
- Bellenger, D.N., Korgaonker, P.K., 1980. Profiling the recreational shopper. Journal of Retailing 56, 77–91.
- Berman, B., Evans, J.R., 1998. Retail Management: A Strategic Approach, sixth ed. Prentice-Hall, Englewood Cliffs, NJ.
- Burke, S., 1998. Designing catalog. Catalog Age 15, 55.
- Burstein, D., Kline, D., 1995. Road Warriors: Dreams and Nightmares Along the Information Highway. Dutton, New York.
- Buttle, F., 1984. Merchandising. European Journal of Marketing 18, 4-25.
- Chebat, J., Michon, R., 2003. Impact of ambient odors on mall shoppers' emotions, cognition, and spending: a test of competitive causal theories. Journal of Business Research 56, 529–539.
- Childers, T.L., Carr, C.C., Peck, J., Carson, S., 2001. Hedonic and utilitarian motivations for online retail shopping behavior. Journal of Retailing 77, 511–535.
- Cowee, H.W., 1951. Research in visual merchandising. In: Abrhams, H.P., Eldredge, I.C., Gray, W.A., Melnicove, H.K. (Eds.), Display Manual. National Retail Dry Goods Association, New York, pp. 40–51.
- Curry, D.J., Riesz, P.C., 1988. Prices and price quality relationships: a longitudinal analysis. Journal of Marketing 52, 36–51.
- Darden, W.R., Schwinghammer, J.K.L., 1985. The influence of social characteristics on perceived quality in patronage choice behavior. In: Jacoby, J., Olson, J.C. (Eds.), Perceived Quality: How Consumers View Stores and Merchandise. LexingtonBook, Lexington, pp. 161–172.
- Donovan, R.J., Rossiter, J.R., 1982. Store atmosphere: an environmental psychology approach. Journal of Retailing 58 (1), 34–57.
- Eckman, M., Damhorst, M.L., Kadolph, S.J., 1990. Toward a model of the in-store purchase decision process: consumer use of criteria for evaluation women's apparel. Clothing and Textiles Research Journal 8, 13–22.
- Electronic retailing, 4 May 1998. ZDNet [On-line]. Available: <a href="http://www.zdnet.com/icom/cyberstats/1998/05">http://www.zdnet.com/icom/cyberstats/1998/05</a>>.
- Ernst and Young, January 1998. Internet shopping: An Ernst & Young special report. Store, Section 2.
- Eroglu, S.A., Machleit, K.A., Davis, L.M., 2001. Atmospheric qualities of online retailing: a conceptual model and implications. Journal of Business Research 54, 177–184.

- Eroglu, A.S., Machleit, K.A., Davis, L.M., 2003. Empirical testing of a model of online store atmospherics and shopper responses. Psychology & Marketing 20 (2), 139–150.
- Forsythe, S.M., 1991. Effect of private, designer, and national brand names on shoppers' perception of apparel quality and price. Clothing and Textiles Research Journal 9 (2), 1–6.
- Fountain, J.E., 2000. Construction the information society: women, information technology, and design. Technology in Society 22, 45–62.
- Geissler, G.L., 2001. Building customer relationships online: the website designers' perspective. Journal of Consumer Marketing 18 (6), 488–502.
- Generation Y and future of mall retailing, 2002. Jones Lang Lasalle [Online]. Available: <http://www.jllretail.com/NR/rdonlyres/4420B744-4281-422E-978C-0D8F1AF547E8/16026/GenY longfinal.pdf >.
- Goldsmith, R., 2002. Explaining and predicting consumer intention to purchase over the Internet: an exploratory study. Journal of Marketing Theory and Practice 10 (1), 22–28.
- Gould, J.K., 1951. The manufacturers' viewpoint on display and point of purchase. In: Abrhams, H.P., Eldredge, I.C., Gray, W.A., Melnicove, H.K. (Eds.), Display Manual. National Retail Dry Goods Association, New York, pp. 80–86.
- Grewal, D., Munger, J.L., Iyer, G.R., Levy, M., 2003. The influence of Internet-retailing factors on price expectations. Psychology and Marketing 20, 477–493.
- Gutman, J., Alden, S.D., 1985. Adolescent's cognitive structures of retail stores and fashion consumption: a mean-end chain analysis of quality. In: Jacoby, J., Olson, J.C. (Eds.), Perceived Quality: How Consumers View Stores and Merchandise. LexintgonBook, Lexington, pp. 154–169.
- Hastak, M., Olson, J.C., 1989. Assessing the role of brand-related cognitive responses as mediators of communication effects on cognitive structure. Journal of Consumer Research 15, 444–456.
- Hantula, D.A., 2005. Guest editorial: experiments in e-commerce. Psychology & Marketing 22 (2), 103–107.
- Heisey, F.L., 1990. Perceived quality and perceived price: use of the minimum information environment in evaluating apparel. Clothing and Textiles Research Journal 8, 22–28.
- ICSC Research Quarterly, 2002. Spring. Internet Retail—Did anything happen while no one was looking? 9.
- Jarvenpaa, S.L., Todd, P.A., 1997. Consumer reactions to electronic shopping on the World Wide Web. International Journal of Electronic Commerce 1 (2), 59–88.
- Kotler, P., 1973. Atmospheric as a marketing tool. Journal of Retailing 49, 42–49.
