



# An experimental analysis of disgust sensitivity and fear of contagion in Spider and Blood Injection Injury Phobia

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## ABSTRACT

Disgust sensitivity and concern with contamination have been frequently associated with Spider and Blood-Injection-Injury (BII) Phobias. This study assessed the domain specificity of disgust sensitivity and concern with contamination in 29 Non-Phobic Controls, 25 clinical Spider Phobics, 26 clinical BII Phobics, and 27 persons who met clinical criteria for Spider Phobia and BII Phobia. On self-report measures we found evidence of domain specificity of disgust sensitivity for the Spider and BII Phobia groups. Furthermore, we found that persons with both phobias may be more disgust sensitive than persons with a single phobia. Interestingly, the animal reminder disgust stimulus used in this research was more sensitive to detecting domain specific differences in disgust sensitivity between Phobic groups than was the core disgust stimulus, emphasizing the importance of developing standardized behavioral measures of disgust sensitivity in future research. Lastly, findings from this research suggest that concern with contamination may be more influential in phobic avoidance for persons with Spider Phobia than for persons with BII Phobia. Treatment implications for these findings are discussed.

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## 1. Introduction

Disgust has been identified as a robust, independent feature of Spider and Blood-Injection-Injury (BII) Phobias (Olatunji, 2006), and in some research it has been found to eclipse fear in intensity (Olatunji, Lohr, Sawchuk, & Westendorf, 2005; Sawchuk, Lohr, Westendorf, Meunier, & Tolin, 2002). Disgust has also been shown to play an instrumental role in increasing the aversive properties of feared stimuli as a function of contamination concern (Davey, Forster, & Mayhew, 1993; de Jong & Muris, 2002; Fallon, Rozin, & Pliner, 1984; Olatunji, Wolitzky-Taylor, Willems, Lohr, & Armstrong, 2009; Rozin, Markwith, & Nemeroff, 1992; Woody, McLean, & Klassen, 2005; Woody & Teachman, 2000). Furthermore, it has been found that phobic patients tend to broadly label their phobia-related distress as “anxiety”, yet in describing their symptoms, frequently report physiological reactions that are consistent with the disgust response (Olatunji & McKay, 2009). Patients’ mislabeling of the disgust response and clinicians’ subsequent failure to recognize its contribution to the avoidant behavior associated with phobias and other Anxiety Disorders (e.g., Obsessive Compulsive Disorder) may have negative repercussions for treatment outcomes

(McKay & Olatunji, 2009; Meunier & Tolin, 2009; Olatunji, Forsyth, & Cherian, 2007; Olatunji & McKay, 2009).

Research also suggests that, in addition to disgust, concern with contamination contributes to avoidant behaviors in persons with Specific Phobia (e.g., Davey et al., 1993; Davey & Marzillier, 2009; Woody et al., 2005) and that concern with contamination renders the disgust response more resistant to habituation than the fear response (Edwards & Salkovskis, 2006; McKay, 2006; Olatunji, Smits, Connolly, Willems, & Lohr, 2007; Olatunji et al., 2009). What remains unclear from previous research, however, is whether or not persons with certain types of Specific Phobia are more behaviorally avoidant and disgust sensitive than are other subsets of Phobics. Furthermore, questions remain regarding differences in the degree to which categories of disgust-relevant stimuli are perceived as having contaminating properties. The purpose of this research was to experimentally examine disgust, fear, and concern with contamination in persons with Spider Phobia and BII Phobia through the use of Behavioral Approach Tasks (BATs) involving disgust-relevant stimuli.

### 1.1. Disgust and Specific Phobia

Disgust is typically defined as repugnance at the idea of orally consuming a substance or object that is considered to be revolting (Rozin & Fallon, 1987). Included in this definition are the laws of contagion and similarity. According to the law of contagion, any contact between the disgusting substance and a neutral substance

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renders the neutral substance “contaminated” even if there is no actual transfer of physical residue between the two substances. According to the law of similarity, any object that resembles a disgusting substance becomes the equivalent of the actual disgusting substance (Haidt, McCauley, & Rozin, 1994). Furthermore, research has indicated that the construct of disgust comprises two factors: core and animal reminder disgust (e.g., Rozin, Haidt, McCauley, Dunlop, & Ashmore, 1999). Core disgust stimuli have been described as sharing the qualities of general unpleasantness, repulsiveness upon ingestion, and the ability to contaminate neutral materials around them (de Jong & Merckelbach, 1998; de Jong & Muris, 2002; Olatunji, Williams, Lohr, & Sawchuk, 2005; Rozin, Haidt, & McCauley, 2000; Woody et al., 2005). Such items include: rotten food-based materials, small animals, and body products. Animal reminder disgust stimuli, which include blood, veins, and other types of tissue that are common to both animals and humans (Sawchuk, Lohr, Tolin, Lee, & Kleinknecht, 2000), are thought to remind people of their commonalities with animals (Rozin et al., 2000). In addition to body envelope violations that would expose the inner tissues of the organism (Sawchuk et al., 2000), this category includes death reminders, deviant sexual practices, and poor hygiene.

