

Smelling how to feel: Does ambient odor affect how we evaluate emotional stimuli?

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BACKGROUND

- Olfaction is strongly related to affective processing.
- The presence of pleasant or unpleasant ambient odor can influence self-reported mood ratings (Knasko 1992; 1995).
- Odors have been shown to influence people's preferences for people (Todrank, Byrnes, Wrzesniewski, & Rozin, 1995), as well as commercial products (Bone & Ellen, 1999; Bone & Jantrania, 1992).
- Crossmodal neural connectivity occurs between vision and olfaction, with odor modulating attentional processing of visual cues (Seigneuric, Durand, Jiang, Baudouin, & Schaal, 2010).
- No study has examined how odor could impact affective evaluation of visual stimuli, nor considered the relationship between odor's impact on mood and affective evaluation.
- Thus, the purpose of this study was to investigate whether the presence of a pleasant or unpleasant odor can affect self-reported mood as well as affective ratings of emotionally-charged visual stimuli.
- We hypothesized that self-reported mood and ratings of images will change depending on the odor presented, and that the changes image ratings are mediated by changes in mood.

METHODS

Sample

- Participants were recruited from the student population at the University of Dayton using SONA. A total of 133 participants (63% female) were recruited.

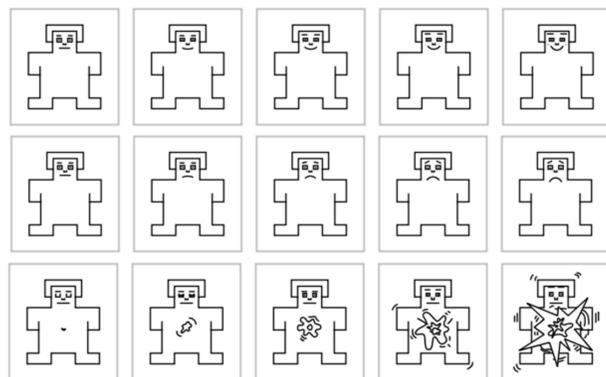


Figure 1. Self-Assessment Manikins (SAM) for pleasantness (top), unpleasantness (middle), and arousal (bottom)

METHODS (CONT.)

Materials & Measures

- International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008):** Participants were presented with 60 images that have been standardized for ratings of affective valence. Each participant was presented the images in a random order (Figure 2, bottom right).
- Ambient Odor:** During the experiment, participants were either exposed to a pleasant odor (sweet orange essential oil), an unpleasant odor (clove oil), or no odor (control) via diffuser.
- Self-Assessment Manikins (SAM; Bradley & Lang, 1994):** Ratings of pleasantness, unpleasantness, and intensity for the images and odor manipulation were assessed using three five-point unipolar pictorial representation scales (Figure 1, bottom left). The pleasantness and unpleasantness scales were modified from their original design.
- Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988):** Participants completed this scale as part of the pre-experiment survey and the experimental session in order to assess current emotional state.
- Affective Impact of Odor Scale (AIO; Wrzesniewski, McCauley, and Rozin, 1999):** How participant's liking of new things are affected by odor was rated using this scale.

Procedure

- Participants were initially asked to complete a demographic questionnaire, the PANAS, and the AIO. Afterwards, they were then presented with 30 IAPS images and rated them for pleasantness, unpleasantness, and intensity via computer task.
- Upon completing the first computer task, participants were then asked to relocate to another room prepared with one of the ambient odors or no odor, depending on condition. Participants then completed a distraction task and the PANAS again.
- Next, they completed a second computer task where they rated 60 IAPS images for pleasantness, unpleasantness, and intensity. 30 of these images were new, while 30 were the same images presented during the first computer task.
- Once all images were presented, participants were asked if they noticed an odor in the room. They then rated the odor for pleasantness, unpleasantness, and intensity (if present).

References are available upon request.
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RESULTS

- Issues with the manipulations emerged, despite pilot testing.
- As a result, hypotheses were generally not supported.
- For affect, only exposure to unpleasant odor predicted a significant decrease in positive affect.
- Odor exposure did not predict any significant changes in affective ratings for the visual stimuli.
- However, some unexpected trends emerged.
- Image pleasantness and unpleasantness ratings were correlated with each, suggesting there may be a tendency to rate highly across both dimension simultaneously.

DISCUSSION & FUTURE DIRECTIONS

- Hypotheses were not supported, but it's unclear if this is due to design issues. The presence of some significant findings suggest that this domain could be exploring further in the future, following adjustments and improvement to design.
- However, this study featured an additional benefit of providing support for the validation of the modified SAM scales used in this study.
- The scales were modified from a bipolar single-scale format in order to better represent the theoretical view that positive and negative affect are orthogonal constructs (Watson & Tellegen, 1985).
- Additional research can provide further support for these scales.
- Future research may also consider sex differences, due to the observed differences in the olfactory systems between males and females (Doty & Cameron, 2009).



Figure 2. Examples of images rated as having positive, neutral, and negative valence from IAPS