

Specificity of disgust sensitivity in the prediction of fear and disgust responding to a brief spider exposure

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Abstract

This study examined the specificity of disgust sensitivity in predicting fear and disgust responses to exposure to a spider. Participants high ($n = 22$) and low ($n = 28$) in spider fear completed self-report measures of disgust sensitivity, contamination fear, anxiety, and negative affect. They then participated in a behavioral avoidance task (BAT) in which they were briefly exposed to a realistic-looking, but fake, tarantula. Results revealed that disgust sensitivity was associated with fear and disgust responding to the BAT. The association between disgust sensitivity and disgust responding to the BAT remained significant after controlling for gender, spider fear group membership, contamination fear, anxiety, and negative affect. However, the association between disgust sensitivity and fear responding to the BAT was only marginally significant after controlling for the same variables. Contamination fear was also strongly related to fear and disgust responding to the BAT. However, this relationship was fully mediated by disgust sensitivity. These findings indicate that disgust sensitivity has a unique association with aversive responding to spiders. The implications of these findings for better understanding the complex role of fear and disgust as they related to disgust sensitivity in spider phobia are discussed.

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Epidemiological research has found that fear of small animals account for 46% of the total group of individuals who report any phobia (Chapman, 1997). Perhaps the most common specific phobia is the fear of spiders (Davey, 1992). Spider phobia is generally associated with the expectation that aversive, harm-related consequences will follow exposure to spiders. This expectancy bias is consistent with a fear-mediated predator-defense model (e.g., Öhman, Dimberg, & Öst, 1985) that is supported by

spider phobics' endorsement of beliefs that spiders are predators ("the spider will kill me") and that contact with spiders can be harmful (Arntz, Lavy, van den Berg, & van Rijsoort, 1993). In addition to fear, evidence suggests that phobic responses to spiders may also include disgust (e.g., de Jong & Merckelbach, 1998; Tolin, Lohr, Sawchuk, & Lee, 1997). For example, when viewing pictures of spiders, phobics report experiencing both elevated fear and disgust compared to non-phobics (Sawchuk, Lohr, Westendorf, Meunier, & Tolin, 2002), and this disgust response to picture presentations of spiders has been shown to be independent of fear responses (Olatunji, 2006).

Disgust responses to spider exposure among phobic individuals may be motivated by irrational beliefs about

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spiders. Indeed, phobics report that spiders are not only their most feared objects, they are also the ones they find most disgusting (Thorpe & Salkovskis, 1998). The disgust-evoking properties of spiders have been demonstrated with the “contaminated cookie” paradigm (Mulkens, de Jong, & Merckelbach, 1996). After allowing a spider to briefly contact a cookie, approximately 75% of spider phobics refused to eat the cookie compared to only 30% of a matched sample of non-phobics. These findings suggest that spiders may have a specific disgust-evoking property that may be perceived to result in contamination after physical contact among phobic individuals (Vermon & Berenbaum, 2002). Despite evidence of a co-occurring disgust response during spider exposure, spider phobic individuals are categorized as primarily fearful with disgust occurring as a secondary emotion (Sawchuk et al., 2002). However, recent research has shown that disgust is a stronger predictor than anxiety of avoidance of spiders (Woody, McLean, & Klassen, 2005), and expectancy bias towards disgust-relevant consequences, rather than fear-relevant consequences, has recently been shown to be a predictor of spider fear (van Overveld, de Jong, & Peters, 2006). Supportive evidence of the spider phobia–disgust relation has also been found in psychophysiological studies. For example, spider phobic individuals appear to respond with greater disgust-specific facial EMG activity than non-fearful individuals when exposed to spiders (i.e., activity of the *m. levator labii*; de Jong, Peters, & Vanderhallen, 2002). A recent study also found that spider phobic individuals show greater amygdala activation than control subjects while viewing disgust inducing (i.e., dirty toilets) pictures (Schienle, Schafer, Walter, Stark, & Vaitl, 2005).

Disgust responses to and appraisals of spiders have been elucidated in the context of the disease-avoidance model. This model suggests that certain small animals (e.g., rat, spider, cockroach, maggot, snail, slug) may be avoided due to their perceived disgust, contamination, and disease (subsequent to physical contact) properties rather than concerns of harm during exposure to the animals (Matchett & Davey, 1991). Sawchuk, Lohr, Tolin, Lee, & Kleinknecht (2000) provided preliminary evidence for the disease-avoidance model by demonstrating that spider phobics score higher than do non-phobics on self-report inventories of contamination concerns. In fact, de Jong and Muris (2002) found that spider phobic girls rated their eagerness to eat their favorite candy bar as significantly dampened if a spider had walked across it, even if the bar remained in its packaging. Furthermore, it has been shown that the fear

of being contaminated by a disgusting object is the best predictor of spider fear (de Jong & Muris, 2002), and contamination-related implicit associations have been shown to discriminate strongly between spider phobic and non-phobic individuals (Huijding & de Jong, 2007).

Disgust sensitivity, defined as the propensity to experience disgust towards a wide range of stimuli, has been described as a specific, genetically based personality vulnerability factor (as opposed to a general vulnerability such as neuroticism or behavioral inhibition) that may contribute to the development of spider phobia (Davey, Forster, & Mayhew, 1993; Muris, 2006). In support of this, researchers have documented a significant relationship between measures of disgust sensitivity and spider phobia (e.g., de Jong & Merckelbach, 1998). Studies have also shown that spider phobics score significantly higher than non-phobics on measures of disgust sensitivity (Merckelbach, de Jong, Arntz, & Schouten, 1993; Tolin et al., 1997). Although it has been suggested that the relation between disgust sensitivity and spider phobia may be spurious and accounted for by trait anxiety or negative affect (e.g., Muris, Merckelbach, Schmidt, & Tierney, 1999; Thorpe & Salkovskis, 1998), Mulkens et al. (1996) found that the relationship between spider phobia and disgust sensitivity was unchanged when the effects of neuroticism and introversion were controlled, suggesting that the relation between disgust sensitivity and spider fear is relatively unique.

Although there is mounting evidence in the literature implicating disgust sensitivity in spider phobia, the relationship between disgust sensitivity and fear and disgust responses to spiders is yet to be clearly elucidated. It is possible that disgust sensitivity is a specific vulnerability for disgust responses to spiders, whereas more traditional vulnerabilities (i.e., trait anxiety) are specific to fear responses to spiders. One study did find that disgust sensitivity was significantly correlated with fear ($r = .41$) and disgust ($r = .38$) responding to a spider behavioral avoidance task (BAT) (Vermon & Berenbaum, 2002). However, this study did not examine if the association between disgust sensitivity and fear and disgust responding was a possible artifact of negative affectivity. Thus, there is a need for additional studies that examine the extent to which potential third variables (i.e., anxiety, negative affect) account for the proposed disgust—spider phobia association (e.g., Davey & Bond, 2006; Thorpe & Salkovskis, 1998).

The present study examines the specificity of disgust sensitivity in predicting fear and disgust responding

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