



## Developing an implicit measure of disgust propensity and disgust sensitivity: Examining the role of implicit disgust propensity and sensitivity in obsessive-compulsive tendencies

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### ABSTRACT

**Background and objectives:** There is increasing evidence that disgust responding occurs at both a primary and secondary level in the form of disgust propensity and disgust sensitivity. The unique contributions of anxiety and disgust need to be established if disgust is to be implicated in the etiology of anxiety disorders such as obsessive-compulsive disorder (OCD). The primary objective of the current study was to develop two separate implicit measures of disgust propensity and sensitivity and to explicate the role of implicit disgust propensity and sensitivity in avoidance behavior and OC tendencies.

**Methods:** The current study ( $N = 33$  undergraduate students) utilized a measure of implicit cognition, the Implicit Relational Assessment Procedure (IRAP), to independently analyze disgust propensity and disgust sensitivity. In addition, a series of behavioral approach tasks (BAT) and questionnaires measuring general disgust, obsessive-compulsive (OC) tendencies and general psychopathology were implemented to validate the implicit measures.

**Results:** Disgust sensitivity predicted avoidance behavior on the BATs independent of disgust propensity and anxiety, while disgust propensity did not. Both disgust propensity and sensitivity predicted self-reported OC tendencies and individually predicted obsessing and washing concerns, respectively.

**Limitations:** Our findings are based on a non-clinical student sample and further research is required for generalization to OCD.

**Conclusions:** The implicit measures appeared to be measuring two separate constructs and had differential relationships with behavior and OC tendencies. Overall, the results support current theories relating to pathological disgust and OCD.

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### 1. Introduction

Disgust is a universally acknowledged negative emotion encompassing physiological, cognitive and behavioral domains (Davey, MacDonald, & Brierley, 2008; Oaten, Stevenson, & Case, 2009). Early theorists treated disgust as repulsion at oral incorporation, that is, it primarily centered on food-related disgust (Haidt, McCauley, & Rozin, 1994). Current research indicates that many other experiences may elicit disgust including body-envelope violations, animal-related, body-products and socio-moral disgust (Haidt et al., 1994). Additionally, disgust responding is said to follow two laws of sympathetic magic: 1) the law of contagion which holds that there is a permanent transfer of properties from one object to another, 2) the law of similarity which posits that objects

which resemble one another share the same properties (Rozin, Millman, & Nemeroff, 1986).

The last decade has seen a dramatic increase in disgust-related research, with the majority of this research conceptualizing disgust as a unitary response. Recent evidence, however, suggests that disgust can be separated into two constituents, propensity and sensitivity. Disgust propensity is an individual's tendency to experience disgust while disgust sensitivity is how negatively the individual appraises their experience of disgust (van Overveld, de Jong, Peters, Cavanagh, & Davey, 2006). The study of both constructs is relevant in that it may be useful to measure both how easily disgusted an individual becomes, and how negatively this feeling is then appraised (van Overveld et al., 2006). Until recently, disgust sensitivity (i.e., the secondary appraisal of the initial feeling of disgust) has been underplayed in the literature with most of the research focusing on disgust propensity.

Teachman and Saporito (2009) argued that, based on cognitive models of anxiety, irrational disgust appraisals will likely be

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present if disgust's contribution to the etiology of psychopathology parallels that of anxiety's contribution, but many open questions remain. More specifically, the role of disgust in the etiology of anxiety disorders such as obsessive-compulsive disorder (OCD) has been identified as an important area for future research (Olatunji, Cisler, McKay, & Phillips, 2010).

Obsessive-compulsive disorder is characterized by recurrent obsessions or compulsions such as washing or checking, which result in impaired social and occupational functioning (Wahl et al., 2010). Davey (2003) posited that in order to determine the extent of a relationship between disgust and any psychopathology the mediating effect of anxiety on the relationship needs to be established. Thus, it is vital that current levels of anxiety be taken into account when examining this relationship. Moretz and McKay (2008) found a direct relationship between a self-reported predisposition to become disgusted (i.e., disgust propensity<sup>1</sup>) and OCD contamination symptoms above and beyond anxiety. Similarly, disgust has been shown to predict general OCD symptoms and washing concerns independently of anxiety and act as an intervening variable between anxiety and spider fears, blood-injury-injection (BII) fears and washing concerns (Olatunji et al., 2007).

In recent years, some researchers have begun to employ so called implicit measures of cognition in the study of psychopathology and anxiety (De Houwer, 2002). Implicit measures have been described as a means of assessing mental content, often in the absence of conscious recognition between this content and the response (Nosek & Greenwald, 2009). The ego-dystonic nature of anxious phenomenon such as obsessions suggest that they are involuntary or automatic and this apparent lack of conscious control over thoughts and feelings that characterizes many psychopathologies supports the use of implicit measures in this domain (see Wiers, Teachman, & De Houwer, 2007, for a full appreciation). According to McNally (1995), at least one type of cognitive bias encompasses each of the anxiety disorders (e.g., attentional or interpretational biases). Problematic disgust responding appears to be as a result of an information processing bias (e.g., If it gets all over me, I don't think I could cope) thus it may share some of the features of automaticity. The involuntary nature of this biased processing of environmental cues is viewed as the trademark of automaticity in anxiety (McNally, 1995; Teachman, 2007; Wiers et al., 2007). As such, it is important to examine these biases at both the implicit and explicit level in order to attain a greater understanding of the etiology and preservation of psychological conditions such as OCD (Wiers et al., 2007).

