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Attention bias to emotional information in children as a function of maternal emotional disorders and maternal attention biases



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ABSTRACT

Background and objectives: Children of parents with emotional disorders have an increased risk for developing anxiety and depressive disorders. Yet the mechanisms that contribute to this increased risk are poorly understood. The present study aimed to examine attention biases in children as a function of maternal lifetime emotional disorders and maternal attention biases.

Methods: There were 134 participants, including 38 high-risk children, and their mothers who had lifetime emotional disorders; and 29 low-risk children, and their mothers without lifetime emotional disorders. Mothers and children completed a visual probe task with emotional face pairs presented for 500 ms.

Results: Attention bias in children did not significantly differ solely as a function of whether or not their mothers had lifetime emotional disorders. However, attention bias in high-risk children was significantly related to their mothers' attention bias. Specifically, children of mothers with lifetime emotional disorders showed a greater negative attention bias if their mothers had a greater tendency to direct attention away from positive information.

Limitations: This study was cross-sectional in nature, and therefore unable to assess long-term predictive effects. Also, just one exposure duration of 500 ms was utilised.

Conclusion: Attention bias for negative information is greater in offspring of mothers who have lifetime emotional disorders and a reduced positive bias, which could be a risk marker for the development of emotional disorders in children.

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1. Introduction

Children of parents with emotional disorders have an increased risk for developing anxiety and depressive disorders (e.g. Micco et al., 2009; Weissman et al., 2006). Parental depression is associated with a threefold increase in an individual's risk for developing a depressive episode during adolescence (Williamson, Birmaher, Axelson, Ryan, & Dahl, 2004), and maternal depression is linked with an earlier onset and more severe course of depression in offspring (Lieb, Isensee, Hofler, Pfister, & Wittchen, 2002). Similarly, offspring of parents with anxiety disorders are at 3.5 (range 1.3–13.3) times greater risk for anxiety disorders than are offspring of non-anxious parents (e.g., Merikangas, Avnevoli, Dierker, & Grillon, 1999). However, the mechanisms underlying this risk to

offspring are not well understood. Children's exposure to maternal cognitive biases might be one factor influencing offspring risk for emotional disorders (Goodman & Gotlib, 1999).

Cognitive theories propose that individuals with emotional disorders, and those at risk for their development, selectively attend to negative stimuli and/or fail to attend to positive stimuli (Beck, 1967; Eysenck, 1997; Mogg & Bradley, 1998; Teasdale, 1988; Williams, Watts, MacLeod, & Mathews, 1997). Empirically, it has been repeatedly demonstrated that emotional disorders are linked with attention biases. For example, increased attention bias to threat is associated with both high levels of anxiety symptoms and a range of anxiety disorders (e.g., see Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007 for a review) while increased attention bias to negative information, and a reduced bias for positive information has been repeatedly found in depression (e.g., Gotlib & Joormann, 2010; Joormann & Gotlib, 2007; Browning, Holmes, Charles, Cowen, & Harmer, 2012). Thus, if mothers have a lifetime history of an emotional disorder and

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dysfunctional attention biases (e.g. increased bias for negative information and/or reduced bias for positive information), their offspring may be more likely to develop attention biases favouring negative information and to develop emotional disorders later in life.

Previous studies of high-risk children suggest that attention biases may be cognitive markers of risk for emotional disorders. For example, children of mothers with a lifetime history of depression showed greater attention bias to negative faces, and a reduced bias for positive faces, compared with children of mothers with no history of emotional disorders (i.e., Joormann, Talbot, & Gotlib, 2007). Daughters of mothers with a lifetime history of depression have also showed greater attention to sad faces than children of never-depressed mothers, while no group differences were observed for positive faces (i.e., Kujawa et al., 2011). In both of these studies, attention bias was assessed following negative mood induction. In other studies (not using mood induction), children of mothers with a lifetime history of depression showed greater avoidance of sad faces than children of never-depressed mothers and no effect for angry or happy faces (i.e., Gibb, Benas, Grassia, & McGeary, 2009), while children of mothers with lifetime panic disorder showed increased bias towards threat stimuli (i.e., Mogg, Wilson, Hayward, Cunning, & Bradley, 2012). Attention bias for positive stimuli was not assessed.

Therefore, evidence to date regarding the direction of attention biases in high-risk children is mixed in terms of biases towards versus avoidance of negative information. One factor that could be contributing to these mixed findings is that attention biases of high-risk children are influenced by the attention biases exhibited by their mothers (Goodman & Gotlib, 1999). That is, high-risk children may exhibit an attention bias for negative information if their mothers also preferentially attend to negative information and/or ignore positive information.

