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Disgust propensity and sensitivity: Differential relationships with obsessive-compulsive symptoms and behavioral approach task performance

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ABSTRACT

Research indicates that disgust propensity (DP; the tendency to respond with disgust) and disgust sensitivity (DS; the tendency to experience disgust as aversive) are differentially correlated and predictive of specific anxiety disorder symptoms. Based on this distinction, we sought to investigate the relationship of disgust indices to specific obsessive-compulsive (OC) symptoms in a large, non-clinical sample ($N=755$). DP significantly predicted washing symptoms even after controlling for the influence of gender, negative effect and anxiety sensitivity, whereas DS did not. Additionally, in a subset of participants ($N=152$) we examined the indices of DP and DS in the prediction of in vivo disgust and avoidance on a contamination-based behavioral approach task (BAT) while controlling for the aforementioned covariates and OC symptoms. Analyses revealed that elevated DP significantly predicted heightened disgust and greater behavioral avoidance on the BAT. Our data suggest important conceptual and phenomenological differences between the two disgust constructs: DP is more associated with avoidant action tendencies to repugnant materials whereas DS is linked with more general emotional sensitivity.

1. Introduction

Research has increasingly placed emphasis on disgust as an emotion that serves an important function in psychopathology. It possesses its own unique set of qualities distinct from other emotions with respect to (a) subjective feelings of revulsion (Izard, 1977; Rozin & Fallon, 1987), (b) strong behavioral avoidance (e.g., an intent to withdraw from situations in which certain smells, tactile sensations, tastes, or sights is objectionable or questionable; Rozin & Fallon, 1987; Woody & Teachman, 2000), (c) distinct facial expressions (e.g., nose wrinkling; Ekman & Friesen, 1975), and (d) specific physical reactions (e.g., nausea or vomiting; Angyal, 1941). Disgust has also been implicated in various anxiety (e.g., blood-injection-injury phobia, Page, 1994; spider phobia, Rozin & Fallon, 1987; vomit phobia, van Overveld, de Jong, Peters, van Hout, & Bouman, 2008) and non-anxiety conditions (e.g., eating disorders; Davey, Buckland, Tantow, & Dallos, 1998).

One notable condition that has received much research attention for its association with disgust is contamination fear (Cisler, Olatunji, Sawchuk, and Lohr 2008; Olatunji, Cisler, Deacon, Connolly, & Lohr, 2007; Olatunji, Sawchuk, Lohr, & de Jong, 2004). Individuals with contamination fear typically experience mental intrusions concerning potential contaminants (e.g., obsessive thoughts regarding dirt, germs, bacteria, viruses) which are followed by attempts to remedy themselves by engaging in cleaning and washing rituals. Individuals with contamination fear score higher on measures that assess an inability to tolerate disgust, relative to individuals low in contamination fear (Olatunji et al., 2004). This suggests that those with symptoms of excessive washing and contamination fear are less able to cope with disgusting situations or experiences when compared to those without contamination fear concerns. Further, research has demonstrated that individuals with contamination fear evidence greater behavioral avoidance of disgusting stimuli (Olatunji, Lohr, Sawchuk, & Tolin, 2007; Tsao & McKay, 2004).

Despite the significant attention paid to the disgust-contamination fear linkage, little research has been conducted on the theoretical accounts for such an association. The disease-avoidance model is one possible way by which disgust is associated with contamination concerns. According to the model, individuals fear non-predatory animals due to their associations with the spread of disease and contamination, rather than as a fear of potential animal attack (Matchett & Davey, 1991). With previous

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research suggesting that disgust may serve an adaptive or defensive function, disgust and behavioral avoidance of contaminating stimuli may protect individuals from physical harm or illness acquisition when in contact with perceived or actual sources of contamination (Woody & Teachman, 2000). Taken together, the linkage between disgust and contamination fear may be due to several important shared characteristics including: (a) specific triggers (e.g., potential illness-related threat), (b) underlying motivational goal (e.g., maintenance of physical integrity), (c) ensuing behavioral reactions (e.g., increased avoidance), and (d) associated negative effect (e.g., anxiety).

Research on the nature of disgust has resulted in several self-report measures that assess its various aspects in specific contexts (e.g., disgust reactivity to decaying materials or sexually deviant acts). Self-report measures including the Disgust and Contamination Sensitivity Questionnaire (Rozin, Fallon, & Mandell, 1984), the Disgust Emotion Scale (Kleinknect, Kleinknect, & Thorndike, 1997), and the Disgust Sensitivity Scale-Revised (Haidt, McCauley, & Rozin, 1994, modified by Olatunji et al., 2007) assess disgust elicitors (e.g., *It would bother me to be in a science class, and to see a human hand preserved in a jar*; Haidt et al., 1994, modified by Olatunji et al., 2007). However, the aforementioned measures tend to index the extent to which individuals are disgusted by specific stimuli but they do not measure more general appraisals for the experience of disgust (see Olatunji & Cisler, 2009 for an excellent review). Consequently, the Disgust Propensity and Sensitivity Scale (DPSS; Cavanaugh & Davey, 2000) was developed to address the limitations of those instruments as well as provide an appraisal of disgust experiences, regardless of disgust trigger (van Overveld, de Jong, Peters, Cavanagh, & Davey, 2006). Importantly, the emotion of disgust is not simply limited to contamination, but may be found in other areas (e.g., moral and ethical concerns) such that devising a measure that addresses all contextual disgust environments and elicitors is not feasible. The DPSS provides a significant advancement in that it does not examine a narrow area of content (e.g., mutilation or decaying bodies), but instead, measures disgust in a decontextualized manner. DPSS is then able to tap into many other non-contamination specific concerns without restrictions placed on item content.

