Olfactory Comfort in Close Relationships: You Aren’t the Only One Who Does It

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Abstract

Smelling the unwashed clothing of a loved one when separated is at the same time little known but widely practiced (McBurney, et al., 2006). A majority of persons surveyed reported that they did it to remember an absent romantic partner and because it smells good; additionally, it made them feel happy and comfortable. Shoup, et al. (2008) found that such olfactory comfort behavior extended to relatives as a function of degree of relatedness. In both American and German subjects, olfactory comfort correlated with adult attachment style: positively with Secure attachment, and negatively with Dismissive attachment. Number of personal photos displayed in a student’s dorm room correlated with olfactory comfort behavior and showed the same relationships with attachment. Streeter (2008) experimentally demonstrated the role of olfactory comfort by having subjects smell various T-shirts after experiencing a stressor. Smelling a partner’s T-shirt increased comfort, and reduced anxiety and negative affect. The smell of an unknown individual also reduced anxiety and negative affect, but did not influence comfort. Those with Secure attachment showed greater reduction in anxiety than those with other attachment styles. Euler (unpublished) found that smelling of clothing correlated positively with the love styles (Lee, 1973) mania, agape, and eros. In this contribution we review these findings and suggest that they indicate a system of olfactory comfort that relates to Harlow’s contact comfort (e.g, Harlow, Harlow, & Suomi, 1971) as well as Bowlby’s (1969) theory of attachment as extended to adult romantic attachment (Hazan & Shaver, 1987).
Introduction

The role of olfaction in social relationships is well known, although relatively little studied (Levine & McBurney, 1986). Less well known, however, is the importance of smell in close (romantic) relationships. Herz and Inzlicht (2001), for example, found that a potential lover’s odor was a very important consideration in mate choice, either 2nd or 4th out of 10 items. But there remains a class of olfactory-related behaviors that is at the same time extremely common and little known in the scientific literature, namely smelling a loved one’s clothing during separation. The first mention of this behavior to our knowledge was by Krafft-Ebing (1931), who noted that

Among the natives of the Philippine Islands...when it becomes necessary for an engaged pair to separate, they exchange articles of apparel, by means of which each becomes assured of faithfulness. These objects are carefully preserved, covered with kisses and smelled. (p.32)

The fact that Krafft-Ebing’s book was entitled *Psychopathia Sexualis*, however, suggests that the behavior is not quite normal. In addition, the fact that Krafft-Ebing attributes the behavior to only one culture suggests that it is limited geographically. When one of us asked a clinical psychologist how common he thought it was for people to smell each other’s clothing during separation, he was visibly repulsed by the idea, and said he supposed possibly one in a hundred might do it. Prior to our study (McBurney, Shoup, and Streeter, 2006), which showed the behavior to be engaged in by the majority of people we asked, there were only scattered reports in the media (e.g., Eisman, 2004) and the Krafft-Ebing anecdote in the literature, to our knowledge.

This behavior, then, is one of those behaviors that falls outside the common, unremarkable, public, ritualized activities of everyday life. But it is well known that there are
other behaviors that are commonly done in private, such as picking one’s nose, passing gas, and scratching oneself in places called, appropriately, private parts. We find it interesting that olfactory comfort behavior does not even get the public mention that these other behaviors do. Only occasionally in a movie do we see a character smell an absent partner’s clothing.

The work of Harlow on attachment in infant monkeys is among the best known in psychology, and has given us the concept of contact comfort (Harlow, Harlow, & Suomi, 1971). We note that Harlow demonstrated that contact comfort is a prerequisite for attachment bonds to develop. Because of the relationship between olfaction and attachment that we discuss below, our working hypothesis is that his argument can be extended beyond the concept of “comfort” as simply a tactile sense to an olfactory one too.

We suggest that olfaction plays a crucial role in social behavior that has been overlooked in humans partly because the behaviors are so private, and partly because olfaction has not received as much attention as other senses. But social olfaction has been well studied in other animals (e.g., Sanchez-Andrade & Kendrick, 2009). The rise of evolutionary psychology in recent years (e.g., Gaulin & McBurney, 2004) provides both the framework and motivation to examine this virtually unexplored area.

