



Olfaction and Human Social Behavior: Effects of a Pleasant Scent on Attraction and Social Perception

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A total of 94 undergraduate males participated in an experiment designed to examine the impact of a pleasant scent (perfume) on interpersonal attraction and social perception. Subjects met and interacted briefly with one of two female confederates who either wore perfume or did not, and who were dressed either neatly (in a blouse, skirt, and hose) or informally (in jeans and a sweatshirt). Results indicated that the presence of a pleasant scent increased attraction toward the confederates and produced positive shifts in perceptions of several of their traits when they were dressed informally. When the confederates dressed in a neater manner, however, opposite effects were observed. These findings were interpreted as stemming from the fact that subjects reacted more favorably to the confederates when they appeared to be intermediate rather than high or low along a dimension of informality—formality.

Each year, advertisers spend huge sums in an attempt to convince consumers that emitting a pleasant scent is crucial. Ads for perfumes, colognes, shampoos, soaps, and many other products suggest that a pleasant scent is the key to both love and personal happiness. Judging from the sales of such products, millions of persons are indeed persuaded by these messages (Brady, 1978). In short, there seems to be a general and widespread belief that scent plays an important role in human social relations. But is this actually the case? Surprisingly, little direct evidence exists on this issue. A large body of research has examined the role of scent (especially pheromones) in the social behavior of animals (Doty, 1976; Leshner, 1978). However, only a few studies have examined corresponding effects among humans (Baron, 1980; Morris & Udry, 1978; Rotton et al., 1978). Thus, at present, relatively little is known about this potentially important phenomenon.

Despite the absence of a large body of relevant evidence, however, there seem to be clear grounds for anticipating an effect of scent on at least two aspects of social interaction: attraction and social perception. With respect to attraction, a large body of research suggests that when individuals are associated or paired

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with positive stimuli, liking for them increases (Byrne & Clore, 1970). In view of such results, it seems possible that the presence of pleasant aromas, too, may serve to enhance interpersonal attraction.

Turning to social perception, no direct evidence for an effect of scent appears to exist. However, many studies indicate that noticeable characteristics of other persons, such as their attractiveness, race, and sex exert powerful effects on our perceptions of their traits (see, Schneider, Hastorf, & Ellsworth, 1979). In view of such evidence, it seems only reasonable to expect that scent—which is a highly noticeable aspect of others' total stimulus pattern—may also exert such effects.

The present study was designed to provide preliminary information concerning the potential effects of a pleasant scent on both of these aspects of social behavior. Specifically, it was designed to determine if pleasant scents do in fact enhance attraction toward the persons who emit them, and also influence perceptions of the traits possessed by such persons. The basic procedures employed to investigate these effects were quite straightforward. Male subjects met and interacted with one of two female confederates who either wore or did not wear a measured amount of perfume. Following this meeting, they indicated their attraction for the confederate they met, and also rated her on a number of different traits. It was tentatively predicted that the presence of a pleasant scent would enhance attraction toward the confederates, and would also influence subjects' perceptions of several of their traits.

Because it seemed possible that the impact of scent is mediated by other aspects of a stranger's appearance, a second factor—the confederates' mode of dress—was also varied. In one condition, they dressed very neatly in a skirt, blouse, and hose. In another, they dressed informally in jeans and a sweatshirt. It was anticipated that this factor might interact with the presence of a pleasant scent in influencing both attraction and social perception. Specifically, it was tentatively predicted that the impact of a pleasant scent might be stronger in the presence of additional positive cues (that is, neat dress) than in their absence.

METHOD

Subjects and Design

Subjects were 94 undergraduate males enrolled in introductory psychology at Purdue University. They participated in the experiment in order to satisfy a course requirement. Two female undergraduates who differed somewhat in physical appearance served as confederates.

A 2×2 factorial design based upon the presence or absence of perfume and two modes of dress by the confederates (neat, informal) was employed. Subjects were randomly assigned to each of the cells of this design as they appeared for their experimental appointments.