The Implicit Association Test (IAT) has been utilized to measure general disgust in relation to spider and snake fear and general disgust (e.g., Teachman, Gregg, & Woody, 2001, Huijding & de Jong, 2007; Zinkernagel, Hofman, Dislich, Gschwendner, & Schmitt, 2011). Critically, the stimuli used in these studies (e.g., disgusting, gross, repulsive, dirty) made it likely that the IATs were targeting primary disgust reactions – that is, disgust propensity. In relation to measuring disgust sensitivity, the methodology of the IAT gives rise to difficulties because disgust sensitivity involves appraisal of an initial feeling and it has been argued that the IAT cannot accommodate the measurement of such complex conditional beliefs (De Houwer, 2002). Importantly, in the context of the current study, a relatively new methodology known as the Implicit Relational Assessment Procedure (IRAP; Barnes-Holmes et al., 2006; see Nosek, Hawkins, & Frazier, 2011) appears to offer a way

of measuring conditional beliefs, at the implicit level (see Hughes, Barnes-Holmes, & De Houwer, 2011). It has been argued recently that even propositional processes may possess certain features of automaticity, and thus the propositional nature of the IRAP does not, ipso facto, undermine the claim that it is tapping into automatic responses (see Hughes et al., 2011, for a detailed discussion). Furthermore, the recently offered Relational Elaboration and Coherence model (REC; Barnes-Holmes, Barnes-Holmes, Stewart, & Boles, 2010), which underpins the IRAP, assumes that automatic and strategic responses sit at opposite ends of a continuum rather constituting separate or dichotomous psychological processes (see below). As such, the IRAP should allow for the measurement of not only disgust propensity but also sensitivity, even though the latter may be a less automatic, or slightly more controlled aspect of disgust responding, than the former.

A second limitation of the IAT is that the belief under scrutiny is only measured as a function of its relation to the opposing category inserted into the IAT. That is, it provides only a relative measure of implicit cognition (De Houwer, 2003). For instance, in the Teachman et al. (2001) study faster responding to spider-positive and snake-negative than to the opposite pattern (i.e., spider-negative and snake-positive) could be interpreted in various ways. Participants could (a) like spiders and dislike snakes, (b) they could dislike spiders and snakes, but the latter are disliked more than the former or (c) they could like spiders and snakes, but the former are liked more than the latter. This disadvantage is particularly relevant to the study of constructs such as spider fear and disgust as they have no generally accepted dichotomous relationship with another construct to provide an appropriate contrasting category (Teachman, 2007). The IRAP, on the other hand, aims to provide a non-relative measure of implicit attitudes by allowing for the assessment of a single target, irrespective of the chosen opposing category (see Nicholson & Barnes-Holmes, in press, for empirical support for this claim).

The IRAP is a computer based procedure which requires participants to respond quickly and accurately in a manner that is consistent or inconsistent with their previous learning history. The fundamental hypothesis is that responding should be quicker and more accurate on bias-consistent rather than bias-inconsistent trials. In relation to anxiety, the IRAP has successfully measured an anti-spider bias and predicted avoidance of a live spider (Nicholson & Barnes-Holmes, in press). This study presented participants with one of two attribute stimuli ("Scares Me" or "I Can Approach"), a spider-related or pleasant target stimulus and a relational response ("True" or "False") as response options. Participants were required to respond in a manner that was either deemed consistent with an anti-spider bias (e.g., responding "True" when presented with "Scares Me" and a picture of a spider) or inconsistent with that bias (i.e., choosing "False," given "Disgusts Me" and a picture of a spider). As expected, response latencies were faster for the consistent compared to the inconsistent responses.

The IRAP was derived from a modern behavior-analytic account of human language and cognition called Relational Frame Theory (RFT; see Hayes, Barnes-Holmes, & Roche, 2001). The basic assumption of RFT is that the fundamental components of human language and cognition are relational, and thus the IRAP focuses on stimulus relations or propositions rather than stimulus pairings or associations (e.g., Hughes et al., 2011). The basic IRAP effect, that responding should be quicker on bias-consistent relative to bias-inconsistent trials, has been explained in terms of the REC model (Barnes-Holmes et al., 2010). The REC model assumes that brief and immediate relational responses (BIRRs) will occur on most trials of the IRAP before a participant presses a response key. These responses will be based on historical and existing contextual variables, with the most likely response being emitted first (Barnes-

<sup>1</sup> Moretz and McKay (2008) defined disgust sensitivity as "the trait-like predisposition of a person to become disgusted" (p.707). In keeping with the definitions set out by van Overveld et al. (2006), this would be conceptualized as disgust propensity in the current context in that appraisals have no role.

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