



# Positively biased processing of mother's emotions predicts children's social and emotional functioning<sup>☆</sup>



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## ARTICLE INFO

### Article history:

Received 25 November 2015

Received in revised form 26 May 2016

Accepted 26 August 2016

### Keywords:

Emotion processing

Positivity bias

Prosocial skills

Internalizing problems

Mother-child relationship

## ABSTRACT

Risk for internalizing problems and social skills deficits likely emerges in early childhood when emotion processing and social competencies are developing. Positively biased processing of social information is typical during early childhood and may be protective against poorer psychosocial outcomes. We tested the hypothesis that young children with relatively less positively biased attention to, interpretations of, and attributions for their mother's emotions would exhibit poorer prosocial skills and more internalizing problems. A sample of 4- to 6-year-old children ( $N = 82$ ) observed their mothers express happiness, sadness and anger during a simulated emotional phone conversation. Children's attention to their mother when she expressed each emotion was rated from video. Immediately following the phone conversation, children were asked questions about the conversation to assess their interpretations of the intensity of mother's emotions and misattributions of personal responsibility for her emotions. Children's prosocial skills and internalizing problems were assessed using mother-report rating scales. Interpretations of mother's positive emotions as relatively less intense than her negative emotions, misattributions of personal responsibility for her negative emotions, and lack of misattributions of personal responsibility for her positive emotions were associated with poorer prosocial skills. Children who attended relatively less to mother's positive than her negative emotions had higher levels of internalizing problems. These findings suggest that children's attention to, interpretations of, and attributions for their mother's emotions may be important targets of early interventions for preventing prosocial skills deficits and internalizing problems.

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Young children typically exhibit positivity biases, meaning that they acquire and maintain positively biased views of the self and others by selectively attending to, processing, and interpreting positive over negative information (Boseovski, 2010; Mezulis, Abramson, Hyde, & Hankin, 2004). This positivity bias is most pronounced during early to middle childhood (Boseovski & Lee, 2006; Harter & Pike, 1984) and diminishes during late childhood and adolescence (Mezulis et al., 2004). Although aspects of young children's emotional development, such as their emotion knowledge and emotion regulation skills, have been associated with their academic

success and social and emotional functioning in classroom settings (Denham et al., 2012; Garner & Waajid, 2012), researchers have not yet studied whether individual differences in young children's positivity biases are associated with their social and emotional functioning. Lower positive attributional style biases have been associated with depression and anxiety in older children and adolescents (Meyer, Dyck, & Petrinack, 1989; Mezulis et al., 2004; Toms, Stewart, Skinner, Hughes, & Emslie, 1993), and determining whether this association is present in early childhood may provide an important clue about processes that contribute to social and emotional functioning in this developmental period.

Early childhood is a critical developmental stage for the acquisition of emotion processing and interpersonal skills (Herba, Landau, Russell, Ecker, & Phillips, 2006; Thompson & Lagattuta, 2006), and mothers' expressions of emotions are an important context for children's emotion learning (Denham & Grout, 1992). Although risk for impaired prosocial functioning and internalizing psychopathology is thought to be emerging during early childhood (Hay, Payne, & Chadwick, 2004; Luby, Belden, Pautsch, Si, & Spitznagel, 2009),

<sup>☆</sup> Research reported in this publication was supported by the National Institute of Mental Health under award number [F31 MH 072095]. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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mechanisms of risk at such young ages are not well understood. Negatively biased processing of emotional stimuli has support as a correlate of impaired interpersonal functioning and depression and anxiety during adulthood, adolescence, and late childhood (Riskind, Alloy, & Iacoviello, 2010; Rudolph, Hammen, & Burge, 1997). However, as young children tend to exhibit positivity biases when processing social information, relatively less positively biased, rather than negatively biased, emotion processing may be particularly relevant to risk for poorer social and emotional functioning during early childhood.

### 1. Emotion processing risks for internalizing problems in children

Studies have found links between emotion processing biases, including attention, interpretation, and attribution biases, and internalizing problems in older children and adolescents. The majority of this research has focused on relations between negatively biased processing of static, non-personal emotional stimuli and internalizing problems. Attention biases toward strangers' negative facial expressions have been found in youth with elevated anxiety and anxiety disorders (Roy et al., 2008) and daughters of depressed mothers (Joormann, Talbot, & Gotlib, 2007). Negatively biased interpretations of the intensity of others' emotions have also been linked to depression; studies have shown that depressed youth interpret low-intensity angry faces as more intensely angry than children with low depression (Van Beek & Dubas, 2008) and sons of depressed mothers identify sad facial expressions at lower intensities than low-risk children (Lopez-Duran, Kuhlman, George, & Kovacs, 2013). Children's misattributions of personal responsibility for others' negative emotions have also been linked to internalizing problems. Depressed children were found to perceive overly hostile intentions in others and to misattribute themselves as the cause of the hostility (Quiggle, Garber, Panak, & Dodge, 1992), and in the context of parental depression, children who misattributed personal responsibility for their parent's negative emotions had higher levels of internalizing problems (Goodman, Tully, Connell, Hartman, & Huh, 2011). Although these studies are cross-sectional, studies demonstrating negatively biased processing in children of depressed parents who are at risk for depression but do not yet have clinically significant symptoms (e.g., Joormann et al., 2007) and research on cognitive vulnerabilities more broadly (Jacobs, Reinecke, Gollan, & Kane, 2008) suggest that these biases are precursors of internalizing problems, although cognitive biases and internalizing problems likely have bidirectional influence (Masten & Cicchetti, 2010).

