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Family emotional climate, attachment security and young children's emotion knowledge in a high risk sample

H. Abigail Raikes[1]* and Ross A. Thompson[2]
[1] University of Nebraska, Lincoln, USA
[2] University of California, Davis, USA

Despite its prevalence in low-income populations, there has been little attention paid to how maternal depression influences mother–child conversations about emotions and low-income preschool children's developing emotion understanding. The importance of a secure attachment as a positive influence on emotion understanding has also been infrequently studied in lower-income families. This longitudinal study examined attachment security and maternal depression when children were age 2 as predictors of mother–child references to emotion in conversations, and children's emotion understanding when children were three. Maternal depression at age 2, but not at age 3, showed a direct, negative relation to children's emotion understanding at age 3, independent of mother–child references to emotion and attachment security. More securely attached dyads made more references to emotion in conversation, which, in turn, promoted children's emotion understanding. It was concluded that secure attachment relationships support children's emotion understanding by promoting mother–child discussion of emotions, while emotion understanding in preschoolers is directly impaired by maternal depression.

Gaining emotion understanding – learning to identify and discuss emotions – is an important aspect of social development in early childhood. Children who are better at identifying emotions in others exhibit less aggression in interactions with peers (Denham *et al.*, 2002), and have fewer behaviour problems in preschool (Hughes, Dunn, & White, 1998) and in elementary school (Izard *et al.*, 2001). Moreover, children who discuss emotional states more frequently have more successful peer relationships (Fabes, Eisenberg, Hanish, & Spinrad, 2001). Accordingly, identifying the antecedents of emotion understanding is an important research goal, perhaps particularly so among populations of low-income children, who are less advanced in social cognitive development in the preschool years (Pears & Moses, 2003) and for whom emotion understanding is negatively associated with behaviour problems later in life

(Schulz, Izard, Ackerman, & Youngstrom, 2001). This study examined the influence of attachment security and maternal depression when children were 2 years old on the content of mother–child conversations about emotion and young children's emotion understanding when children were 3 years old in a high risk sample.

Emotion understanding expands significantly in scope and clarity during early childhood. Thompson (1998) has proposed that children who have more secure relationships with parents, and who frequently discuss emotions with them, acquire more accurate understanding of emotions than other children. Previous research has demonstrated that children learn about emotions in conversations with parents, and that secure attachment relationships promote children's emotion understanding.

More precisely, the content and style of parent–child conversations, especially those about emotion, influences children's acquisition of emotion understanding. Children of mothers who make frequent references to emotion in conversations are more skilled in identifying emotions because such conversations provide children with an opportunity to learn about emotions and their antecedents, and offer an opportunity for mothers and children to negotiate shared meaning around emotional encounters (Stern, 1985). In line with this theoretical proposition, several studies show that the frequency of mothers' references to emotion in conversation with children is a reliable predictor of children's emotion understanding (Denham, Zoller, & Couchoud, 1994; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Garner, Jones, Gaddy, & Rennie, 1997; Laible & Thompson, 2000), findings that are striking given that the total frequency of conversation between mothers and children shows no relation to children's emotion understanding (Dunn, Brown, & Beardsall, 1991).

Examining the content of everyday, naturalistic conversations between mothers and young children, Dunn *et al.* (1991) found that children who made more feeling-state references with their mothers when they were 2 years old performed better on tasks of social understanding 7 months later. Similar associations between mothers' use of emotion language and children's emotion understanding have been reported in both concurrent and longitudinal studies assessing mothers' emotion language with their children in semi-structured conversation tasks designed to elicit conversation about feeling states. Garner *et al.* (1997) found that children who made more references to emotion in conversation with mothers also showed higher levels of emotion understanding, when measured concurrently, and Laible and Thompson (2000) reported that mothers who provided more labels for emotional states had children who performed better on tests of emotion understanding six months later. Mothers' use of emotion language also predicts preschool children's concurrent production of emotion language (Denham, Cook, & Zoller, 1992; Denham *et al.*, 1994; Garner *et al.*, 1997), even after controlling for children's overall language competence.

Parent–child attachment relationships also provide a primary forum for children to learn about emotions, and children with open, responsive relationships with their parents have greater understanding of emotions. More securely attached children show more advanced emotion understanding in the preschool years (De Rosnay & Harris, 2002; Greig & Howe, 2001; Laible & Thompson, 1998; Ontai & Thompson, 2002). This relation is believed to exist because secure attachment relationships foster open communication around emotional events, which, in turn, promotes young children's competence in identifying emotions and understanding their causes (Thompson, 1998, 2000).

