

The Influence of Store Environment on Quality Inferences and Store Image

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The study reported here examines how combinations of specific elements in the retail store environment influence consumers' inferences about merchandise and service quality and discusses the extent to which these inferences mediate the influence of the store environment on store image. Results show that ambient and social elements in the store environment provide cues that consumers use for their quality inferences. In addition, store environment, merchandise quality, and service quality were posited to be antecedents of store image—with the latter two serving as mediators—rather than components of store image (as they are typically treated in the store image literature). Theoretical and managerial implications of the findings are discussed, and future research directions are proposed.

Retailers facing an increasingly competitive marketplace are finding it more difficult to differentiate their stores solely on the basis of merchandise, price, promotion, or location. The store itself, however, can offer a unique atmosphere, or environment, that may influence the consumer's patronage decision (Kotler 1973). Consumers interact with retailing environments during virtually all household purchases they make (Sarel 1981), and many consumers make decisions at the point of purchase (Keller 1987). Thus, in-store elements such as color, lighting, style, or music may have more immediate effects on decision making than other marketing inputs that are not pre-

sent at the point of purchase (e.g., advertising). A key role store environment plays is to provide informational cues to customers about merchandise and service quality (Gardner and Siomkos 1985; Olson 1977; Zeithaml 1988).

Store environment has also been found to be one of several inputs into the consumer's global store image, or overall attitude toward the store (e.g., Lindquist 1974; Darden, Erdem, and Darden 1983; Zimmer and Golden 1988). Furthermore, store image is an important part of the store choice decision (e.g., Stanley and Sewall 1976; Nevin and Houston 1980; Malhotra 1983). Darden, Ordem, and Darden (1983) found that consumers' beliefs about the physical attractiveness of a store had a higher correlation with patronage intentions than did merchandise quality, general price level, or selection.

The store image literature also treats merchandise quality and service quality as key variables influencing store image (e.g., Hildebrandt 1988; Mazursky and Jacoby 1986). Additionally, merchandise and service quality evaluations are critical inputs to the consumers' decision-making process (Dodds, Monroe, and Grewal 1991; Zeithaml 1988). Thus the literature suggests that there are linkages between store environment, merchandise and service quality, and store image. We propose that these linkages are established through the process of inference making. In particular, we posit that consumers make inferences about merchandise and service quality based on store environment factors and that these inferences, in turn, influence store image. The inference-making perspective is consistent with Mazursky and Jacoby's (1986, p. 147) definition of store image that has been adopted for this study: "a cognition and/or affect (or a set of cognitions and/or affects), which is (are) inferred, either from a set of ongoing perceptions and/or memory inputs attaching to a phenomenon (i.e., either an object or event such as a store,

a product, a 'sale,' etc.), and which represent(s) what that phenomenon signifies to an individual."

In the store image literature, store environment and store image are viewed as different constructs, in that the former has been treated as one of several (e.g., price, quality, selection, location) components of the latter (e.g., Lindquist 1974; Zimmer and Golden 1988). We are proposing, however, that store environment, merchandise quality, and service quality are antecedents of store image rather than components of store image. We are also proposing that rather than having a direct influence on store image, store environment indirectly influences store image through merchandise and service quality inferences. That is, merchandise and service quality inferences mediate the relationship between store environment and store image.

Past research has focused on a general construct called "store atmosphere" rather than on understanding how specific store elements may be combined to create a particular environment. For example, Mazursky and Jacoby (1986) provided pictures of a store's interior as cues for consumers to use in judging merchandise and service quality but did not describe the characteristics of this store. The term "physical attractiveness" used in the Darden, Erdem, and Darden (1983) study was similarly undefined in terms of specific environmental elements. The purpose of the research reported here, therefore, was to examine how combinations of specific elements in the store environment influence inferences about merchandise and service quality as well as the extent to which these inferences mediate the influence of store environment on store image.

The next section reviews the relevant literature on store environment and presents the hypotheses investigated in this study. A $2 \times 2 \times 2$ between-subjects design is then described. We manipulated the store ambient factor (prestige-image vs. discount-image), the store design factor (prestige-image vs. discount-image), and the store social factor (prestige-image vs. discount-image) through videotapes. This experimental approach enabled us to enhance the study's internal validity and complemented past research that primarily manipulated store environment using verbal descriptions (e.g., Gardner and Siomkos 1985). Analysis of variance procedures used to test the hypotheses are discussed next. Finally, the theoretical and managerial implications of the study are presented, along with limitations and avenues for future research.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

Inference Making Based on Environmental Cues

Evidence from environmental psychology supports the notion that people form inferences about a focal object or person based on environmental cues. Sadalla, Vershure, and Burroughs (1987) found that subjects were able to correctly infer a homeowner's self-concept from looking

at pictures of that person's dwelling. Contemporary judges were able to discriminate appropriately among the nineteenth-century homes of different socioeconomic groups, identifying the status of the original owners from photographs of their houses (Cherulnik and Wilderman 1986).

