



# Attachment anxiety moderates the relationship between childhood maltreatment and attention bias for emotion in adults



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## ABSTRACT

Research indicates that some individuals who were maltreated in childhood demonstrate biases in social information processing. However, the mechanisms through which these biases develop remain unclear—one possible mechanism is via attachment-related processes. Childhood maltreatment increases risk for insecure attachment. The internal working models of self and others associated with insecure attachment may impact the processing of socially relevant information, particularly emotion conveyed in facial expressions. We investigated associations among child abuse, attachment anxiety and avoidance, and attention biases for emotion in an adult population. Specifically, we examined how self-reported attachment influences the relationship between childhood abuse and attention bias for emotion. A dot probe task consisting of happy, threatening, and neutral female facial stimuli was used to assess possible biases in attention for socially relevant stimuli. Our findings indicate that attachment anxiety moderated the relationship between maltreatment and attention bias for happy emotion; among individuals with a child abuse history, attachment anxiety significantly predicted an attention bias away from happy facial stimuli.

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## 1. Introduction

Given that biases in attention for emotionally-valenced cues have been linked to anxiety disorders, depression, and PTSD (see Bar-Haim et al., 2007 for a review) and may even play a causal role in the emergence of some internalizing conditions (e.g., Osinsky et al., 2012), a growing body of research has focused on identifying factors that might precipitate their development. One such factor that has generated a great deal of interest in recent years is childhood maltreatment, which has been shown to relate consistently both to the development of mood and anxiety disorders (McCauley et al., 1997; Dube et al., 2001; Gillespie et al., 2009b) and to the emergence of biased socioemotional processing (Dodge et al., 1990; Weiss et al., 1992).

Research focused explicitly on associations between attention biases for emotional cues and childhood maltreatment, however, has yielded conflicting results. In particular, findings regarding the direction and nature of attentional biases in individuals maltreated as children vary across studies. In one study, for example, children

with documented maltreatment histories demonstrated a bias to direct attention away from threatening faces (Pine et al., 2005); another study found that young adults who retrospectively reported maltreatment during childhood demonstrated a bias to orient towards threat (Gibb et al., 2009). In a third study, Fani and colleagues (2011) found that adults with a retrospectively-reported child maltreatment history showed a bias to attend preferentially to happy faces, but no significant bias either toward or away from threatening faces.

One possible explanation for the discrepancies across studies is that research to date on attention bias and maltreatment has not identified and taken into account potential moderators. Both interpersonal and intrapersonal moderating variables, which affect the direction and/or strength of an association between two other variables (Baron and Kenny, 1986), have been shown to modulate associations between attention biases and outcome variables such as depression (Connell et al., 2013; Romens and Pollak, 2012). Less is known, however, about variables that moderate associations between attention biases for emotional cues and predictors, such as childhood maltreatment. A growing literature suggests that attachment style merits attention as one such variable.

Attachment theory (Bowlby, 1980; Main et al., 1985; Bretherton et al., 1990) postulates that individuals develop an attachment

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style—a cognitive-behavioral representation of an internal working model of attachment—based on early life experiences with their primary caregivers. These internal working models of self and others guide later interpersonal beliefs, behavior, and information processing abilities. The attachment system is activated in times of need or threatening situations, with the primary goal of establishing close proximity to the attachment figure. Secure attachment with a caregiver has been shown to increase one's ability to regulate emotions in an appropriate manner (Thompson, 2008) and may buffer against the negative consequences of stress (Ahnert et al., 2004; Gilissen, 2008; Alink et al., 2009). In cases of child maltreatment the development of a secure attachment system is particularly threatened when the primary adult that the child turns to for security is also the source of threat or fear for the child (Schuengel et al., 1999; Cassidy and Mohr, 2001; Bradley et al., 2011). Research has repeatedly demonstrated that children who develop in environments characterized by physical and emotional abuse and neglect are more likely to develop an insecure attachment style than are children who grow up in safer contexts (Lyons-Ruth and Jacobvitz, 1999; Cicchetti et al., 2006; Cyr et al., 2010).

Attachment representations are believed to direct feelings and behavior, as well as cognitive processes, towards information that agrees with established mental frameworks (Main et al., 1985. Van Emmichoven et al., 2003) found that attachment representations influence processing of social information, especially in tasks that demand attention and memory. Although it is not entirely clear how this path of influence develops, internal working models of attachment may act as a filter for new information, directing attention towards schema-congruent material (Dewitte et al., 2007). For example, insecurely attached six-year old children in one study were more likely to attribute hostile intent to ambiguous stimuli than were securely attached children (Cassidy et al., 1996).