1. *Smelling the Clothing of Loved Ones*

McBurney, Shoup and Streeter (2006) asked American college students who were or had ever been in a committed relationship with a member of the opposite sex a number of questions about smelling their partner’s clothing during separation. Seventy two percent of women and 26% of men had slept in or with an item of unwashed clothing of a partner when separated. Euler, Shoup, Streeter and McBurney (2005) found with German students that 66% of women and 29% of men had done the same. The American students were asked their reasons for smelling the clothing. Women most often said that they did it to remember him or feel close to
him, followed by being comforted, and the less specific reason that it smells good. The men were less articulate than the women. Their most common response was that it smells good, and they gave no response twice as often as the women did. But their more specific reasons were the same as the women’s, although they gave them about half as often (See Table 1).

**INSERT TABLE 1 ABOUT HERE**

The women were also more specific about the resulting emotion from smelling their partner’s clothing. They felt happy, relaxed or safe when they smelled the clothing. Males most commonly gave no response, although those who did reported similar emotions as the women. Interestingly, both men and women listed feeling safe at the same frequency, although it was the third most common articulated reason for both (See Table 2).

**INSERT TABLE 2 ABOUT HERE**

Shoup, Streeter and McBurney (2008) replicated the previous study, and extended the questions to others besides lovers. They found that although smelling of clothing was much less common among relatives, it was not uncommon. In accordance with evolutionary theory (Gaulin & McBurney, 2004) the degree of relationship was a strong predictor of smelling clothing: It was most common with first degree relatives (parents and siblings) than second degree relatives (grandparents, aunts and uncles) followed by third degree relatives (cousins and great grandparents (See Table 3). (Because of their ages, these subjects did not have enough children to include as first degree relatives.)

**INSERT TABLE 3 ABOUT HERE**

2. **The Relationship Between Olfactory Comfort and Attachment**

Bowlby (1969) studied the attachment of infants to their primary caregivers. His groundbreaking work led to a large body of research. Ainsworth and others (e.g., Ainsworth, Blehar, Waters, & Wall, 1978) defined three fundamental styles of infant attachment: secure,
anxious/ambivalent, and avoidant. It was not long before the concept of attachment was extended to adults. Hazan and Shaver (1987) were the first to consider romantic love as an attachment process, and make an important distinction between the infant system and adult process. The logic underlying the argument is relatively simple: The same qualities that Bowlby describes as hallmarks of the infant system are preserved and co-opted in adults to promote pair bonds. Attachment theorists have explored the individual differences between these types in the service of many goals: parenting skills, psychopathology, adjustment, and relationship quality (e.g., Schmitt et al., 2003; Simpson, Rholes & Nelligan, 1992; Watt, McWilliams, & Campbell, 2005; Weems, Berman, Silverman & Rodriguez, 2002).

Bowlby’s theory of attachment is widely considered a mid-level evolutionary theory, like the theory of parent-offspring conflict, or the theory of reciprocal altruism. These mid-level theories all relate to the theory of natural selection above it, but make more specific predictions related to the particular question of interest (Buss, 1995). Accordingly adult attachment should be similarly grounded by early experiences and sensitive to the local environment. Consequently, we may not expect that individual differences in adult attachment should be necessarily stable. When disparities in mate value exist, different strategies should be explored for potential in a manner similar to the Belsky, Steinberg, and Draper (1991) model, whereby father-absence leads to early puberty as a response to uncertain environmental conditions.

While there is considerable variability in the way humans approach pair-bonding or romantic relationships, the mechanisms proposed by attachment theory suggest that early relationships (e.g., one with a warm, responsive caregiver) are a factor that facilitate stability in attachment styles. Further, the evolutionary viewpoint suggests that environmental factors are incorporated into new relationships (Fraley & Spieker, 2000). Thus, the infant attachment system
is parsimoniously co-opted by evolution for the maintenance of pair-bonds and continues to operate in essentially the same context (Kirkpatrick, 1998; Zeifman & Hazan, 1997).

We examined the relations between olfactory comfort and behaviors and attachment cross-culturally (McBurney, Euler, Streeter, & Shoup, 2005). The same American and German subjects who were asked about smelling clothing of lovers and family members were also given the Relationship Questionnaire, which is a measure of Adult Attachment (Bartholomew & Horowitz, 1991). It asks individuals to select which of the statements listed below best describe them:

Secure Attachment: “It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don’t worry about being alone or having others not accept me.”

Fearful Attachment: “I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.”

Preoccupied Attachment: “I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don’t value me as much as I value them.”

Dismissive Attachment: “I am comfortable without close relationships. It is very important for me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.”

There is some disagreement regarding whether these types should be considered as categorical styles or dimensional measures (e.g., Bartholomew & Shaver, 1998). We followed the more common practice of using continuous, seven-point rating scales in the present study to permit more quantitative analysis.
Because cultural differences are not relevant to the present discussion and for the sake of clarity, we collapsed across nationality and combined the two samples for correlational analysis. These correlations are presented in Table 4.

