



## Disgust propensity in obsessive–compulsive disorder: Cross-sectional and prospective relationships

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### ABSTRACT

**Background and Objectives:** Findings from non-clinical samples suggest that disgust propensity is associated with contamination concerns in obsessive–compulsive disorder (OCD). However, studies of clinical samples have yielded conflicting results. We investigated the relationship between disgust propensity and OCD symptoms in a clinical sample and examined whether changes in disgust propensity are associated with changes in OCD symptoms.

**Methods:** One hundred and nine OCD participants completed measures of disgust propensity and OCD symptoms. Sixty of these underwent a six-month follow-up assessment.

**Results:** At the baseline assessment, disgust propensity was associated with all OCD symptom dimensions except hoarding. Changes in overall disgust propensity between baseline and the six-month follow-up assessment were associated with changes in overall self-reported OCD symptoms but not with changes in contamination-based OCD symptoms or changes in interviewer-assessed OCD symptoms.

**Limitations:** There was substantial participant attrition between the baseline and follow-up assessments.

**Conclusions:** Our study is the first to investigate prospective relationships between disgust propensity and OCD across a six-month interval. Our findings suggest that if there is an association between changes in disgust propensity and changes in contamination-based OCD symptoms its magnitude is likely to be small.

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## 1. Introduction

Many studies in recent years have indicated that the propensity to experience disgust is associated with obsessive–compulsive disorder (OCD) symptoms. Crucially, this has been demonstrated using both self-report questionnaires (Charash & McKay, 2002; Cisler, Brady, Olatunji, & Lohr, 2010; Mancini, Gagnani, & D'Olimpio, 2001; Muris et al., 2000; Schienle, Stark, Walter, & Vaitl, 2003; Thorpe, Patel, & Simonds, 2003; Woody & Tolin, 2002) and behavioural avoidance tasks (Deacon & Olatunji, 2007; Olatunji, Lohr, Sawchuk, & Tolin, 2007; Tsao & McKay, 2004). Moreover, the association between disgust propensity and OCD symptoms remains after controlling for anxiety and depression symptoms, and age and gender (Mancini et al., 2001).

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Of the various manifestations of OCD, disgust propensity is most closely associated with contamination concerns and washing compulsions (Berle & Phillips, 2006) and correlations are typically medium to large in magnitude ( $r_s = .20$  to  $.50$ ; Mancini et al., 2001; Muris et al., 2000; Olatunji, Sawchuk, Lohr, & de Jong, 2004; Schienle et al., 2003; Thorpe et al., 2003; Tolin, Woods, & Abramowitz, 2006). There is preliminary evidence to suggest that disgust propensity might also be associated with religious obsessions (e.g.,  $r = .52$ ; Olatunji, Tolin, Huppert, & Lohr, 2005), however, correlations with other domains of OCD are generally only small to medium in magnitude (e.g.,  $r_s = .21$  to  $.32$ ; Schienle et al., 2003). The association with contamination-based OCD is consistent with the notion that elevated disgust propensity may serve a protective function by eliciting avoidance of physical contact with, and ingestion of, potentially infected or dirtied objects (Woody & Teachman, 2000).

Disgust propensity appears to be a multi-factorial construct (Olatunji, Williams, Lohr, & Sawchuk, 2005) comprised of core disgust, animal reminder disgust and contamination disgust. Core

disgust leads to evaluations of objects as possible sources of contamination, such that strong feelings of aversion result from the prospect of oral incorporation (Rozin, Haidt, & McCauley, 2008). Rotting foods, waste products and small animals that may potentially spread disease or contagion are considered to be objects of core disgust (Olatunji, Williams et al., 2005). Animal reminder disgust, on the other hand, involves a repugnance of objects and acts that remind humans of our animal origins and of our mortality. Aversion to sexual acts, mutilation, injury and death characterise this form of disgust. Contamination disgust involves disgust reactions based on the perceived threat of transmission of contagion (Olatunji, Williams et al., 2007). Unlike core disgust, contamination disgust is thought to involve a perceived risk of contamination from other people, rather than other objects (Olatunji, Haidt, McKay, & Bieke, 2008).

Core disgust is considered to be more closely related to OCD, and contamination-based OCD in particular, than is animal reminder disgust (Olatunji, Sawchuk, de Jong, & Lohr, 2007). Findings from a series of studies provide some support for this proposition in that core disgust, but not animal reminder disgust, was positively associated with OCD washing and contamination concerns (Olatunji, Williams et al., 2005). However, only contamination disgust, and not core or animal reminder disgust, predicted OCD contamination concerns after controlling for gender in the study of Olatunji, Haidt et al. (2008). Also, other studies (e.g., Tolin et al., 2006) have reported small-size correlations between OCD washing symptoms and disgust subscales in both the core and animal reminder disgust domains (e.g.,  $r$ s of .17–.20 for Food, animals and Body Products subscales and  $r$ s of .11–.31 for the sex, envelope violations, death and hygiene subscales of the Disgust Scale).