Similar results have been reported in the marketing literature. Bitner (1990), for example, found that subjects formed attributions about service failures based on the physical environment of a travel agency. In another study, customers' inferences about the prototypicality of restaurants were strongly influenced by environmental cues (Ward, Barnes, and Bitner 1992). Likewise, a study of bank customers showed that expensive-looking facilities would prompt customers to infer that the bank was inappropriately spending their money (Baker, Berry, and Parasuraman 1988).

Consumers with incomplete information about merchandise or service quality tend to base purchase decisions on inferences they make from various information cues (Bloom and Reve 1990; Nisbett and Ross 1980; Zeithaml 1988). The retail store environment offers a multitude of stimuli that can serve as cues to consumers looking for this information-processing shortcut or heuristic. For example, a store with thick carpeting, low-level lighting, and muted, but fashionable, colors may lead customers to infer that the store sells high quality merchandise, or offers high quality service.

The inferences of interest in the present study pertained to merchandise and service quality. Merchandise quality and service quality have been identified as critical components in the consumer's decision-making process (Dodds, Monroe, and Grewal 1991; Kerin, Howard, and Jain 1992; Zeithaml 1988). Additionally, quality is a determinant of store image (Lindquist 1974; Mazursky and Jacoby 1986; Zimmer and Golden 1988). The marketing literature contains limited empirical research on the linkages between specific environmental elements, or combinations of elements, and inferences about merchandise and service quality. The following sections review the extant literature and develop the hypotheses tested in the study.

Effects of Store Environment on Merchandise and Service Quality Inferences

The retail store environment has a major influence on consumers' inferences about merchandise quality (Darden and Schwinghammer 1985; Olshavsky 1985). Mazursky and Jacoby (1986) found that pictures of a store's interior were second only to brand name in being the most heavily accessed of several cues from which consumers could choose to evaluate merchandise quality. Research on the effects of color in retail environments has shown that subjects inferred merchandise in a warm-colored environment to be more up-to-date (arguably one dimension of merchandise quality) than merchandise in a cool-colored environment (Bellizzi, Crowley, and Hasty 1983; Crowley 1993). In a study using verbal descriptions of store envi-

ronments, Gardner and Siomkos (1985) found that subjects evaluated perfume more favorably when it was sold in an environment with a prestige image (e.g., soft lighting, "mood" music, carpeting, clean and large dressing rooms, wide aisles, nicely dressed salespeople) than when it was sold in an environment with a discount image (e.g., harsh lighting, no music, linoleum floors, dirty and small dressing rooms, narrow aisles, sloppily dressed salespeople).

Consumer inferences about service quality can also be influenced by the retail store environment. This assertion is consistent with work by Parasuraman, Zeithaml, and Berry (1988) that identified elements of the physical environment (e.g., up-to-date equipment, visually appealing facilities, well-dressed and neat employees) as important "tangibles," a key component of service quality. Rys, Fredericks, and Luery (1987) concluded that environmental factors were the most important cues to consumers judging restaurant quality. In a study by Crane and Clarke (1988), respondents who were asked to list the cues they used to assess the nature and scope of four service providers (doctor, bank, hairstylist, and dentist) indicated that the physical facilities were one type of cue they relied upon. In yet another study, patients who did not have prior knowledge of a physician's reputation appeared to depend on tangible attributes (e.g., the physician's office) to evaluate the physician's competence—one aspect of quality (Baumgarten and Hensel 1987).

A number of environmental elements can affect consumer inferences of merchandise and service quality. Baker (1986) has developed a typology categorizing the elements into three broad groups: ambient factors, design factors, and social factors. The first column of Table 1 presents illustrative elements for the three groups of factors. The remainder of Table 1 demonstrates that specific characteristics associated with prestige-image and discount-image stores in past studies, and those suggested in retailing textbooks and trade publications, can be fit into Baker's (1986) three-category framework.

Based on the framework illustrated in Table 1, this study developed and tested hypotheses addressing the effects of specific store environmental factors on quality inferences. Because the store environment is an entity consisting of multiple elements, consumers' inferences are likely to be based on combinations of these elements, rather than based on only one or two. To provide a realistic store setting, multiple elements representing each factor (ambient, design, and social) were manipulated to create the prestige-image and discount-image conditions. The nature of the factors, and the experimental manipulations and hypotheses pertaining to them, are discussed next.

