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Does perfume really make women more attractive as the advertisements claim? This study examines this question by comparing people's perceptions of women who use four levels of perfume, ranging from no perfume to several sprays of perfume. Results showed that women are seen as less attractive when they wear a lot of perfume. However, men's rating of women's attractiveness were highest in the "light" perfume condition, suggesting that a little perfume might be better than none. Taken together, the results suggest that there can be "too much of a good thing" when it comes to applying perfume.

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The Effects of Perfume Use on Perceptions of Attractiveness and Competence

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There is a growing body of research demonstrating the psychological, emotional, and physiological responses humans experience in response to various scents, fragrances, and airborne chemicals. For instance, it has been well established that exposure to pheromones can affect the regulation of ovulation in women (McClintock, 1971; Stern & McClintock, 1998). More recent research shows that levels of cortisol in women can be affected by smelling a component of male sweat (Wyart et al., 2007). Smelling a sex-steroid derived compound has been shown to affect the mood of women (Bensafi, Tsutsui, Khan, Levenson, & Sobel, 2004). Airborne exposure to underarm odor has produced rapid mood changes, including reduction in depressive mood, in research participants (Chen & Haviland-Jones, 1999). Finally, both men and women have shown the ability to correctly identify fear and happiness from the body odor of the persons experiencing the emotions (Chen & Haviland-Jones, 2000).

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Research has examined various social and behavioral responses to olfactory information as well. For example, women's perceptions of the attractiveness of men's body scent can differ as a function of their fertility cycle (Thornhill, Gangestad, Miller, Scheyd, McCollough, & Franklin, 2003). In a simulation of a hiring procedure, Sczesny and Stahlberg (2002) found that interviewees were more likely to be "hired" when wearing a typically masculine rather than feminine perfume. In another simulated interview study, Baron (1986) had confederate interviewees engage in positive or neutral nonverbal cues while wearing or not wearing perfume. Men rated the future success of the interviewees lower when both positive cues and perfumes were used than cues or perfume alone. When "real world" employers offered their thoughts on various men's and women's fragrances, both men and women cautioned against wearing strong fragrances or fragrances that "permeated the space and lingered in the room" (Fiore & Kim, 1997, p. 256).

In spite of the increasing attention that olfactic research is receiving in other fields, olfactic codes still receive rather short shrift in communication research. Not surprisingly, nonverbal textbooks tend to follow this pattern as well. Andersen (1999) points out that a number of authors of nonverbal textbooks see fit to include a chapter on olfactics, suggesting we at least acknowledge the role that olfactory information plays in communication. Still, the attention given olfactory codes in our texts and our research belies the billions of dollars spent on, and the effort that goes into manipulating, our personal fragrance and our immediate local atmosphere.

Clearly (at least in many parts of Europe and North America), people do seem to have an ongoing interest in how others perceive and evaluate their olfactory cues. In the United States we spend billions of dollars every year to manipulate our various personal and environmental smells. We consider it quite normal to minimize, mask, or complement bodily odors. Bodily odor that is not minimized or masked is often perceived as offensive. We attempt to cover our odors with various marketed smells found in mouthwashes, toothpastes, deodorants, antiperspirants, perfumes, and colognes. Further, we wash our skin and hair with scented soaps and shampoos, insert "odor-eaters" in our shoes, and make certain we have our breath mints before we leave the house in the morning. We even put air "fresheners" in our homes and cars.

A routine manipulation of an olfactic code for women comes in the form of the application of perfume. Informal class discussions with our students suggest that women are quite systematic regarding how they apply fragrance, taking into consideration the social context (e.g., work; dinner out; romantic date; "friend" date; etc.); time of day (e.g., middle of the day; late evening); their relationship with the person(s) with whom they are socializing (e.g., friends; co-workers; romantic partner; etc.); even the degree of relationship (e.g., potential romantic partner; long-term romantic partner). Men, too, report they are systematic in their application of fragrances.