Studies of older children and adolescents have also demonstrated that positively biased emotion processing is associated with low levels of internalizing problems (e.g., Boseovski, 2010). For example, studies have found biased attention toward positive stimuli in children and adolescents with low levels of depression (Jacobs et al., 2008; Ladouceur et al., 2005) and daughters of non-depressed mothers (Joormann et al., 2007). Moreover, non-depressed children and adolescents have been found to misclassify negative facial expressions as happy (Jenness, Hankin, Young, & Gibb, 2015; Schepman, Taylor, Collishaw, & Fombonne, 2012). On the other hand, depressed adolescents interpreted low-intensity happy faces as less intensely happy than adolescents with low depression (Van Beek & Dubas, 2008). Depressed youth have also been found to have greater impairments in recalling positive information, including fewer positive personal memories, than non-depressed children (Drummond, Dritschel, Astell, O'Carroll, & Dalgleish, 2006; Whitman & Leitenberg, 1990), and among depressed adults, greater recall of self-referential positive words uniquely predicted a decrease in symptoms nine months

later (Johnson, Joormann, & Gotlib, 2007). This research underscores that not only negatively biased, but also less positively biased processing of emotions are associated with internalizing problems.

Whereas most of the studies of positivity biases have samples with age ranges that span middle childhood to middle adolescence, early childhood is a particularly critical stage for studying emotion processing biases given that emotion discernment skills, including skills for discerning negative emotions and low-intensity emotional displays, are still developing (Herba et al., 2008, 2006; Vicari, Reilly, Pasqualetti, Vizzotto, & Caltagirone, 2000). Very little attention has been given to emotion processing biases in early childhood, although a few studies have found support for associations between biased attention toward negative emotional facial expressions and internalizing problems in young children. Specifically, behavioral inhibition in toddlerhood predicted social withdrawal at age five in children with biased attention toward angry faces but not in children without this negative attention bias (Pérez-Edgar et al., 2011), and 5- to 7-year-old daughters of depressed mothers exhibited biased attention toward sad faces (Kujawa et al., 2011). Studies have not examined relations between young children's less positively biased processing and their internalizing problems. Moreover, this research has focused on attention to strangers' static negative emotions in photographs; our study utilized a paradigm in which mothers simulated emotions *in vivo*, which provides a more developmentally relevant context for studying young children's emotion processing biases.

### 2. Emotion processing and social functioning

Emotion processing biases may be associated not only with young children's internalizing problems but also with their social functioning. Indeed, accurate understanding of another's emotions and needs is a critical component of selecting an appropriate social response (Saarni, 1992), and biased processing of others' emotions may interfere with a child's ability to interact effectively with others, for example by impeding accurate recognition of others' needs, empathy and prosocial actions. Prosocial actions are voluntary social behaviors that are helpful, supportive, and intended to benefit another (Eisenberg & Fabes, 1998). Acquiring skills for acting prosocially is important for developing social competence during early childhood, when expanding social networks that include school contexts require more sophisticated prosocial skills (Vandell, Nenide, & Van Winkle, 2006). As young children learn social rules and become increasingly sensitive to situations in which prosocial behaviors are needed and desired, their prosocial behaviors become increasingly selective; for example, they are more likely to behave prosocially toward friends and their own mothers than unfamiliar peers and adults (Hay & Cook, 2007). Moreover, individual differences in young children's prosocial skills are predictive of later prosocial tendencies (Eisenberg et al., 1999).

Research has largely focused on how biased emotion processing is related to children's negative social behaviors; indeed, four- to five-year-old children who misidentified anger in others displayed more aggression and hostility in the classroom (Barth & Bastiani, 1997; Schultz, Izard, & Ackerman, 2000). Yet, emotion processing biases are thought to be associated not only with children's negative social behaviors but also their positive social behaviors; for example, interpreting social cues as friendly may facilitate social approach, and misidentifying sadness and anger in others may inhibit positive social interactions and prosocial behaviors. Surprisingly little research has focused on this topic, although one study found that adolescents who exhibited negatively biased processing by attributing greater hostile intent to others in ambiguous vignettes engaged in fewer altruistic prosocial behaviors (Laible, Murphy, & Augustine, 2014). We expected that

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