In adults, anxious attachment style is associated with a tendency to over-emphasize the presence and seriousness of threat and to attend preferentially to cues of negative emotion (Shaver and Mikulincer, 2007). In contrast, individuals with avoidant attachment models attempt to block negative emotions such as fear, anger, shame or guilt. These tendencies could directly relate to the formation of attention bias. It has been previously observed that impairment on tasks of attention and memory among individuals with varied insecure attachment styles are specific to attachment-related themes (Edelstein, 2006; Dewitte et al., 2007; Edelstein and Gillath, 2008). Research suggests that in both children and adults, avoidant and anxious attachment styles are associated with aversion of attention away from attachment-relevant stimuli (Ainsworth, 1978; Main et al., 1985; Dewitte et al., 2007) that may be either positive or negative in emotional valence (Kirsh and Cassidy, 1997). This pattern may reflect a tendency among insecurely attached individuals to experience anxiety in the face of any emotionally-charged interpersonal cues, which activate the attachment system whether they are positive or negative. In contrast, securely attached individuals, for whom interpersonal cues appear less anxiety-provoking, may be more open to attending to and processing both positive and negative social information, because neither type of data activates problematic schemata.

Thus, recent research and theory suggest that social information processing, which includes but is not limited to attention biases, unfolds as a function of both the type of information presented and the quality of a person's attachment style (for a complete review see Dykas and Cassidy, 2011). In the present study, we examined relationships among child maltreatment, level of anxious and avoidant attachment as measured by the Experiences in Close Relationships inventory (ECR), and attention bias in

response to both threatening and happy facial stimuli using an adult, clinical population. We hypothesized that both avoidant and anxious attachment styles as measured by the ECR would interact with self-reported child maltreatment history to predict attention bias away from both happy and threatening facial stimuli.

## 2. Method

### 2.1. Procedure

Subjects in this study were enrolled in a NIH-funded study of risk and resilience factors related to PTSD (Binder et al., 2008; Bradley et al., 2008; Gillespie et al., 2009a). Participants were recruited from the General Medical and Obstetric/Gynecological Clinics at a publicly funded, nonprofit healthcare system that serves a low-income population in Atlanta, Georgia. Participants completed a battery of self-report measures assessing trauma history, childhood maltreatment, and associated symptoms (completion time largely depended on the extent of the participant's trauma history and symptoms, with heavily traumatized participants requiring more time to finish the measures). A trained interviewer read all questionnaires to each participant. As described in full detail previously (Gillespie et al., 2009a), study participants who completed this initial interview were invited to participate in a secondary phase of the study, which involved a more comprehensive assessment including clinical diagnostic interviews, the attachment related questionnaire, and assessment of attention bias via a dot probe task using facial stimuli. Therefore childhood trauma, attention bias, and attachment style were measured on three different days of the study. All procedures in this study were approved by the Institutional Review Board of Emory University School of Medicine and the Grady Memorial Hospital Research Oversight Committee. The presented data were collected between 2009 and 2011.

### 2.2. Participants

The data presented in this manuscript are based on a sample of 142 study participants. However, data from 45 participants were excluded from analysis due to poor performance on the dot probe task or because of withdrawal from the study before completing the attachment measure, resulting in a total of 97 participants whose data were included in analyses. These participants were predominantly female (75.4%), with ages ranging from 18 to 63 years. The sample was 95% African American. The majority of the participants had a low income, with 44.2% reporting a household monthly income less than \$500, 29% reporting a household monthly income between \$500 and \$1000, 20.3% reporting a household monthly income between \$1000 and \$2000; the remaining 6.5% reporting a household monthly income of \$2000 or higher.

### 2.3. Measures

#### 2.3.1. Childhood Trauma Questionnaire

This is a 28-item self-report measure of child maltreatment (Bernstein and Fink, 1998; Bernstein et al., 2003) with acceptable reliability and validity in both clinical and community populations (Bernstein et al., 2003). Moderate levels of consistency were found between CTQ scores and therapist observation ratings; the measure also yields good internal consistency scores (Bernstein et al., 2003). Additionally, the CTQ has strong reliability in the present sample, where data yielded a Cronbach alpha coefficient of 0.88. We used established cutoff scores to group participants according to level of maltreatment, such that each participant was classified as having experienced no abuse or mild, moderate, or severe levels of physical, sexual, and emotional abuse (Bernstein and Fink, 1998). Using these scores, and remaining consistent with our previous analyses (Bradley et al., 2008; Binder et al., 2008) as well as research conducted by other research groups using the CTQ and other measures of adverse childhood experiences (Dube et al., 2001), we assigned participants to no abuse or mild, moderate, or severe abuse groups for each of the three abuse types. We then collapsed those participants reporting no or mild levels of physical, sexual or emotional abuse into a "low childhood abuse" group and collapsed those participants reporting moderate to severe levels of abuse in any of the three categories into a "high childhood abuse" group.

#### 2.3.2. The Experiences in Close Relationships Inventory

This self-report measure of attachment anxiety and avoidance that can be used in adult and adolescent populations queries an individual's attachment-related expectations, actions, and emotions in the context of close romantic relationships (ECR; Brennan et al., 1998). The dimensional measure includes an 18-item scale for attachment-related anxiety, and an 18-item scale for attachment-related avoidance. Possible answers to each of the 36 items range from "1, Strongly Disagree" to "7, Strongly Agree" and high scores on each of the 2 scales indicate high levels of insecure attachment (Quirin et al., 2008). The ECR has been found to be a valid (Mikulincer and Shaver, 2005; Hesse, 2008), stable, and test-retest reliable

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