

# The development of information processing biases in childhood anxiety: A review and exploration of its origins in parenting

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## Abstract

The aim of this paper is to explore parenting as one potential route through which information processing biases for threat develop in children. It reviews information processing biases in childhood anxiety in the context of theoretical models and empirical research in the adult anxiety literature. Specifically, it considers how adult models have been used and adapted to develop a theoretical framework with which to investigate information processing biases in children. The paper then considers research which specifically aims to understand the relationship between parenting and the development of information processing biases in children. It concludes that a clearer theoretical framework is required to understand the significance of information biases in childhood anxiety, as well as their origins in parenting.

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## 1. Introduction

Childhood anxiety is a serious condition affecting around 3% to 14% of young children and adolescents (Cohen et al., 1993). It tends to remain stable across childhood and adolescence (Ialongo, Edelsohn, Werthamer-Larsson, Crockett, & Kellam, 1994), can follow a chronic pathway into adulthood (e.g., Silove et al., 1995) and is associated with a number of adverse outcomes including antisocial behaviour and academic problems, as well as the development of further disorders (Rabian & Silverman, 2000). The cause of anxiety in children is linked with both genetic and environmental influences (Essau, Aihara, Petermann, Reiss, & Wiswasi, 2001; Gross & Hen, 2004; Stevenson, Batten, & Cherner, 1992), where genetic vulnerability includes broad temperamental traits (negative affect/neuroticism; Lonigan & Phillips, 2001), and behaviour categories (behavioural inhibition; Kagan, Snidman, Zentner, & Peterson, 1999; for a review, see Goldsmith & Lemery, 2000). In a recent paper, for example, Gross and Hen (2004) reviewed empirical evidence which supports the proposition that anxiety in childhood reflects an interaction between genetic vulnerability and early environment, where the development of specific anxieties reflect the nature of the environmental risk (see also Eley & Stevenson, 2000).

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Cognitive theory (e.g., Beck, 1976; Williams, Watts, MacLeod, & Mathews, 1988; Williams, Watts, MacLeod, & Mathews, 1997) and empirical research have demonstrated the presence of cognitive or information processing biases towards threatening words and pictures in anxious adults and children (e.g., Mogg, Millar, & Bradley, 2000; Taghavi, Moradi, Neshat-Doost, Yule, & Dalgleish, 2000). These information processing biases are proposed to operate throughout several aspects of cognition and to cause (MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002) or maintain (Mogg & Bradley, 1998) anxiety levels. In addition, it is proposed that biases associated with threat are specific to anxious, but not depressed affect in adults and children (Beck & Clark, 1988). Recent theoretical models highlight an interaction between genes and environment with cognitive mechanisms to understand the development of anxiety in children (Craske, 1997; Ginsburg & Schlossberg, 2002; Muris & Merckelbach, 2001; Rapee, 2001).

Rapee's (2001) model of anxiety, for example, highlights temperamental factors associated with genetic risk (increased arousal, emotionality and cognitive biases). In addition, it proposes a link between environmental factors (parent and peer socialisation), information processing biases for threat and the development of anxiety. In this case, information processing biases mediate parental (and peer) factors and the development of anxiety in children. Developmental research has reliably demonstrated an association between parenting style and childhood anxiety. It has found, for example, that (compared with non-anxious children) anxious children are more likely to have parents who exhibit parenting styles characterised by overcontrol, intrusiveness, overprotection and increased criticism (reviews by Bögels & Brechman-Toussaint, *in press*; Rabian & Silverman, 2000; Zahn-Waxler, Klimes-Douglas, & Slattery, 2000). It is important to recognise that parenting style can reflect qualities of the child, as well as those of the parent (Belsky, 1984) and the developmental context (McCarty & McMahon, 2003). Despite the rapid increase in empirical investigations looking at links between family and childhood anxiety the mechanism through which parenting contributes to its development is, however, unclear (Wood, McLeod, Sigman, Hwang, & Chu, 2003).

The aim of this paper is to explore evidence which highlights links between parenting, information processing biases and childhood anxiety. Developmental research in information processing biases and anxiety has relied heavily on theoretical models and experimental paradigms used in adult research. This review, therefore, considers theory and evidence for information processing biases for threat in anxious adults and looks at the extent to which this literature is supported in developmental research. In addition, it will highlight how recent models have proposed developmental constraints which moderate information processing biases for threat in anxious children (Kindt & Van Den Hout, 2001; Lonigan, Vasey, Phillips, & Hazen, 2004). Following models in development (Ginsburg & Schlossberg, 2002; Rapee, 2001) the paper considers evidence which suggests that parenting serves to increase anxious affect in children. Specifically, it reviews research that has explored whether the link between parenting and childhood anxiety reflects the transmission of a cognitive style from parents to their children, which leads the child to perceive situations as dangerous and threatening (Zahn-Waxler et al., 2000).

## 2. Review of information processing in adult anxiety

### 2.1. Theoretical models of information processing in adult anxiety

Cognitive theories propose that biases in information processing play an important role in the aetiology and maintenance of emotional disorders such as Generalised Anxiety Disorder (GAD) and depression (Beck, 1976; Beck, Emery, & Greenberg, 1985; Eysenck, 1992, 1997; Mathews & MacLeod, 1994; Williams et al., 1988, 1997). Early schema (e.g. Beck, 1976) and network (Bower, 1981) models of emotional disorders suggested that information processing biases operate throughout all aspects of cognition, but that the content of the bias differs across disorders. Specifically, whilst depressed individuals have a bias for information related to sadness, loss and failure, anxious individuals selectively process threatening information. According to early information processing models, therefore, anxiety should be characterised by increased attention to threat cues, a tendency to interpret ambiguous information as threatening, and increased propensity to remember emotional information in a negative fashion.

Evidence of attentional bias for threat in anxiety (e.g. GAD; MacLeod, Mathews, & Tata, 1986) is consistent with predictions from early cognitive models. However, a failure to reliably demonstrate memory biases in anxiety (e.g. Mogg, Mathews, & Weinman, 1987) led subsequent cognitive theories to associate anxiety disorders primarily with a bias favouring threat stimuli in preattentive processes (prior to awareness) and in selective attention and depression with biases in more strategic elaborative processes (Williams et al., 1988, 1997; Eysenck, 1992; Mathews, 1990; Mogg & Bradley, 1998; Mathews & Mackintosh, 1998). Williams et al. (1997), for example, considered the direction of

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