Disgust sensitivity refers to the degree to which one experiences revulsion in the presence of situations or stimuli that typically elicit a disgust response (Haidt et al., 1994). Currently, the subtypes of Specific Phobia that have been most frequently associated with disgust sensitivity are Spider Phobia and Blood-Injection-Injury (BII) Phobia (e.g., de Jong & Merckelbach, 1998; de Jong & Muris, 2002; Olatunji, 2006; Olatunji, Sawchuk, de Jong, & Lohr, 2006; Sawchuk et al., 2000; Thorpe & Salkovskis, 1998; Woody et al., 2005). It is possible that persons with these phobias perceive their respective phobia-relevant stimuli as rapidly approaching (looming vulnerability to threat model), and that they anticipate having extreme difficulty in coping with the perceived aversive consequences of having contact with these stimuli (Riskind, 1997). For these phobia sufferers, the anticipation of experiencing intense disgust, coupled with perceived deficits in managing their disgust reactions, may contribute to the avoidance of situations in which they might encounter phobia-relevant stimuli.

Although both types of Specific Phobia sufferers report higher levels of disgust sensitivity than do Non-Phobic persons, research has suggested that Spider and BII Phobics are sensitive to different categories of disgusting stimuli (de Jong & Merckelbach, 1998; Olatunji et al., 2006; Sawchuk et al., 2000). Specifically, in survey-based research, sensitivity to core disgust stimuli has been associated with Spider Phobia (de Jong & Merckelbach, 1998), while sensitivity to animal reminder disgust stimuli has been associated with BII Phobia (de Jong & Merckelbach, 1998; Olatunji et al., 2006). Behavioral research has corroborated the domain specificity of disgust sensitivity for persons with BII Phobia (Koch, O'Neill, Sawchuk, & Connolly, 2002; Olatunji, Connolly, & Bieke, 2008), but has not included a comparison group of persons with Spider Phobia. Thus, it is difficult to draw conclusions regarding between-group differences in sensitivity to each disgust domain as measured by behavioral avoidance.

### 1.2. Disgust categories and concern with contamination

While concern with contamination appears to play a role in Spider Phobia (de Jong & Peters, 2007; Woody et al., 2005) and BII Phobia (Sawchuk et al., 2000), there is some discrepancy as to whether or not sensitivity to core disgust stimuli is more strongly associated with fear of contamination than sensitivity to animal reminder disgust stimuli, or vice versa. In one study, sensitivity to animal reminder disgust stimuli was demonstrated to be more strongly associated with contamination fear than was sensitivity to

core disgust stimuli (Olatunji, Sawchuk, Lohr, & de Jong, 2004). In a separate study, however, it was demonstrated that sensitivity to core disgust stimuli was positively associated with contamination ideation and excessive washing tendencies, but that sensitivity to animal reminder disgust stimuli was negatively associated with these constructs (Olatunji, Lohr, et al., 2005; Olatunji, Williams, et al., 2005). These discrepant findings were unexpected, and the reason for this discrepancy was unclear.

Taken together, research suggests that disgust and disgust sensitivity play a salient role in the emotional responses and avoidant behavior of persons with Spider and BII Phobia. Concern with contamination also appears to contribute to the avoidance of phobia-relevant stimuli by these two groups of phobia sufferers. It is less clear, however, whether or not the pattern of domain-specific disgust sensitivity associated with Spider and BII Phobia translates to differences in behavioral avoidance of disgust-relevant stimuli. It is also unclear whether or not concern with contamination plays a stronger role in Spider Phobia or BII Phobia. The present investigation, by using in vivo disgust-relevant stimuli and Behavioral Approach Tasks (BATs), addressed these questions.

The first question addressed in this study was whether or not sensitivity to specific categories of disgust-relevant stimuli is significantly different for persons with Specific Phobia, Spider Type than for persons with Specific Phobia, BII Type. We extended previous work by directly comparing BII and Spider Phobics with non-clinical controls and a sample of persons with both phobias. It was predicted that Spider Phobics would exhibit more disgust and avoidance when exposed to core disgust stimuli than would BII Phobics, and that Spider Phobics would exhibit more disgust and avoidance when exposed to core disgust stimuli than to animal reminder disgust stimuli. The converse was predicted for BII Phobics. Given that previous research had not included a comparison group of persons with both phobias, no a priori hypotheses were generated for this group. In addition, we included a behavioral approach paradigm to examine the role of concern with contamination in the avoidant behaviors in persons with each phobia. Given that the two phobic groups had not been directly compared on contamination-driven behavioral avoidance of phobia-relevant stimuli, there were no a priori predictions for this paradigm.

## 2. Method

*Participant characteristics.* Participants were recruited from a medium-sized university where they were completing their undergraduate or graduate studies. Although a convenience sample was used, participants were screened using a diagnostic measure to determine phobic status. 155 prospective participants were screened, 107 of whom qualified for the study. Participants included 29 Non-Phobic Controls, 25 persons who met clinical criteria for Specific Phobia, Spider Type, 26 persons who met clinical criteria for Specific Phobia, BII Type, and 27 persons who met clinical criteria for Specific Phobia, Spider Type and for Specific Phobia, BII Type. It should be noted that we cannot address the base rates of phobias in our sample since we specifically advertised for either phobics or those who had no fear of either phobic stimuli. Participants were largely female (84%), Caucasian (76%), and approximately 20 years old. There were no significant between-group differences in age ( $F(3,99)=1.13, p=.34$ ), gender ( $\chi^2(1,3)=2.2, p=.54$ ), or ethnicity ( $\chi^2(1,24)=23, p=.52$ ).

Diagnostic status was determined from the Specific Phobia module of the Anxiety Disorders Interview Schedule for the DSM-IV (ADIS) (Brown, DiNardo, & Barlow, 1994). All participants were interviewed by advanced graduate students who had received extensive training in administering the ADIS and who were supervised by a licensed, doctoral level clinical psychologist with over 20

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