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Improving the Store Environment: Do Olfactory Cues Affect Evaluations and Behaviors?

The popular press has recently reported that managers of retail and service outlets are diffusing scents into their stores to create more positive environments and develop a competitive advantage. These efforts are occurring despite there being no scholarly research supporting the use of scent in store environments. The authors present a review of theoretically relevant work from environmental psychology and olfaction research and a study examining the effects of ambient scent in a simulated retail environment. In the reported study, the authors find a difference between evaluations of and behaviors in a scented store environment and those in an unscented store environment. Their findings provide guidelines for managers of retail and service outlets concerning the benefits of scenting store environments.

Managers of retail and service outlets are increasingly recognizing that the store environment significantly affects sales (Milliman 1982, 1986; Smith and Curnow 1966; Stanley and Sewall 1976), product evaluations (Bitner 1986; Rappoport 1982; Wheatley and Chiu 1977), and satisfaction (Bitner 1990; Harrell, Hutt, and Anderson 1980). In fact, it has been shown that attitudes toward the store environment are sometimes more important in determining store choice than are attitudes toward the merchandise (Darden, Erdem, and Darden 1983). Researchers have investigated several dimensions of the store environment, including music (Bruner 1990; Milliman 1982, 1986; Yalch and Spangenberg 1988, 1990, 1993), color (Belizzi, Crowley, and Hasty 1983; Crowley 1993), clutter and cleanliness (Bitner 1990; Gardner and Siomkos 1985), lighting (Golden and Zimmerman 1986), crowding, (Harrell and Hutt 1976a, b; Hui and Bateson 1991), and many others (for a review, see Baker, Grewal, and Parasuraman 1994).

An underdeveloped aspect of the store environment that is of interest to retailers and service providers is its scent. Specialty stores, such as bakeries, coffee shops, tobacco shops, and popcorn and nut shops (e.g., Borowsky 1987; Shappro 1986; Simmons 1988), have long relied on the scent of their products to draw customers (Bone and Ellen 1994). Recently, however, service providers and managers of stores carrying diverse product lines or products not having a distinctive scent have employed olfaction consultants to develop customized fragrances to diffuse throughout their

stores (Miller 1993). *Ambient scent*—scent that is not emanating from a particular object but is present in the environment—may be of greater interest than product-specific scents, because it could affect perceptions of the store and all its products, including those products that are difficult to scent (e.g., office supplies and furniture; Gulas and Bloch 1995). Reports in the popular press provide examples of this activity. The *Wall Street Journal* reports that pleasant scents increase lingering time in stores (Lipman 1990) and that one Marriott hotel scents its lobby to alleviate stress (Pacelle 1992). Furthermore, proprietary research purportedly shows a 45% increase in slot machine use in scented casinos (Hirsch and Gay 1992).

Unfortunately, the significance of these findings is unclear because the research has not been conducted in controlled environments nor has it been submitted to rigorous statistical analyses. For example, a highly publicized finding that Nike athletic shoes were evaluated more positively in a scented than in an unscented environment (Hirsch and Gay 1991; Miller 1991) is actually not statistically significant (Bone and Ellen 1994). Despite the increased interest, potential expense, and time involved in scenting retail environments, there is no scholarly research published that demonstrates the effects of ambient scent on the evaluations of a store, its products, or customers' shopping behaviors within the store.

Some conceptual work exists that postulates effects of ambient scent on consumer evaluations and shopping behaviors. Literature from diverse disciplines provide theoretical grounding for a conceptual framework that Bitner (1992) advances for exploring the impact of physical surroundings on the behaviors of both customers and employees. Among several others, one of the environmental dimensions Bitner includes as an input in her model is ambient odor. Drawing from Bitner's framework, Gulas and Bloch (1995) develop a model portraying ambient scent specifical-

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ly as an environmental cue that they compare with scent preferences to influence emotional responses and ultimately shopping behaviors. Both of these models are congruent with general models of environmental effects (e.g., Mehrabian and Russell 1974). Thus, though virtually no consumer studies have been conducted, there is ample theoretical justification for the empirical study of the effects of ambient scent on consumer responses.

Our purpose is to determine whether ambient scent affects store and product evaluations and/or shopping behaviors. The most common theoretical basis for studying the effects of scent on the shopping environment is drawn from environmental psychology. We review this research and olfaction literature in our hypothesis development. We then report the results of a pretest and an experiment. Finally, we draw conclusions, suggest avenues for further research, and discuss managerial implications.

Environmental Psychology

Environmental psychology draws from the stimulus-organism-response (S-O-R) paradigm, which posits that the environment is a stimulus (S) containing cues that combine to affect people's internal evaluations (O), which in turn create approach/avoidance responses (R) (e.g., Craik 1973; Mehrabian and Russell 1974; Russell and Pratt 1980; Stokols 1978). Psychologists suggest that people respond to environments with two general, contrasting forms of behavior: approach and avoidance (Mehrabian and Russell 1974). Approach behaviors include all positive behaviors that might be directed at the environment; for example, a desire to remain in a store and explore its offerings could be construed as an approach response. Avoidance behaviors reflect contrasting responses; that is, a desire to leave a store or not to browse represents avoidance behavior. Some form of these two general responses are the postulated output variables in Bitner's (1992) and Gulas and Bloch's (1995) models. (For reviews of environmental psychology in a marketing context, see Bitner 1992; Donovan and Rossiter 1982; Ridgway, Dawson, and Bloch 1990.)

An environment's characteristics are thought to combine to determine both how affectively pleasing and arousing or activating the environment is. We define *affect* as a general descriptor of a positive or negative state of emotion or feeling. An *affective response*, then, is an emotional reaction to an entity with which a person has come into psychological contact (Bower 1981). *Arousal* is conceptualized as a physiological "feeling state" that is most directly assessed by verbal report (Berlyne 1960; Mehrabian and Russell 1974). The construct of arousal is often referred to in environmental psychology literature as *load*. A high-load (arousing) pleasant environment produces approach behaviors, whereas a high-load unpleasant environment produces avoidance behaviors. A low-load environment is not activating enough to motivate any measurable approach/avoidance behavior.

The S-O-R paradigm has taken a fairly straightforward form in marketing research. The stimulus cues (S) that have been studied include those previously mentioned (e.g., music, color, lighting) as well as scent, the focus of this study. Research on characteristics of the environment typi-

cally begins with calibrating the stimuli in terms of their affective and arousing qualities, as well as other stimulus-specific characteristics, such as tempo for music or saturation for color. Environments are then developed that vary along the dimensions of one of these stimulus cues (e.g., a store with liked music versus disliked music in respective conditions).

