

RIGHT UNDER OUR NOSES: AMBIENT SCENT AND CONSUMER RESPONSES

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ABSTRACT: Despite frequent mention, we know relatively little about the effect of ambient environmental factors on consumer behavior. This paper discusses one important aspect of the environment, ambient scent. Based on research from several disciplines, a model describing the effect of ambient scent on consumers is proposed. Ambient scent is portrayed as an environmental cue that is compared with scent preferences to influence affective responses and ultimately approach-avoidance reactions. Moderators of these presumed relationships are also described. Suggestions for empirical research are provided and implications for marketing management are presented.

- Does the smell of bread baking in an oven help sell a house?
- Will shoppers linger more minutes in a store offering pleasant background scent?
- Are products sold in a pleasantly scented environment evaluated more favorably than if no scent was present?

The above questions suggest that scent can play a role worthy of exploration by consumer researchers. However, since virtually no consumer studies on scent have been conducted, the size of these effects and the mechanisms by which they may operate are not known. While researchers in psychology and olfaction have explored the effect of scent on human behavior, only recently have consumer researchers turned any attention to this topic. This small body of research has focused almost exclusively on product scents (Bone & Jantrania, 1992). The role of

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ambient scent on consumer behavior remains largely unexplored. Based on literature from several disciplines, a model describing the mechanism of scent effects on consumption is proposed. Suggestions for future research are also provided and implications for marketing management are described.

SCENT AND CONSUMER REACTIONS

Scent is relevant to consumption in two forms. The first reflects scent that is directly associated with an evaluation object, such as scented products or the scent associated with a salesperson. In the second instance, scent is part of the overall ambient environment.

Scented Products

A visit to any supermarket will make it clear that scent is added to products to increase their appeal to consumers. Dishwashing soap is scented with lemon while facial tissues receive floral scents. The preponderance of scented goods is further in evidence from the need to highlight unscented offerings such as Cheer-Free detergent. Several studies support this marketing practice with findings that pleasant scents directly associated with a product increase the favorableness of consumer evaluations. In an early experiment, Laird (1932) tested the effect of scent on product quality perceptions. Subjects evaluated four pairs of hosiery, differing only in scent. Although researchers did not ask the subjects to smell the hose, 50% of the subjects preferred narcissus scented hose while only 8% of the respondents preferred the unscented hose. Respondents attributed their preferences for the scented hose to nonfragrance attributes such as durability, sheen, and weave. Baron (1983) conducted a study in which subjects evaluated confederates acting as applicants in mock job interviews. Applicants wearing scent were rated higher on several job related abilities than were candidates not wearing scent. More recently, Bone and Jantrania (1992) found that a product-appropriate scent enhanced product evaluations, while inappropriate scents lowered evaluations. However, it is not clear from this finding what makes a certain scent appropriate. These results may simply indicate a consumer's ability to learn scent-product pairings that have been used by marketers for years.

Ambient Scent

The findings noted above indicate that scent attributed to a product has the ability to influence evaluations of that product. Potentially of

greater interest to consumer researchers are the effects of ambient scent. Marketing researchers have long believed that the environment in which products and services are delivered has a significant impact on marketplace responses. This point has been made in the context of situational effects (Belk, 1975; Lutz & Kakkar, 1975) and in the work on retail atmospherics (Donovan & Rossiter, 1982; Grossbart, et al., 1990; Kotler, 1973; Obermiller & Bitner, 1984). Unlike product scents, ambient scent can potentially influence reactions to all products sold in a given setting, including those that would be difficult or inappropriate to add fragrance.