Procedure

The study was described to subjects as one dealing with the manner in which individuals form first impressions of others. It was explained that in order to investigate this topic, they and their partner (the confederate) would respond

verbally to a series of questions posed by the experimenter (for example, "What are your career plans or goals?" "What are your favorite hobbies or leisure time activities?"). They would then use the information they had acquired about their partner in this manner to form a first impression. On each question, the confederate responded first, followed by the subject. The confederate's replies were based on a memorized script, specifically designed to be totally noncontroversial. The two individuals sat side by side during this portion of the session. Thus, they were fully visible to one another. Following the subject's response to the last question, both individuals completed a "First Impression Form." This form contained the major dependent measures of attraction and social perception. After these forms were collected, a thorough debriefing was conducted. No subjects expressed suspicion or indicated that they had guessed the true purpose of the study during these sessions.

Presence or absence of perfume. In the *perfume* condition, the confederate placed two drops of perfume behind each ear prior to the start of the session. In the *no perfume* condition she did not follow these procedures, and wore no scent. The perfume employed was named "Jungle Gardenia," and was rated by a panel of 5 undergraduate males as being both pleasant and potent in terms of its olfactory properties.

Confederates' mode of dress. In the *neat dress* condition, the confederates wore a blouse, skirt, and hose. In the *informal dress* condition, they wore a sweatshirt and jeans. In all other respects, their appearance was identical in the two conditions.

Dependent measures. The first 20 items on the "First Impression Form" were designed to assess subjects' perceptions of the confederates. Each item required subjects to rate the confederate they met on a different dimension. Ten of these were perceived by undergraduate judges as being relevant to personal appearance (such as, conceited—modest; neat—sloppy; unromantic—romantic). Ten other dimensions were judged to be irrelevant to personal appearance (such as, patient—impatient; energetic—lazy; generous—stingy). In all cases, ratings were made on 7-point scales. (It was anticipated that the dependent variables would affect ratings only on the first set of dimensions.)

Two other items on the "First Impression Form" required subjects to rate their liking for the confederate (did not like—liked very much) and how attractive they found her to be (very unattractive—very attractive). These items provided the major dependent measures of attraction.

RESULTS

Preliminary analyses revealed no confederate effects for any of the dependent measures. In view of this fact, the data for both individuals were combined in all subsequent analyses.

Interpersonal Attraction

Separate analyses of variance were performed on subjects' ratings of liking for the confederates and the attractiveness of these persons. In both cases, only

TABLE 1 Mean Ratings of Liking for the Confederates and of the Confederates' Attractiveness

Mode of Dress	<i>Liking for the Confederates</i>		<i>Confederates' Attractiveness</i>	
	<i>No Perfume</i>	<i>Perfume</i>	<i>No Perfume</i>	<i>Perfume</i>
Informal	5.09 _a	5.87 _b	4.87 _a	5.50 _b
Neat	5.58 _b	5.00 _a	5.67 _b	4.91 _a

Note: Means within each dependent measure that share a common subscript do not differ significantly ($p < .05$) by Duncan multiple-range test.

one effect was significant: the interaction between perfume and mode of dress, $F(1,93) = 11.01, 13.36, p < .002, p < .001$, respectively. The means for both measures are presented in Table 1. As can be seen from this table, the pattern of the interaction was identical in each case. Specifically, the presence of perfume increased subjects' liking and attraction for the confederates when they dressed informally ($p < .05$). However, perfume seemed to reduce subjects' liking and attraction for the confederates when they dressed neatly, in somewhat more formal attire ($p < .05$). Thus, perfume did indeed appear to influence interpersonal attraction, but the effects of this variable were mediated by the confederates' mode of dress.