The content of mother–child conversations about internal states is meaningfully related to the overall quality of their relationship. Mothers' references to internal states

when interacting conversationally with their 6-month-old children, referred to as *mind-mindedness*, shows longitudinal associations with children's theory of mind development (Meins *et al.*, 2002), presumably because mothers' descriptions of internal states supports children's understanding of causality in emotion and behaviour (Fonagy & Target, 1997). More secure dyads also have richer, more descriptive conversations about emotions (Laible, 2004a; Laible & Thompson, 2000), thus facilitating children's coherent accounts of emotion in themselves and others. However, whether secure attachment relationships promote children's emotion understanding by enhancing conversations about emotion, or whether mother–child conversations about emotion and attachment make independent contributions to children's emotion understanding, is unclear from present research and deserves further empirical attention (Harris, 1999).

Family emotional climate and children's emotion understanding

While mother–child conversations about emotion and the security of the attachment relationship provide a dyadic setting for learning about emotion, both occur within the broader context of the family. The family environment provides a natural laboratory for learning about feelings (Dunn, 1999), and families vary quite dramatically in the prevalence and intensity of negative affect (Halberstadt & Eaton, 2003). Exposure to intense negative affect within the home may overwhelm young children and impede their ability to link emotions with their antecedents and consequences (Parke, Cassidy, Burks, Carson, & Boynum, 1992; Thompson, 1994), leading to difficulty in discussing and identifying emotions. Making the connection between the causes and consequences of emotion helps young children acquire emotion understanding (Harris, 1994), and when children have trouble understanding these connections, they may have difficulty comprehending the feelings they observe in others or experience in themselves.

Current research supports the hypothesis that intense negative affect disrupts the development of emotion understanding in young children. The expression of negative affect in the family environment (Dunn & Brown, 1994), and especially exposure to maternal anger (Denham *et al.*, 1994), is associated with decreased emotion understanding in preschool-aged children. Nixon and Watson (2001) found links between emotional expressivity in the home and children's interpretations of emotions in puppets enacting scenes of family conflict. Preschool-aged children were less likely to report that a staged spousal argument evoked negative feelings in puppets if they had been exposed to high degrees of positive affect in the home, while children whose parents reported high levels of negative affect were more likely to report that the puppets were angry with one another, suggesting that children's interpretation of emotion is to some extent related to their emotional experiences in the family.

Specifically, maternal depression could affect how young children learn about emotions. Maternal depression may cause disruptions in the child's perception of how emotions are related to external situations, which is a fundamental component of understanding emotion in others (Harris, 1994). Greig and Howe (2001) found no effect of maternal depression on children's emotion understanding abilities after controlling for children's attachment security, and concluded that maternal depression may affect children's emotion understanding because of the greater likelihood of insecure attachment. However, Grieg and Howe measured depression concurrently with preschool children's emotion understanding. Because the period between 2 and 3 years

may be especially critical for young children's emotion understanding (Dunn, 1999), children who are exposed to maternal depression before the preschool years could also show significant deficits in emotion understanding, warranting examination of depression in young children using a longitudinal design.

Although some studies have reported associations between socio-economic status and emotion understanding (Pears & Moses, 2003), other studies have reported no association (Cutting & Dunn, 1999; Smith & Walden, 1999). These inconsistencies may arise due to the failure to include measures of family emotional climate, which may be more negative in some low-income families than in others. Raver and Spagnola (2003), for example, found that there were no main effects of poverty risk on children's references to anger in a story-stem completion task designed to elicit predictions of maternal anger, after statistically controlling for maternal negative expressiveness. Maternal depression, which is more prevalent among low-income mothers (Belle, 1990), takes on a wide range of symptoms, and can encompass sadness, irritability and proneness to anger and conflict within intimate relationships, and therefore can create a home environment in which intense negative affect is common. In low-income families where depression is present, the family emotional climate could be qualitatively different from that in middle-class families (Raver & Spagnola, 2003; Smith & Walden, 1999), providing one explanation for why emotional understanding is delayed among low-income children.

Links between family emotional climate, mother–child references to emotion and children's emotion understanding

Existing work on the family emotional climate and children's emotion understanding has not clearly defined the mechanisms linking them. The family emotional climate could affect children's emotion understanding (a) directly through the impact of emotional stressors on emotion understanding, (b) indirectly by influencing the content of mother–child conversations about emotion or (c) indirectly because children growing up in homes characterized by intense negative affect are also more likely to be insecurely attached.