The frequency of intentionally smelling a loved one’s clothing correlated significantly and positively with higher scores on Preoccupied attachment and approached significance for Secure attachment. The same behavior correlated significantly but negatively with higher scores on Dismissing attachment. Women smelled clothing much more often than men in both samples. These correlations suggest that olfactory comfort behaviors are an expression of attachment style.

3. Another Attachment-Related Behavior: Displayed Photos

It occurred to us that number of photos students put up in their dorm room might be another measure of attachment style. We asked both American and German subjects to report number of photos they had on display of people they knew, leaving out celebrities and the like. Because number of photos was markedly skewed, we logarithmically transformed the data. We will, however, report the antilog mean log (retransformed) numbers. There was no difference between German and American subjects in the number of photos, although there was a significant interaction between nationality and sex, such that the sex difference was larger with American subjects. Consistent with the sex difference in olfactory comfort behavior, females had many more photos than males: M = 12.2, vs. 2.4; t(268) = 11.45, p < .001. Supporting our intuition, we found a strong correlation between number of photos and intentional smelling, r = .25 (p< .001) for German data, and r = .39 (p < .001) for the US data.

Even more interesting is the fact that number of photos paralleled smelling in the pattern of relationships with attachment style. Among the US subjects, secure attachment correlated
with photos, $r = .19$ (p < .001) and also with intentional smelling, $r = .18$ (p < .003). The pattern with the German subjects was more complex: For secure attachment, only number of photos correlated significantly: $r = .17$ (p < .005). Both photos and smelling correlated negatively with dismissive attachment: $r = -.15$ (p < .015) and $r = -.18$ (p < .003), respectively. Preoccupied attachment correlated with intentional smelling, $r = .16$ (p < .01), but not with photos.

It is possible that with the German subjects there is less emphasis on body odor, such that olfactory comfort behaviors are only expressed among less stable/secure individuals who are seeking attachment (i.e. preoccupied attachment style).

4. An experimental test of olfactory attachment

Streeter (2008) explored olfactory attachment at a different level of analysis: Do olfactory comfort behaviors serve a functional purpose? Why do we take comfort in the scent of a significant other, and could individual differences in adult attachment be a moderating factor?

**Methods**

Three established instruments to measure anxiety, affect, and attachment style were used. The first was Spielberger’s (Spielberger, Gorsuch, & Lushene, 1970) State-Trait Anxiety Inventory (STAI). The State Anxiety (S-Anxiety) subscale is designed to measure transient changes in anxiety, as opposed to the Trait Anxiety subscale (T-Anxiety), which measures persistent and relatively stable individual differences in tendencies toward anxiety-proneness. Streeter modified the S-Anxiety subscale to include affective words that were most common from our earlier open-ended questionnaires. The second instrument was the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988). This scale is designed to measure transient changes in positive affect (PANAS-P) and negative affect (PANAS-N) orthogonally. The third instrument was the Relationship Questionnaire (RQ) discussed above.

*Participants*
One hundred eighteen university students (94 females and 23 males) participated in the study. The only criterion for inclusion was being in possession of an item of clothing that retains the smell of a romantic partner. Their mean age was 19.64 (± 4.66), and their mean relationship length 1.52 years (± 16.09) (median = 1 year; mode = 6 months). One participant was removed from the dataset as an outlier on several demographic characteristics. Participants were asked to bring an item of clothing that retained the odor of their romantic partner.

**Design**

The experiment was a between-subjects design with 3 randomized conditions: 1) Experimental condition, Partner’s Odor: a clothing item with the smell of their partner; 2) Control condition, Neutral Odor: cotton t-shirt item laundered in unscented detergent; 3) Placebo condition, Other Odor: a clothing item with the odor of an unknown volunteer. This item of clothing was never more than three days old and was different for every participant.

**Procedure**

Baseline PANAS and STAI were measured at the beginning of the session. Because the hypotheses are based upon reduction of negative affect and anxiety, and because Bowlby (1979) claims that attachment is most strongly activated in times of distress it is under these conditions that attachment processes should be most evident (Simpson, Rholes & Nelligan, 1992). In order to increase the likelihood of seeing changes in negative affect caused by the experimental manipulation, Streeter asked participants first to perform a challenging mental task known to be a mild stressor (Feeney & Kirkpatrick, 1996): They were to count backwards by, e.g., 17 from a randomly chosen 4-digit number for 5 minutes. (The interval was sometimes changed to 25, 7, or 13 based on the subject’s facility with the task, in order to keep it appropriately difficult.) PANAS and STAI were administered immediately following the stressor task (post-stress, but pre-odor exposure).
Each participant was blindfolded, and instructed to smell the contents of an opaque odorless bucket that contained the item from one of the experimental conditions described above.

