

## Threat interpretation bias as a vulnerability factor in childhood anxiety disorders

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### Abstract

The present study examined threat interpretation biases in children 7–12 years of age with separation, social and generalised anxiety disorders ( $N = 15$ ), non-anxious offspring at risk due to parental anxiety ( $N = 16$ ) and non-anxious controls of non-anxious parents ( $N = 14$ ). Children provided interpretations of ambiguous situations to assess cognitive, emotional and behavioural responses. In comparison with non-anxious control children and at-risk children who did not differ from each other, anxious children reported stronger negative emotion and less ability to influence ambiguous situations. These results suggest that threat interpretation bias may be a cognitive factor associated with ongoing childhood anxiety but not a vulnerability factor associated with parental anxiety.

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### Introduction

The tendency to selectively process events as threatening is a central feature of cognitive models of anxiety (e.g., Beck, Emery, & Greenberg, 1985; Mogg & Bradley, 1998; Rapee, 2001; Williams, Watts, MacLeod, & Mathews, 1997). Numerous experimental studies with adults demonstrate an association between threat interpretation biases and panic disorder (e.g., Richards, Austin, & Alvarenga, 2001), social phobia (e.g., Hirsch & Mathews, 2000; Stopa & Clark, 2000; Voncken, Bögels, & deVries, 2003) and generalised anxiety disorder (GAD) (Hazlett-Stevens & Borkovec, 2004) (see Mathews & MacLeod, 2005, for review).

Although investigations of cognitive factors in childhood anxiety disorders have lagged behind research with adults (see Hadwin, Garner, & Perez-Olivas, 2006, for review), an accumulating literature based on various experimental paradigms shows similar threat interpretation biases in relation to childhood anxiety disorders. For example, elevated levels of children's trait anxiety are associated with threatening interpretations of homographs (Hadwin, Frost, French, & Richards, 1997). Similarly, children with GAD

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make more threatening than neutral interpretations of homographs relative to controls (Taghavi, Moradi, Neshat-Doost, Yule, & Dalgleish, 2000).

Using an ambiguous scenario approach, a number of studies have found that anxious children interpret ambiguous or mildly aversive scenarios as more negative and dangerous, overestimate danger and underestimate their ability to cope, adopt more avoidant solutions and make threatening judgements based on less information (e.g., Barrett, Rapee, Dadds, & Ryan, 1996; Bögels, van Dongen, & Muris, 2003; Bögels & Zigterman, 2000; Chorpita, Albano, & Barlow, 1996; Creswell, Schniering, & Rapee, 2005; Muris et al., 2000).

Such biases are thought to exacerbate anxious children's emotional state and avoidant behaviour, which in turn may further bias children in favour of threatening meanings, and so on in a vicious circle (Taghavi et al., 2000). It is unclear, however, whether threat interpretation bias represents a cognitive vulnerability trait or relates exclusively to ongoing anxiety disorders in children. The investigation of threat interpretation biases in children vulnerable to anxiety disorders is an important strategy for identifying premorbid risk factors and early manifestations of anxiety.

Parental anxiety is one of the strongest predictors of childhood anxiety, with the risk to offspring of anxious parents averaging 3.5 (range 1.3–13.3) times greater than the risk for healthy controls (e.g., Merikangas, Avenevoli, Dierker, & Grillon, 1999; Tillfors, Furmark, Ekselius, & Fredrickson, 2001; Turner, Beidel, & Costello, 1987). Several studies have documented factors that may represent vulnerability traits in the offspring of anxious parents. For example, offspring of parents with panic disorder reported higher subjective fear ratings and had slower reaction times for rating fearful faces compared with offspring of parents without panic disorder (Pine, Klein, Manuzza et al., 2005). Offspring of parents with anxiety disorders have also exhibited elevated baseline and fear-potentiated startle blink reflexes and slowed habituation, as indexed by electrodermal responses, relative to offspring of non-anxious parents (Grillon, Dierker, & Merikangas, 1997, 1998; Merikangas et al., 1999; Turner, Beidel, & Roberson-Nay, 2005). Another study found elevated cortisol levels in the infants of mothers with panic disorder (e.g., Warren, Gunnar, & Kagan, 2003).

Not all studies, however, have reported differences in the offspring of anxious parents relative to controls. For example, offspring of parents with panic disorder did not exhibit perturbed respiratory regulation in response to CO<sub>2</sub> inhalation relative to controls (Pine, Klein, Roberson-Nay et al., 2005). Instead, offspring who themselves had ongoing anxiety disorders exhibited elevated respiratory rates during CO<sub>2</sub> inhalation and reported significantly more panic symptoms and panic attacks compared with controls (Pine et al., 2000; Pine, Klein, Roberson-Nay et al., 2005). Similarly, offspring of parents with panic disorder did not show memory deficits for non-emotional stimuli, whereas offspring with ongoing social anxiety did, relative to controls (Vasa et al., 2007).

These findings encourage further research on vulnerability factors associated with risk conferred by parental anxiety disorders. In particular, no studies have examined threat interpretation bias in offspring of anxious parents. The present study examined self-reported cognitive, emotional and behavioural responses of children to mildly threatening ambiguous scenarios used in previous research (i.e., Bögels & Zigterman, 2000). If threat interpretation bias is not only characteristic of ongoing childhood anxiety but also represents a trait vulnerability for childhood anxiety (e.g., Grillon et al., 1997, 1998; Merikangas et al., 1999; Pine, Klein, Manuzza et al., 2005; Turner et al., 2005; Warren et al., 2003), then threat interpretations should be elevated in non-anxious offspring of anxious parents (i.e., at-risk [AR] children) and currently anxious children (i.e., ANX children) compared with non-anxious offspring of non-anxious parents (i.e., control [CON] children). Alternatively, if threat interpretation bias is a cognitive correlate of ongoing child anxiety rather than a trait vulnerability for childhood anxiety (e.g., Pine et al., 2000; Pine, Klein, Roberson-Nay et al., 2005; Vasa et al., 2007), then threat interpretations should be elevated in ANX relative to AR and CON children.

## Method

### *Participants*

Participants were 45 children (22 boys; 13 girls) between the ages of 7 years, 2 months and 12 years, 8 months ( $M = 9.27$  years;  $SD = 1.66$ ). Anxious children were recruited through the UCLA Child and Adolescent OCD, Anxiety and Tic Disorder Program. AR children were recruited through the UCLA Anxiety

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