Whether the family emotional climate has direct effects on children's emotion understanding, or whether effects are mediated through the content of mother–child conversations about emotion, has received limited attention. Denham *et al.* (1994) found that mothers who expressed more anger in a laboratory situation with their children were less likely to discuss emotions with their children, but anger expressions ceased to be a significant predictor of emotion understanding after accounting for mothers' emotion language. However, analyses were not designed to test whether mothers' emotion language fully accounted for the effect of anger on children's emotion understanding. Although children's exposure to maternal depression has been hypothesized to affect children's social cognition (Harris, 1994), there have been few studies to date specifically testing the impact of depression on the content of mother–child conversations about emotion. Mothers who are depressed could be less effective in discussing negative feelings with their children due to the pervasive negative affect they are experiencing themselves. Maternal depression could also have direct effects on children's developing emotion understanding because of its effects on other features of parent–child interaction, such as social play, discipline and affective sharing.

It is also possible that links between the family emotional climate and emotion understanding are mediated by attachment security. Children of depressed mothers are

more likely to be insecurely attached (Radke-Yarrow *et al.*, 1995; Teti, Gelfand, Messinger, & Isabella, 1995), which could account for the association of these risk factors with impoverished emotion understanding (Garber & Martin, 2002).

Accordingly, this study was designed to test the relations between family emotional climate, mother–child conversations about emotion and children's emotion understanding while accounting for the security of attachment between mothers and children. Because attachment security and mother–child conversations about emotion are each reliably related to children's emotion understanding, we were also interested in determining the independent impacts of attachment security and mother–child conversations about emotion on children's emotion understanding in a high risk sample.

This study thus had three over-arching goals. First, we were interested in determining whether maternal depression is associated with children's emotion understanding. Second, we were interested in identifying whether attachment security or mother–child conversations mediated the hypothesized effect of depression on children's emotion understanding. Specifically, we were interested in determining whether maternal depression was indirectly related to children's emotion understanding through an association with the content of mother–child conversations about emotion or attachment security, or instead had a direct association with emotion understanding. Third, we were interested in determining whether the content of mother–child conversations about emotion and attachment security made independent contributions to children's emotion understanding, or whether the effects of attachment were mediated by the content of mother–child discourse.

We tested the following hypotheses. First, we expected that children's emotion understanding would be negatively associated with exposure to maternal depression. We were then interested in learning whether the associations between depression and emotion understanding were mediated by either attachment security or mother–child references to emotion. Second, we hypothesized that attachment security and mother–child conversations would both be positively associated with children's emotion understanding. Based on literature demonstrating that securely attached dyads talk more openly and richly about emotion, we also hypothesized that the content of mother–child conversation about emotion would mediate the association between attachment security and emotion understanding.

Method

Participants

Participants were 42 mothers and children (22 girls; 20 boys) who were enrolled in an early intervention programme (*Early Head Start*) designed to provide family support and promote child development among children living in poverty. Mothers and children were enrolled in the study when the children were between 2 and 3 years of age ($M = 28$ months; $SD = 0.33$) and were seen again when children were between 3 and 4 years of age ($M = 42$ months; $SD = 0.35$). Average time between visits was 1 year ($SD = 0.28$). Mothers' ages ranged from 19 to 40 years ($M = 25.5$ years; $SD = 4.9$). The majority of mothers were white ($N = 33$). Five mothers were African-American, three were Hispanic and one was Asian. Data on mother and child language are missing for one family who refused to be videotaped due to religious reasons. Half of mothers were not married at the time of the first visit (50%), and 10 of the mothers reported either being married or living with the child's father. Of the mothers, 80% (34) had graduated from high school, but only 3 mothers had obtained college degrees. Of the families,

34 had yearly income under $18,000, and 13 of the families were receiving governmental cash assistance, a marker of severe poverty. The majority of the mothers, 27 of 42 (64%), were employed at the time of the first visit.

Procedure

At the first visit, mothers were asked to report on depression, and children's attachment security was assessed using observer sorts of the attachment Q-set (Waters & Deane, 1985). Observers spent on average 2 hours in the families' homes.