Women's systematic manipulation of the application of perfume should not come as a surprise. Given the way perfume is presented to consumers, it is likely to be perceived as a tool to multiple ends. Perfume advertisements would have us believe that perfume use can enhance one's attractiveness and indirectly contribute to both personal happiness and career success. A perusal of many perfume ads indicates that marketing strategies focus on the strong implication that perfume use can enhance sexual attraction (Largey & Watson, 1972).

This article reports a study that examines how the use of perfume can affect the outcomes of social interaction. Specifically, we looked at the perceptions various interviewees formed about female interviewers who varied whether and how much perfume they wore during the interview.

Perfume Use, Impression Management, and Attribution Formation

Nearly all actions can carry some social meanings that have implications for what a person is like (Schlenker, 1980). We tend to attribute characteristics to people by the way they look, dress, talk, and act. It is likely the case that we make attributions about people according to the natural and artificial scents they emit and the degree to which those scents are noticeable.

It is reasonable to suggest that the quantity of perfume a woman wears would have an effect on what we might think about her. Levine and McBurney (1986) argue that the more an odor departs from normative expectations, the more likely the odor will trigger attributional analyses. If the quantity of perfume exceeds the range considered appropriate for the situation, then negative attributions may result. That is, there may be a curvilinear relationship between the quantity of perfume applied and social judgments such as social attractiveness and competence. Perceptions of a woman wearing perfume may become more positive as the perfume becomes more noticeable, but perceptions may become increasingly negative as the salience of perfume goes beyond normative expectations.

In this study we tested the effect of norm violations in perfume use on respondents' perceptions. Specifically we looked at how varying applications of perfume, ranging from none at all to more than average, would affect perceptions of the wearer's social/physical attractiveness and competence.

Method

The study was conducted at the University of Hawai'i at Mānoa, in Honolulu. Prior to conducting the study, data were collected from women attending the university to determine which perfumes they used most frequently when on campus, and how they applied them. Local retailers provided samples of the three most popular perfumes, which were used in the subsequent study.

The study utilized an interview situation in which women confederates wore varying amounts of perfume while interviewing study participants. After the interview, participants recorded their perceptions of the interviewers' social and physical attractiveness, as well as their competence.

Confederates

Four undergraduate women served as confederates in the experiment. The confederates were similar in height, weight, and hair and skin coloring. During data collection, each dressed in a manner typical of women university students, wearing a white t-shirt and blue jeans. They applied their makeup in typical fashion and were careful not to wear any distracting or attention-getting jewelry.

Participants and Procedures

Two hundred thirty-eight university students served as participants in the study. Participants were individually approached outside one of the university libraries and asked if they could be interviewed regarding their library usage habits. Interviewers explained that they were taking a course in interviewing and the interview was part of an assignment. In each interview, one of the confederates served as the interviewer. Before the experiment, confederates had been instructed as to how they should approach the participants and were provided with a short script to follow in their interactions with the participants. The confederates were to stand approximately two to three feet from the participants during the interview. Confederates also explained that since the interview was part of an assignment, they would be asking the participants to answer a few additional items assessing the interview-

ers' performance after the interview was completed. These final items constituted the dependent variables for the experiment.

Manipulation

For each interview, confederates wore either no perfume or applied one of the three perfumes identified by, and in a manner consistent with, student input from the initial data collection. The perfume was applied to the neck/chest area prior to the data-collection period. Perfume was applied in a "low condition" (one spray), "moderate condition" (approximately two to three sprays), or "high usage condition" (approximately five to six sprays). The moderate condition reflected the approximate normative usage reported by respondents in the earlier data collection, and the low and high conditions were operationalized by spraying approximately one standard deviation above and below the mean usage as reported in the initial data.