The internal evaluations (O) that have been studied in marketing include evaluations of the affective and arousing nature of the environment as a whole, as well as evaluations of merchandise selection, prices, quality, and so on (e.g., Bellizzi, Crowley, and Hasty 1983). Russell and Pratt (1980) find the affective and arousing nature of the environment to be independent dimensions. Berlyne (1971, 1974) suggests that affect and arousal are related such that arousal influences affect directly. Supporting this view in the only marketing study to examine the dimensionality of evaluations of the environment, Crowley (1993) finds two correlated dimensions of affect and activation, with activation being similar to arousal. Finally, the approach/avoidance behaviors studied in marketing, which are the response (R) portion of the S-O-R paradigm, include measures of the level of product examination, time spent in the store, intent to visit the store, social interaction with personnel, and money spent (Bitner 1992; Donovan and Rossiter 1982; Ridgway, Dawson, and Bloch 1990; Yalch and Spangenberg 1988, 1990).

Marketing research grounded in environmental psychology has successfully linked environmental stimuli (S) with evaluative responses (O) and approach/avoidance behaviors (R). For example, color has been shown to affect liking of the store and perceptions of merchandise (Bellizzi, Crowley, and Hasty 1983; Crowley 1993). Clutter in the environment negatively affects satisfaction and attributions made concerning services (Bitner 1990). Crowding can change the use of in-store information, satisfaction, and enjoyment of the shopping environment (Eroglu and Machleit 1990; Harrell, Hutt, and Anderson 1980). Increasing the tempo and intensity of in-store music has been shown to reduce the time consumers spend in the store, thus linking an environmental characteristic with an avoidance behavior (e.g., Milliman 1982, 1986). A further effect of environmental music regards consumers' perceptions of time; different types of environmental music have been shown to shorten or lengthen the perceived amount of time spent (relative to actual time spent) in retail environments (e.g., Yalch and Spangenberg 1988, 1990). Finally, Bitner (1992), Bone and Ellen (1994), and Gulas and Bloch (1995) make links for scent at the theoretical level. These findings show clearly that environmental features affect evaluations of a store and its products, as well as in-store behaviors. Environmental psychology is therefore useful in identifying appropriate methods and measures for studying the effects of ambient scent on responses to a store. We next provide justification for examining ambient scent as a stimulus cue in the S-O-R paradigm.

Olfaction Research

The dimensions identified in environmental psychology literature as explaining the impact of an environment on people are similar to those dimensions found regarding re-

sponses to olfactory cues. In particular, most researchers have differentiated among scents along three different, albeit not necessarily independent, dimensions. These include the affective quality of the scent (e.g., how pleasant it is), its arousing nature (e.g., how likely it is to evoke physiological response), and its intensity (e.g., how strong it is). The affective dimension of scent dominates scent perception in existing research (Engen 1982, p. 172; Moskowitz 1979; Schiffman 1979; Woskow 1968). That scents are processed in the limbic system of the brain, which is the center of emotions, explains this dominance (Leukel 1976; Restak 1984). The pleasantness or unpleasantness of scents has been found to produce approach/avoidance behaviors (Levin and McBurney 1986; Takagi 1989), which makes scents particularly appropriate for study in environmental settings.

The arousing dimension of scent is evidenced by the effect of odors on both EEG (electroencephalograph) and respiratory patterns, which indicates that scents can affect arousal levels (Lorig and Schwartz 1988; Schwartz et al. 1986a, b). Scent could therefore contribute to how arousing an environment is, though no known research has investigated the arousing nature of scent independent of its affective quality.

The intensity dimension of scent relates negatively to scent evaluations such that as scent becomes stronger in intensity, reactions to it become more negative (Doty et al. 1978; Henion 1971; Richardson and Zucco 1989). This dimension of scent research examines the relationship between scent intensity and affect for all scents *on average*, but we believe that there is ample theoretical and empirical support with regard to other stimuli (e.g., environmental color and music) to suggest that the relationship between scent intensity and affective reactions depend on how pleasing the scent is. In particular, optimal arousal theory suggests that each stimulus characteristic has an optimal level that is most preferred (Berlyne 1971; McClelland et al. 1953). For more pleasant scents, we expect that the optimal level of intensity is higher than for less pleasant scents. Thus, the finding that intensity is negatively related to affect may apply to scents of average initial pleasantness. Alternatively, for more pleasant scents, increases in intensity may produce an initial increase in liking up to the optimal level of intensity. Increases in intensity beyond this optimal level may then reduce liking. The relationship between intensity and liking may therefore be negative for neutral scents and follow an inverted U-shaped function for pleasant scents. The inverted U-shaped function has been commonly found in work on relationships between characteristics of stimuli and liking, and is referred to as a *Wundt curve* (for this common stimulus-intensity-affect relationship, see, e.g., Anand and Holbrook 1986; Berlyne 1971, 1974; Takagi 1989; Wundt 1874). These predictions, however, have not yet been tested for scents.

In addition to research on the different dimensions of scent, research exists on its effects (for reviews in marketing of olfaction literature, see Bone and Ellen 1994; Gulas and Bloch 1995). Most of this research has focused primarily on responses to nonambient scent, that is, scent that is localized, such as in a vial or on a card (Cain 1982; Gilbert and

Wysocki 1987), a person (e.g., Baron 1983), a product (e.g., Bone and Jantrania 1992; Laird 1932), or an advertisement (e.g., Ellen and Bone 1993). Findings suggest that evaluations of people and products are enhanced when they are scented. Such effects appear to be moderated for both advertisements and products by the congruency of the scent with the object (Bone and Jantrania 1992; Ellen and Bone 1993). For example, congruency has been manipulated by pairing advertisements for sunscreen or household cleanser with coconut or lemon scent, respectively. Congruent scents tend to improve evaluations more than incongruent scents (Bone and Jantrania 1992).

Research on ambient scent, as opposed to scent attached to a particular object, is less common (Bone and Ellen 1994; Gulas and Bloch 1995). In psychology, the presence of an ambient scent in a laboratory was found to improve evaluations of people viewed in photographs (Kirk-Smith and Booth 1987). Pleasant ambient scents have resulted in setting higher negotiation goals and making more concessions than in unscented conditions (Baron 1990). Ambient scent also affects interpersonal interactions in many complex ways (Rotton et al. 1978). Mixed results have been found regarding the effects of ambient scent on mood (e.g., Baron 1990; Cann and Ross 1989; Ehrlichman and Bastone 1992b; Ehrlichman and Halpern 1988; Knasko 1992; Ludvigson and Rottman 1989), cognitive processes (e.g., Knasko, Gilbert, and Sabin 1990; Lawless 1991; Ludvigson and Rottman 1989), and creativity (e.g., Ehrlichman and Bastone 1992b; Knasko 1992).