On the second visit, a researcher visited the home, assessed the child using the Denham emotion understanding task (Denham, 1986), and asked mothers to respond to an inventory of depression, using the same mother-report scale as was presented to mothers on the first visit. Researchers then videotaped the mother and the child discussing previous incidents when the child was happy, angry and sad. Mothers were asked to discuss emotion with their children because of the evidence demonstrating that mothers' conversations with children about emotion, as opposed to conversations more generally, are critical for children's emotion understanding (Dunn *et al.*, 1991). Mothers were explicitly asked to 'discuss recent times with the child that the child was happy, angry and sad'. The study protocol for eliciting mother–child discussion of emotion was based on a modification of a procedure developed by Fivush (1991). A substantial body of research on mother–child conversations and children's emotion socialization rests on semi-structured conversation tasks (e.g. Denham *et al.*, 1994; Garner *et al.*, 1997; Laible, 2004a, 2004b; Leibowitz, Ramos-Marcuse, & Arsenio, 2002), demonstrating the validity of measuring mother–child language using this protocol. Conversations were considered complete when mothers and children had discussed all three emotions, regardless of how long the conversation continued, and mothers were given no additional prompts beyond the request to discuss the three emotions. Conversations continued for 25.85 turns on average, ranging from 10 to 78 ($SD = 14.69$). Both visits were conducted at the family's convenience, and mothers were given a small stipend for their agreement to participate.

Measures

Attachment security

To assess attachment security, children were observed in their homes for 90 to 120 minutes by trained observers who then completed the attachment Q sort (Waters & Deane, 1985). Observer sorts of the attachment Q sort have been shown to provide a valid indication of children's attachment security (van Ijzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). Observers sorted 90 cards into nine groups based on how accurately the cards described the child's behaviour. Each item on the Q sort has been assigned a value indicating the score a prototypically *most secure* child would receive on that item; security scores were calculated by correlating the observed child's scores on Q sort items with a security criterion sort containing values for the prototypically secure child.

Two research assistants with substantial background in attachment theory were trained to conduct Q sort observations using guidelines provided by Everett Waters, and by conducting practice observations in pairs. Reliability for the two observers who conducted the observations was calculated by correlating their scores on sorts of 10 different children's behaviour, some of whom were included in the sample for the present study, and averaged 0.71. Visits were scheduled at a time convenient for the

mothers, and mothers were told that they should behave as they normally do while at home with the child. Information about maternal depression and family characteristics was collected at the end of the observation, and observers were blind to depression and family characteristics before completing the sorts. Children's scores on the attachment Q sort ranged from -0.21 to 0.75 ($M = 0.22$, $SD = 0.25$). The mean for this sample is consistent with security score means for other high risk samples; across multiple studies using the attachment Q sort, van Ijzendoorn *et al.* (2004) reported a mean of 0.32 for typically developing samples and a mean of 0.21 for clinical samples.

Maternal depression

Depression was assessed by determining the frequency of depressive symptoms experienced in the preceding two weeks. The Center for the Epidemiological Study – Depression inventory (CES-D; Radloff, 1977), which contains 20 items indicating depressive symptoms, was administered to mothers through surveys at Time 1 and Time 2. Scores of depression are calculated by adding the number of days for which depressive symptoms were reported; scores of 16 or higher are considered indicative of clinical depression. On average, mothers in this sample reported relatively frequent depressive symptoms ($M = 13.95$ at Time 1, $SD = 9.12$; $M = 12.90$ at Time 2, $SD = 9.19$). Reports of depressive symptoms were significantly correlated with one another across the two time points ($r = .43$; $p < .001$).

Mother–child references to emotion

To create a variable indexing the content of mother–child conversations about emotion, both mothers' and children's references to emotion in the semi-structured conversation task were tabulated. Mothers' references to emotion in conversation with the child were measured by transcribing the videotapes verbatim, and then counting the number of times she used positive and negative emotion words while discussing previous incidents when the child was angry, happy and sad. Emotion words were defined as words depicting emotional states (e.g. *happy, sad, angry, scared*) as well as those depicting direct behavioural consequences of emotional states (e.g. *crying, laughing*), because both were thought to communicate an awareness of emotional states, and also because this coding procedure is consistent with coding schemes used frequently in studies on mother–child conversation (e.g. Brown & Dunn, 1992; Denham *et al.*, 1994; Fivush, 1991; Zahn-Waxler, Ridgeway, Denham, Usher, & Cole, 1993). The first mention of each emotion word was not counted, as the prompt by the experimenter required mothers to use emotion words. The number of emotion words used by mothers ranged from 0 to 30 ($M = 8.26$; $SD = 6.78$). Two raters counted emotion words and their counts were highly correlated ($r = .99$). Discrepancies were resolved through conferencing. The total number of emotion references was then adjusted by the number of conversational turns to control for differences in conversation duration.

