



Effects of exposure to erotica on disgust: A preliminary test among contamination-fearful individuals

Kelly A. Knowles*, Andrew J. Tomarken, Bunmi O. Olatunji

Vanderbilt University, Department of Psychology, 312 Wilson Hall, Nashville, TN 37240, USA



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ABSTRACT

Disgust has been implicated in the fear of contamination that is commonly observed in obsessive-compulsive disorder (OCD). However, basic and treatment-oriented research has shown that disgust is resistant to extinction among those with a fear of contamination. Consequently, there is growing interest in discovering novel approaches to targeting heightened disgust responding among those with OCD. Recent experimental research suggests that sexual arousal may inhibit disgust responding. Accordingly, the present study examines the effects of exposure to erotica on verbal reports of disgust and behavioral avoidance in a contamination-fearful sample of adults. Participants viewed sexually arousing, positively arousing, or neutral films and participated in a series of sexually relevant and non-sexually relevant behavioral approach tasks. Participants also gave ratings of disgust before and after completing each behavioral task. Although no group differences were observed for the number of steps completed on the behavioral approach tasks, those who viewed sexually arousing films reported significantly less change in disgust throughout the behavioral approach task compared to those who viewed positively arousing and neutral films. The potential clinical implications of the effects of sexual arousal on disgust responding in contamination-based OCD are discussed.

Fear of contamination is a common concern among individuals with obsessive-compulsive disorder (OCD; [Rachman & Hodgson, 1980](#); [Rasmussen & Eisen, 1992](#); [Rasmussen & Tsuang, 1986](#)). For individuals with contamination-based OCD, obsessions about feeling dirty or spreading germs to others and compulsions involving washing and cleansing can be highly distressing ([Rachman, 2004](#); [Steketee, Grayson, & Foa, 1985](#)). Avoidance of possible situations where one could become contaminated is also a key feature ([Rachman, 1994, 2004](#)). Although contamination concerns have traditionally been thought to be driven by “fear,” disgust may be the more relevant emotion for these individuals. Indeed, questionnaire-based studies demonstrate a high degree of correlation between disgust proneness and contamination fear ([Cisler, Reardon, Williams, & Lohr, 2007](#); [Deacon & Olatunji, 2007](#); [Olatunji, Lohr, Sawchuk, & Tolin, 2007](#); [Olatunji, Sawchuk, Lohr, & de Jong, 2004](#)). Neurobiological studies have also demonstrated relationships between disgust, contamination concerns, and washing compulsions. When viewing disgusting images, OCD patients with contamination-focused obsessions and compulsions had increased activity in the insula, a region implicated in disgust, compared to healthy volunteers. No significant differences were found during a threat viewing task ([Shapira et al., 2003](#)). Studies examining behavior also demonstrate that willingness to complete aversive behavioral approach tasks in individuals

with high contamination fear is largely driven by disgust proneness ([Deacon & Olatunji, 2007](#); [Olatunji, et al., 2007](#)).

Traditional OCD treatment involves exposure and response prevention (ERP): exposure to feared thoughts and situations that are the subject of an individual's obsessions without carrying out a subsequent compulsive response to reduce distress that might arise as a consequence of the exposure. Given evidence from multiple modalities implicating disgust in contamination-based OCD, directly targeting disgust during ERP may improve treatment outcomes. However, experimental research has consistently shown that learned disgust reactions are resistant to extinction ([Mason & Richardson, 2010, 2012](#); [Olatunji, Forsyth, & Cherian, 2007](#)). Research among those high in contamination fear has also shown that habituation of disgust is slower than fear during repeated exposure to a disgusting contamination-relevant stimulus ([Adams, Willems, & Bridges, 2011](#)). Similarly, research with OCD patients has found that individuals with contamination-related OCD habituated more slowly to disgust stimuli than individuals with other forms of OCD ([McKay, 2006](#)). Given that successful reductions in disgust during treatment of OCD are associated with better outcomes ([Athey et al., 2015](#); [Knowles, Viar-Paxton, Riemann, Jacobi, & Olatunji, 2016](#); [Olatunji, Tart, Ciesielski, McGrath, & Smits, 2011](#)), treatment methods that facilitate increased disgust extinction are

* Corresponding author.

