

## Is anxiety sensitivity a predictor of PTSD in children and adolescents?

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### Abstract

**Objective:** Anxiety sensitivity (AS) is the fear of the physical symptoms of anxiety and related symptoms. Longitudinal studies support AS as a vulnerability factor for development of anxiety disorders. This study aimed to investigate AS as a vulnerability factor in the development of childhood posttraumatic stress disorder (PTSD) following traumatic experiences. **Methods:** The study included 81 children 8–15 years of age who experienced the 1999 earthquake in Bolu, Turkey. The earthquake survivors were compared to a randomized group of age- and sex-matched controls 5 years after the earthquake. Both the subject and control groups were administered the Childhood Anxiety Sensitivity Index (CASI), State and Trait Anxiety Inventory for

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Children (STAI-C), and Child Depression Inventory (CDI), while the PTSD symptoms of the subjects were assessed using the Child Posttraumatic Stress Reaction Index (CPTS-RI). **Results:** Subjects and controls did not differ significantly in CASI, STAI-C, or CDI scores. Multiple regression analysis showed that both trait anxiety and CASI scores predicted CPTS-RI scores of the subjects; the prediction by CASI scores was over and above the effect of trait anxiety. **Conclusion:** The results of this study support the hypothesis that AS may be a constitutional factor, which might increase the risk of PTSD following traumatic experiences.

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### Introduction

Several factors are held responsible for the development and chronicity of posttraumatic stress disorder (PTSD) in children and adolescents exposed to traumas. These include within-trauma factors such as trauma severity, and pretrauma factors including gender and age [1]. Biological vulnerability factors, such as anxiety sensitivity, have also been shown to play such a role in adult samples. This study aims to show if the same relationship holds for children and adolescents.

#### *The concept of anxiety sensitivity*

Anxiety sensitivity (AS) is a concept that was originally developed by Reiss and McNally [2] to describe the degree of discomfort and negative attributions to anxiety sensations arising from the belief that these sensations are signs of

physical, psychological, or social harm. Rather than being a sign of psychopathology itself, AS is seen as a constitutional trait variable, acting as a risk factor for the development of various anxiety disorders. The measurement of AS includes the assessment of the consequences of physical, cognitive, and social harm associated with anxiety symptoms, such as body awareness and feared cognitions. The Anxiety Sensitivity Index (ASI) [3] is the principal measure used to assess AS in adults.

Studies that have used ASI in adults have generally examined panic disorder and most found a positive association between the presence of panic disorder and high ASI scores [4,5]. Subjects with high AS have higher rates of comorbid anxiety disorders and tend to be susceptible to marked anxiety reactions following biological challenge tests [6,7]. Evidence from several longitudinal investigations suggests that AS is a predictor of subsequent panic attacks in nonclinical samples [8].

Several studies have attempted to show the mechanisms that link AS to specific anxiety disorders. Avoidance has

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been suggested to be a clinically significant mechanism that might play a role in maintaining anxiety disorder and to be associated with poorer diagnosis. Wilson and Hayward [9], in their prospective study on adolescents with panic disorder, showed that AS may precede and exacerbate avoidance, which, in turn, increases anxiety. Isyanov and Calamari [10], on the other hand, hypothesized that individuals with high levels of AS appraise many life events as much more stressful due to their reactivity to both the event and to the anxious arousal they experience. They suggest that AS might lead to increased general stress levels by altering stress appraisal. Since they appraise anxious arousal as not just unpleasant, but as dangerous, life experiences that lead only to a transitory increase in anxiety will elicit greater distress in individuals with elevated AS. While individuals with high trait anxiety will respond to stressors with more fear and distress, individuals with high AS may react to both the stressor and the associated anxiety experience. Additional evidence exists that demonstrating AS is not merely a reflection of trait anxiety, but it is shown to be related to disorders other than anxiety, namely somatoform disorders and substance use disorders [11–13].

