



## The Role of Pleasant and Unpleasant Odors in the Individual and Social Attractiveness

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**ABSTRACT:** Many factors affect interpersonal attractions. According to Social psychological studies, pleasant and unpleasant odors of individuals and environment, could be one of them. This study aimed to explore the impact of pleasant and unpleasant odors on interpersonal and social attractions. In addition, different situations in which these influences might be stronger, and the differences between men and women, also were examined. Odor Awareness Scale (OAS) was used in this research. Its validity and reliability were measured for the first time in Iran. Also, demographic questionnaire was used. The research population was university of Isfahan students in 2013. A sample of 155(73 men) was chosen by simple random sampling method. Data were analyzed by t-Test and correlation. The OAS's social and interpersonal relations items were analyzed. All items of the scale were significantly correlated with the scale's total sum ( $P < 0.001$ ) The gender differences were significant, only in positive sub-scale's items ( $P < 0.05$ ) but, no significant difference was found between men and women in negative sub-scale's items. Pleasant odor would increase interpersonal attraction and unpleasant odor would decrease it. Interestingly, attraction reduction due to unpleasant odors are more than attraction increases while pleasant odors are present. Pleasant odors have more influence on women, but the effects of unpleasant odors, are the same for both sexes.

**Key words:** odor, odor awareness, olfaction, social attraction, interpersonal attraction

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### INTRODUCTION

Social psychologists have long been tried to identify the factors affecting social and interpersonal attraction. Their efforts resulted in identifying some of the main factors causing social and interpersonal attraction. Most of the politicians, retailers, and lovers who seek attention use these factors and principals. But these efforts do not always lead to the desired results. Goods not yet sold, politicians who lost elections, and the unfortunate lovers are the evidence of the existence of other subtle factors in the formation of social and interpersonal attraction. Some experts attribute these failures to the factors beyond an individual's control such as the personality of other people; and other experts believe that in addition to the above factors there are some small but significant environmental factors which can affect social and interpersonal attraction. People resort to small clues to explain a situation, especially when the situation is ambiguous. One of these small factors can be the pleasant and unpleasant odor of other people or an environment (Zhou and Chen, 2009). Olfactory stimuli usually act without human's knowledge. In fact, people cannot distinguish their function (Sela and Sobel, 2010). On the other hand, olfactory stimuli are interpreted in the limbic system of the brain; the system related to immediate emotion in humans (Wilkie, 1995). The olfactory stimuli can cause emotional responses in

humans (Zald and Paldo, 1997). According to the studies of social psychologists, emotional responses can influence the evaluation of individuals and the environment (Baron et al., 2009). Environmental odors can change mood<sup>7</sup> and thereby influence individual decisions (Chebat and Michon, 2003). The effect of odors on individual moods, and their likes and dislikes is known to others. Positive mood induce positive evaluation of others, while negative emotions induce negative evaluation (Byrne, 1997). Investigating the effect of individual and environmental odors on social and interpersonal attraction can be useful and important. This research aimed to investigate the effect of pleasant and unpleasant odors on interpersonal and social relationships.

In 1981, Robert Baron investigated the relationship between olfaction and human social relations, and concluded that pleasant odor has a positive effect on attraction and social perception. The research participants perceived the strangers more attractive and intimate in the presence of pleasant odors (Baron, 1981). On the other hand, pleasant odors in the environment can increase social interactions between strangers. People tend to talk more with each other, make eye contact, and can better assess group members in the presence of pleasant odors in the environment (Zemke and Shoemaker, 2008). In recent years, many hotels and service providers have used

pleasant odors to create a friendly and welcoming environment for their visitors and guests. They use different fragrances in different places (such as restaurant, lobby, and the gym) (Higgins, 2006; Jeffers, 2006).

Pleasant and unpleasant odors are effective at the interpersonal level. When facial expressions are ambiguous, the odors emitted by individuals help to detect whether or not they are dangerous. Women, in particular, when were exposed to the smell of fearful sweat<sup>7</sup> interpreted ambiguous faces as dangerous, however, they didn't have the same perception in case of clear facial expression. It is often argued that the role of information exchange using chemical senses such as olfactory, particularly in humans, due to their strong senses of sight and hearing is limited. The role of subliminal<sup>8</sup> odors in interpreting mood inputs is obvious (Li et al., 2007).