A revised version of the DPSS is composed of two factors: Disgust Sensitivity (DS) and Disgust Propensity (DP; van Overveld et al., 2006). DS refers to how bothered an individual is by the experience of disgust and may reflect an individual's emotional vulnerability towards the experience of disgust. For example, a disgust-sensitive person may feel they will faint when disgusted. Items in the measure reflect both negative cognitive and affective consequences as a result of feeling disgusted.

Whereas DS reflects the evaluation of feeling disgusted, DP is defined as how readily, frequently, or easily a person responds with disgust (e.g., "I avoid disgusting things;" van Overveld et al., 2006). DP items primarily assess behavioral tendencies towards the experience of disgust. The distinction between the two subscales is succinctly addressed by Olatunji and Cisler (2009) who state "the differentiation of disgust sensitivity from disgust propensity is akin to the differentiation of the degree to which an individual experiences anxiety (i.e., trait anxiety) from the degree to which an individual's experience of anxiety is aversive (i.e., anxiety sensitivity)" (p. 41). That being the case, DS may be conceptually similar to anxiety sensitivity while DP is akin to trait anxiety.

More recent research suggests DP and DS possess differential relationships with clinical variables of relevance. DP is uniquely associated with obsessive-compulsive disorder (OCD) when compared with generalized anxiety disorder (GAD), demonstrating that the tendency to experience disgust is specific to OCD rather than nonspecific anxiety (Study 1, Olatunji, Tart, Ciesielski, McGrath, & Smits, 2011). In contrast, DS is associated with greater difficulty in regulating emotions (Cisler, Olatunji, & Lohr 2009). This is corroborated by neuroimaging research implicating DS as negatively associated with prefrontal lobe activation, suggesting disgust-sensitive individuals may display inefficient cognitive control to assist in emotion regulation (Schafer, Leutgeb, Reishofer, Ebner, & Schienle, 2009). Consistent with this distinction, DP is linked with the severity of washing symptoms in both nonclinical and clinical samples (Olatunji et al., 2010; Study 1), but DS does not predict behavioral task avoidance above and beyond DP (van Overveld, de Jong, & Peters 2010).

Taken together, DP may evidence a relationship with behaviors motivated to avoid repulsive or contaminating materials (e.g., washing or cleaning rituals in OCD) while DS is more strongly associated with deficient emotion regulation. Owing to this distinction, some studies have shown only a mild-to-moderate range of correlation coefficients between DP and DS (Cavanagh & Davey, 2000; Fergus & Valentiner, 2009; Olatunji et al., 2007; van Overveld et al., 2006, 2010), indicating there is more unique, rather than shared,variance between the two indices.

The current study sought to examine the differential nature of DP and DS using self-report and behavioral assessment across two studies. Examining different aspects of disgust constructs in the prediction of OC symptoms and behavioral indices is important for a few reasons. First, a contamination approach task provides a potent context to elicit disgust reactions thereby allowing researchers to examine various aspects of such emotional reactions. Second, research has shown considerable phenomenological overlap between disgust and contamination fear. Furthermore, as detailed earlier, disgust and contamination fear share important motivational goals of disease avoidance while also ensuring one's physical integrity. Thus, contamination threat is expected to provide a theoretically and clinically relevant context for examining various facets of disgust. Understanding the DP–DS distinction may also provide a clearer pattern of association between disgust and contamination fear.

The present study aimed to examine the relative contribution of DP vs. DS in explaining specific domains of OC symptoms and relevant behavioral performance using a contamination-based behavioral approach task (BAT). Overall, we predict that DP will emerge as a better predictor of avoidance of repulsive materials (e.g., washing-related OC symptoms, heightened disgust experience, and greater avoidance of potential contaminants), whereas DS would be more strongly associated with general pathological emotional sensitivities (e.g., anxiety sensitivity and negative effect). The decision to examine contamination fear and washing symptoms specifically was important given this domain of OCD is the most thematically relevant to disgust.

2. Study 1

In Study 1, we sought to examine the relative contribution of DP and DS to OC symptoms. We hypothesized that the relation between OC symptoms and disgust would be specific to DP, and that DS would best predict more general emotional sensitivities like anxiety sensitivity and negative affectivity; this is again based on our conceptualization that DP shares theoretical and phenomenological variance with avoidance of repulsive materials (e.g., OC symptoms), whereas DS reflects general emotional vulnerabilities that are more strongly associated with anxiety sensitivity and negative affect. Similar to anxiety sensitivity (Cox, Borger, Taylor, Fuentes, & Ross, 1999), DS is expected to be significantly associated with negative emotionality. Additionally, avoidance of repugnant materials is often demonstrated in contamination fearful persons who may also excessively wash their body parts. On the other