For the interviews in which the confederates wore perfume, confederates first applied the low level of one of the perfumes, then proceeded to interview approximately three men and three women. Upon completion of the interviews (approximately one hour), the confederate applied the same perfume at the moderate level and interviewed another round of three men and three women. Finally, the confederate applied the high quantity of perfume and completed the round of interviewing.[1] At this point the interviewer would quit interviewing for the day. In this manner, each confederate wore each of the three perfumes at low, moderate, and high levels. In addition, in order to assess the responses to the confederates without the influence of perfume, confederates first collected data, following the procedures described above, while wearing no perfume.

Dependent Variables

The first part of the survey consisted of items regarding the interviewee's library usage. These items provided the confederates' cover and were orally presented to the interviewee by the interviewer, who recorded the responses. The second part of the survey, containing the measures of perceived social attraction, physical attraction, and competence, was completed by the interviewee. Each dependent variable was assessed using seven-point Likert-type items bounded by "highly disagree" and "highly agree." Social and physical attraction were assessed using three items and five items, respectively, from McCroskey and McCain's (1974) interpersonal attraction scale. Competence was assessed with five Likert-type items designed for the present study.

RESULTS

Data analysis showed that the quantity of perfume applied was related to perceptions of both social attraction and competence in a negative manner: positive perceptions were highest in the "no perfume" condition, and steadily decreased until they were lowest in the "high perfume" condition. The data showed a slightly different pattern for physical attraction, however. Although roughly the same general pattern of means emerged, the highest ratings were in the "low perfume" condition, rather than the "no perfume" condition. This latter finding seemed to be driven by the men's responses. The patterns of men's and women's responses were remarkably similar except for the finding that men's ratings of physical attractiveness peaked in the "low perfume" condition, while the women respondents' scores generally fell more directly from the "no perfume" condition to the "high perfume" condition.

DISCUSSION

Regardless of the respondent's sex, increasing applications of perfume resulted in steadily increasing negative evaluations of the interviewers' social and physical attractiveness, and competence. However, before throwing out our expensive perfumes, we need to consider some possible limitations to our manipulation.

It is obvious to anyone who regularly applies an artificial scent (i.e., most of us) that applications of perfume, cologne, deodorant or antiperspirant, and so forth are always most potent, most noticeable immediately after application. We expect the effect of these scents to lighten through the course of the day. However, in this study the confederates collected data immediately subsequent to applying the perfume. Data-collecting sessions at each level of the manipulation lasted approximately one hour, whereupon the confederates prepared for the next level of the manipulation. Consequently, data were always collected when applications of perfume were at their most salient. It is likely that even the low perfume condition was still quite obvious to the participants, and perhaps not consistent with expectations for a "light" application of perfume. As mentioned previously, a light application of perfume, as manipulated in this study, produced the most positive perceptions of women for the male participants. If this study were to be replicated, a more realistic manipulation of perfume application should be tested by introducing a "buffer" period between the application of perfume and the data collection.

Nevertheless, the results were remarkably consistent: the more perfume the interviewers wore, the more negative their evaluations

were. This result is consistent with Baron's (1986) finding that positive kinesic cues coupled with wearing perfume produced lower estimates of an interviewee's potential for future success than did either the kinesic cues or the perfume alone. The results also reflect the counsel of Fiore and Kim's (1997) managers against the use of too much perfume by an interviewee.

However, this result is particularly interesting in the case of physical attraction ratings. Ratings of social attractiveness and competence are social and psychological judgments arising from inferences the participants make about the interviewers based on a variety of verbal and nonverbal sources of information. Ratings of physical attractiveness, however, would seem to be based on judgments of directly observable data, not inferences from those data. In short, the presence, absence, or abundance of perfume does not affect a person's visual features. Yet ratings of physical attractiveness fell consistently with increasing applications of perfume.