Although we know of no studies on the effect of ambient scent in marketing environments, two studies have examined the effect of the ambient scent of the study location on product choice. In the first study, a catalog shopping task was conducted in scented and unscented rooms, and it was found that subjects spent more time on the task in the presence of an ambient scent (Bone and Ellen 1994). In the second study, a computer-aided product-choice experiment was conducted in differently scented rooms (not designed to appear like stores), and congruency of the scent with the product category influenced various information-processing measures (Mitchell, Kahn, and Knasko 1995). Both of these studies further encourage the examination of ambient scent in a store environment.

Hypotheses

We investigate whether the presence of an inoffensive ambient scent versus no scent affects evaluations of and approach/avoidance behaviors in a retail environment. Our secondary goal is to explore whether this impact varies according to the affective nature and intensity of the ambient scent. In referring to inoffensive scents, we mean scents that are not considered unpleasant by most people, though some people do not prefer scents enjoyed by a majority of others. In general, inoffensive scents (e.g., certain floral scents) generate either positive or neutral affective responses as opposed to the negative affective responses associated with offensive scents (e.g., sulfur gas or overripe vegetables). Thus, for the purposes of this research, inoffensive scents are either pleasant or neutral.

The weight of evidence from literature on olfaction suggests that the presence of a scent, as opposed to no scent, tends to enhance evaluations. This is in part due to the arousing nature of scent; the presence of ambient scent in a store should increase the arousing nature, or load, of the environment, thereby increasing how interesting and pleasing it is. We therefore expect that scent improves evaluations of the store environment. Furthermore, we expect that these positive reactions to the store environment extend to the merchandise. Research has shown that emotional responses to the overall environment may transfer to objects in the environment (i.e., products; Bitner 1992; Maslow and Mintz 1956; Obermiller and Bitner 1984). For example, Obermiller and Bitner (1984) find a direct relationship between the pleasantness of the environment and evaluations of products in the environment. Similarly, Crowley (1993) finds that varying the color of the environment affects ratings of merchandise style.

Assuming an ambient scent is not unpleasant, we expect its presence also to produce approach behaviors regarding the environment and merchandise contained therein. From a theoretical standpoint, optimal arousal theory suggests that minor changes in an environment, such as adding a low level of a scent, increases the environment's perceived novelty and pleasingness (Berlyne 1971; McClelland et al. 1953), thereby creating superior evaluations, which should encourage approach behaviors. This theoretical relationship was postulated by Gulas and Bloch (1995) and is consistent with previous findings concerning other arousing stimuli, such as color, which can increase intentions to visit a store (Crowley 1993). Similarly, music intensity and pace have been shown to change time perceptions (e.g., Kellaris and Altsech 1992) and the amount of time shoppers spend in a retail environment (e.g., Milliman 1982; Yalch and Spangenberg 1988). We therefore hypothesize that an inoffensive ambient scent has positive effects on evaluations of the environment, store merchandise in general, specific products, and approach behaviors.

H₁: The presence of an inoffensive ambient scent produces evaluations of the (a) store, (b) store environment, (c) merchandise in general, and (d) specific products that are more positive than those produced with no ambient scent present.

H₂: The presence of an inoffensive ambient scent, compared to no ambient scent, increases approach behaviors, including (a) intentions to visit the store, (b) purchase intentions for specific products, (c) actual and perceived time spent in the environment, and (d) products examined in the store.

Furthermore, we propose that the affective nature and intensity of the ambient scent influences the effect of the ambient scent on our dependent measures. Although our main interest is the scent/no-scent test of H₁ and H₂, the literature reviewed suggests the possibility of interaction effects between the affective quality and intensity of scents. With respect to the affective quality of scents, we examine relatively neutral and positively evaluated scents. We do not examine aversive scents, because a retailer is unlikely to purposely introduce an aversive scent into the store environment. Whether the scent is neutral or positive, we continue to expect that its presence enhances evaluations of the

environment and approach behaviors. Furthermore, on the basis of optimal arousal theory, we expect that the optimal or preferred intensity of a scent is lower for neutral than for pleasant scents (Berlyne 1971; McClelland et al. 1953). We also expect that as intensity increases beyond this optimal point, evaluations decrease. Because previous research has shown that evaluations of scents, on average, worsen as intensity increases (cf. Doty et al. 1978; Henion 1971; Richardson and Zucco 1989), we predict that at low intensities, neutral scents, which represent the average scent, have the most positive effect on store evaluations and in-store behavior. Therefore, we expect that evaluations of neutral (or average) scents are greatest at their lowest intensities, because these low intensities represent the optimal level. As intensity increases, arousal increases beyond what is optimal and evaluations become less positive. Thus, we expect the most positive evaluations for low intensities and the least positive evaluations for high intensities of these neutral or average scents, which results in a negative relationship between scent intensity and responses to the store for neutral scents. If positive evaluations of a scent diminish, then evaluations of the environment and approach behaviors may also do so.

Correspondingly, we expect that optimal intensity is higher for pleasant scents than for neutral scents. In other words, as intensity of a pleasant scent diffused into the environment increases toward an optimal point, evaluations of and approach behaviors in the environment tend to increase (Berlyne 1971). Once the intensity passes the optimal level, we expect to see a decrease in store evaluations and approach behaviors. For pleasant scents, this increase followed by a decrease results in an inverted U-shaped relationship between scent intensity and responses to the store (Anand and Holbrook 1986; Wundt 1874). This is consistent with previous research suggesting that even pleasant scents can be aversive at high levels of intensity (Gulas and Bloch 1995; Takagi 1989). And, as with H₁ and H₂, we expect these interactions to hold for merchandise and approach behaviors. Therefore, we hypothesize,

H₃: Scent intensity interacts with scent affect such that (a) low intensities of affectively neutral scents produce evaluations that are more positive than those produced with either moderate or high intensities of these scents and (b) moderate intensities of affectively pleasing scents produce evaluations that are more positive than either low or high intensities of these scents. This interaction effect occurs in evaluations of (1) the store, (2) the store environment, (3) merchandise in general, and (4) specific products.