Children's use of positive and negative emotion words were counted according to the same standards as for mothers. Using the verbatim transcripts of mother–child conversations, scores were calculated by counting the number of positive and negative emotion words used by the child. Two raters counted emotion words and their counts were highly correlated for children's use of negative words ($r = .95$). Discrepancies were resolved through conferencing. Children's use of negative emotion words ranged from 0 to 10 ($M = 2.52$, $SD = 4.51$), and children's use of positive emotion words ranged from 0 to 7 ($M = 0.86$, $SD = 1.42$). Scores were adjusted for conversational turns and then transformed into z scores and summed for use in analyses. Mother and child scores were

aggregated into one variable, referred to in analyses as mother–child references to emotion, by transforming both mother references to emotion and child references to emotion into z scores and summing them together.

Emotion understanding

Children's emotion understanding was assessed using an affective perspective-taking task (Denham, 1986). In the first part of the task, children's abilities to recognize facial expressions associated with emotions were assessed. Children were first presented with four felt puppet faces that were unattached to the puppets' bodies. These faces were laid out in front of the child, one each with prototypically happy, sad, scared and angry expressions drawn with paint, and for each face, they were asked, 'How does this one feel?' They were then asked to point to the face that corresponded with each of the target emotions (e.g. 'show me the happy face'). If children pointed to the wrong face, they were corrected at the end of this first step of the task and asked to re-identify the faces they inaccurately identified the first time. Each child received 2 points for accurately naming the faces at the experimenter's first request; children were given 1 point if they had the correct valence but the wrong emotion (for instance, if the child reported that the angry face was sad). Children were also given 2 points for each time they correctly pointed to the face that expressed the requested emotion, and were given 1 point if they matched a face with the right valence but the wrong emotion.

In the second part of the task, children were presented with 20 short vignettes, acted out by hand puppets whose gender matched the child's gender, describing an emotional event. The vignettes were accompanied by visual and facial cues by the experimenter. For example, if the story was about a child seeing a big dog and feeling scared, the experimenter used vocal cues to communicate fear, and also made a scared face before asking the child how the puppet felt. In 8 of the 20 stories, the puppet was shown to feel the same way that most people would feel in the given situation (e.g. scared to see a big dog and happy to get ice cream); these were called the *stereotypical vignettes*. In the other 12 vignettes, the puppet was made to feel opposite to how the child would feel, based on maternal reports of the child's typical feelings in these situations; these were called the *non-stereotypical vignettes*. Therefore, each of the non-stereotypical vignettes was tailored to the child's expected responses. Mothers filled out a forced-choice questionnaire at the start of the visit that asked them how to predict how their child would probably feel in each of the 12 situations, and in each of the 12 non-stereotypical stories, the puppet was portrayed to feel in a way that was contrary to what the child would feel. Thus, the non-stereotypical vignettes were designed to assess whether children could separate their own feelings from that of the puppet's, and rely on the experimenter's facial and vocal cues to generate the right emotion for the puppet. At the end of each story, children were asked, 'How did the puppet feel?' If children did not respond with a verbal emotion label, they were asked to point to the corresponding face. Children were given 2 points if they either verbally produced the right emotion or pointed to the face, and 1 point was given if children matched the valence of the emotion but did not accurately identify it (e.g. saying that the angry puppet was sad). Total scores were calculated by summing the child's scores on the first part of the task and on the 20 vignettes. The highest possible score was 48, and scores in this sample ranged from 21 to 44 ($M = 32.95$, $SD = 6.50$).

Children's receptive vocabulary

Because existing literature has demonstrated a strong correlation between children's receptive vocabulary skills and their performance on tests of social understanding (e.g. Cutting & Dunn, 1999; De Rosnay & Harris, 2002), children's receptive vocabulary was assessed with the Peabody Picture Vocabulary Test-III (PPVT; Dunn & Dunn, 1997). This test is a widely used measure of receptive vocabulary. In the test, the child is shown four pictures and is asked to match to the corresponding picture a word that the interviewer says aloud. The PPVT-III has good internal consistency reliability (Cronbach $\alpha = .92$ to .98) and correlates highly (.80 to .90) with intelligence tests. Children's standard scores were used in analyses, and are normed on a scale with a mean of 100. Scores ranged from 68 to 117 ($M = 93.14$, $SD = 10.58$).