PANAS and STAI were then administered again (post-odor exposure). The final questionnaire given was the RQ to measure adult attachment.

**Results**

Participants exposed to their partners’ odor had a significant $(p < .001)$ increase in reported feelings of Comfort $(M = 3.05, sd = .74)$ relative to both the control (Neutral odor; $M = 2.34, sd = .90$) and placebo (Other odor; $M = 2.60, sd = .89$) conditions as illustrated in Figure 1.

**INSERT FIGURE 1 ABOUT HERE**

Exposure to a partner’s scent significantly reduced Anxiety $(M = -13.49, sd = .926)$ only when compared to a neutral odor $(M = -7.63, sd = 11.60)$ but not when compared to other persons $(M = -12.82, sd = 8.94)$. Figure 2 illustrates this effect.

**INSERT FIGURE 2 ABOUT HERE**

The pattern for Negative Affect was similar to that of Anxiety. Figure 3 shows that exposure to a partner’s scent significantly improved Anxiety $(M = 10.70, sd = 4.02)$ only when compared to a neutral odor $(M = 12.19, sd = 5.26)$ but not when compared to the odor of other persons $(M = 10.64, sd = 3.82)$. Because the figure is based on percentiles rather than the mean, and the data are skewed, the figure minimizes the size of the effect.

**INSERT FIGURE 3 ABOUT HERE**

Multiple regression analysis was performed to determine the percent of variance accounted for on the various dependent variables. For Comfort, the regression equation accounted for 25% of the variance; for Anxiety the equation accounted for 36% of the variance, and for Negative Affect 39% of the variance was accounted for by the regression equation.

**Summary of experimental findings**
The scent of a romantic partner improved feelings of comfort compared to the scent of another person or a neutral scent. This experimental finding validates our conceptualization of “olfactory comfort.” The scent of one’s partner also improved anxiety and negative affect when compared to a neutral odor, but its ability to reduce these aversive states was not different from the scent of unknown persons. This implies that there may be a specific quality to human odors, possibly an olfactory cue to the presence of another person is sufficient to improve negative emotional states.

Overall, the smell of a romantic partner increased feelings of comfort compared to either a neutral odor or that of another unknown person. This result validates our previous findings (McBurney, Shoup & Streeter, 2006) from questionnaires confirming that people do derive comfort from the smell of a loved one. Even though participants are not always able to accurately report the reasons for engaging in a particular behavior, in this case they appear to be accurately describing the qualia associated with the scent of a romantic partner. This also validates our conceptualization and coining of the term “olfactory comfort.” The results presented in this paper suggest that this behavior is not only common, but it is also functional.

In this manipulation, Comfort was experimentally decreased and a clear main effect of the scent of the romantic partner emerged: A partner’s scent increased comfort when compared to both placebo (unknown persons) and control (neutral).

*Love Styles and Olfactory Comfort*

Another theoretical approach to the phenomenon of olfactory comfort is given by the concept of love styles, which Lee (1973) developed on the basis of extensive interviews. Hendrick and Hendrick (1986) constructed a questionnaire, the results of which showed suitable internal reliability and reasonable independence for each of the following love styles: Eros (passionate love); Ludus (game playing love); Storge (friendship love); Pragma (logical, or
“shopping list” love); Mania (possessive, dependent love); Agape (selfless love). We thought that this theory might be provide some triangulation on the theoretical significance of olfactory comfort. Euler (unpublished) administered a German version of the Love Styles questionnaire (Bierhoff & Klein, 1991) to German students and correlated the results with those of the following question: “How often (when you were separated) did you smell the clothes of another person to be closer to him or her?” The strongest correlation was with Mania: $r = .41$ (p < .001, N = 69) for males, and $r = .21$ (p < .001, N = 227) for females. Significant correlations were also found for Agape ($r = .16$, p < .005, N = 296) and Eros ($r = .14$, p < .016, N = 296) for all data. The data separated by sex were similar but the significance was marginal except for females on Agape ($r = .19$, p < .003, N = 227). Note that the number of males surveyed was much smaller than that of females. The magnitude of the correlations, especially for Mania, suggests that further exploration of the relationship between love styles and olfactory comfort would be fruitful. Further, the Mania love style may be similar to the Preoccupied attachment style, and Agape may relate to the Secure attachment style.