H₄: Scent intensity interacts with scent affect such that (a) low intensities of affectively neutral scents produce stronger approach behaviors than do either moderate or high intensities of these scents and (b) moderate intensities of more affectively pleasing scents produce stronger approach behaviors than do either low or high intensities of these scents. This interaction effect occurs in the following approach behaviors: (1) intentions to visit the store, (2) purchase intentions for specific products, (3) actual and perceived time spent in the environment, and (4) products examined in the store.

Finally, we examine the effect of scent on mood by using Mehrabian and Russell's (1974) three-factor mood

scale consisting of six 7-point semantic differential items per factor. We do not formulate specific hypotheses concerning effects of ambient scent on mood, because theory has not been sufficiently advanced to enable the prediction of when to expect mood effects from environmental stimuli. Consistent with the mixed results regarding effects on mood in the literature, we find no main or interaction effects regarding scent on mood in our study and therefore do not discuss the construct hereafter.¹

Pretest

Purpose and Measures

Before conducting our main study it was necessary to pretest olfactory stimuli to identify their affective quality. In the pretest we were also interested in whether we could separate the affective dimension of the scent (e.g., good/bad) from its arousing (or activating) dimension (e.g., boring/stimulating). Relevant items from Fisher's environmental quality scale (Fisher 1974), previously used in environmental marketing research (Crowley 1993), were used to examine the dimensionality of scent evaluations and scale, or calibrate, the scents. This scale was also selected because it could be used later in the main study to measure evaluations of the environment as a whole. The items used from Fisher's scale consist of the following 7-point scales: negative/positive, unattractive/attractive, tense/relaxed, uncomfortable/comfortable, bad/good, boring/stimulating, unlively/lively, dull/bright, unmotivating/motivating, and uninteresting/interesting. We also included a 7-point perceived intensity measure (very weak to very strong).

Stimuli, Subjects, and Procedure

To identify scents that managers might consider acceptable, we visited the room freshener sections of local supermarkets, because these fragrances are used by consumers to scent their personal environments. Scents based on flowers, spices, woods, and citrus were observed. Additionally, a review of popular press aromatherapy reference books suggested the use of mints as having therapeutic and/or psychological effects (see, e.g., Rose 1992). All scents used in the study were natural essential oils (plant extracts obtained from flowers, plants, fruits, barks, etc.) purchased from a single supplier. We chose several scents within each of the five scent categories, which resulted in 26 individual scents (see Table 1).

Subjects were a convenience sample of 704 people (62% female) with a mean age of 26.1 years, who were intercepted near entrances to a student union building at a large northwest university. Subjects were randomly assigned in a between-subjects design to one of 26 different scent conditions; cell sizes ranged from 23 to 31 subjects. Subjects read and signed an informed consent form screening for allergies. They were then handed a vial containing the olfactory stimulus and a single-page survey containing the dependent measures (Fisher's [1974] 10 semantic differential items and

the perceived intensity measure) and general classification measures (i.e., age and gender). Subjects were invited to sniff the scent as often as they liked while completing the survey; most subjects sniffed the stimulus several times. Stimuli were presented in vials rather than as ambient environmental scents because this is the way retailers would initially choose a scent for use in their stores. Eleven drops of each oil were placed on a cotton ball in a tightly capped vial, labeled by scent number only and with no verbal descriptors. The vial was opaque to reduce the influence of color on judgments (Zellner and Kautz 1990).

Results and Discussion

Principal components factor analysis with an orthogonal rotation was conducted to determine whether one general affective dimension or separate affective and activation dimensions explained subjects' responses and to calibrate the scents on the resulting dimensions. Using the criterion of eigenvalues greater than one, two distinct factors emerged mirroring those of Crowley (1993), who identified the dimensions of affect and activation in evaluations of the color of retail environments. Items loading on Factor 1 were more affective in nature, including positive (factor loading = .81), attractive (.77), relaxed (.81), comfortable (.85), and good (.67). Items loading on Factor 2 were more activating in nature including stimulating (.78), lively (.79), bright (.74), motivating (.71), and interesting (.78). Table 1 shows factor scores of each test scent on the two dimensions.

The affective dimension captured most of the variance (52.5%), whereas the activation dimension explained considerably less (14.5%). To determine whether we could manipulate these two dimensions separately, we subsequently used an oblique rotation to assess the extent of their relationship and found a correlation of $r = .49$. This correlation suggests that it is difficult to manipulate the two factors independently (i.e., find scents eliciting high affective reactions yet low activation responses or vice versa). Although research in psychology suggests the existence of both affective and activation dimensions for scents, we know of no research that has explicitly demonstrated their independence.

Perceived intensity was not included in the factor analysis so that it could be used independently to control for intensity when choosing scents for the subsequent experiment. All scents were perceived as strong with 25 of the 26 scents having means between 5.0 to 6.3. This extreme perceived intensity is likely a function of smelling oils out of vials.

Effects of Ambient Scent in a Retail Environment

To test our hypotheses concerning the use of scent in a retail environment, we conducted a 2 (scent affect: neutral versus pleasing) \times 3 (scent intensity: low, medium, high) between-subjects study with a control (no scent) condition.

Stimuli and Measures

Several factors entered into our choice of affectively neutral and pleasing scents for the main study. All of our pretest scents were judged inoffensive. We initially screened scents

¹Tables of means of individual measures with respect to mood are available from the authors on request.

TABLE 1
Pretest: Olfactory Stimuli and Factor Scores^a

Scent Category	Individual Scent Tested	Number of Subjects	Affective Dimension Score^b	Activation Dimension Score^c
Florals:	Lavender ^d	30	-.26	-.09
	Ylang ylang	30	-.31	-.92
	Blue chamomile	26	-.78	.07
	Geranium	25	-.29	.06
Spices:	Cinnamon leaf	27	.17	.03
	Nutmeg	27	-.53	-.15
	Clove buds	26	.53	-.38
	Sage	27	-.32	.00
	Cardamom	25	-.30	.14
	Rosemary	29	-.17	.08
	Marjoram	31	-.33	.21
	Ginger ^d	30	-.62	-.31
Woods:	Juniper berry	26	-.36	.15
	Spruce	29	.16	.04
	Sandalwood	27	.25	-.61
	Cedarwood	27	-.07	-.37
	Birch	26	.66	.24
	Rosewood	23	.29	.16
	Pine	30	-.72	-.27
Citrus:	Lemon	26	1.11	.54
	Tunisian neroli	26	.31	-.15
	Bergamot	23	.17	.70
	Orange ^e	30	.37	.60
Mints:	Peppermint	24	.75	.10
	Pennyroyal	24	-.07	.14
	Spearmint ^e	30	.49	.35

^aFactor scores are for each scent from principle components factor analysis implementing orthogonal rotation in SPSSPC+.