In another study, women were exposed to pleasant and unpleasant odors. They were asked to classify the attractiveness of male faces in a series of images. In the presence of unpleasant odors, the women significantly found men less attractive, while in the presence of pleasant odors there was no difference in their evaluation of men compared to the lack of odor. These effects were not dependent on the types of smells used by men. The trend of responses to human body odors or other smells (like leather) was similar. Moreover, women are able to detect their romantic partner's<sup>11</sup> odor from other men. In fact, women can recognize the odor of their romantic partner from strangers, and other male friends and colleagues, and this is one of the reasons of loyalty between spouses.

They pay less attention to other potential partners (Lundstrom and Jones-Gotman, 2009). In general, olfactory plays an important role in evaluating the attractiveness of the opposite sex (Saxton et al., 2008). Several studies indicated the effect of olfactory on mate selection and finding the right person for marriage and reproduction (Havlicek and Roberts, 2009; Havlicek et al., 2008). According to Herz and Inzlicht, the most important senses for mate selection in men and women are vision and olfaction, respectively (Herz and Inzlicht, 2002). As discussed above, odor awareness is of a great importance. To evaluate an odor, one should first identify a certain odor from a mass of odors in the environment. Odor awareness is defined as: A person's awareness of the

## RESULTS

This section aimed to discuss the questions of the Odor Awareness Scale associated with the social and interpersonal relationships. Seven of the 32 questions of the scale are discussed here. Noting that the remaining questions were about odors found in the

olfactory stimuli he/she perceives (Smeets et al., 2008). Odor awareness has been studied in four main categories: civilization, food and drink, nature, and man (Schleidt et al., 1988). This study focused on the two categories of social relationship and people (close ties) to investigate the effect of pleasant and unpleasant odors on social and interpersonal relationships.

## MATERIALS AND METHODS

The population of the study consisted of students in Isfahan University in 2012. The two instruments used in this study were demographic questionnaire, including age, gender, handedness, marital status, smoking history, history of asthma and seasonal allergies, previous experience with odors, such as working in perfumeries and laboratories; and odor awareness scale (OAS) that with the permission of the designers was translated into Persian by researchers. After being edited and approved by at least 5 English language experts, the final version of the translated text was translated back into English by a British Iranian residing in London. The final translation which has been used in this research was obtained after comparing the back-translation version with the original text and making necessary amendments. The validity of OAS was approved by five professors and experts, and the reliability of the scale was tested by internal consistency which had Cronbach's  $\alpha = 0.901$  for the full scale, positive sub-scale 0.790, and negative sub-scale 0.851.

Given the (Attentional blink) paradigm (Ogawa and Suzuki, 2004) used in this study, the odor awareness was divided into positive and negative dimensions based on hedonic value (Smeets et al., 2008). The Attentional blink (AB) paradigm suggests that there is a pre-preparation in humans for the perception of negative stimuli which allows the organism to adapt itself to the dangerous environment and survive (Ogawa and Suzuki, 2004). In 2012, 155 students of Isfahan University were randomly selected as samples. Participants were asked to answer the Odor Awareness Scale (all the questions). Of 155 questionnaires, 152 (73 male, 82 female) were completely answered (the rate of return was equal to 98%). The average age of participants was 22.62, with a minimum 18 years and maximum 35 years. The standard deviation of age was 3.390. Descriptive and inferential statistics were used for data analysis, and SPSS version 15 was used for data processing.

nature and foodstuffs, and also the difference between men and women; therefore, they were not related to the topic of the study. Table 1 demonstrates the questions of the Odor Awareness Scale associated with the categories of social and interpersonal relationships. The questions of each dimension are also specified in the table.

Table 2 displays the correlation between the questions above, grand total, and the score of positive and negative dimensions. It also illustrates partial correlation of answers to the questions with grand total after controlling the positive and negative dimensions. It can be seen that all ordinary correlations are

significant, while some of the partial correlations are insignificant.

The difference between men and women is analyzed in the above questions as illustrated in Table 3. As can be seen, except for three questions, there is no significant difference between men and women in other questions.

