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Olfaction and Disgust as Predictors of Elevated Perfectionism

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BACKGROUND

• Odor detection and disgust sensitivity were once vital to survival by providing a means to assess if foods were safe for consumption.
• Obsessive-compulsive traits, such as checking or rigid perfectionism, may have increased chance of survival by decreasing the likelihood of consuming contaminated foods (Rozin & Fallon, 1987).
• The insula and orbitofrontal cortex are implicated in disgust, olfaction and OCD (Kringelbach & Rolls, 2004; Naevi, Rudrauf, Damasio, & Bechara, 2007; Shapira et. al., 2003; Volkahnor, 2017); thus, neural connections suggest a relation between obsessive-compulsive traits, olfaction, and disgust.
• Research findings also suggest that obsessive compulsive disorder (OCD) and obsessive compulsive personality disorder (OCPD) are associated with:
  - Increased disgust sensitivity (Olatunji et al., 2007)
  - Increased neuroticism (sensitivity (Lynam & Widiger, 2001)
  - Decreased odor pleasantness (Reactor, Hood, Richter & Bagby, 2002)
• However, these variables have not been examined in relation to rigid perfectionism in a nonclinical sample.
• The purpose of the present study was to examine associations between rigid perfectionism, odor detection sensitivity, perceived odor pleasantness and disgust sensitivity.

HYPOTHESES

1. Higher self-reported levels of rigid perfectionism will be correlated with lower odor detection sensitivity.
2. Higher self-reported rigid perfectionism will be correlated with decreased odor pleasantness ratings.
3. Higher rigid perfectionism will be correlated with higher self-reported levels of contamination based disgust sensitivity.
4. Higher rigid perfectionism will be correlated with higher neuroticism.

METHODS

Sample
• 79 undergraduate students (ages 18-23) at a Midwestern university participated in the study for course required research credit
  - 37 males, 40 females

Measures
• NEO-Personality Inventory-3 (NEO-PI-3; McCrae, Costa, & Martin, 2005): 240 item questionnaire used to assess the Big Five personality traits. The Neuroticism domain was the only scale used in the present study.
• Personality Inventory for DSM-5 (PID-5; Krueger, Derrick, Markon, Watson, & Skodol, 2012): 220 item questionnaire that assesses 25 maladaptive personality facets which comprise five domains. The Rigid Perfectionism facet, which was the variable used in this study, is comprised of 11 items.
• Contamination disgust sensitivity was measured with the Disgust Sensitivity Scale-Revised (DSS-R; Haidt, McCauley, & Rozin, 1994), a 27 item questionnaire that assess contamination disgust, animal reminder disgust and core disgust.
• Odor detection sensitivity was measured with the Sniffin Sticks Threshold test (Burghart Instruments, Wedel, Germany). Odor filled pens are administered in triplicate (two blanks with one odor) to blindfolded participants using a staircase method. (See Figure 1a).
• Ratings of odor pleasantness were assessed during administration of the Sniffin Sticks Identification Test (Burghart Instruments, Wedel, Germany). Participants were asked to smell 16 odor filled pens and to identify each odor using a forced choice response (see Figure 1b). They were also asked to rate the pleasantness and unpleasantness of each odor using two five point Likert scales (see Figure 2).

RESULTS

• Means and standard deviations of all variables are reported in Table 1.

Hypothesis One
• Higher rigid perfectionism was associated with more sensitive odor detection (r = .25, p = .03).

Hypothesis Two
• Rigid perfectionism was not correlated with odor pleasantness ratings (r = 0.01, p = .90).

Hypothesis Three
• Rigid perfectionism was not correlated with disgust sensitivity (r = .09, p = .47).

Hypothesis Four
• Rigid perfectionism was not correlated with neuroticism (r = .19, p = .11)

Table 1. Means and standard deviations for all study variables

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PID-5 Rigid Perfectionism facet</td>
<td>1.03</td>
<td>0.71</td>
</tr>
<tr>
<td>Odor detection sensitivity level</td>
<td>7.48</td>
<td>1.86</td>
</tr>
<tr>
<td>Average odor pleasantness rating</td>
<td>1.57</td>
<td>0.49</td>
</tr>
<tr>
<td>DSS-R Contamination Disgust scale</td>
<td>1.41</td>
<td>0.76</td>
</tr>
<tr>
<td>NEO-PI-3 Neuroticism domain</td>
<td>53.84</td>
<td>9.25</td>
</tr>
</tbody>
</table>

CONCLUSIONS

• Hypothesis one was not supported
  • Instead, higher rigid perfectionism was related greater odor detection sensitivity
• Possible that increased need for environmental control in individuals with perfectionistic traits may result in sensitivity to environmental cues, including olfaction.
• The present findings are inconsistent with findings of decreased odor sensitivity in OCD (Barrett et al., 1999), which may reflect differences in clinical and nonclinical samples.

• Hypothesis two was not supported
  • Results are consistent the finding for hypothesis one as improved olfactory function is associated with greater life satisfaction (Mia et al., 2001), which is related to more physical and social pleasure (Ritsner, Arbelman, & Lisker, 2011).
  • While odor pleasantness ratings were not related to trait rigid perfectionism in the present study, previous findings do suggest that individuals with OCD may perceive odors as less pleasant (Reactor, Hood, Richter & Bagby, 2002). To understand this inconsistency, future research studies should compare a clinical sample with OCD to a nonclinical sample of individuals high in rigid perfectionism.

• Hypothesis three was not supported
  • While the DSS-R measures the likelihood a person will experience disgust in specific situations, it does not measure how often a person experiences disgust (Cisler, Brady, Olatunji, & Loh, 2009).
  • Future studies on disgust and rigid perfectionism should include a disgust propensity measure (e.g. Disgust Propensity and Sensitivity Scale; van Overveld et al., 2006)

• Hypothesis four was not supported
  • Results inconsistent with previous findings of correlations between neuroticism and rigid perfectionism (Thomas et al., 2012), as well as with socially prescribed perfectionism and self-oriented perfectionism (Heath, Flett, Blankstein, 1991).

Limitations
• College student sample may not generalize to general population

ACKNOWLEDGEMENTS

Thank you to my adviser Dr. Julie Walsh-Messinger, the members of the Psychopathology, Personality, and Affective Science lab for data collection and data entry, and the Honors department

Figure 1: Sniffin' Sticks Smell Threshold Test (a), and Sniffin' Sticks Identification Test (b)

Figure 2. Odor pleasantness and unpleasantness rating scales