Results

Bivariate analyses

Before beginning multivariate analyses, bivariate correlational analyses were conducted. Depression at Time 1, but not at Time 2, was associated with lower scores in emotion understanding. At neither Time 1 nor Time 2 was depression associated with mother–child references to emotion. Children's attachment security was positively associated with mother–child references to emotion and children's emotion understanding scores. Mother-child references to emotion were positively associated with children's emotion understanding scores. Children's receptive vocabulary scores were positively associated with emotion understanding scores, but were not associated with mother–child references to emotion or children's attachment security. There were no gender differences in mother–child references to emotion or in emotion understanding scores, although boys were less securely attached than girls. Results appear in Table 1.

Table 1. Correlations between predictor and outcome variables

	Depression Time 1 (1)	Depression Time 2 (2)	Attachment security (3)	Mother–child emotion (4)	Emotion references to (5)	PPVT understanding (6)	Gender (7)	Age (8)
1.		.43**	−.28 +	.07	−.38*	.02	.10	.01
2.			−.28 +	−.11	−.11	−.04	.21	.12
3.				.31*	.44**	.18	−.46**	−.06
4.					.35*	.00	−.23	.10
5.						.43**	−.07	.14
6.							.31*	−.01
7.								−.29 +
8.								

Note. $+p < .10$, $*p < .05$, $**p < .01$, $***p < .001$. For the gender variable, boys were coded as 1 and girls coded as 0.

Is depression related to children's emotion understanding?

Because depression at Time 1 was significantly associated with depression at Time 2, we created regression models predicting children's emotion understanding that included depression at both time points, controlling for children's receptive vocabulary skills. Consistent with results from the bivariate analyses, depression at Time 1, but not at

Time 2, was significantly associated with children's emotion understanding scores, and the model explained 34% of the variance in children's emotion understanding, $F(3, 42) = 6.78; p < .01; R^2 = .34$; depression at Time 1 explained 14% of the variance in emotion understanding. Mothers who reported more depressive symptoms at Time 1 had children who scored lower in emotion understanding at Time 2. Results appear in Table 2.

Table 2. Summary of regression predicting children's emotion understanding

	B	SEB	β
Depression at Time 1	− 0.30	0.10	− 0.42*
Depression at Time 2	0.06	0.10	0.09
Receptive vocabulary	0.27	0.44	0.44*

Note. $R^2 = .34$, *$p < .05$, **$p < .01$.

We then proceeded to determine whether attachment security or mother–child references to emotion mediated the association between depression and emotion understanding. We did not include depression at Time 2 in further analyses, because it did not show an association with children's emotion understanding.

Are the effects of depression on emotion understanding mediated through attachment or mother–child references to emotion?

Consistent with a substantial body of research, depression at Time 1 showed a marginal and negative relation with children's attachment security. Because attachment security showed a positive association with children's emotion understanding, the next set of regression models assessed whether the association between depression and emotion understanding was mediated through insecure attachment relationships. Results indicated that the negative effects of depression at Time 1 on emotion understanding were apparent, even after accounting for children's attachment security and children's verbal competence. Both children's attachment security and depression at Time 1 made independent contributions to children's emotion understanding scores. The final model accounted for 41% of the variance in children's emotion understanding, $F(3, 42) = 9.02; p < .01; R^2 = .41$. Results appear in Table 3.

Table 3. Summary of regression predicting children's emotion understanding from depression and security

	B	SEB	β
Step 1			
Depression Time 1	− 0.27	0.09	− 0.39**
Receptive vocabulary	0.27	0.08	0.44**
Step 2			
Depression Time 1	− 0.22	0.09	− 0.30*
Receptive vocabulary	0.24	0.08	0.39**
Security	7.63	3.64	0.29*

Note. $R^2 = .34$ for Step 1, $R^2 = .41$ for Step 2, R^2-*change* = .07 ($p < .01$).
*$p < .05$, **$p < .01$, ***$p < .001$.

Because there was no association between depression at Time 1 and mother–child references to emotion, there was no justification for testing a mediated model.

How are depression, mother–child references to emotion and children's attachment security related to emotion understanding?

In the last set of analyses, we examined the relations between depression at Time 1, mother-child references to emotion, attachment security and children's emotion understanding scores, controlling for children's receptive vocabulary skills. Because there was a significant association between mother-child references to emotion and children's attachment security, we were interested in determining whether both variables made unique contributions to emotion understanding, or conversely, whether mother–child references to emotion mediated the association between attachment and emotion understanding. In this last set of models, we were also interested in identifying whether depression at Time 1 remained associated with emotion understanding after accounting for both mother–child references to emotion and children's attachment security. There were no gender differences in children's emotion understanding scores, so gender was not included as a control variable.

