This study focused on the predictive contributions of infants’ temperamental negative emotionality (proneness to fear, anger), sex, maternal responsivity, and their interaction on toddlers’ empathy-related responding to distress in 3 contexts. Ninety-eight infants and their mothers participated in a longitudinal study. When the infants were 10 months of age, mothers completed assessments of infant temperamental anger and fear, and maternal behaviors were observed in a free-play setting. At 18 months of age, toddlers’ empathy-related responding to the distress of a stranger, a crying baby doll, and the mother was assessed. A series of hierarchical and logistic regressions were performed, and results indicated that infant fear predicted higher concerned awareness toward adults and higher personal distress reactions toward the mother. In addition, maternal responsivity predicted higher concerned attention and lower personal distress reactions toward the baby doll and mother. Findings also revealed several interaction effects to predict toddlers’ empathy-related responding to distress.
The ability to respond appropriately to others’ distress is an important developmental task, and research has demonstrated these skills are linked to children’s positive social functioning. For example, children’s prosocial behaviors have been associated with higher quality contemporaneous and earlier social functioning (Murphy, Shepard, Eisenberg, Fabes, & Guthrie, 1999), popularity and supportive friendships (Clark & Ladd, 2000; LaFontana & Cillessen, 2002; Sebanc, 2003), and lower aggression and externalizing problems (Crick, Casas, & Mosher, 1997; Diener & Kim, 2004). Given the significance of these behaviors to children’s developmental outcomes, we aimed to examine the early antecedents of individual differences in empathy-related responding to distress in a sample of young toddlers.

According to both theory and empirical work, the emergence of empathy and prosocial behavior occurs during the second year of life and is accompanied by changes in cognitive development and self–other differentiation (Hoffman, 1982, 2000; Kopp, 1982). Between 12 and 18 months of age, toddlers have been found to show empathic concern toward others’ negative emotions and sometimes make helpful advances toward a victim of distress (i.e., patting, touching, hugging) or signal someone else to help (Zahn-Waxler & Radke-Yarrow, 1982; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). Researchers have been interested in what factors contribute to individual differences in these behaviors.

Parenting and Children’s Empathy-Related Responses to Distress

A large body of literature has focused on the contribution of the social environment to the development of children’s empathy, although the majority of this work has been done with school-aged children (Eisenberg, Fabes, & Spinrad, 2006). In work with younger children, maternal warmth and responsiveness (including appropriate, contingent, and sensitive responding to a child’s cues) has been linked with higher empathy from 18 to 30 months of age (Kestenbaum, Farber, & Sroufe, 1989; Kiang, Moreno, & Robinson, 2004; Kochanska, Forman, & Coy, 1999; Robinson, Zahn-Waxler, & Emde, 1994; Zahn-Waxler, Radke-Yarrow, & King, 1979). Although most research in this area has used concurrent data, in a recent study, Kiang et al. (2004) found that maternal sensitivity observed when toddlers were 12 to 15 months old was positively related to toddlers’ prosocial behavior (which included both helping and concerned attention) toward the mother at age 21 to 24 months. This study extends the Kiang et al. (2004) study downward, by examining maternal responsivity at 10 months of age, a period during which the mother–infant attachment relationship is developing, and toddlers’ empathy-related responding to distress earlier in development, at 18 months, when these behaviors begin to emerge (Zahn-Waxler, Radke-Yarrow, & King, 1983). Moreover, in this examination, we differentiated between toddlers’ prosocial behavior, concerned awareness, personal distress, and negative affect toward the distressed.
Temperamental Negative Emotionality and Children's Empathy-Related Responding to Distress

In addition, temperamental factors also may account for differences in toddlers’ empathy-related reactions. One aspect of temperament is children's negative emotionality (Eisenberg & Fabes, 1992). Low negative emotionality has been associated with greater empathy-related responses in young children (Eisenberg & Fabes, 1995; Eisenberg, Fabes, Murphy, et al., 1996) and adolescents (Murphy et al., 1999) and has been found to characterize more socially competent children (Coie & Dodge, 1988; Eisenberg, Fabes, Nyman, et al., 1994).