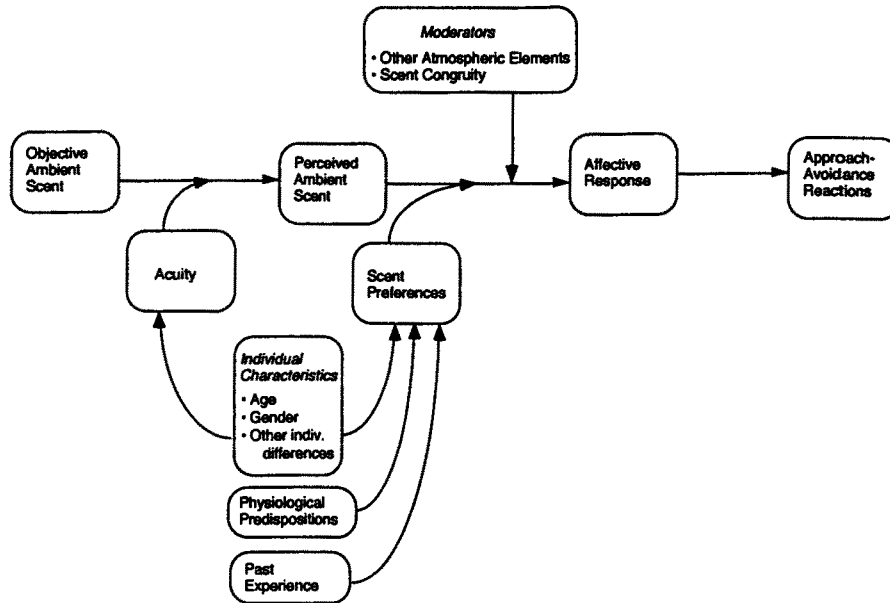
Several researchers have developed classification frameworks for environmental variables. Kotler (1973) posited four environmental dimensions: visual, aural, olfactory, and tactile. More recently, Baker (1986) provided a taxonomy of environmental cues that included design factors, social factors, and ambient factors. In environmental psychology, Hall (1966) described three types of environmental cues: fixed feature elements (such as walls and floors), semi-fixed feature elements (such as furniture type and arrangement, window displays) and non-fixed feature elements (such as ambiance and people in the environment). Despite differences across these taxonomies, each contains an ambiance component that includes elements such as temperature, lighting, sounds, and scents.

Although essentially unstudied in consumer behavior, ambient scent appears to have the ability to influence consumption activity. A recent study reported that when a pleasant ambient scent was introduced to one section of a casino, slot machine gambling significantly increased compared with non-scented periods in the same area (Hirsch, 1992a). Lipman (1990) reported that the introduction of a pleasant ambient scent increased lingering time in a retail store. In another study, Kirk-Smith and Booth (1987) found that under conditions of pleasant ambient scent, subjects provided higher attractiveness ratings of people in photographs as compared to the unscented condition. Because of its relevance to a variety of products and retail settings and its lack of research attention, ambient scent will serve as the primary focus for this paper. In the next section, the methods by which ambient scent may influence consumer reactions are discussed.

PROPOSED MODEL OF AMBIENT SCENT EFFECTS

By what mechanism do ambient scent effects occur? In the sections that follow, a conceptual model of ambient scent effects is proposed (see Figure 1). This model is congruent with larger scale models of environmental effects (Mehrabian & Russell, 1974; Bitner, 1992) and incorpo-

Figure 1
Proposed Model of the Influence of Ambient Scent on Consumer Responses



rates those concepts that appear most promising in explaining the role of ambient scent in influencing consumer behavior.

PERCEIVED AMBIENT SCENT

Ambient scent must be perceived in order to influence consumer behavior. Perceptions of ambient scent are expected to be a function of the objective scent levels in the physical environment and the smell acuity of the consumer.¹ Although human olfaction is not as well developed as in many other mammals, it is none-the-less remarkably acute (Doty, 1981; Freedman, 1993). There is, however, a wide variance in the acuity of human olfaction and much of this variation appears to be systematic. For example, a cross cultural study by Doty and his colleagues found that women consistently out-performed men in odor identification ability (Doty, et al., 1985). Other variables such as age level, illness, and

¹Being able to perceive a scent does not necessarily mean being able to recognize a specific odorant, however. Scents are often perceived without the individual being able to name the odorant or identify the specific source of the scent.

smoking also have been found to depress levels of smell acuity (Engen, 1982; Freedman, 1993; Van Toller, Dodd & Billing, 1985).