**Table 1.** Questions of the Odor Awareness Scale Associated with the Categories of Social and Interpersonal Relationships

Questions No.	Question	Dimension
7	When a person you know smells different, for example due to a new perfume, will you notice it immediately?	+
8	Does the smell of breath (mouth) or sweat of others draw you attention?	-
9	Do you notice the odor of perfume, cologne or cream that others use after shaving?	+
22	Will you find people unattractive because of their unpleasant body odor?	-
23	Will you consider people attractive because of their pleasant body odor?	+
27	How important is it to you if your current or future partner smells pleasant?	+
30	You are sitting in a public place next to someone who has a bad smell. Will you look for another seat, if possible?	-

**Table 2.** Correlation between Answers to the questions with Grand Total and the Score of Positive and Negative Dimensions

Question No.	Correlation with Grand Total**	Correlation with Positive Dimension**	Correlation with Negative Dimension**	Partial Correlation with Grand Total (After Controlling Positive Dimensions)	Partial Correlation with Grand Total (After Controlling the Positive & Negative Dimensions)
7	0.539	0.603	0.456	-0.520	0.444*
8	0.543	0.415	0.570	0.432	-0.048
9	0.590	0.650	0.505	0.008	0.473*
22	0.501	0.398	0.517	0.360*	-0.002
23	0.366	0.460	0.281	-0.131	0.398*
27	0.558	0.593	0.490	0.602	0.387*
30	0.399	0.301	0.421	0.312*	-0.042

P < 0.05\*

P < 0.001\*\*

**Table 3.** The Difference between men and Women

Question No.	Men Average	Women Average	Men SD	Women SD	T value	Sig.
7	3.59	4.06	1.21	0.947	2.714	0.007*
8	4.09	4.33	1.00	0.847	1.601	0.112
9	3.63	4.11	1.07	0.930	2.919	0.004*
22	3.97	4.04	0.900	0.922	0.440	0.661
23	3.73	3.82	0.850	0.983	0.595	0.890
27	4.39	4.74	0.708	0.562	3.474	0.001*
30	4.11	4.24	1.11	0.942	0.774	0.440

P < 0.05 \*

**DISCUSSION**

The grand total of the scale is in fact the concern and awareness of individuals of different odors. Significant correlation between the answers of questions and the grand total indicates that consistent with the increasing of their odor awareness and perception, the individuals pay more attention to odors in their social and interpersonal relationships. According to Table 1, the smells are present in both positive and negative categories. Both types of odors influence the interpersonal relationships.

One of the most important results is correlation between the questions 22 and 23. As illustrated in Table 1, the question 22 was about a decline in attractiveness

in the presence of unpleasant odors, and the question 23 was about increase in attractiveness in the presence of pleasant odors. Table 2 shows that the correlation between the answer to question 22 and the grand total of the scale is greater than the correlation between question 23 and the grand total. It can be concluded that, unpleasant odors can reduce the attractiveness of individuals while pleasant odors increase their attractiveness. However, the reduction of attractiveness because of unpleasant odors is more effective than its increasing due to pleasant odors. Unpleasant odor of individuals can influence the perception of other people and they will be evaluated more unattractive than in the absence of smell;

however, the pleasant smell of individuals will not affect the other people's perception of their attractiveness. As shown in Table 3, the question 23 indicates a significant difference between men and women, while in question 22 the difference is not significant. The increased attractiveness due to pleasant odors is more common in women than men; but a decline in attractiveness due to unpleasant odors occurs equally in both sexes. This conclusion is consistent with the conclusions of Dematte et al. (2007) indicating that unpleasant odors reduced attractiveness, but pleasant smells did not increase the attractiveness of men.

The question 27 was on the importance of pleasant smell in partners. The answer to this question had a great correlation with the grand total, indicating that good smell has a positive effect on partners. There is a significant difference between men and women in this question. Therefore, women pay more attention to the good smell of their partners than men. According to the report of Herz and Inzlicht (2002), olfactory is the most important sense for women in mate selection. Pleasant odor of a partner is of a greater importance to women than men. According to the studies of Havlicek et al. (2008) and Havlicek and Roberts (2009), women are able to recognize their spouses by smell. By smelling the odor of men's body, women are able to recognize the right partner who is genetically in better condition for reproduction; and avoid men with genetic disorders. These studies can explain the reason of difference between men and women in this question. Actually, if pleasant smell of the partner is a matter of preference for men, it is absolutely critical for women (Havlicek et al., 2008). Considering the limits of women's reproduction, choosing the right partner for women is more important than men (Saxton et al., 2008).