The only prospective studies of the relationship between disgust and OCD symptoms are those of David et al. (2009), Olatunji (2010), and Olatunji, Tart, Ciesielski, McGrath, and Smits (2011). Using a student sample, Olatunji (2010) found that changes in overall disgust predicted changes in OCD contamination-based symptoms across a 12-week period, controlling for age, gender, depressive symptoms and negative affect. Interestingly, this relationship only applied to disgust propensity (i.e., a heightened frequency and intensity of disgust experiences; Olatunji, 2010) rather than disgust sensitivity (i.e., the tendency to overestimate the negative consequences of experiencing disgust; Olatunji, 2010). The study of David et al. (2009) investigated disgust sensitivity, but not propensity, across a 12-week interval in a non-clinical sample. These authors found that disgust sensitivity did not predict changes in OCD symptoms after controlling for anxiety sensitivity, negative affect, demographic variables and OCD-relevant beliefs. Finally, Olatunji et al. (2011) found that changes in disgust propensity predicted changes in OCD symptoms across two to three weeks of intensive OCD treatment. Thus, prospective relationships between OCD and disgust may apply only to disgust propensity, and not to disgust sensitivity.

An important limitation of the aforementioned literature is that, with very few exceptions, the evidence for an association between disgust propensity and OCD symptoms is built largely upon findings from non-clinical samples and from clinical analogue groups. There is evidence to suggest that non-clinical participants who score highly on OCD symptoms frequently meet diagnostic criteria for OCD (Burns, Formea, Keortge, & Sternberger, 1995), and that they share a number of features in common with clinical participants, including personality traits and cognitive styles (Gibbs, 1996). Also, OCD symptoms may be distributed dimensionally rather than categorically in the overall population (Olatunji, Williams, Haslam, Abramowitz, & Tolin, 2008). Thus, individuals who do not meet diagnostic criteria may still have similar OCD

tendencies to those who do. Nevertheless, studies of clinical samples are needed to ensure the generalisability of findings from the non-clinical literature. Most of the non-clinical samples have been recruited from student populations that may not share the characteristics of individuals from the broader community who have OCD.

The few studies that have used clinical samples have generated inconsistent results. Woody and Tolin (2002) recruited 56 treatment-seeking individuals with OCD as well as a group of patients with generalised social phobia and a non-anxious control group. Within the OCD and the OCD-washing compulsions groups, only small-size correlations were found between OCD symptoms and disgust propensity ( $r$ s = .17 and .14 respectively). In contrast, in the clinical sample of Olatunji et al. (2010), disgust propensity was significantly correlated with OCD washing symptoms ( $r$  = .35) as well as a number of other OCD symptom domains (e.g.,  $r$  = .40 with hoarding symptoms). An earlier study by Olatunji, Williams et al. (2007) reported that OCD participants with washing concerns scored higher than OCD participants without washing concerns and non-anxious controls on measures of core disgust, contamination disgust and overall disgust, but not animal reminder disgust. Thus, there are conflicting findings and the question of the relationship between disgust propensity and OCD symptoms in clinical samples remains unresolved.

### 1.1. Aims and objectives

The present study therefore included the following aims. First, we wanted to determine whether relationships between disgust and OCD found in non-clinical samples extend to a clinical sample. On the basis of the three clinical studies that we are aware of, we expected small to medium-sized associations between overall disgust propensity and contamination-based OCD symptoms, and weaker associations between disgust propensity and other OCD symptom domains. Second, we sought to investigate whether specific domains of disgust are more closely associated with contamination-based OCD symptoms and overall OCD symptoms than are others. In this regard, we expected that, consistent with previous literature from non-clinical samples, core disgust would be more strongly associated with OCD symptoms than would animal reminder disgust. Finally, we aimed to replicate the findings of Olatunji (2010) that suggested that change in disgust propensity over time is associated with change in OCD symptoms.

## 2. Method

One hundred and nine adults with a principal diagnosis of OCD were recruited through the Nepean Anxiety Disorders Clinic, OCD support groups, newspaper advertisements and referrals from general practitioners, psychiatrists, clinical psychologists, and mental health services. The principal diagnosis of OCD was determined on the basis of a semi-structured interview, such that OCD was the condition for which help was sought or which caused the most distress or impairment in functioning. Individuals with a current psychosis, bipolar disorder, or with other conditions that were considered to be more severe or disabling than their OCD were not included in the study. Institutional ethics committee approval was obtained prior to commencing the study.

### 2.1. Assessments

Participants were administered the Mini Neuropsychiatric Interview (MINI; Sheehan et al., 1999) and the Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman, Price, Rassmussen,

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