SCENT PREFERENCES

As shown in Figure 1, scent preferences in combination with consumers' perceptions of ambient scent influence affective responses. Despite notable individual differences in scent preferences, there are some generalizations that can be made. Moncrief (1970) noted that some smells are universally considered to be unpleasant. Many of these odors are members of the chemical family of mercaptans including decaying vegetation, spoiled milk, and skunk secretions. In these instances, scent preferences serve a defensive purpose, protecting us from illness or danger. Moncrief also reported that floral scents tend to be consistently viewed as pleasant across cultures and individuals. Research has also shown that babies only a few hours old make facial expressions indicative of pleasure when exposed to pleasant food odors (Doty, 1991). These findings suggest that some scent preferences may be essentially hard-wired.

Interestingly, there is also evidence that age and gender may influence scent preferences, that differ from preferences held by other generations (Hirsch, 1992b). For example, people born before 1930 are more likely to have positive nostalgia induced by nature scents (e.g., pine, hay, grass, horses) than those born after the 1930s. Similarly, smells such as sweet tarts and playdough have been demonstrated to evoke nostalgia among those born between 1930 and 1979 (Hirsch, 1992b).

Although some scent preferences are physiological in origin, others may be conditioned responses to past experiences. The olfaction literature indicates that scent can be used as a conditioning stimulus and that olfactory memory lasts longer than visual memory (Benderly, 1988; Kirk-Smith & Booth, 1987; Kirk-Smith, Van Toller & Dodd, 1983). In addition, both anecdotal evidence and scholarly research have indicated that scents paired with an experience often become powerful cues for that experience for years to come (Laird 1935; Richardson & Zucco 1989). For example, a consumer may have a strong positive preference for the smell of peach ice cream due to associations with many enjoyable Fourth of July picnics. Shared past experience may help explain age and gender differences in scent preferences.

Affective Responses

According to the proposed model, perceived ambient scent in combination with preexisting scent preferences produces affective reactions.

For example, shoppers encountering a floral scent that meshes with their preferences may experience some elevation in mood. Researchers have described olfaction as an affective phenomenon with the primary response to scent being liking or disliking (Ehrlichman & Halpern, 1988). Additionally, a recent review of the literature concludes that while consistent mood effects due to scent are elusive, evidence for such effects is mounting (Lawless, 1991).

Affect is expected to be a particularly relevant reaction to ambient scent due to the nature of olfaction itself. Because much of the olfactory system is subcortical, models of scent effects typically allow for a non-cognitive component (Doty, 1981; Lorig & Schwartz, 1998). The sense of smell differs from sight and hearing in that odors enter the limbic lobe of the brain directly (Gibbons, 1986; Stoddart, 1988). "Virtually no mental effort is involved in experiencing odor. . . odors are simply there" (Ehrlichman & Halpern, 1988, p. 770). Studies have shown that scent affects brain wave patterns as measured by an electroencephalograph (EEG) (Lorig & Schwartz, 1988; Lorig & Roberts, 1990). Buck and Axel (1991) suggest the presence of a pre-conscious or subconscious effect by noting that many scents are classified as pleasant or unpleasant within the nose itself.

In considering the relationship of ambient scent to affect, the argument for a non-cognitive response should not be viewed as an argument against cognitive effects. Baron (1983) and others (e.g., Knasko, Gilbert & Sabini, 1990) have shown that scent effects are also subject to cognitive mediation. One brain wave study (Lorig & Roberts, 1990) indicated that EEG modification under scent conditions may be due, in part, to cognitive activity. These findings suggest that scent may operate in both cognitive and non-cognitive arenas.