Store Ambient Factor

Ambient factors are nonvisual, background conditions in the environment, including elements such as temperature, lighting, music, and scent (e.g., Milliman 1982, 1986; Ward and Russell 1981; Wineman 1982; Yalch and Spangenberg 1990). Based on studies already reviewed, environmental effects were hypothesized for both mer-

chandise-quality and service-quality inferences. Lighting levels and music were the elements chosen to operationalize the ambient factor in this study because they were identified in the literature as contributing to store image and because they can be controlled easily by retailers. The prestige-image ambient environment had soft, low-level lighting and played classical music, whereas the discount-image ambient environment used bright lighting and Top 40 music (Gardner and Siomkos 1985; Golden and Zimmerman 1986; Morris 1985). A pretest was conducted confirming that the music types were perceived as representing prestige- and discount-image stores for the student subjects used in the study. Both the music selections chosen had a slow tempo, to avoid any possible tempo effect. It was hypothesized that

H1: Consumers will infer higher merchandise quality in a prestige-image ambient environment than in a discount-image ambient environment.

H2: Consumers will infer higher service quality in a prestige-image ambient environment than in a discount-image ambient environment.

Store Functional/ Aesthetic Design Factors

Design factors are store environmental elements that are more visual in nature than are ambient factors. These elements may be functional and/or aesthetic in nature (Marans and Spreckelmeyer 1982). Functional store elements include layout, comfort, and privacy. Aesthetic elements include factors such as architecture, color, materials, and style. In addition to evidence reviewed previously, studies have shown that design elements in the environment influenced individuals' evaluations of people and objects (e.g., Campbell 1979; Morrow and McElroy 1981; Zweigenhaft 1976) and that service-setting design affected consumer perceptions and attitudes about that service (McElroy, Morrow, and Eroglu 1990). For example, the color used within a store was found to affect consumer evaluations of the store and the merchandise it carried (Bellizzi, Crowley, and Hasty 1983). Wheatley and Chiu (1977) demonstrated that consumers evaluating carpet samples perceived a darker shade of carpeting to be of higher quality than a lighter shade of carpeting.

The aesthetics of the prestige-image design environment were operationalized in this study with the use of gold metallic accents on displays (Golden and Zimmerman 1986). Moreover, this environment employed a peach and green color scheme that was popular at the time of the study. A manipulation check confirmed peach and green to be currently fashionable colors (see the appendix for the item pertaining to this attribute). A free-form layout (Burstiner 1986) in the front area of the store operationalized the functional aspect of the prestige-image design environment. Dated colors (neutral beige and white), lack of gold accent trim, and a grid layout were used in the discount-image design environment. It was hypothesized that

TABLE 1
Characteristics of Prestige-Image and Discount-Image Store Environments

<i>Characteristic</i>	<i>Prestige-Image</i>	<i>Discount-Image</i>	<i>Authors</i>
Ambient factors			
Music	Classical	Top 20	Golden and Zimmerman, 1986 Gardner and Siomkos, 1985
Lighting	Soft/dim	Bright/harsh	Golden and Zimmerman, 1986 Morris, 1985 Gardner and Siomkos, 1985
Smell	Incandescent	Fluorescent	Golden and Zimmerman, 1986
	Not available	Popcorn	Gallager and Cornwall, 1985
Design factors			
Floor covering	Pile carpeting	Linoleum/cement	Berman and Evans, 1989 Gallager and Cornwall, 1985 Gardner and Siomkos, 1985 "Flooring Choices" 1987
	Hardwood	Vinyl	
Wall covering	Textured/flocked	Paint	Berman and Evans, 1989
Displays/fixtures	Not available	Bins	Golden and Zimmerman, 1986
	Disguised/decorated	Exposed	Berman and Evans, 1989
Color	Gold, silver, black	Not available	Golden and Zimmerman, 1986
	Up-to-date	Dated	Birren, 1945
	Classifier	Declassifier	McFarland, 1989
	Neutral/monochromatic	Vivid	Footte, 1983
Cleanliness	Clean	Dirty	Gardner and Siomkos, 1985
Ceilings	Sheetrock and decorative	Not available and painted	"Chains Respond" 1985
Dressing rooms	Private	Semi-private or none	Berman and Evans, 1989
	Large	Small	Golden and Zimmerman, 1986
Aisles	Wide	Narrow	Berman and Evans, 1989 Golden and Zimmerman, 1986 Gardner and Siomkos, 1985
Layout	Free-form	Grid	Burstiner, 1986
Signs	Discreet	Apparent	"Big Y" 1987
Social factors			
Salespeople	Nicely dressed	Sloppily dressed	Gardner and Siomkos, 1985
	Cooperative	Uncooperative	Berman and Evans, 1989

H3: Consumers will infer higher merchandise quality in a prestige-image design environment than in a discount-image design environment.

H4: Consumers will infer higher service quality in a prestige-image design environment than in a discount-image design environment.

Store Social Factor

The social factor involves the people who are within a store's environment. Russell and Snodgrass (1987) noted that the physical presence of another person is an important part of any environment. The number, type, and behavior of other customers and sales personnel in the environment are elements of the social factor.

