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Anxiety sensitivity moderates behavioral avoidance in anxious youth

Eli R. Lebowitz*, Frederick Shic, Daniel Campbell, Krista Basile, Wendy K. Silverman

Yale University Child Study Center, 230 S. Frontage Rd., New Haven, CT 06519, USA

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ABSTRACT

Individuals who are high in anxiety sensitivity (AS) are motivated to avoid sensations of anxiety. Consequently, AS is hypothesized to contribute to overall avoidance of any feared stimuli. No studies have yet examined whether fear of a stimulus is a stronger predictor of behavioral avoidance in individuals who are high in AS compared to individuals who are low in AS. We examined whether AS moderates the association between fear of spiders and behavioral avoidance of spider stimuli in 50 clinically anxious youth. Fear of spiders significantly predicted avoidance of spider stimuli in youth high in AS but not in youth low in AS. These results provide support for the role of AS in avoidant behavior and help to explain the link between AS and the anxiety disorders. The results have implications for exposure-based anxiety treatments and highlight the importance of increasing anxious patients' ability to tolerate sensations of anxiety.

Anxiety sensitivity (AS) refers to individuals' beliefs that sensations related to anxiety pose a threat to their physical or psychological safety, and the consequent fear and avoidance of those sensations (Reiss, Peterson, Gursky, & McNally, 1986). AS can be measured reliably in children and adults and explains variance beyond that explained by trait anxiety (Leen-Feldner, Reardon, & Zvolensky, 2007; Silverman, Fleisig, Rabian, & Peterson, 1991; Zinbarg, Brown, Barlow, & Rapee, 2001). AS is linked to the presence of the various phobic and anxiety disorders in children and in adults (Olatunji & Wolitzky-Taylor, 2009; Silverman, Goedhart, Barrett, & Turner, 2003).

Reiss's expectancy model (Reiss, 1991; Reiss & McNally, 1985) provides a theoretical formulation for the role of AS in the development and maintenance of phobic and anxiety disorders, particularly with respect to avoidant behavior, which characterizes these disorders. The model proposes that during encounters with fear- and anxiety-provoking stimuli, individuals experience not only fear or anxiety toward the stimuli, but they also experience fear and anxiety about the physical sensations elicited by these encounters. As Reiss explained (1991, p. 142): "Avoidance motivation implies the presence of both fear-outcome expectations and fear-outcome sensitivities." As such, AS is thought to amplify the impact of any fearful or anxious experience on avoidant behavior, and to act as a risk factor for anxiety pathology (Schmidt, Lerew, & Joiner, 1998).

It follows from Reiss's (Reiss, 1991) formulation that fear of a stimulus would be a stronger predictor of avoidance in individuals who are high in AS compared to individuals who are low in AS. In other words, AS moderates the link between fear and avoidance. If avoidance is indeed moderated by AS than this would be in line with Reiss's expectancy model. If on the other hand avoidance is predicted by individuals' fear and anxiety of the stimulus only and not moderated by AS, than this would be less in line with the expectancy model.

Although the role of AS in avoidant behaviors is a cornerstone of expectancy theory (Reiss, 1991), we could not identify a single child or adult study that has examined the above moderation hypothesis. The closest study we could identify examined AS as a moderator of response to fear or anxiety-provoking situations, but of interest was whether AS would moderate subjective ratings of distress in the situations, not avoidant behavior. In that study, Orsillo, Lilienfeld, and Heimberg (1994) asked 62 clinic referred social phobic adults to participate in behavioral exposures (e.g., public speaking, one-on-one conversations). Findings indicated that AS moderated the relation between social anxiety and distress.

One kind of aversive sensation that can drive avoidant behavior of various stimuli is disgust. Woody, McLean, and Klassen (2005) for example, using a sample of 115 undergraduate students who rated

* Corresponding author. Yale Child Study Center, 230 S. Frontage Rd., New Haven, CT 06520, USA.
E-mail address: eli.lebowitz@yale.edu (E.R. Lebowitz).

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themselves highly fearful of spiders found the students' behavioral avoidance of spiders related more strongly to their sensations of disgust than to their fear or anxiety about harm from the spider. Building on this research, Olatunji, Cisler, Meunier, Connolly, and Lohr (2008) examined harm- and disgust-related expectancies associated with spiders, in fifty undergraduate student participants who rated themselves either high or low in fear of spiders. Disgust-related expectancies were found to significantly predict avoidant behavior; harm-related expectancies did not.

In summary these findings support the idea that avoiding aversive sensations contributes to behavioral avoidance in anxiety. Whether a similar pattern of findings would emerge if the focus was not on disgust but on AS is unknown.

Testing the hypothesis that AS moderates avoidant behavior requires accurate assessment of both AS and avoidant behavior. AS has been assessed reliably for decades using rating scales such as the Anxiety Sensitivity Index (Peterson & Heilbronner, 1987), and the Childhood Anxiety Sensitivity Index (Silverman et al., 1991), but assessing avoidant behavior presents methodological challenges. Traditional Behavioral Avoidance Tests (BAT) have faced challenges including generating few data points with low-resolution information, the risk of demand characteristics because participants are aware that their avoidance is the variable of interest, and limited ecological validity (Kazdin, 1979; Kirsch, 1982; Miller & Bernstein, 1972).