^bScale items representing affect: positive attractive, relaxed, comfortable, and good.

^cScale items representing activation: stimulating, lively, bright, motivating, and interesting.

^dScents used in the main study: d = affectively neutral.

^eScents used in the main study: e = affectively pleasing.

according to pretest factor-score quartile and considered only scents in the same respective quartile on both the affect and activation dimensions. We chose two scents to represent each of the two affect conditions (neutral and pleasing) to alleviate idiosyncratic results due to the nature of either a particular scent or scent group. We also collapsed analyses across the two scents in each condition. This approach is common in studies on the effect of a stimulus on evaluations (e.g., Berlyne 1971, 1974; Moreland and Zajonc 1976, 1977). (Note that no statistically significant differences on dependent measures were found between scents within either affect group.) We also chose scents from four different scent groups to ensure that any effects found could not be attributed to a specific within-scent-group effect (e.g., we did not want to use two spices or two florals). Chosen scents were also approximately equal in perceived intensity, with ratings from the pretest ranging from 5.6 to 6.1 (a range of less than one-half of a standard deviation; Duncan multiple range tests indicated no significant differences in perceived strength between scents). We also selected scents that were judged to be neutral with regard to congruency or incongruity with the products we used in the simulated store environment or with products associated with store maintenance.

For example, though dimension scores suggest lemon or pine could have been used in the study, these scents are often associated with cleaning products (e.g., Bone and Jantrania 1992) and were therefore eliminated to avoid potential association with store (or laboratory) upkeep. Finally, we wanted to use scents that retailers realistically would use; Blue Chamomile, for example, was not chosen, because it is an expensive and unlikely candidate for large-scale commercial applications. Thus, the scents chosen for use in the study were lavender and ginger in the affectively neutral conditions and spearmint and orange in the affectively pleasing conditions.

In a separate pilot test conducted in the experimental room subsequently used for the main study, subjective scent intensity was further refined by testing perceived intensity after operating a scent diffuser for 15, 30, 45, 60, 75, 90, and 120 seconds (9-point scale of "The smell in the room is weak/strong"). For the low, moderate, and high intensity conditions in the main study, selected diffusion times were 15, 30, and 90 seconds, respectively. The diffuser was run in the experimental store environment for the specified time period at the beginning of the day and every 40 minutes (after every two subjects) thereafter. Only one scent per day

was diffused to avoid mixing odors, and the lab was fully ventilated overnight with a large exhaust fan to remove any lingering trace of the scent. Before beginning the study each morning, the room was “sniff-tested” by at least three experimenters; no odors were detected to have remained in the room or adhered to products. During the 20-week study, all scent conditions were counterbalanced across days of the week.

Subjects and Procedure

Subjects were 308 students recruited from undergraduate business classes at a large northwest university and were randomly assigned to one of thirteen conditions (twelve scented conditions and the unscented or control condition).² The twelve scented conditions consisted of one of the two affectively neutral scents diffused at either low, moderate, or high intensity or one of the two affectively pleasing scents diffused at either low, moderate, or high intensity. Subjects completed an informed consent form that contained allergy screening questions within a larger pool of questions. Scent was not mentioned at any point in the procedure to eliminate that potential demand effect. Of the total sample, 10 subjects were dropped from the analyses, because they mentioned scent at some point during the experiment and/or in response to the hypothesis-guessing question asked at the end of the experimental session (these subjects came from 10 different conditions). The final sample was 298 subjects (46% female).³

Subjects participated in the experimental procedure one at a time in a simulated store environment constructed in a consumer behavior laboratory. The simulated store environment was created in a room (16 × 20 feet), with the theme of “one-stop shopping” for students. The product categories represented included kitchen items, decor items (e.g., non-floral plants, fans, calendars, framed posters), clothing with the university insignia, books, school supplies, and outdoor athletic gear. Because none of these items emitted any detectable scents they could not be construed as being either congruent or incongruent with the chosen scents (e.g., few students are likely to associate products such as school supplies, tennis shoes, and framed posters with a particular scent). Furthermore, the scents we chose (lavender, ginger, spearmint, and orange) were particularly unrelated to any of the themes that might be construed as inherent in the products used (e.g., calendars including forest and other wilderness scenes). All laboratory assistants were instructed to

wear no perfume or cologne while administering the study to prevent introducing additional scents.

Subjects waited in a room that was remote from the simulated store so that no scent would reach them until they entered the laboratory store. In the waiting room, subjects were told,

This study is being conducted by a group of research students for a retail business that is considering locating near campus in the old Burger King building. The business would offer “one-stop shopping” for students, offering such products as items for dorm rooms/apartments, school supplies, etc. We are gathering input from students about this retail concept and have set up a simulated store so that you can see what the business will be like. Keep in mind that this is just a sampling of the products that the store will carry, to give you some idea of what the store will offer. You will be asked to rate the “store” and several products within the store.

Subjects were then handed a clipboard with the dependent measures (see Tables 2, 3, and 4) and taken into the simulated store, where they were invited to explore the store alone and at their own pace while completing the questionnaire. A laboratory assistant behind a one-way mirror recorded the time subjects entered and left the simulated store, the number of items subjects examined, and whether subjects made a scent-related comment at any point during the experimental procedure. On exiting the simulated store, subjects were asked to estimate how much time they had spent in the store, without looking at their watch. They were also asked to list any thoughts they had about the purpose of the experiment.

Dependent Measures

Evaluations of the store. Three 7-point scales were used to assess impressions of the store overall: bad/good, unfavorable/favorable, and negative/positive. A fourth 7-point scale (outdated/modern) was included to measure evaluations of the store’s image (cf. Bellizzi, Crowley, and Hasty 1983). We also used a two-part liking scale in which subjects were asked if they liked (coded as +1) or disliked (coded as -1) the store and were then asked, “How strongly do you like or dislike this store?” with a rating scale from 1 (not strongly) to 7 (strongly). The combination of these two measures produced a 14-point like/dislike scale ranging from -7 to +7.

Evaluations of the store environment. Fisher’s (1974) 13-item environmental quality scale was included to obtain evaluations of the environment (see Table 2 for endpoints of 7-point items). To these scales, a 7-point unpleasant/pleasant scale was added.