E-mail address: kelly.a.knowles@vanderbilt.edu (K.A. Knowles).

needed (Viar-Paxton & Olatunji, 2012).

Emerging research on the mechanisms of sexual arousal may offer important insights on facilitating disgust extinction. Sexual arousal is a powerful approach motivator that can override the instinct to avoid disgusting stimuli (Stevenson, Case, & Oaten, 2011). During a sexual encounter, bodily products and odors that may normally be considered disgusting are present and yet typically do not inhibit an individual's desire for sexual activity. Although the experience of disgust produces a drive to avoid contaminants (Oaten, Stevenson, & Case, 2009), most adults succeed in overcoming this tendency and enjoy their sexual experiences. Consistent with this view, it has been suggested that sexual arousal functionally inhibits disgust, which facilitates an organism's willingness to engage in high-risk, but evolutionarily necessary, reproductive behaviors (Lee, Ambler, & Sagarin, 2014).

The dual control model of sexual behavior suggests that sexual excitation and sexual inhibition work as two separate, opposing processes to determine sexual response (Bancroft & Janssen, 2000; Bancroft, Graham, Janssen, & Sanders, 2009), and disgust may be one key component of sexual inhibition (de Jong, van Overveld, & Borg, 2013). Disgust motivates avoidance behavior, and individuals with sexual dysfunctions often experience increased disgust propensity (de Jong & Peters, 2009). Individuals with contamination-based OCD may also avoid sexual activity because it involves exposure to bodily products that may carry pathogens and are strong disgust elicitors (Rozin & Fallon, 1987). Sexual activity also involves close contact between bodily apertures, such as the mouth, vagina, and anus, which are highly sensitive to pathogen disgust (Rozin, Nemeroff, Horowitz, Gordon, & Voet, 1995).

Experimental research has supported the view that sexual arousal inhibits disgust responses. In a sample of healthy female undergraduates, Borg and de Jong (2012) demonstrated that sexual arousal, induced in a laboratory setting, reduced feelings of disgust and behavioral avoidance of disgusting stimuli compared to participants who were exposed to a generally positive arousing stimulus. Fleischman and colleagues (2015) recently found that although sexual arousal increased self-reported disgust in women with high trait disgust, sexual arousal was observed to decrease self-reported disgust in women with low trait disgust. When disgust is not effectively inhibited, this has recently been shown to correspond with more sexual avoidance behavior (DePesa & Cassisi, 2016). In a study where participants were randomly assigned to either view disgust priming images and subsequently view sexually explicit images or view neutral primes and sexually explicit images, sexual arousal was found to be lower in the disgust condition compared to the neutral condition (Andrews, Crone, Cholka, Cooper, & Bridges, 2015). This finding supports an inhibitory effect of disgust on sexual arousal. Taken together, these studies suggest a reciprocal relationship where disgust dampens sexual arousal and vice versa.

The observation that sexual arousal plays a critical role in counteracting disgust-induced avoidance via lowering the threshold for engaging in disgusting behaviors (de Jong et al., 2013) may have implications for reducing avoidance behaviors among those with contamination-based OCD. Accordingly, the present study examines the extent to which sexual arousal influences behavioral and verbal responding to disgusting sex-related and non-sexual contamination-related stimuli. Specifically, the present study compares individuals high in contamination fear who watched sexually arousing videos with those who watched positively arousing (non-sexual) videos and those who watched neutral videos on subsequent avoidance and experienced disgust. It was predicted that individuals in the sexual arousal condition would complete more steps on behavioral approach tasks (BATs) than individuals who were in the positive arousal and neutral conditions. The use of these both sex-related and non-sexual contamination-related stimuli in the BATs allowed for a test of the generalizability of the effect of the sexual arousal manipulation. For example, contamination-fearful individuals in the sexual arousal condition may exhibit increased approach behavior toward sexually-relevant stimuli but not other