Several studies have shown that crowded conditions that involved other customers in a retail store negatively

affected their inferences (e.g., Eroglu and Harrell 1986; Harrell, Hutt, and Anderson 1980; Hui and Bateson 1991). Sociological theory regarding understaffing suggests that the number of employees influences consumer inferences (Wicker 1973). Understaffing is a condition that occurs when the number of people in a facility is less than the setting requires, resulting in an environment that does not function as it should. According to the understaffing perspective, more sales personnel will be present in a prestige-image social environment than in a discount-image social environment. Mazursky and Jacoby (1986) found that the number of salespeople per department was a critical cue in evaluating service quality.

Furthermore, a prestige-image store is likely to have nicely dressed salespeople, whereas a discount-image store is likely to have sloppily dressed salespeople (Gardner and Siomkos 1985). Berman and Evans (1989) suggested that

a prestige-image store would have cooperative salespeople and a discount-image store would have uncooperative salespeople. These social characteristics are consistent with research that defined tangibles (e.g., employee dress), responsiveness (e.g., cooperative employees), and empathy (e.g., employees willing to give customers personal attention) as being important components of service quality evaluation (Parasuraman, Zeithaml, and Berry 1988).

The literature also suggests a linkage between the social factor and merchandise quality. Gardner and Siomkos (1985) found salesperson dress (as a component of high-image vs. low-image store) influenced quality evaluations of perfume. Similarly, Hildebrandt (1988) showed that "good staff," as a component of store atmosphere, was associated with product quality. More directly, the number of salespeople and cashiers per department were used as cues in judging merchandise quality (Mazursky and Jacoby 1986).

The study reported here used store personnel to represent the social factor. The prestige-image social environment had three salespeople on the floor, whereas the discount-image social environment had only one. To incorporate a request to the researchers from a regional sales manager for the store chain used in the study, sales personnel wearing professional-looking aprons were used to operationalize the dress component in the prestige-image condition, whereas no aprons were worn in the discount-image condition. As a cue to salesperson cooperativeness and willingness to give personal attention, a salesperson at the entrance to the store greeted customers in the prestige-image condition, whereas no greeting occurred in the discount-image condition. It was hypothesized that

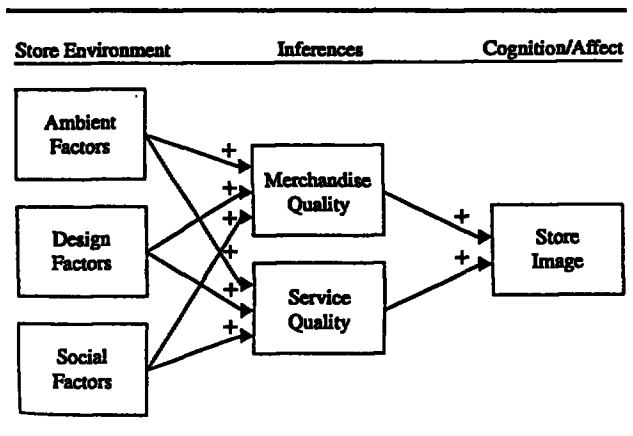
H5: Consumers will infer higher merchandise quality in a prestige-image social environment than in a discount-image social environment.

H6: Consumers will infer higher service quality in a prestige-image social environment than in a discount-image social environment.

The Mediating Effect of Merchandise and Service Quality on Store Image

Olshavsky (1985) suggested that store image may serve as a cue to the quality of a brand and vice versa. Merchandise quality, styling, price, assortment, locational convenience, sales clerk service, general service, store environment, and pleasantness of shopping have been identified as components of store image (e.g., Lindquist 1974; Mazursky and Jacoby 1986). These studies have examined the effects of merchandise quality, service quality, and store environment as components of store image. Our model refines and extends the literature by proposing that merchandise and service quality are antecedents of rather than components of store image and that they mediate the relationship between store environment and store image. This view is consistent with the study's definition of store image as a cognition/affect that is inferred from a

FIGURE 1
The Influence of Store Atmospherics on Store Image



set of perceptions (Mazursky and Jacoby 1986) and with the suggestion of Greenberg, Sherman, and Schiffman (1983) that the relationship between store environment and store image is mediated by consumer inferences. Therefore, it was hypothesized that

H7: The relationships between store environment factors (ambient, design, social) and store image are mediated by merchandise quality and service quality inferences.

Figure 1 provides a pictorial summary of the hypotheses proposed and tested in this study. It also depicts store image as a cognition/affect that is influenced by inferences stemming from store environment cues, as suggested by the store image definition adopted for this study.

RESEARCH METHOD

Overview of Experimental Design

The hypotheses were tested in an experiment in which the ambient, design, and social factors were manipulated in a card and gift store to achieve the prestige-image and discount-image conditions. Thus the study employed a 2 (Prestige vs. Discount Ambient) \times 2 (Prestige vs. Discount Design) \times 2 (Prestige vs. Discount Social) between-subjects factorial design.¹ Each factor was operationalized with more than one environmental element (the specific elements used are summarized in Table 2). The selection of these characteristics was determined by the retailing and store-image literature, two focus groups (one student and one nonstudent), and the remodeling effort of the store participating in the study. In addition, two pretests confirmed the effectiveness of the manipulations.