Evaluations of the merchandise. The following 7-point semantic differential scales from Bellizzi, Crowley, and Hasty’s (1983) work were used to assess perceptions of the merchandise: merchandise style (outdated/up-to-date), merchandise selection (inadequate/adequate), merchandise prices (low/high), and merchandise quality (low/high).

Evaluations of specific products. Subjects were required to evaluate three individual products, including a gray Jansport backpack (\$27.95), a Sierra Club calendar (\$9.95), and

²The use of students as subjects is of concern when they may not have the knowledge, experience, or educational background representative of the general population, and these differences affect responses on dependent measures. For the effect of scent on evaluations, however, there is no evidence from the literature that these characteristics or age (except for the elderly) affect the perception of scent or its effects on evaluative processes or approach behaviors. Thus, it is appropriate to use student subjects in this study.

³Tests for gender differences throughout our study showed no differences. Prior olfaction research has produced mixed results regarding variables, such as gender and the effects of smoking, indicating that these effects may be small and/or situational (Cain, Cometto-Muniz, and de Wijk 1992).

a third product of their own choosing. Subjects rated these products on the following 7-point scales: bad/good, unpleasant/pleasant, unfavorable/favorable, low quality/high quality, unattractive/attractive, and poor value/good value.

Intentions to visit the store. Intentions to visit the store were measured by asking, "Assuming you were going to purchase this type of merchandise and had the money, how likely would you be to visit this store?" (unlikely/likely; 7-point scale).

Purchase intentions for specific products. Subjects were asked, "If you were going to purchase (a backpack/a calendar/this type of product) in this price range, how likely would you be to purchase this particular (product)?" (very unlikely/very likely; 7-point scale).

Actual versus perceived time spent. Actual time spent in the simulated store environment (in seconds) was measured by a lab assistant. Perceived time spent in the environment was measured by asking subjects, "About how much time do you think you spent in the simulated store (just give us your best guess without looking at your watch)?"

Number of products examined. Before each subject entered the lab, all price tags were turned "price down." A lab

assistant behind a two-way mirror counted the number of price tags (attached by string) the subject examined within each product class.

Analyses and Results

We compared scent with no-scent conditions in our tests of H_1 and H_2 , both of which expected increased evaluations and approach behaviors in scented environments. Results are reported as MANOVA overall F-tests (to control for Type I error) for each subcategory of dependent measures, followed by planned univariate comparisons for the individual measures. The hypothesized interactions between scent affect and intensity on evaluations and approach behaviors (H_3 and H_4) were examined in a 2 (scent affect: neutral versus pleasing) \times 3 (scent intensity: low, moderate, high) MANOVA.

H₁: Impact of scent versus no scent on evaluations. Following a procedure recommended by Cohen and Cohen (1983, pp. 172–76), we conducted a MANOVA overall F-test of each of the subgroups of measures relevant to H_1 (included in Tables 2 and 3), followed by univariate tests of individual measures. The multivariate tests were significant: $F(6,291) = 5.51, p < .001$ for the 6 store variables;

TABLE 2
Mean Evaluative Reactions in the Presence Versus Absence of Ambient Scent

Evaluations	No Scent	Scent	F-Value ^a	$p =$
Store ^b	Mean	Mean		
Bad/good	4.49	5.11	13.91	.001
Unfavorable/favorable	4.27	5.10	22.84	.001
Negative/positive	4.65	5.24	10.10	.002
Dislike/like (2-point)	.10	.57	12.68	.001
Dislike/like (14-point)	.39	2.81	15.87	.001
Image: outdated/modern	3.76	4.72	19.05	.001
Store Environment ^c				
Unattractive/attractive	4.12	4.98	17.51	.001
Tense/relaxed	5.10	5.38	1.41	.123
Uncomfortable/comfortable	4.84	5.17	2.74	.099
Depressing/cheerful	4.35	4.90	11.57	.001
Closed/open	4.04	4.99	19.22	.001
Drab/colorful	3.63	4.72	25.53	.001
Negative/positive	4.47	5.11	12.04	.001
Boring/stimulating	3.75	4.40	8.79	.003
Bad/good	4.22	5.05	19.78	.001
Unlively/lively	3.73	4.35	8.02	.005
Dull/bright	4.00	4.58	7.36	.007
Unmotivating/motivating	3.84	4.40	6.67	.010
Uninteresting/interesting	4.03	4.87	13.72	.001
Unpleasant/pleasant	4.47	5.16	13.40	.001
Merchandise ^d				
Style: outdated/up to date	4.71	5.43	11.01	.001
Selection: inadequate/adequate	3.80	4.65	10.76	.001
Quality: low/high	4.81	5.48	12.50	.001
Prices: low/high	5.20	4.93	2.48	.116

^aUnivariate F-tests associated with (1,296) d.f.

^bMANOVA overall test of significance for 6 store evaluations.
 $F(6,291) = 5.51, p < .0001$.

^cMANOVA overall test of significance for 14 store environment evaluations.
 $F(14,283) = 3.50, p < .0001$.

^dMANOVA overall test of significance for 4 merchandise evaluations.
 $F(4,293) = 4.72, p < .001$

TABLE 3
Mean Evaluations of Specific Products in the Presence Versus Absence of Ambient Scent

Products ^a	No Scent	Scent	F-Value ^b	p =
Backpack	Mean	Mean		
Bad/good	4.33	4.80	3.95	.048
Unpleasant/pleasant	3.96	4.40	3.52	.061
Unfavorable/favorable	3.59	4.24	6.48	.011
Low quality/high quality	4.73	5.23	5.58	.019
Unattractive/attractive	3.00	3.71	5.72	.017
Poor value/good value	4.18	4.62	4.28	.040
Calendar				
Bad/good	5.65	5.70	.06	.806
Unpleasant/pleasant	5.77	6.02	2.36	.126
Unfavorable/favorable	5.45	5.76	2.38	.124
Low quality/high quality	5.28	5.77	7.42	.007
Unattractive/attractive	5.45	6.00	7.29	.007
Poor value/good value	4.90	5.23	1.99	.159
Self-Selected Product				
Bad/good	5.47	5.74	1.49	.223
Unpleasant/pleasant	5.35	5.78	4.21	.041
Unfavorable/favorable	5.57	5.80	1.06	.303
Low quality/high quality	5.14	5.68	6.40	.012
Unattractive/attractive	5.41	5.71	1.60	.207
Poor value/good value	5.10	4.78	1.35	.246

^aMANOVA overall test of significance for 18 product-specific evaluations.

F(18,279) = 2.34, $p < .002$.