Baron (1983) found a similar effect in an earlier study. His data showed that judgments of how well groomed and dressed interviewers appeared were affected by whether they were wearing perfume. Albada, Knapp, and Theune's (2002) interaction appearance theory offers an explanation for this phenomenon. They suggest that discrepancies between perceptions of another's physical attractiveness and positive outcomes of socially interacting with that person might lead to revised judgments of the person's physical attractiveness. The revised judgment effectively reduces or eliminates the discrepancy. In the present study the judgments of social attractiveness and competence may have influenced the perceptions of physical attractiveness as well.

Although the present study focuses on women's perfume use, men are frequent users of aftershave and cologne as well. We would expect to find similar results if male confederates had been used. Yet we also must consider the possibility that men may have more rigid constraints regarding their use of scents. It might be the case that our expectations regarding women's use of scents are more flexible and consequently more difficult to violate. On the other hand, our expectations for men's use of scents may be more strictly limited by both context and quantities. Perhaps men's use of scent is expected to be more subtle than women's and is limited to more formal situations. For instance, most women in our classes report applying at least some perfume or cologne before going to class; it is more rare to find men reporting the application of cologne before leaving for campus. University women also claim that they apply perfume differently for time spent on campus relative to a formal work situation. They report applying their perfume differently as a function of their attraction to a dating partner. We suspect men are more binary in their approach to cologne application—they either apply it or not.

In short, we really do not know a lot yet about the norms and constraints that govern our use of scents. The present study adds to a small body of research in this neglected area of communication. Evidence is mounting that olfactic codes make significant contributions to our social and communicative behavior. Research needs to be conducted to fully articulate these olfactory codes before our understanding of their contribution to human communication is on par with other nonverbal codes.

Note

[1] In order to account for residual scent left from the prior application, the interviewers operationalized the moderate and high use conditions as additions to the prior conditions. That is, after the low use condition, the interviewer would spray approximately one or two additional sprays for the moderate condition, for a total of three sprays over the two conditions. In the high use condition, the interviewers added two or three additional sprays, for a total of about five or six sprays over the three conditions. While there may have been some attenuation of scent over time, this was deemed a lesser problem than an overaccumulation of scent.

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—*Section B*—

KINESIC CUES
The Body, Eyes, and Face

The kinesic code includes body, eye, and face behavior. We use our bodies to communicate in many ways. Our *posture* can express our feelings and attitudes. If we *lean* toward someone while talking, this may be a sign of interest and involvement, while leaning away is often interpreted as disinterest. Similarly, we tend to face friends *directly,* and this may be a sign of interest, liking, or respect. It is also important to consider *postural relaxation* (more relaxed postures are found in higher-status people), *mirroring* as in two or more people adopting the same or similar posture (this is often a sign of similarity or attraction), and *openness* (crossing of arms or legs may indicate defensiveness).

In addition to these body cues, kinesics include *gestures* or hand movements. The first two readings in this section focus primarily on various types of hand movements. Ekman and Friesen's classic work describes five types of kinesic behavior: emblems, illustrators, adaptors, affect displays, and regulators. In this reader, however, their article focuses on the first three of these types of behaviors, all of which tend to be communicated via gestures. *Emblems* are gestures that stand for or symbolize something. They have a verbal translation. For example, placing your finger over your lips can mean "be quiet," waving at someone can mean "hello" or "goodbye," and extending your thumb up in the air can mean "way to go!" or "I need a ride." *Illustrators* are usually pictorial representations, such as tracing a spiraling staircase in the air or using your hand to show how tall someone is. *Adaptors* are idiosyncratic gestures that help you feel more comfortable or exert nervous energy. Twisting the ring on your finger, wringing your hands together nervously, or moving a strand of hair out of your eyes or the eyes of a friend are all examples of adaptors. Two other types of kinesic behavior are also important. *Affect displays* help reveal the emotions that someone feels. Jumping up and down and smiling with joy are examples of kinesic behaviors that serve as affect displays. Finally, *regulators* help you structure and manage interaction. You might lean forward and put your hand out when you are interrupting someone or want a chance to