In the first step of the model, depression at Time 1 and children's receptive vocabulary scores were entered into the model predicting children's emotion understanding. On the second step, attachment security was entered, and on the third step of the model, mother–child references to emotion were entered. Results indicated that both depression at Time 1 and mother–child references to emotion remained significant predictors of emotion understanding, along with children's receptive vocabulary scores. However, attachment security ceased to be a significant predictor of emotion understanding after including mother–child references to emotion in the model; the effects of security were mediated through mother–child references to emotion. To probe whether the mediation effects were statistically significant different from zero, Sobel's test of mediation was employed (Preacher & Leonardelli, 2001) and results indicated a marginally significant mediation effect ($p = .08$). The final model accounted for 50% of the variance in

Table 4. Summary of regression predicting children's emotion understanding from depression, mother–child references to emotion and security

	B	SEB	β
Step 1			
Depression Time 1	− 0.27	0.09	− 0.38**
Receptive vocabulary	0.27	0.09	0.44***
Step 2			
Depression Time 1	− 0.21	0.08	− 0.30*
Receptive vocabulary	0.24	0.08	0.39**
Security	7.58	3.52	0.29*
Step 3			
Depression Time 1	− 0.25	0.09	− 0.35**
Receptive vocabulary	0.25	0.07	0.41**
Security	4.43	3.51	0.17
Mother–child references to emotion	0.94	0.37	0.32*

Note. $R^2 = .34$ for Step 1, $R^2 = .41$ for Step 2, R^2-*change* $= .07$ ($p < .05$); $R^2 = .50$ for Step 3, R^2-*change* $= .09$ ($p < .05$).
*$p < .05$, **$p < .01$, ***$p < .001$.

children's emotion understanding scores, $F(4, 41) = 9.71$; $p < .01$; $R^2 = .50$. Results appear in Table 4.

In sum, mother–child references to emotion emerged as an important and reliable predictor of emotion understanding scores, and mediated the association between attachment security and children's emotion understanding. However, depression at Time 1 exerted a reliable negative association with children's emotion understanding, even after accounting for mother–child references to emotion, children's attachment security and receptive vocabulary scores. In addition, consistent with previous findings, we found positive relations between children's receptive vocabulary skills and emotion understanding scores.

Discussion

This study was designed to longitudinally assess how the family emotional climate, defined by maternal depression, and children's attachment security at age 2 affected the content of mother-child conversations about emotions and children's emotion understanding at age 3 within a high risk sample of children. There were two main conclusions that emerged from this study. First, attachment security, measured when children were 2 years old, was a strong and reliable predictor of mother–child references to emotion, which in turn was positively associated with children's emotion understanding at age 3. Results suggest that secure attachment relationships may be related to emotion understanding by facilitating mother–child discussions of emotion. Second, family emotional climate is an important contributor to children's emotion understanding, and operates independently of the dyadic processes of mother–child conversational content or children's attachment security. Children who are exposed to intense and pervasive negative affect in the home through conditions like maternal depression may have difficulty understanding emotions. These findings have implications for understanding normative developments in emotion understanding, and they also elucidate the ways in which growing up in a high risk family make the process of learning about emotions more challenging.

First, while previous studies have found that attachment security is related to children's skills in emotion identification (De Rosnay & Harris, 2002; Laible & Thompson, 1998; Ontai & Thompson, 2002), no research to date has specifically examined the association between 2-year-old children's attachment security and mother–child references to emotion in conversation one year later. The longitudinal nature of the present study suggests that attachment security promotes mother–child references to emotion, which in turn are related to skills in emotion understanding. Previous research has reported that securely attached children show advanced social cognitive development, and that mothers of securely attached children discuss mental states more frequently with them, which could be partially responsible for this association (Meins, Fernyhough, Russell, & Clark-Carter, 1998). The findings reported here are consistent with the greater 'open communication' believed to be shared by securely attached children with their parents, and support hypotheses posed by Harris (1999) that secure attachment relationships promote emotion understanding by enhancing children's abilities to construct coherent accounts of emotional events. Indeed, our findings confirm these theoretical views by showing, for the first time, that the effects of attachment security on children's emotion understanding were mediated through the association between security of attachment and mother–child references to emotion. While *post hoc* testing indicated that these effects were only marginally significant, the

small sample size used here may have precluded the discovery of statistically significant mediation effects. Nonetheless, findings demonstrate the significance of the communication between parent and child in early childhood for the growth of psychological understanding and, more broadly, the growth of the internal working models arising from secure or insecure attachments (Thompson, 1998, 2000).