Technological advances are being used to overcome such limitations by employing accurate motion-tracking technology to facilitate the development of sophisticated BATs that provide high-resolution measurement of avoidant behavior in participants who are free to physically move around, and are not explicitly focused on the issue of avoidance thereby reducing demand characteristics. In the current study we used the Yale Interactive Kinect Environment Software (YIKES) platform (Lebowitz, Shic, Campbell, MacLeod, & Silverman, 2015) to measure behavioral avoidance of spider images in children and adolescents with clinical anxiety disorders. In a previous study with 86 adult women, self-rated fear of spiders was positively correlated with behavioral avoidance of spider images in YIKES, explaining approximately 25% of variance in the measured avoidant behavior (Lebowitz et al., 2015).

YIKES experiments can be used to measure avoidance of any visual stimulus but previous research has focused on spider images which have been among the most commonly studied stimuli in the avoidance literature. There are several advantages to using spider stimuli in studies of fear and avoidance, as well as AS. Fear of spiders is common in both general population and clinical populations, with a wide distribution of severity (Davey, 1992; Oosterink, de Jongh, & Hoogstraten, 2009). Because all spiders are predators and most are venomous, fear of spiders has long been considered and evolutionary adaptation contributing to its prevalence in the general population (Seligman, 1971). Research comparing spiders to other animals, including other potentially dangerous arthropods (e.g., wasps), supports this conclusion and the usefulness of spider images in studies of fear and avoidance (Gerdes, Uhl, & Alpers, 2009). Global measures of anxiety (e.g., trait anxiety), as well as fear of spiders, predict response to spider stimuli, and images of spiders are effective stimuli for triggering fear of spiders (Arntz, Rauner, & van den Hout, 1995; Lipp & Derakshan, 2005; Muris, Mayer, & Merckelbach, 1998; Renaud, Bouchard, & Proulx, 2002; Thorpe & Salkovskis, 1998). Finally, spiders elicit both fear of harm and aversive physical sensations, with individuals frequently reporting they avoid spiders because of a fear of panic-like symptoms, making them well suited to test the hypothesis that AS moderates the association between fear of spiders and behavioral avoidance of spider stimuli (McNally & Steketee, 1985).

In the current study we aimed to test this hypothesis in a sample of clinically anxious youth, with a range of anxiety disorders. We focused on a clinical sample, rather than a nonclinical sample of the general population, because understanding the factors that motivate or maintain avoidance in youth with anxiety disorders, in which avoidance is a key factor contributing to impairment, is of prime importance and potentially high impact. We chose not to limit the sample to youth with spider phobia, to ensure a broader range of fear of spiders. Because fear of spiders is highly prevalent in the population and is linked to overall trait anxiety, it provides an excellent model in which to conduct this first test of the role of AS in moderating avoidance (Arntz et al., 1995; Lipp & Derakshan, 2005; Muris et al., 1998; Renaud et al., 2002; Thorpe & Salkovskis, 1998).

Our objective was to test whether AS moderates the association between fear of spiders and behavioral avoidance of spider stimuli. We hypothesized, in line with Reiss and McNally (1985) expectancy model, that fear of spiders would predict behavioral avoidance of spider stimuli more strongly in youth who were high in AS compared to youth who were low in AS.

1. Method

1.1. Participants

Participants were 50 youth, aged 7–17 years (Mean = 11.86 years; SD = 3.19; 48% males), who presented consecutively for evaluation at a specialty anxiety clinic at a large medical center in the eastern United States, and were either self-referred or were referred to the clinic by primary care providers, other mental health providers, or school personnel. The clinic regularly distributes printed information on clinical services and research activities to local providers and school staff. Participating youth met DSM-5 (American Psychiatric Association, 2013) criteria for a primary anxiety disorder diagnosis of generalized anxiety disorder (35%), social phobia (32%), separation anxiety disorder (14%), specific phobia (15%), or panic disorder (4%). The average number of anxiety diagnoses was 2.3 (SD = 1.22), and ranged from 1 to 5. Secondary non anxiety disorder diagnoses included attention deficit hyperactivity disorder (20.6%), major depression (10.3%), oppositional defiant disorder (5.9%) and conduct disorder (1.5%). No participants met criteria for specific phobia of spiders. This is due, however, to our adherence to the DSM-5 criteria for specific phobia, which require significant interference with normal routine or functioning. Most previous research on spider phobia has waived this requirement for inclusion criteria or relied only elevated ratings of fear of spiders, which were well represented in our sample. All participants were enrolled in a regular educational setting and fluent English speakers. English was the primary language spoken in most (93.1%) of the homes with the remainder having Spanish as primary langauge. Youth were predominantly White (83.3%) and non-Hispanic (94.5%), with a minority being African American (6%), Asian (2%), or of mixed ethnic background.

1.2. Procedure

The study was approved by the University Institutional Review Board. Upon arrival, study procedures were explained and signed consents and assents were obtained from parents and youths respectively, before any additional study procedures. Participating youths first completed a diagnostic interview and rating scales. Youth were aided in the completion of study forms if necessary, by trained research personnel. Youth then participated in the motion tracking YIKES task (described below), which took approximately 10 min, including instructions and a 1-min practice.