^bUnivariate F-tests associated with (1,296) d.f.

F(14,283) = 3.5, $p < .001$ for the 14 store environment variables; F(4,293) = 4.72, $p < .001$ for the 4 merchandise variables; and F(18,279) = 2.34, $p < .002$ for the 18 product-specific variables (three products; six measures each). Thus, the MANOVA overall F-tests alleviated concern regarding Type I error for H_1 , which enabled us to proceed with the univariate comparisons.

In Table 2, we show results for univariate comparisons. Evaluations of the store overall and of the store environment in particular were more positive when the store was scented than when it was not scented, thus providing strong support for H_{1a} and H_{1b} . Specifically, in the scented conditions, the store was perceived as more favorable, good, positive, liked, and modern ($p < .002$). The store environment was rated more positively in the scented conditions on all variables ($p < .01$), with the exception of comfortable/uncomfortable ($p < .10$) and tense/relaxed ($p = .12$).

Similarly, evaluations of the merchandise in general in the scented environment were more positive (i.e., more up-to-date, better selection of, and higher-quality merchandise) than in the unscented environment, thus providing strong support for H_{1c} . This difference was large and statistically significant ($p < .01$) with one exception: Merchandise prices were viewed as lower in the scented than in the unscented store (directionally consistent with our hypothesis), but statistical significance was not evident ($p = .12$).

Although the MANOVA overall F-test for the 18 product-specific measures (see Table 3) is significant, univariate comparisons show mixed support for H_{1d} . In particular, all evaluations of the backpack were significantly more positive in the scented environment. However, there were fewer

significant differences for either the calendar or the self-selected product measures. Quality ratings were also more favorable ($p < .02$) in the scented conditions for all three products. Although our data do not specifically address the issue, impact of scent on specific product evaluations may have been moderated by attitude toward the product. As shown in Table 3, mean evaluations of the backpack are lower across the board than evaluations of the calendar or self-selected product. This suggests that ambient scent may improve evaluations of less pleasing products but may not significantly improve evaluations of products that already are evaluated positively. Alternatively, it is possible that these results stem from a restriction-of-range problem, because evaluations of the calendar and the self-selected product are relatively high in the unscented condition. Still, a restriction-of-range problem may reflect accurately how difficult (and perhaps unnecessary) it is to improve evaluations of well-liked products. This explanation is consistent with considerable evidence in psychology that affective state can influence responses to ambiguous or neutral stimuli but not to stimuli that are clearly positive or negative (cf. Ehrlichman and Bastone 1992a; Isen and Shalcker 1982).

H₂: Impact of scent versus no scent on approach/avoidance. The MANOVA overall F-test for all approach/avoidance measures in Table 4 was statistically significant (F(12,285) = 3.13, $p < .001$). A univariate test found that subjects expressed a stronger intent to visit the store in the scented condition, thus providing support for H_{2a} ($p = .003$).

Results regarding purchase intentions for specific products are similar to evaluation results in tests of H_1 . Specifici-

TABLE 4
Mean Approach/Avoidance Reactions in the Presence Versus Absence of Ambient Scent

Approach/Avoidance ^a	No Scent	Scent	F-Value ^b	<i>p</i> =
	Mean	Mean		
Intent to Visit Store	4.20	4.94	8.99	.003
Purchase Intentions (very unlikely/very likely)				
Backpack	2.29	2.97	5.84	.016
Calendar	4.40	4.42	.06	.936
Self-Selected Product	5.08	4.77	1.12	.291
Time Spent (in seconds)				
Actual Time	585.61	577.71	.11	.735
Perceived Time	660.82	576.01	5.38	.021
Difference ^c	-75.22	1.70	6.16	.014
Number of Product Tags Examined				
Outdoor	2.14	2.72	4.08	.044
Decor	1.65	2.02	2.91	.089
University	2.71	2.73	.00	.955
Kitchen	1.43	1.51	.10	.746
Books	.20	.14	.64	.425
School Supplies	2.24	2.28	.02	.897
Total ^c	10.35	11.39	1.03	.312

^aMANOVA over-all test of significance for 12 approach/avoidance items. $F(12,285) = 3.13, p < .001$.

^bUnivariate F-tests associated with (1,296) d.f.

^cApproach/avoidance MANOVA over-all tests were conducted without these two variables because they are linearly dependent on other variables (i.e., time spent and number of specific tags, respectively).

cally, there is a statistically significant difference between purchase intentions for the backpack in the scented and unscented store, but not for the calendar or the self-selected product, thus providing mixed support for H_{2b} . Again, this product-specific effect may result from initial overall purchase intentions being lower for the backpack than the other two products. This finding is not likely to result from a restriction of range, because purchase-intention means are closer to the midpoint of the scales. It is possible that ambient scent does not significantly increase purchase intentions for products to which consumers are already favorably disposed.

For time spent in the store (H_{2c}), subjects did not remain in the scented store longer than in the unscented store. Subjects in the scented store, however, perceived spending less time shopping than subjects in the unscented store ($p = .02$). The difference between actual and perceived time was also statistically significant ($p = .01$). Thus, though actual time spent did not vary, perceived time seemed to pass more slowly in the unscented environment, thus providing mixed support for H_{2c} .

With respect to product examination (H_{2d}), subjects in the scented store examined more outdoor products ($p < .04$) and decor items ($p < .10$) than subjects in the unscented store. For three of the four remaining product classes (kitchen items, university clothing, and school supplies) and for the total number of products examined, the means are not statistically significant. Thus, H_{2d} received limited support. Overall, our tests of H_2 indicate that the presence of ambient scent does increase some types of approach behaviors.

H_3 : *Interaction of scent affect and intensity on evaluations.* H_3 proposes an interaction effect of scent affect (neutral versus pleasing) with intensity (low, moderate, high) on the dependent variables used to test H_1 . MANOVA overall F-tests of each of the subgroups of measures were conducted. Results of the multivariate tests of significance were $F(12,474) = 1.07, p = .385$ for the 6 store variables; $F(28,458) = .64, p = .924$ for the 14 store environment variables; $F(8,478) = 1.54, p = .143$ for the 4 merchandise variables; and $F(36,450) = 1.02, p = .444$ for the 18 product-specific variables (three products; six measures each). Recognizing a risk of Type I error, these results did not justify presenting univariate tests across the individual measures. Thus, H_3 was not supported.