Five types of music—classical, Top 40, country-western, oldies, and easy listening were pretested for their associations with prestige-image and discount-image stores. The respondents (157 students) each listened to all

TABLE 2
Experimental Treatments

<i>Characteristic</i>	<i>Prestige-Image Store Environment</i>	<i>Discount-Image Store Environment</i>
Ambient factors		
Music	Classical	Top 40
Lighting	Soft	Bright
Design factors		
Color	Green/peach	Brown/white
Brass trim on displays	Yes	No
Layout	Open	Grid
Organization of merchandise	Neat	Messy
Social factors		
Number of salespeople	3	1
Greeting by salesperson	Yes	No
Salesperson dress	Apron	No apron

five selections and used 7-point scales to rate how likely it was that each selection would be heard at prestige-image and discount-image stores. The five selections were rank-ordered. The classical selection ranked as the music most associated with prestige-image stores. The discount-image selection (Top 40) was actually the second lowest-ranked music but was chosen because this music was deemed more likely to be used by a card and gift store than was country-western, which was the lowest prestige-image music. A second pretest (64 students) was conducted to ensure that the operationalizations of the store environment factors were perceived by the subjects as intended. Results of this preliminary investigation indicated that the attributes used to manipulate the ambient, design, and social factors were appropriate.

Experimental Procedures Used

A laboratory experiment was conducted with 297 undergraduate students (35 to 39 students per treatment) enrolled in marketing courses at a large state university. Shopping in a card and gift store, the context used in this study, is within the realm of consumer experience for these students (98% of the subjects indicated that they had shopped in a card and gift store).

The store shopping experience was simulated using videotapes. This protocol has been found to be effective for examining the effects of the environment on customer perceptions (e.g., Bateson and Hui 1992; Carpmann, Grant, and Simmons 1985; Hershberger and Cass 1974). The store that was shown on the videotape was a card and gift store located in a large mall. This store underwent extensive remodeling, offering a unique opportunity to study different environmental effects within the same store setting. Familiarity effects were avoided as the store was located in a different city than were the subjects. Eight experimental versions of the store were created to represent all combinations of the prestige- and discount-image levels of the three environmental factors. For example, the treatment that represented the prestige-level operationali-

zation of each factor (ambient, design, social) included classical background music, soft lighting, a green/peach color scheme, an open layout, brass trim on display units, and three salespeople with aprons who greeted the "customer." An example of a treatment that combined prestige and discount levels of the factors was one that included classical background music, soft lighting, a green/peach color scheme, an open layout, brass trim on display units, and one salesperson without an apron who ignored the "customer."

Small groups of subjects viewed the videotape, which visually "walked" them through the store environment. All eight videotapes were the same length (about 5 minutes), and they were equivalent in terms of the path taken through the store. This path differed slightly between the videotapes shot before and after the store was remodeled. Specifically, the remodeling changed the location of the checkout counter and the arrangement of the displays in the front part of the store. After viewing the videotape, subjects were asked to complete a self-administered questionnaire that contained the study measures.

Measures

A questionnaire was developed to measure merchandise quality and service quality inferences as well as store image. A systematic review of the quality and store-image literatures provided a basis for developing scale items for each construct (e.g., Gutman and Alden 1985; Mazursky and Jacoby 1986; Morgan 1985; Parasuraman, Zeithaml, and Berry 1988; Sherry and McGrath 1989). The questionnaire was pretested on several groups of undergraduate students, and refinements were made based on the results of the pretests.

Because the card and gift store carries several types of products (e.g., cards, gifts, party items, gift wrap) that may elicit different quality inferences, it was decided to instruct the study respondents to focus only on the gift category when completing the questionnaire. This decision was made based on pretest respondents' comments that a more general term such as "merchandise" denoting all products in the store was confusing. Cards were viewed by these respondents as a commodity item with little variability in quality, whereas gifts were perceived to have more quality variation. Thus to ensure sufficient variation in the measured constructs, gifts were chosen as the focal merchandise in testing the hypothesized relationships.

Respondents were instructed to think about gift items such as figurines, brass items, and decorative accessories for the home as a category when answering questions. Overall quality inferences for the gift category were measured rather than quality inferences for any specific gift item.