As indicated in the model, there are potentially significant moderators of the relationship between ambient scent perceptions and affective responses. Atmosphere is multidimensional and non-scent characteristics of the environment may influence the level of affective responses that would otherwise result from scent alone. For example, the effects of a pleasant, nostalgia-evoking scent might be increased by the presence of pleasant, nostalgic background music. The combination of these factors may be greater than the sum of the parts. On the other hand, a pleasant floral scent is unlikely to overcome the effects of a poorly lighted, uncomfortably warm, overcrowded, noisy environment.

Bone and Jantrania (1992) suggest that the congruity of a product's scent with other product characteristics influences scent reactions. A similar moderation may occur in the case of ambient scent. For example, the perceived congruity of a scent with other atmospheric elements may serve as a moderator. In other words, a pleasant scent may not elicit positive affective responses when that scent is mismatched with other features of the environment. A floral scent that is regarded as pleasing

in isolation may be seen as inappropriate for a motorcycle dealership and fail to elicit the expected positive affect.

Approach-Avoidance

As indicated on the right side of the figure, affective responses to ambient scent are expected to result in approach or avoidance reactions relevant to the consumption situation. Environmental psychologists have developed a large body of literature to address the impact of physical environments on individuals (cf., Mehrabian, 1976; Rapoport, 1982). According to this literature, perceptions of environmental conditions determine whether an individual is either attracted to or repulsed by features of the environment. In the context of services, Bitner (1992) described approach behaviors as an attraction for the service location, a willingness to stay longer, and a tendency to spend money on site, among others. Avoidance was defined as opposite responses.

Researchers have shown that several environmental elements influence consumers' approach and avoidance responses, and scent is likely to have similar effects. Milliman (1982, 1986) showed that music influenced approach behaviors such as spending levels and length of stay in the environment. Other researchers have looked at store crowding as an ambient element that increases avoidance reactions in retail environments (Eroglu & Machleit, 1990; Harrell, Hunt, & Anderson, 1980). In retail settings where the ambient scent is congruent with consumers' scent preferences, a positive affective reaction is expected to occur leading to an increase in approach reactions.

As suggested by Bitner (1992), positive evaluations of the store setting and its merchandise represent another non-behavioral category of approach responses. In support of this conclusion, Gardner (1985) posited that a consumer's mood state may be transferred to the product or store to which it is associated. Several other researchers have found that mood influences consumer evaluations of products (Dube-Rioux, 1990; Hill & Gardner, 1987; Mano, 1989) and stores (Dawson, Bloch & Ridgway, 1990; Donovan & Rossiter, 1982). If ambient scent alters a consumer's mood, evaluations of the store and its products also may be influenced. The remainder of this paper addresses issues relevant to the empirical investigation of ambient scent and those issues of potential importance to managers.

EMPIRICAL INVESTIGATIONS OF AMBIENT SCENT EFFECTS

This paper has discussed ambient scent as a potentially important, yet under-researched dimension of the retail or service environment. As such, it is important for both consumer researchers and managers to

gain insight into the effects of ambient scent. The proposed model gives rise to several questions worthy of future study.

First, future research concerning age and gender differences in scent preferences appears valuable. For example, following the lead of Hirsch (1992b) on nostalgia might suggest ways to target specific age segments with appropriate types of ambient scent. Researchers also might investigate the extent to which marketers can condition preferences for scent.

The nature and degree of interaction between ambient scent and other features of the environment also represents a potentially important research direction. In particular, researchers might profitably explore the nature and degree of interaction between ambient scent and design features of the environment. Similar work could highlight interactions with the social milieu of the setting and the interaction of scent and other ambient components of the environment.

Also of interest is the degree of affect transfer from ambient scent to the environment and the objects contained in the environment. Perhaps perceived product quality can be influenced by the scent of the setting in which an item is sold. If ambient scent influences store image, retailers may wish to know if particular scents are more congruent with a desired image. For example, would a scent of fine leather be more likely to reinforce an upscale image than would floral scents. Would this or similar effects differ by gender and/or age? In addition, such research could be used to determine whether these scent effects are curvilinear with more obtrusive scent levels lowering product and store evaluations.