contaminated stimuli. Due to the lack of empirical research on this question, no specific hypotheses are offered. As an exploratory analysis, differences in disgust ratings for each BAT were examined by group to determine if individuals in any condition responded differently to sex-related BATs compared to non-sexual contamination BATs.

1. Method

1.1. Participants

Undergraduate classes at Vanderbilt University were screened using the Padua Inventory – Contamination Obsessions and Washing Compulsions Subscale (PI; Burns, Keortge, Formea, & Sternberger, 1996) in order to identify students high in contamination fear. In line with past studies (e.g., Deacon & Maack, 2008; Deacon & Olatunji, 2007; Olatunji et al., 2007), we based our group selection on the PI means of the OCD patient group (13.87). Seventy-six participants who scored above the patient mean on the PI participated in the study, including 54 women ($M_{\text{age}} = 19.44$ years) and 22 men ($M_{\text{age}} = 19.23$ years); 56.6% of the sample identified as Caucasian. There is compelling evidence that studies of analogue OCD samples are relevant to understanding OCD in clinical populations (see Abramowitz et al., 2014, for a review). For example, Burns, Formea, Keortge, and Sternberger (1995) found that non-treatment-seeking individuals who scored highly on self-report measures of OC symptoms often met diagnostic criteria for OCD, evidenced stability of symptoms over time, and exhibited similar associated symptom features as patients diagnosed with OCD.

1.2. Materials

The *Mini-International Neuropsychiatric Interview* (M.I.N.I.; Lecrubier et al., 1997). The M.I.N.I. is a brief structured diagnostic interview that covers a range of mental disorders. For the purposes of this study, only the OCD module was administered. While the current study examined an analogue sample of contamination fear, OCD was assessed to determine the extent to which individuals in the study were experiencing significant obsessions, compulsions, and impairment. To reduce participant burden, other modules of the M.I.N.I were not administered, as they were not directly relevant to study hypotheses.

The *Padua Inventory* (PI; Burns et al., 1996) contamination subscale. The Padua Inventory is a 10 item self-report questionnaire designed to assess fear of contamination. Items are rated on a Likert scale from 1 (“strongly disagree”) to 5 (“strongly agree”). Higher scores on this inventory indicate more contamination fear. In the present sample, the PI demonstrated good internal consistency ($\alpha = 0.82$).

The *Disgust Propensity and Sensitivity Scale – Revised* (DPSS-R; van Overveld, de Jong, Peters, Cavanagh, & Davey, 2006). The DPSS-R is a 16-item self-report questionnaire designed to measure disgust propensity (i.e. “I avoid disgusting things”) and disgust sensitivity (i.e. “Disgusting things make my stomach turn”). Participants rate the frequency of experience of items on a 5-point Likert scale from 1 (“never”) to 5 (“always”). Higher scores indicate higher disgust propensity and disgust sensitivity. Due to experimenter error, one item was missing from the disgust sensitivity subscale; thus, only data from the disgust propensity subscale is presented. In the present sample, the 8-item DPSS-R propensity subscale demonstrated acceptable internal consistency ($\alpha = 0.78$).

The *State Trait Anxiety Inventory–Trait Version*, Form Y (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The STAI-T is a 20-item scale that measures the enduring or chronic experience of anxiety (e.g., “I feel nervous and restless”). In contrast to the state version of the measure, items probe how much one *generally* experiences a symptom of anxiety, and responses range from 1 (“not at all”) to 4 (“very much so”). The STAI-T demonstrated excellent internal consistency in the present sample ($\alpha = 0.94$).

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