Measures of Social Perception

In order to determine whether perfume and mode of dress influenced subjects' perceptions of the confederates, separate multivariate analyses of variance were performed on the 10 items judged to be unrelated to personal appearance, and the 10 items judged to be related to this dimension. As expected, results for the analysis on the unrelated items yielded no significant effects. In contrast, the multivariate analysis performed on data for the 10 related items yielded a significant effect of dress, $F(10,81) = 2.17, p < .03$, by both Wilks-Lambda and Hotellings tests. Further, the interaction between perfume and mode of dress approached, but did not attain, significance, $F(10,81) = 1.44, p \approx .15$. Follow-up univariate analyses indicated that the main effect for mode of dress stemmed primarily from ratings on two dimensions: confident—lacking in confidence, and neat—sloppy. Subjects perceived the confederates as significantly more confident when they dressed informally ($M = 5.02$) than when they dressed more neatly ($M = 5.50$), $F(1,93) = 4.10, p < .05$. Further, they perceived the confederates as being neater when dressed in a skirt, blouse, and hose ($M = 5.65$) than when dressed in jeans and a sweatshirt ($M = 6.31$), $F(1,93) = 12.73, p < .001$.

Turning to the trend toward an interaction between perfume and mode of dress, univariate analyses indicated that this finding stemmed primarily from ratings on two dimensions: cold—warm and unromantic—romantic. The

interaction between perfume and mode of dress was significant in both cases, $F(1,93) = 8.77, 4.80, p < .005, p < .03$, respectively. These interactions reflected the fact that the presence of perfume led to more positive perceptions of the confederates when they were dressed informally, but to less favorable perceptions when they were dressed more neatly. Specifically, in the informal dress condition, the confederates were perceived as warmer ($M = 5.78$) and more romantic ($M = 4.83$) when they wore perfume than when they did not ($M = 4.96, 4.61$). In contrast, in the neat dress condition, they were perceived as colder ($M = 5.46$) and less romantic ($M = 4.66$) when they wore perfume than when they did not ($M = 5.70, 5.25$).

DISCUSSION

Results offered support for the view that important aspects of social behavior can be affected by the presence of a pleasant scent. However, the pattern of effects obtained was relatively complex. Perfume did not increase attraction toward the confederates in a consistent or uniform manner. Rather, it exerted such effects only when they were dressed informally. When the confederates dressed neatly, in contrast, the presence of perfume actually seemed to reduce attraction. Similarly, perfume led to positive shifts in social perception only when the confederates dressed informally. When they dressed neatly, opposite effects occurred. Thus, it appears that the impact of a pleasant scent on both attraction and social perception may be strongly mediated by other factors, such as an individual's mode of dress.

At first glance, the pattern of the interaction between perfume and mode of dress seems to be counterintuitive. However, one possible explanation for its occurrence can be readily suggested. It may be the case that perfume, like style of dress, influenced subjects' perceptions of the confederates along a dimension of informality—formality. That is, the confederates may have been perceived as most formal when both dressed neatly and wearing perfume, but as least formal when dressed in jeans and not wearing perfume. Subjects may then have reacted most positively to the confederates when they appeared to be intermediate along this dimension, and so most similar to themselves (that is, in the perfume-informal dress and no perfume-neat dress conditions). Some support for this interpretation is provided by the fact that during debriefing sessions, many subjects noted that they viewed the confederates as aloof and unattainable when they were both dressed up and wore perfume. Additional evidence on the validity of this and related interpretations can be obtained in future studies through the inclusion of appropriate questionnaire items (for example, ratings of the confederates along a formal—informal dimension; measures of subjects' perceived similarity to the confederates).

At this point, it is important to note that the present findings were obtained only with males. Thus, the extent to which they may be generalized to females remains unclear. Research conducted with many animal species suggests that both males and females are influenced by scent (see Keverne, 1977). Thus, there

do not seem to be any strong grounds for assuming that human males and females will differ sharply in this regard. However, the possibility of such differences exists, and must be examined in further investigations.

To conclude: the present research provides preliminary evidence for the view that scent can play an important role in human social behavior. It also suggests, however, that the impact of this factor is mediated by other variables. As a result, it is more complex than has previously been assumed. While pleasant aromas sometimes exert positive effects on social behavior, they do not always do so. Thus, contrary to what advertisements often suggest, unquestioning faith in the benefits of perfume, cologne, and similar products does not seem justified.

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