While most studies have reported a positive relation between attachment and emotion understanding (e.g. De Rosnay & Harris, 2002; Laible & Thompson, 1998), Ontai and Thompson (2002) failed to find the predicted association when measuring attachment and emotion understanding concurrently among 3-year-olds, but did find an association between attachment security measured at age 3 and emotion understanding measured at age 5. Taken with findings from the present study, we conclude that attachment security at younger ages may facilitate acquisition of insight into internal states that is needed for relative success in social understanding later in life, perhaps by facilitating high quality conversations about emotion. Because most studies have measured attachment security concurrently with emotion understanding, greater use of longitudinal designs is needed to determine how attachment at younger ages may promote emotion understanding later in life. Strong causal conclusions about the influence of mother–child conversations on children's emotion understanding from this study are constrained by the fact that the study design did not include an antecedent assessment of children's emotion understanding.

Another interpretive caveat concerns the mother–child conversation task, which enlisted semi-structured probes to elicit discussions of emotion that would approximate everyday conversations between mothers and children. Although the results from our data suggest that meaningful and important elements of mother–child conversational style were assessed within the semi-structured conversation task used in the present study, other research indicates that different conversational tasks, such as conversations that take place during maternal-child book-reading versus those specifically about children's emotion, show different associations with emotion understanding (e.g. Laible, 2004b). Future studies should enlist a broader variety of conversational probes that include naturalistic as well as semi-structured assessments.

Second, we were specifically interested in defining the role of the family emotional climate in the content of mother–child conversations with their children, and in children's emotion understanding. Neither maternal depression at Time 1 nor at Time 2 was related to the content of mother–child conversations about emotion, but maternal depression at Time 1 emerged as a reliable and negative predictor of children's emotion understanding. Depression at Time 2 had no impact, consistent with results reported by Greig and Howe (2001) regarding the lack of a concurrent impact of maternal depression on preschoolers' emotion understanding. Because mothers' depression scores were strongly associated with one another across the two time points, and also because attachment security showed similar relations to depression at Time 1 and Time 2, the assessments of maternal depression appear to be equally valid. The differential effects of depression at Time 1 and Time 2 on children's emotion understanding may instead reflect the importance of maternal depression during the early toddler years for children's nascent abilities to identify emotion in others. The time between 2 and 3 years may be especially critical for young children's developing emotion understanding, and children who experience maternal depression during this period may have particular difficulty in accurately identifying emotions. It is also important to note that the effects of depression on children's emotion understanding were not mediated by attachment security, as depression remained a significant

predictor of emotion understanding even after controlling for children's attachment security. Because this is the first study to examine longitudinal associations between maternal depression and children's emotion understanding, more research is needed to clarify how depression influences children's emotion understanding.

While we did not find links between mother–child references to emotion and maternal depression, it is possible that maternal depression influences aspects of mother–child conversations not measured in the present study. Previous research on the role of mother–child conversations in children's emotion socialization has reported that the quality of discourse, as well as the content, is an important predictor of young children's emotion understanding (Laible, 2004a; Laible & Thompson, 2002). Maternal depression could affect the manner of elaboration that mothers use in conversation with their children, or could also moderate the influence of mother–child conversations on children's emotion understanding. Both possibilities should be explored in greater detail in future research. It is also possible that maternal depression affects other aspects of parent–child interaction relevant to children's developing emotion understanding, such as the affective sharing in social interaction, parent discipline practices and the quality of social play that they share.

Overall, results from the present study expand present understanding regarding the impact of both attachment security and family emotional climate. First, this study expands existing insight into the benefits of a secure attachment relationship for young children's emotion understanding: secure attachment relationships support the open discussion of emotions between mothers and children, which, in turn, is strongly and positively related to children's emotion understanding. Second, consistent with previous work, family emotional climate is an important aspect of the context in which children gain emotion understanding, and maternal depression specifically has direct effects on emotion understanding. Because children growing up in low-income environments are more likely to be insecurely attached, and are also more likely to experience maternal depression, they may face significant hurdles in gaining understanding about emotions. Encouraging mothers to discuss emotions with their children in a healthy and constructive manner, and providing children with opportunities to learn about the antecedents and consequences of emotion, could assist young children in high risk homes in the important task of learning about emotions.

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