H_4 : *Interaction of scent affect and intensity on approach/avoidance.* The MANOVA overall F-test of the interaction between scent affect and intensity regarding all approach/avoidance measures was $F(24,462) = 1.09, p = .353$. This finding, as for H_3 , suggests a risk of Type I error. Univariate tests across individual measures are therefore unjustifiable, and H_4 was unsupported by our data.

Conclusions

Our research shows a difference between evaluations of and behaviors in a scented store environment and an unscented store environment. These differences were obtained despite there being no other changes in the environment than scent, notwithstanding that none of the subjects included in our analyses mentioned the presence of a scent. Although the presence or absence of a scent consistently affected evalua-

tions and behaviors, the nature of the scent itself appears to be less important. Scents that are at least neutral were found to produce these enhanced perceptions; the specific scent used did not matter as much as the presence of the scent. Similarly, the intensity of the scent (within a reasonable range so as not to become aversive) did not dramatically affect the results.

Of considerable interest was the finding that subjects in the scented condition perceived that they had spent less time in the store than subjects in the no-scent condition. And, subjects in the no-scent condition perceived having spent significantly more time in the store than they actually did; subjects in the scented condition did not show this discrepancy. Although similar to findings regarding the effects of environmental music (e.g., Kellaris and Altsech 1992; Milliman 1982), the current findings also are consistent with the concept of an optimal state of experience that has proven theoretically useful to several disciplines. This optimal state of experience is referred to as a state of *flow* (for a comprehensive review, see Csikszentmihalyi and Csikszentmihalyi 1988) and is associated with the quality of subjective experiences—one of which could be the retail shopping experience. A common feature of flow experiences is a distorted sense of time; the clock no longer serves as a good analog of the temporal quality of experience. This effect on time perception has been demonstrated in several contexts, including academic studying (Carli, Delle Fave, and Massimini 1988), playing chess (Francis 1987), and working at a fulfilling career (Lefevre 1988). Our findings suggest that ambient scent may lead to an enhanced subjective experience for retail shoppers (or an enhanced condition of flow); the time consumers spend examining merchandise, waiting in lines, or waiting for help may be made to seem shorter than it actually is by introducing ambient scent into the environment.

Further Research

An interesting avenue for further research highlighted by our study is the possible interaction between ambient scent and product characteristics on evaluations of and purchase intentions for a product. We found that evaluations and purchase intentions regarding the backpack were significantly more positive in the scented than in the unscented store. We did not find these effects for either the calendar or self-selected product. The two latter products were evaluated positively, whereas the backpack received moderate evaluations. This finding suggests that scenting the environment may have a greater impact on less favorably evaluated products. Still, there may be other dimensions on which these products differ that we did not capture in our measures, such as how involving they are, how utilitarian they are, or how much previous experience the consumer has had with the product class. Any of these factors may also influence the effect of scent on evaluations and should be included in additional research that examines the factors moderating the impact of store scenting on product evaluations and purchase intentions.

Also of interest for further research is a broader range of scents. Our focus was on inoffensive scents. We found little

difference among evaluations of the store when it was scented with affectively pleasing scents versus affectively neutral scents and found no interaction between scent affect and intensity. Although most managers are interested in scenting their environments with such scents, some may be concerned about the impact of offensive scents either in their store (e.g., a pet store) or surrounding their businesses (e.g., located near a paper mill) on their customers' shopping behavior. Significant interactions may have occurred had we used scents that differed more in their affective quality (i.e., our affectively neutral scents were merely relatively lower than the affectively pleasing scents, but were not unreasonable choices for use in a retail setting). In particular, we expect to see increased avoidance behaviors in a setting scented with environmentally unpleasant scents. Further research should be conducted using a broader range of scents and using scents to mask unpleasant odors (for research on offensive scents, see Rotton 1983; Rotton et al. 1978).

The generalizability of this study is limited, because it was conducted in a simulated store. Although research has shown that simulated store environments, including photographic representations of stores (e.g., Belizzi, Crowley, and Hasty 1983; Bitner 1990), provide useful results, further research should take this study closer to realism by conducting research in the field and scenting real stores. Research should also examine the effects of ambient scent in a wider variety of store types. Both of these needs for additional research provide interesting opportunities for collaboration between academics and practitioners.

Managerial Implications

The findings provide guidelines for managers of retail and service outlets concerning the benefits of scenting store environments with affectively neutral or pleasing scents. Certainly, further research will detect subtleties based on specific scents and intensities, but the main message for retailers is apparent: The presence of an inoffensive scent in a store is an inexpensive and effective way to enhance consumer reactions to the store and its merchandise. Within limits, the intensity and nature of the actual scent chosen appear to have little impact on consumer evaluations. Because of the latter finding, managers have a wide array of scents from which to choose. We suggest that in conjunction with choosing a neutral or pleasant, as opposed to unpleasant, scent, managers should consider three additional factors.

First, managers should seek to use distinctive scents. As store scenting becomes more popular, it is important that not all stores smell alike because this could eventually reduce the impact of scent on consumers by creating a sort of control (expected- or normal-scent) condition. Just as managers attempt to create distinctive environments that differ from their competition by using store layout, display, color, and so on, they also should consider scent as a mechanism for differentiating their store environment from others.

Second managers should take precautions in choosing scents that could be construed as either congruent or incongruent with their product offering. Recent research on the use of scents (Mitchell, Kahn, and Knasko 1995) has shown that ambient scents judged to be congruent (e.g., a floral

scent in a flower shop) versus incongruent (e.g., the scent of chocolate in a flower shop) have different effects on information processing and choice. To the extent that a store carries a broad array of products, it is likely that a scent judged to be congruent with one product category carried by the store will be incongruent with several other product categories. Because such a scent could positively affect choice processes for one category while negatively affecting choice processes for others, we encourage managers to choose a scent that cannot be construed as either congruent or incongruent with any single product or category. Thus, managers should be careful not to choose strongly scented products for use in store upkeep (e.g., lemon or pine scented cleaning products).

Third, because of the latitude managers have in choosing scents, we recommend careful attention to cost. Several

commercially available scenting oils are prohibitively expensive. A manager who undertakes store scenting on a regular basis must consider not only the most economical method of diffusing scents (e.g., diffuser or heating and ventilation system), but also the cost of the scents themselves.

In conclusion, our study suggests that scent is a potentially useful method by which a manager can increase positive evaluations of the store's environment and merchandise. Furthermore, the potential exists for using scent to increase intentions to shop at specific stores. Scent is a method by which managers can differentiate their stores. The considerations in choosing a scent are relatively uncomplicated and do not require extensive expertise to assess, which gives managers much freedom in creating uniquely pleasing and profitable store environments.

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