The reliabilities of the three multiple-item scales used to measure the model constructs were evaluated by calculating coefficient alphas (merchandise quality = .72, service quality = .84, and store image = .81). The specific items are provided in Table 3. The results of a principal components factor analysis with varimax rotation supported a three-factor solution (see Table 3). The three

TABLE 3
Factor Analysis Results

Item	Principal Component Loadings		
	Factor 1	Factor 2	Factor 3
Merchandise quality inferences			
1. Gifts purchased from this store would be high in quality	.12	.23	.82
2. The workmanship of gifts purchased in this store would be high.	.21	.16	.84
Service quality inferences			
3. Customers could expect to be treated well in this store.	.66	.22	.32
4. Employees of this store could be expected to give customers personal attention.	.70	.23	.36
5. This store's employees would be willing to help customers.	.83	.15	.14
6. This store would offer high-quality service.	.74	.31	.21
7. Employees of this store would not be too busy to respond to customers' requests promptly.	.71	.14	-.09
Store image			
8. This store would be a pleasant place to shop.	.18	.73	.27
9. The store has a pleasant atmosphere.	.38	.70	.11
10. This store is clean.	.19	.77	.05
11. The store is attractive.	.15	.81	.23
Eigenvalue	5.00	1.29	1.08
Percentage of variance explained	45.4	11.7	9.8

NOTE: A 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*) was used to assess each of the items.

factors had eigenvalues greater than 1.00 and accounted for 66.9 percent of the variance in the items.

ANALYSIS AND RESULTS

Manipulation Checks

Subjects evaluated the ambient factor using a three-item scale ($\alpha = .90$), the store design factor using a four-item scale ($\alpha = .78$), and the store social factor using a four-item scale ($\alpha = .83$). The scales used to conduct the manipulation checks are provided in the appendix. The results of a principal components factor analysis supported a three-factor solution. The three factors accounted for 70 percent of the variance. Thus these results support the three store-environment factor typology suggested by Baker (1986).

The results indicated that the prestige-image and discount-image manipulations are effective for all three environmental factors: ambient ($\bar{X}_{\text{discount}} = 3.83$ vs. $\bar{X}_{\text{prestige}} = 5.42$, $F(1, 249) = 73.71$, $p < .001$), design ($\bar{X}_{\text{discount}} = 5.35$ vs. $\bar{X}_{\text{prestige}} = 5.61$, $F(1, 295) = 5.56$, $p < .05$), and social ($\bar{X}_{\text{discount}} = 3.76$ vs. $\bar{X}_{\text{prestige}} = 5.07$, $F(1, 293) = 89.55$, $p < .001$).

Hypothesis Tests

The hypotheses were tested using ANOVA, ANCOVA, and regression procedures. The results, summarized in Table 4, are discussed next.

Ambient Factor

The results indicate that the prestige ambient environment enhances subjects' inferences of merchandise quality ($\bar{X}_{\text{discount}} = 9.42$ vs. $\bar{X}_{\text{prestige}} = 10.16$, $F(1, 286) = 10.18$,

$p < .01$) and service quality ($\bar{X}_{\text{discount}} = 23.61$ vs. $\bar{X}_{\text{prestige}} = 26.12$, $F(1, 286) = 17.86$, $p < .01$). Thus the ambient effect on merchandise and service quality inferences proposed in H1 and H2 is supported.

Design Factor

The results indicate that the design factor does not influence either merchandise quality or service quality inferences. Thus support is not found for H3 and H4.

Social Factor

The results indicate that the prestige social environment enhances subjects' inferences of merchandise quality ($\bar{X}_{\text{discount}} = 9.53$ vs. $\bar{X}_{\text{prestige}} = 10.05$, $F(1, 286) = 4.78$, $p < .05$) and service quality ($\bar{X}_{\text{discount}} = 24.31$ vs. $\bar{X}_{\text{prestige}} = 25.40$, $F(1, 286) = 3.32$, $p = .07$). Thus H5 is supported and H6 is marginally supported.

Mediation Tests

Procedures suggested by Baron and Kenny (1986) and Hastak and Olson (1989) were followed to assess whether merchandise quality and service quality inferences mediate the effects of the environmental stimuli (ambiance, social, and design) on store image. Baron and Kenny (1986) recommended that three conditions need to be satisfied between the independent variables (environmental factors), mediators (merchandise and service quality inferences), and the dependent variable (store image) to establish mediation.

First, the independent variables (environment factors) need to affect the mediators (merchandise and service quality inferences). The previous results provide evidence that the ambient and social environment factors significantly affect merchandise and service quality inferences. The results, however, do not support the hypothesized direct effect of the design factor on merchandise and

TABLE 4
ANOVA and Mediation Analysis

	<i>ANOVA: Merchandise Quality (F values)</i>	<i>ANOVA: Service Quality (F values)</i>	<i>ANOVA: Store Image (F values)</i>	<i>ANCOVA: Store Image (F values)</i>
Ambient factor (A)	10.18***	17.86***	9.66***	.32
Design factor (D)	.00	.27	.24	.73
Social factor (S)	4.78**	3.31*	5.08**	1.23
A × S	.07	.65	1.33	1.14
A × D	.06	1.95	3.21*	1.91
S × D	.11	.55	1.79	1.31
A × S × D	.59	.02	.87	.68
Covariates:				
Merchandise quality				24.03***
Service quality				71.28**

NOTE: The ANOVA and ANCOVA analyses each had one degree of freedom. The error had 286 degrees of freedom for ANOVA analyses and 284 degrees of freedom for ANCOVA analysis.