According to the questions 7 and 9, pleasant odors like perfumes are important for most people. However, women are better than men at detecting the difference of smells; and they are more sensitive to pleasant odors and their differences than men. These findings are compatible with the fact that women have a stronger olfactory system than men (Dotti and Cameron, 2009).

The superior olfactory ability of females was evident even before puberty (Chopra et al., 2008). Therefore, the effect of pleasant odors on increasing the attractiveness is not just limited to partner selection. As shown in Table 3, the significant difference between men and women was only related to the questions about positive dimensions, while there was no significant difference between these two sexes in the negative questions. The term "Attentional blink" (Ogawa and Suzuki, 2004) can justify this matter. Based on this concept, humans are pre-prepared for the perception of negative stimuli. The ability of pre-

preparation protects them from dangers, causing the organism to better adapt to the high-risk environment. Since men like women need to receive and response to the potential risk for their survival, their olfactory sense has grown similar to women to enable them distinguish unpleasant odors, which are probably the warning signs. There is no difference between men and women in terms of their perception of negative and potentially risky odors. This lack of difference can be explained according to the findings of Demotte et al. (2011) which say the experience can strengthen the olfactory sense. The difference in men's and women's sense of smell is rooted in their physiological system (Walla et al., 2009); and since men need to avoid risks, so they have strengthened their ability to perceive unpleasant odors.

The questions 8 and 30 indicate that unpleasant body odors cause others to withdraw from the individual. Table 2 shows that the correlation between question 8 with grand total (sweat and breath odor) is greater than the correlation between question 30 with grand total (totally unpleasant odor), which indicates that people usually pay more attention to the body and breath odor. Although unpleasant odors reduce attractiveness, the type and source of odors are also important. For example, if someone's clothes smell unpleasant due his job, the decline in his attractiveness will be less than if he had a bad breath. This could be attributed to the inherent tendency to avoid risk. Since bad breath and unpleasant body odor of the individuals can be a sign of their illness, people will avoid making social and interpersonal relationships with them.

This statement is consistent with the previous findings on the role of olfactory in choosing a suitable partner (Havlicek and Roberts, 2009). Although, the unpleasant smell of clothes cause negative evaluation of the person, it is not a sign of illness or risk; and people have external reasons to justify unpleasant odors. Therefore, they will not lose their attractiveness.

It can be concluded that the sense of smell and olfactory stimuli have a strong effect on evaluation of other people in their everyday and personal lives. Although the perception of visual and auditory stimuli can occur conveniently at the conscious level, and have clear effects; this will not prevent unconscious attention to olfactory inputs. Furthermore, even the subliminal olfactory stimuli can affect the behavior, decisions, and emotional states of individuals (Li et al., 2007), and play an important role in the interpersonal and social relationship of the olfactory stimuli. People, particularly when the visual and auditory information are less reliable, rely more strongly on their sense of smell to interpret and evaluate the events, people, and the environment (Zhou and Chen, 2009).

Findings of this study can be used for making the convincing process more efficient and being more

successful in attracting the attention of other people. The effect of unpleasant odors is more than the pleasant odors. Therefore, when communicating with others, we should give priority to eliminate unpleasant odors. Noting that this is a self-report study, and it is possible that the participants have reported only their conscious responses; and neither the researchers nor the participants have access to the unconscious answers. Given the differences in people's responses to pleasant and unpleasant odors, as well as changing trends in gender (women's superior olfactory ability) in case of unpleasant odors, the future researchers are recommended to investigate whether or not the perception of pleasant and unpleasant odors is different in the two structures?