**Summary Conclusion**

The data presented here demonstrate that smelling the body odor of a romantic partner or close relative is not only surprisingly common, but that it is functional in reducing anxiety and increasing comfort. It is our hope that these findings will help these behaviors come out of the closet and take their place in research and clinical practice.
References


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Sybil Streeter is now at Olson Zaltman, Inc.
Table 1

*Open-Ended Responses to the Question,* “If you have ever done any of these (i.e. wear partner’s clothing to sleep; intentionally smell partner’s clothing; go into partner’s closet to intentionally smell clothing), please describe your reasons for doing so”.

*Note.* The percentages do not total 100% because of multiple responses (McBurney, et al., 2006, reproduced by permission).

<table>
<thead>
<tr>
<th>Reason given</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>To remember him/her, feel close</td>
<td>53%</td>
<td>28%</td>
</tr>
<tr>
<td>Smells good</td>
<td>22%</td>
<td>38%</td>
</tr>
<tr>
<td>Comforts me</td>
<td>22%</td>
<td>13%</td>
</tr>
<tr>
<td>No response/ No reason</td>
<td>8%</td>
<td>19%</td>
</tr>
<tr>
<td>Feels good</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>29%</td>
<td>28%</td>
</tr>
</tbody>
</table>
Table 2

*Open-Ended Responses to the Question,* “If you have ever done any of these (i.e. wear partner’s clothing to sleep; intentionally smell partner’s clothing; go into partner’s closet to intentionally smell clothing), please describe how it made you feel.”

*Note.* The percentages do not total 100% because of multiple responses (McBurney, et al., 2006, reproduced by permission).

<table>
<thead>
<tr>
<th>Resulting emotion</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happy/ Good</td>
<td>43%</td>
<td>25%</td>
</tr>
<tr>
<td>Comfortable/ Content/ Relaxed</td>
<td>43%</td>
<td>16%</td>
</tr>
<tr>
<td>None/ No response</td>
<td>16%</td>
<td>35%</td>
</tr>
<tr>
<td>Secure/ Safe</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Close</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>20%</td>
<td>31%</td>
</tr>
</tbody>
</table>
Table 3

Frequency of Response to Each Question by Sex and Degree of Relatedness


<table>
<thead>
<tr>
<th>Relatedness</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smelled clothing</td>
<td>9.0%</td>
<td>25.0%</td>
<td>0%</td>
<td>4.3%</td>
<td>0%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Slept with clothing</td>
<td>6.0%</td>
<td>13.0%</td>
<td>0%</td>
<td>4.3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Given/Taken clothing</td>
<td>0%</td>
<td>1.9%</td>
<td>0%</td>
<td>2.1%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Table 4
Correlations between intentional smelling a partner’s clothing and styles of Adult Attachment in a cross-cultural sample

<table>
<thead>
<tr>
<th>Secure</th>
<th>Fearful</th>
<th>Preoccupied</th>
<th>Dismissing</th>
</tr>
</thead>
<tbody>
<tr>
<td>$r = .08$</td>
<td>$r = .02$</td>
<td>$r = .10$</td>
<td>$r = -.18$</td>
</tr>
<tr>
<td>($p=.06$)</td>
<td>n.s.</td>
<td>($p=.02$)</td>
<td>($p=.00$)</td>
</tr>
<tr>
<td>(n=545)</td>
<td>(n=543)</td>
<td>(n=543)</td>
<td>(n=544)</td>
</tr>
</tbody>
</table>
Figure 1. The effect of a partner’s scent on Comfort. Participants exposed to their partner’s odor showed increased comfort compared to another’s odor or a neutral odor. From Streeter, 2008. The boxes indicate the 25th and 75th percentiles and the whiskers show the 10th and 90th percentiles.

Figure 2. The effect of a partner’s scent on Anxiety. Participants exposed to their partner’s odor or to another’s odor showed less anxiety compared to a neutral odor. From Streeter, 2008. The boxes indicate the 25th, 50th, and 75th percentiles and the whiskers show the 10th and 90th percentiles. Circles indicate ratings outside the 10th or 90th percentiles.

Figure 3. The effect of a partner’s scent on Negative Affect. Participants exposed to their partner’s odor or another’s odor showed less negative affect compared to a neutral odor. From Streeter, 2008. The boxes indicate the 25th, 50th, and 75th percentiles and the whiskers show the 10th and 90th percentiles.
Figure 1
Figure 2
Figure 3