Therefore, the aims of the present study were to examine (a) attention biases for emotional information in children as a function of mothers' lifetime history of emotional disorders, and (b) mothers' own attention biases for emotional information. It was hypothesised that (1) attention bias for negative information would be greater in high-risk children (i.e. offspring of mothers with a lifetime history of emotional disorders) compared to low-risk children; and (2) within high-risk children, attention bias to negative information would be greater in children whose mothers have an increased attention bias for negative stimuli, or lack of an attention bias for positive stimuli.

2. Method

2.1. Participants

One hundred and six parent-child dyads were initially assessed to participate in this study which was approved by the Griffith University Human Research Ethics Committee. They were recruited through community advertisements, primary school and university notices and newsletters, local newspapers, GPs, and community mental health clinics as part of a larger study on risk factors for the development of emotional disorders in children (see Waters, Peters, Forrest, & Zimmer-Gembeck, 2014). Initial exclusion criteria for the present study included (a) the child having a psychiatric disorder, including an anxiety or mood disorder, chronic medical condition, intellectual impairment, pervasive developmental disorder, bipolar disorder, oppositional defiant disorder or psychosis, (b) the mother having a past or current chronic medical condition, intellectual impairment, bipolar disorder, psychosis or any psychiatric disorder other than anxiety and unipolar depression, and (c) if the participating parent was not the child's biological

mother. Of the 106 dyads assessed, 28 were excluded due to the child meeting criteria for an anxiety disorder (they were referred for treatment); 3 were excluded due to incomplete diagnostic assessment data, 5 were excluded due to the child's biological mother being unable to participate (2 mothers due to divorce; 1 mother was deceased; 2 mothers were unavailable), and 3 were excluded due to incomplete attention bias data (bias scores were not calculated if more than 50% of RT data were missing, consistent with previous research) (Roy et al., 2008; Salum et al., 2013). Data from some children assessed for this study, but none of the mothers, were included in a larger dataset, (Waters, Bradley, & Mogg, 2014), which was used to address a separate research question, unrelated to the questions examined here.

The final sample of 67 dyads included 29 low-risk dyads (mothers and children without psychiatric disorder) and 38 high-risk dyads, of which 24 mothers had a principal lifetime diagnosis of an anxiety disorder and 14 mothers had a principal lifetime diagnosis of a depressive disorder, with their children having no psychiatric disorder. Five mothers had principal generalised anxiety disorder (GAD), 1 had obsessive-compulsive disorder (OCD), 4 had social phobia, 6 had specific phobia, 2 had panic disorder, 1 had post-traumatic stress disorder (PTSD), 1 had anxiety disorder not otherwise specified, and 1 had major depressive disorder (MDD). Numbers of past principal diagnoses were 1 with OCD, 1 with specific phobia, 1 with separation anxiety, 1 with PTSD, and 13 with MDD. Of the 24 mothers with a principal lifetime diagnosis of an anxiety disorder, 13 had comorbid lifetime anxiety diagnoses, 3 had comorbid lifetime anxiety and depressive disorders, 1 had comorbid lifetime depressive disorder, and 7 mothers had no comorbid diagnoses. Of the 14 mothers with a principal lifetime diagnosis of a depressive disorder, 1 had a comorbid lifetime diagnosis of a depressive disorder, and 2 had comorbid lifetime diagnoses of anxiety, while 11 had no comorbid lifetime diagnoses.

2.2. Measures

2.2.1. Maternal diagnostic status

The Anxiety Disorders Interview Schedule for DSM-IV, Lifetime Version (ADIS-IV-L) (Brown, DiNardo, & Barlow, 1994) is a semi-structured interview that assesses current episodes of DSM-IV anxiety, mood and substance use disorders in addition to past (i.e. lifetime) episodes of these disorders. Clinical postgraduate students who had undergone specialised training in administering the ADIS-IV-L conducted the interviews in person or over the telephone. Mothers answered questions about present and past symptoms of various psychological disorders. If mothers endorsed enough symptoms, they rated the degree of interference caused by the symptoms for both current and past diagnoses using a 0 to 8 scale. Criteria for a disorder was met if a prescribed number of symptoms were endorsed and a clinician severity rating (CSR) of four or greater was assigned based on symptoms, distress and interference (Brown, DiNardo, Lehman, & Campbell, 2001). The ADIS-IV-L has sound psychometric properties (Brown et al., 2001). The diagnosis (past or current) with the highest CSR was considered the principal (i.e., most severe) diagnosis. All ADIS-IV-L diagnoses were reviewed in supervision and 20% were audiotaped and coded by an independent rater for reliability purposes. Inter-rater reliability was excellent (principal diagnosis $\kappa = .89$; second diagnosis $\kappa = 0.82$).

2.2.2. Child diagnostic status

The Anxiety Disorders Interview Schedule for DSM-IV, Parent version (ADIS-C-IV) (Silverman & Albano, 1996) was used to assess the presence/absence of psychiatric disorders in children. Children had an anxiety disorder if they met DSM-IV criteria with a CSR of 4 or higher (scale 0–8), for at least their principal anxiety diagnosis

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