## REFERENCES

- Baron, R. A. (1981) Olfaction and Human Social Behavior: Effects of a Pleasant Scent on Attraction and Social Perception, *Pers Soc Psychol Bull*, 7: 611-616
- Byrne, D. (1997). An overview (and under review) of research and theory within the attraction paradigm, *Journal of Social and Personal Relationships*, 14, 417-431
- Chebat, J. C. Michon, R. (2003). Impact of ambient odors on mall shoppers' emotions, cognition, and spending: a test of competitive causal theories. *Journal of Business Research*; 56 (7):529-40 .
- Chopra A, Baur A, Hummel T. (2008) Thresholds and chemosensory event-related potentials to malodors before, during, and after puberty: differences related to sex and age. *Neuroimage*; 40:1257-63.
- Dematte. M.L., Endrizzi. I, Biasioli. F, Corollaro. M.L., Zampini. M., & Gasperi. F., (2011) Individual Variability in the Awareness of Odors: Demographic Parameters and Odor Identification Ability, *Chem. Percept*. DOI 10.1007/s12078-011-9103-7
- Dematte. M.L., Osterbauer. R., & Spence. C. (2007) Olfactory Cues Modulate Facial Attractiveness, *Chem. Senses* 32: 603-610
- Doty.R.L. & Cameron.E.L., (2009) Sex differences and reproductive hormone influences on human odor perception, *Physiology & Behavior* 97, 213-228
- Havlicek. J. & Roberts. S.C. (2009) MHC-correlated mate choice in humans: A review, *Psychoneuroendocrinology*, 34, 497-512
- Havlicek. J., Saxton. T.K., Roberts. S.C., Jozifkova. E., Lhota. S, Valentova. J., & Flegr.J. (2008) He sees, she smells? Male and female reports of sensory reliance in mate choice and non-mate choice contexts, *Personality and Individual Differences* 45, 565-570
- Herz R, Inzlicht M (2002) Sex differences in response to physical and social factors involved in human mate selection: the importance of smell for women. *Evol Hum Behav* 23:359-364
- Higgins, M. (2006) Figs? Coconut sunscreen? Hotels choose their scents. *New York Times*, April 9, p. 5.2.
- Jeffers, G. (2006) Pepper in the air? Its eau de Park Hyatt. *Chicago Tribune*, June 29, p. 4B.
- Karimi, Y. (2009). *Social psychology*. Tehran: Ravan Publication.
- Li, W., Moallem, I., Paller, K.A., & Gottfried, J.A. (2007). Subliminal smells can guide social preferences. *Psychological Science*, 18, 1044-1049.
- Lundstrom. J.N., & Jones-Gotman. M. (2009) Romantic love modulates women's identification of men's body odors, *Hormones and Behavior* 55, 280-284
- Ogawa T, Suzuki N. (2004). On the saliency of negative stimuli: evidence from attentional blink. *Jpn Psychol Res*. 46:20-30.
- Saxton. T.K., Lyndon. A., Little. A., & Roberts. S.C. (2008) Evidence that androstadienone, a putative human chemosignal, modulates women's attributions of men's attractiveness, *Hormones and Behavior* 54, 597-601
- Schleidt M, Neumann P, Morishita H. (1988) Pleasure and disgust: memories and associations of pleasant and unpleasant odours in Germany and Japan. *Chem Senses*. 13:279-293.
- Sela L, Sobel N (2010) Human olfaction: a constant state of change blindness. *Exp Brain Res* 205:13-29
- Smeets.M.A.M. Schifferstein.H.N.J., Boelema.S.R., & Lensvelt-Mulders.G. (2008). The Odor Awareness Scale: A New Scale for Measuring Positive and Negative Odor Awareness, *Chemical Senses*, 33: 725-734
- Walla,P., Imhof,H. & Lang.W(2009) A gender difference related to the effect of a background odor: a magnetoencephalographic study, *Journal of Neural Transm*, 116:1227-123
- Wilkie, M. (1995). Scent of a market. *American Demography* ;40- 7
- Zald. D.H., Pardo. J.V. (1997) Emotion, olfaction, and the human amygdala: amygdala activation during aversive olfactory stimulation, *Proc. Natl. Acad. Sci. U.S.A.* 94 (1997) 4119-4124.
- Zemke, D. M. & Shoemaker, S. (2008). A Sociable Atmosphere: Ambient Scent's Effect on Social Interaction, *Cornell Hospitality Quarterly*, 49: 317-329
- Zhou. W., & Chen. D., (2009) Fear-Related Chemosignals Modulate Recognition of Fear in Ambiguous Facial Expressions, *Psychological Science*, 20: 177-183.