#### *Anxiety sensitivity and childhood disorders*

Children with anxiety disorders have been shown to have higher levels of AS compared to normal controls in several studies [14,15]. A number of studies have reported a relationship between panic attacks in children and adolescents and AS [16–18]. Reiss et al. [5] suggested that the level of AS at ages 7–14 years might predict the development of panic disorder in adult life. According to their theory, the development of AS is influenced by cognitive factors, in addition to genetic ones. By the time children become 7–10 years old, they will have already developed beliefs about what will happen to them when they become nervous or experience stress. These beliefs are hypothesized to significantly modify the child's inherited sensitivity to anxiety [5]. Likewise, Mattis and Ollendick [19], in their investigation of the cognitive responses of children to panic symptoms, concluded that AS in children predicted catastrophic attributions, regardless of age, and speculated that high levels of AS and elevated internal attributions in response to negative outcomes could set the stage for the development of panic attacks and subsequent panic disorder.

AS has been investigated in various other problems of children and adolescents. Although AS was found to be related to depression [20] and worry [21], AS predicted panic attacks in children and adolescents, even after controlling for general negative affectivity [22]. The predictive value of high AS for panic attacks was also shown in an adolescent African-American sample [23]. Watt and Stewart [11] investigated this concept further, positing that heightened AS in childhood may lead children learn to catastrophize their bodily sensations, leading to hypochondriacal symp-

toms in adolescence. The study of Hayward et al. [18], which showed that AS develops before panic symptoms first appear, supports the conceptualization of AS as a risk factor for anxiety disorders, rather than being a disorder itself. AS, therefore, seems to be a constitutional factor creating the basis for the development of an anxiety disorder in the presence of an external challenge.

#### *AS and PTSD*

Although AS has been widely studied in childhood anxiety disorders, studies on AS in PTSD are scarce. In adults, the relationship of AS and PTSD has been shown in various studies [24]. After the Bam earthquake in Iran, Hagh-Shenas et al. [25] found a relationship between high AS and PTSD among a group of rescue workers. They reported that among the untrained rescue workers, students with high AS scores exhibited greater adverse psychological effects.

PTSD is common in children after disasters; many studies report incidence rates ranging from 30–60% in children and adolescents [26]. The notion that PTSD symptoms decrease with time has been challenged by long-term studies. PTSD may become chronic in a group of disaster survivors, which, in turn, may significantly affect psychological development [27,28]. In their study, after the 1999 earthquake in Turkey, Karakaya et al. [29] found very severe or severe degrees of posttraumatic stress symptoms in 22.2% of adolescents 3.5 years after the disaster.

Risk factors for the occurrence and persistence of PTSD symptoms in children after disasters are widely studied. Proximity to the trauma scene and severity of exposure (loss of house/relatives, injury, etc.) are commonly found to be risk factors [30]. Research has shown that parental reactions to a child's symptoms and parents' symptoms are also important predictors of childhood PTSD [31–37]. The risk of developing PTSD depends upon the severity of trauma, preexisting vulnerability factors, and an interaction between the two. The “stress vulnerability” hypothesis holds that pretrauma characteristics make one more susceptible to the negative effects of a traumatic experience. It is typically seen as an interaction between the predisposing factor and the traumatic stressor, so that the relationship between the predisposing factor and PTSD depends on the level of trauma. In the context of extreme trauma, host factors may diminish in importance, whereas in milder trauma vulnerability factors may be of greater importance. Foy et al. [38] and McCranie et al. [39] demonstrated this form of interaction. Silva et al. [40] have demonstrated that preexisting anxiety predicted PTSD severity in children and adolescents, while higher IQ was a protective factor. AS, which has been implicated as a constitutional factor in the development of several other anxiety disorders, may be the mediating factor that leads to the development and persistence of posttraumatic stress symptoms following psychological trauma. To our knowledge, the only study to

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