* $p < .10$; ** $p < .05$; *** $p < .01$.

service quality inferences. Thus we could not assess the mediation hypothesis for the design factor.

Second, the independent variables (environmental factors) need to affect the dependent variable (store image). As shown in Table 4, ambient and social factors do affect store image, $p < .01$.

Third, the mediators (merchandise and service quality inferences) need to affect the dependent variable (store image), while the effects of the independent variables (store environment factors—ambient, social, and design) are reduced. The analysis of covariance results indicate that when the two mediators (i.e., merchandise and service quality inferences) are treated as covariates, the effects of the ambient and social factors on store image are virtually eliminated. Furthermore, the effect of these two mediators (covariates in the ANCOVA results) are significant, $p < .01$.

The effects of merchandise and service quality inferences on subjects' store image were also examined using regression analysis, $F(2, 291) = 82.88$, $p < .001$, adjusted $R^2 = .36$. The results show that as subjects' merchandise quality inferences and service quality inferences increase, their store image perceptions are enhanced (merchandise quality: $\beta = 0.44$, $t = 8.44$, $p < .001$; service quality: $\beta = 0.26$, $t = 4.90$, $p < .001$).

The above results clearly support the notion that merchandise and service quality inferences mediate the effect of two store environmental factors (ambient and social) on subjects' store image. Thus H7 is supported for the ambient and social factors.

DISCUSSION

This study integrated concepts from marketing and environmental psychology to develop and test a theoretically based model of the cognitive influence of the store environment on inferences of merchandise and service quality and of store image. The findings suggest several theoretical and managerial implications. The potential

limitations of the study also offer an agenda for further research.

Theoretical and Managerial Implications

From a theoretical perspective, this study makes two important contributions to the marketing literature on store environment. First, it is one of the few that examines how a combination of specific atmospheric elements influences consumers' inferences about merchandise and service quality. Managers and researchers alike have recognized that store environment is an important marketing tool and that quality inferences influence consumers' purchase decisions (Sherowski 1983). The extant literature, however, offered little insight into the linkages between specific environmental elements and quality inferences. This study constitutes a modest beginning in terms of filling this void in the literature.

The second theoretical contribution is the refinement of the relationships between store environment, merchandise and service quality, and store image. Conceptual and empirical research to date has identified merchandise quality, service quality, and store environment as components of store image (Lindquist 1974; Mazursky and Jacoby 1986; Zimmer and Golden 1988). The results of this study add to the extant literature by suggesting that the relationship between store environment and store image is mediated by merchandise- and service-quality inferences (i.e., store environment, merchandise quality, and service quality are antecedents of store image, with the latter two serving as mediators rather than components of store image).

For store managers, the study results suggest that ambient and social elements in the store environment provide cues upon which consumers base their quality inferences. Classical music and soft lighting (the ambient elements used in this study) led to inferences that the merchandise and service quality would be higher than did Top 40 music and bright lighting. The store with the prestige-image social factor (more sales personnel on the floor, wearing

aprons, and greeting customers) resulted in inferences of higher service quality than did the store with the discount-image social factor (one salesperson on the floor, wearing no apron, and not offering a greeting). Although the generalizability of these findings to other types of store settings has yet to be established, these elements are relatively easy and inexpensive for managers to test and change within their own stores. Moreover, the finding that design factors—the most permanent of the three sets of environment factors—do not have a significant effect on quality inferences has an important message for managers: regardless of design features such as store layout and architecture, managers can improve customers' quality inferences by upgrading the ambient and social factors.

The lack of significant findings regarding the design factor needs to be verified in other store settings because it is possible that for the card and gift category, consumers do not perceive enough difference in physical characteristics across stores. Thus the context may not have been robust enough to test all the relationships in the model. It is also possible that the original (discount-image) store environment was seen as acceptable and/or that the new design did not provide a noticeable difference (the design manipulation was weaker than the ambient and social manipulations). In any case, the lesson for store managers is that if they are planning to spend large amounts of money remodeling their stores, they need to determine in advance if the design changes will contribute to their marketing objectives. Managers could use techniques such as prototypes, videotaping, renderings, and computer-aided design to ascertain the potential impact of alternative store designs.

Finally, the finding that merchandise- and service-quality inferences mediate the relationship between store environment and store image seems to offer additional support for the suggestion above pertaining to the need for aligning decisions about store atmospheric elements with the retailer's marketing and store image objectives. All ambient, design, and social elements need to be orchestrated so that consumers make the appropriate quality inferences. For example, the use of thick pile carpeting or classical music in a discount store is likely to send a wrong, or confusing, message to consumers about the quality of merchandise or service they might expect.