- Lee, T., 1951. Designing window displays. In: Abrhams, H.P., Eldredge, I.C., Gray, W.A., Melnicove, H.K. (Eds.), Display Manual. National Retail Dry Goods Association, New York, pp. 9–102.
- Lindquist, J.D., 1974. Meaning of image. Journal of Retailing 50, 29–37.
- Liu, C., 1997. Critical success factors for designing an electronic market on the World Wide Web: an exploratory study. Unpublished Dissertation, The Mississippi State University.
- Lohse, G.L., Spiller, P., 2003. Internet retail store design: how the user interface influences traffic and sales. In: Steinfield, C.W. (Ed.), New Directions in Research on e-commerce. Purdue University Press, West Lafayette, IN, pp. 32–63.
- Marans, R.W., Spreckelmeyer, K.F., 1982. Measuring overall architectural quality. Environment and Behavior 14, 652–670.
- Marsh, H., 1999. Pop starts of the retail world. Marketing, 19-20.
- Martineau, P., 1958. The personality of the retail store. Harvard Business Review, 47–55.
- Massara, F., 2003. Interactionism vs. reactionism: are shoppers always prone to store atmospherics? In: Evans, J.R. (Ed.), Retailing 2003: Strategic Planning in Uncertain Times, vol. X. Academy of Marketing Science, Hempstead, NY, pp. 28–37.

- Mazurasky, D., Jacoby, J., 1985. Forming impression of merchandise and service quality. In: Jacoby, J., Olson, J.C. (Eds.), Perceived Quality: How Consumers View Stores and Merchandise. Lexington Book, Lexington, pp. 139–153.
- McKinney, L.N., 2004. Creating a satisfying Internet shopping experience via atmospheric variables. International Journal of Consumer Studies 28 (3), 268–283.
- Mehrabian, A., Russell, J.A., 1974. An Approach to Environmental Psychology. MIT Press, Cambridge, MA.
- Menon, S., Kahn, B., 2002. Cross-category effects of induced arousal and pleasure on the Internet shopping experience. Journal of Retailing 78, 31–40.
- Nunnally, J.C., 1978. Psychometric Theory. McGraw-Hill, Inc, New York.
- Ohanian, R., Tashchian, A., 1992. Consumers' shopping effort and evaluation of store image attributes: the roles of purchasing involvement and recreational shopping interest. Journal of Applied Business Research 8, 40–49.
- Olshavsky, R.W., 1985. Perceived quality in consumer decision making: an integrated theoretical perspective. In: Jacoby, J., Olson, J.C. (Eds.), Perceived Quality: How Consumers View Stores and Merchandise. LexingtonBook, Lexington, pp. 3–29.
- Oliver, R.L., 1980. Theoretical bases of consumer satisfaction research: review, critical, & future direction. In: Lamb, C.W., Dunne, P.M. (Eds.), Theoretical developments in marketing. American marketing Association Proceedings Series, Chicago, pp. 206–210.
- Prakash, V., 1984. Personal values and product expectations. In: Pitts, R.E., Woodside, A.G. (Eds.), Personal Values and Consumer Psychology. LexingtonBook, Lextington, pp. 145–154.
- Richard, M., 2005. Modeling the impact of Internet atmospherics on surfer behavior. Journal of Business Research 58 (12), 1632–1642.
- Shostack, G.L., 1987. Service positioning through of Internet retail stores. Journal of Electronic Commerce 2 (2), 29–56.
- Sproles, G.B., Kendall, E.L., 1986. A methodology for profiling consumers' decision-making styles. The Journal of Consumer Affairs 20, 267–279.
- Stokes, R.C., 1985. The effective of price package design and brand name familiarity on perceived quality. In: Jacoby, J., Olson, J.C. (Eds.), Perceived Quality: How Consumers View Stores and Merchandise. LexingtonBook, Lexington, pp. 233–246.
- The Economist, 1997. Electronic commerce: in search of the perfect market [On-line]. Available: <a href="http://www.economists.com/editorial/freeforall/14-9-97/ec1.htm">http://www.economists.com/editorial/ freeforall/14-9-97/ec1.htm</a>>.
- Turley, L.W., Milliman, R.E., 2000. Atmospheric effects on shopping behavior: a review of the experimental evidence. Journal of Business Research 49, 193–211.
- Twenty trends for 2010: retailing in an age of uncertainty, 2003. Retail forward. Intel Corporation.
- Ward, J.C., Bitner, J.M., Barnes, J., 1992. Measuring the prototypically and meaning of retailing environments. Journal of Retailing 68 (2), 194–220.
- Wilkenson, J.B., Mason, J., Paksoy, C.H., 1982. Assessing the impact of short-term supermarket strategy variables. Journal of Marketing Research 19, 72–86.
- Williams, R., Dargel, M., 2004. From servicescape to cyberscape. Marketing Intelligence & Planning 22 (2/3), 310–320.
- Wolfinbarger, M., Gilly, M.C., 2003. eTailQ: dimensionalizing, measuring and predicting e-tail quality. Journal of Retailing 79, 183–198.
- Wu, B.T.W., Petroshius, S.M., 1987. The halo effect in store image management. Journal of the Academy of Marketing Science 15, 44–51.
- Yang, C.K., 1994. Screen-based interactive advertisements and their effectiveness: an exploratory study of cross-national computer users. Unpublished Dissertation, The Ohio State University, Columbus.
- Zimmer, M.R., Golden, L.L., 1988. Impressions of retail stores: a content analysis of consumers images. Journal of Retailing 64, 265–293.