The exact nature of the affective responses to ambient scent provide another research avenue. Such investigations would be used to determine whether these reactions are best captured by concepts such as mood, pleasure, or simple liking. In addition, this research could indicate whether such reactions are a function of personal relevance. In other words, are consumers who are highly involved in information processing less likely to be influenced by a peripheral cue such as ambient scent?

Research could also be used to determine which approach-avoidance reactions are most affected by scent? Does scent most influence lingering, willingness to explore, willingness to interact with others in the environment, the likelihood of return to the setting, spending levels, or product evaluations?

Finally, future research might address the possible extension of ambient scent effects to a non-retail context. For example, do the scented inserts common in fashion magazines create a pleasantly scented environment that may positively influence impressions of other ads encountered in the publication? Or alternatively, are these scent levels obtrusively high thus causing a negative reaction?

Before one can effectively examine these and other research ques-

tions, several methodological concerns must be addressed. The first area of concern is the selection of the scent stimuli to be used in the research. Selecting an appropriate scent from the approximately 10,000 different odors that the average human can detect (Benderly, 1988) is indeed a daunting task. For consumer researchers, interest will be on approach responses and thus on the selection of pleasant scents. Moncrief (1970) suggests that floral scents are most commonly preferred. Consumer researchers exploring scent would be well advised to pretest numerous scents. Several authors have noted that subjects tend to have difficulty in verbalizing scent preferences (Engen, 1982; McCartney, 1968). Because of potential respondent fatigue and scent wearout, even rank order measures may prove unwieldy. Thus, paired comparisons of different scents may prove a viable research option.

Similarly, appropriate levels of scent to use must be determined through pretests. It is important that scent stimuli be strong enough to be perceived by the majority of subjects, yet be low enough to remain pleasant. Even appealing scents may become aversive at very high levels. Due to individual differences in smell acuity, it is desirable to pretest both the fragrance selection and the level to be used on a sample representative of the target population. The assessment of individual differences in pretest subjects is facilitated by the availability of the Smell Identification Test that provides a standardized measure of smell acuity (Doty, Frye & Agrawal, 1989).

Another area of concern involves the dependent measures used in studies of ambient scent effects. Such effects are expected to be subtle and dependent measures must be sensitive enough to detect even small variations in such variables as product evaluations and purchase intentions. Multi-item scales and multiple measurement techniques should be used wherever possible.

Finally, researchers conducting experimental studies should guard against demand artifacts. Subjects in lab studies presented with high ambient scent levels and given no explanation for this scent may engage in hypothesis guessing, potentially creating a demand bias. This demand artifact may be exacerbated through the use of within-subject designs and contrived settings. One solution is to provide subjects with a plausible explanation for the scent that they may notice. Of course, field experiments in which consumers do not realize they are experimental subjects also may prove useful.

CONCLUSIONS AND MANAGERIAL IMPLICATIONS

For decades, retailers and other managers have recognized that the ambiance of a business establishment can play a vital role in the success or failure of the business. Millions of dollars are spent by retailers each

year on special lighting, background music, carpeting, and fixtures, all with the hope of creating an atmosphere that is conducive to retail success. Some retailers are currently exploring the use of ambient scent in an attempt to create a more favorable olfactory environment (Hinds, 1988; Post, 1991). For example, the scent of fresh bread has been used to make the culinary section of department stores more appealing. However, decision making in the area of atmospheric is still largely based on trial and error or intuition. Unlike decision areas such as pricing and promotion, there is relatively little atmospheric research to provide guidance. Thus, any research in the area of atmospheric can provide vital information for managers. This fact is particularly true in the area of scent effects, an area that has been largely overlooked. Research into the effects of scent may also help our understanding of ambient effects and situational variables in general. By detailing the effects of one situational variable, ambient scent, we may gain insight into the overall importance of this group of variables and the amount of variance that might be explained by them. The effects of ambient scent are right under our noses, yet they are little studied and little understood.

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