Limitations and Future Research

There are several potential limitations to the study. These limitations, along with the study's findings, also suggest directions for future research.

Although the study results generally support the proposed model, the results are necessarily limited to the study's context. For instance, as already acknowledged, the card and gift store context may not have been robust enough to test the impact of design factors on quality inferences. Future research is needed to explore the effects of store environment on quality inferences in other store types (e.g., discount, department, other types of specialty

stores) and for other product categories (e.g., luxury items, durable goods, pure services). Additional store elements also need to be examined. For example, scent would be an interesting element to investigate, given that many stores have distinctive odors (e.g., the smell of popcorn in a discount store or the potpourri used in a bath shop). The effects of store environment on subjects other than students should be studied. Individual characteristics such as age, income, gender, and culture may be critical determinants of how people associate atmospheric elements and quality.

Limitations on the design manipulation were imposed by the remodeling plan of the store used in the study. Although design changes in a real store are expensive to make and are subject to a particular retailer's needs, other methodologies may prove helpful in looking at the effects of alternative design elements. A small-scale, simulated store environment constructed as a laboratory would allow researchers almost unlimited options in testing different design effects on consumers. A less expensive (but also less realistic) alternative may be a computer-aided design system to test many design options. Methods other than using videotape to represent store environments are needed to expand and enrich our understanding of the linkages between store environment and quality. Field studies conducted in actual store settings, participant observation, and in-store verbal protocols are several methods that could achieve this objective.

The model should be expanded to include other store image components such as price, advertising, or selection. Do consumers also make inferences about the price image of a store based on its environment? Does store layout engender inferences about merchandise selection?

It should be pointed out that there was a marginally significant ambient-by-design interaction effect on subjects' assessment of store image (see Table 4). The interaction results suggest that the effect of the ambient factor is more pronounced when the store design factor portrayed a prestige image rather than a discount image. These findings suggest the need for future research to examine the potential interactive effects of store environmental factors on consumers' inferences and assessment of a store's image.

Finally, the findings that store environment and merchandise and service quality are antecedents rather than components of store image implies a need and an opportunity to develop a multiple-item scale to measure store image that is independent of the antecedent constructs and more comprehensive than the scale used in this study. Research is also needed to identify and study the relative impact of other potential antecedents of store image (e.g., advertising, price, word-of-mouth communications).

CONCLUSION

Characteristics of a store's environment influence the inferences that customers make about the store's merchandise and service quality. Such an influence is likely to be especially pronounced for ambient and social charac-

teristics—factors that retail store managers can alter relatively easily, at least more easily than they can change design factors, which, interestingly, seem to have a weaker influence. Because the study's findings suggest that customers' merchandise- and service-quality inferences have a significant impact on overall store image, managers can strive to achieve a desired store image by changing the store's ambient and social characteristics appropriately. Moreover, the apparently weak impact of design factors on customers' quality inferences suggests that managers can shape store image regardless of a store's current layout and architecture. Finally, the study's findings support the notion that both store environment factors and merchandise and service quality inferences are antecedents of store image rather than components of store image, as typically portrayed in past research. This revised conceptualization of store image and its determinants, in addition to offering managerial guidelines for changing customers' store image perceptions, has implications for modeling and measuring the store image construct in future research attempts to enhance our understanding of this area.

APPENDIX

Manipulation Check Measures and Their Reliability Estimates

Store Ambient Factor Manipulation Check (alpha = .90)

1. The background music (in the video) would make shopping in this store pleasant.
2. If I shopped at this store, the background music that I heard on the video would bother me (R).
3. The background music was appropriate.

Store Design Factor Manipulation Check (alpha = .78)

1. The color scheme was pleasing.
2. The colors used in the store appeared to be currently fashionable.
3. The physical facilities were attractive.
4. The merchandise in the store appeared organized.

Store Social Factor Manipulation Check (alpha = .83)

1. There were enough employees in the store to service customers.
2. The employees were well dressed and appeared neat.
3. The employees seemed like they would be friendly.
4. The employees seemed like they would be helpful.

NOTE: A 7-point scale (1 = *strongly disagree* to 7 = *strongly agree*) was used to assess each of the items. The item denoted with an (R) was reverse scored.

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NOTE

1. One reviewer was concerned about the external validity of the experimental design in that retailers would normally want consistency across the three factors (i.e., all three "high" or all three "low"). We agree that a retailer would want such consistency. In reality, however, retailing environments do not always show consistency among the three factors. For example, such a lack of consistency was evident in a card and gift store in the same chain as the study store but in a different location. The design and social factors at this store could be classified as prestige-image, but the store was playing Top 40 music, probably because it was located in an area with a large student population. Our pretest showed that students associated Top 40 music with a discount-image store.

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