Research focusing on the relations of negative emotionality to empathy in toddler samples has been scant and less consistent. For example, Robinson et al. (1994) found a positive relation between observed negative emotionality and high sustained global empathy between 14 and 20 months of age, whereas Kiang et al. (2004) found a negative relation between difficult temperament (characterized in part by fussiness and low soothability) and 21- to 24-month-olds’ inquisitiveness toward the mother’s distress. Thus, the relation of global negative emotionality to empathy-related responding in young children is unclear.

One possible reason for mixed findings in existing work is that negative emotionality in these studies was either unspecified or was measured across the two emotion domains of fear and anger. In this study, we “unpacked” temperamental negative emotionality by examining parent reports of distress to novelty, often referred to as fear reactivity, and distress to limitations, or anger reactivity, as precursors of empathy-related responding. There is evidence that fear and anger are differentially related to children’s empathy-related responding. In terms of empathy, fear reactivity has been found to predict low empathic responding in young children (van der Mark, Van Ijzendoorn, & Bakermans Kranenburg, 2002; Young, Fox, & Zahn-Waxler, 1999). On the other hand, fearful temperament during infancy also has been found to predict high levels of empathy and guilt in school-aged children (Kochanska, 1995; Rothbart, Ahadi, & Hershey, 1994). Thus, whereas some results suggest that fear may interfere with children’s ability to show concern for others, it is also possible that some fear may be needed to sensitize children to another’s distress. Moreover, some aspects of empathy (i.e., concerned attention) may be positively related to proneness to fear, whereas other aspects of empathy (i.e., personal distress, negative affect, prosocial behavior) may be negatively related to temperamental fear.

Findings on the relations of anger to empathy-related responding also have been conflicting. Strayer and Roberts (2004) found that observed anger was negatively related to concurrent global empathy in 5-year-old children, whereas Rothbart et al. (1994) found no relation between infant anger and school-aged children’s empathy. The relation between infant proneness to anger and empathy in toddlers has not been examined; however, Gill and Calkins (2003) unexpectedly found that 2-year-olds who were rated as highly aggressive and destructive
displayed more empathic behavior than toddlers who were seen as low in aggressive behaviors. Because aggression may reflect proneness to anger and poor regulation, these findings provide preliminary evidence that anger may not impede toddlers’ empathy-related responding.

The relation between temperamental negative emotionality and empathy-related responding, however, may be moderated by the social environment. Work by Kochanska (1991, 1993, 1997) and her colleagues examined the contributions of temperament and maternal behavior to understanding the development of children’s internalization or conscience. Because children’s internalization (or guilt) and empathy-related responding to distress are both important and parallel components of moral development (Zahn-Waxler, 2000), it is possible that similar processes will explain individual differences in these behaviors. In one investigation, maternal gentle discipline that deemphasized power was related to higher internalization but only for children who were high on temperamental fear (Kochanska et al., 1994), whereas for children low in fear, a mutually positive mother–child orientation was a better predictor of internalization. These data suggest that there are different developmental pathways to moral development and that they depend on both the child’s temperamental disposition and the parent’s interaction styles. Thus, a goal of this study was to examine how maternal responsivity and infant temperamental proneness to fear or anger jointly predicted later empathy-related responding to distress in toddlers. We measured proneness to fear and anger in infancy because during this period these emotions become increasingly salient to the parent and may elicit more differentiated responses.

Sex and Children’s Empathy-Related Responding to Distress

Previous research has documented sex differences in children’s empathy-related behavior, although the strength of these differences varies based on study characteristics (Eisenberg & Fabes, 1998). There is a common belief that girls are more empathic than are boys, and evidence of these differences has been found in several studies of very young children (Zahn-Waxler, Radke-Yarrow, et al., 1992; Zahn-Waxler, Robinson, & Emde, 1992). Thus, we expect that girls will display more empathy than boys in toddlerhood.

In addition, it is important to consider sex as a potential moderator in predicting empathy-related responding to distress. Specifically, the influences on the development of empathy-related responding may differ for boys and girls. Moreover, girls may be impacted more by the family environment because they may be more sensitive to their mother’s emotional reactions and behaviors than boys. Thus, girls may be at a heightened risk for low empathy when mothers are negative or unresponsive, whereas boys may be less influenced by this same type
of environmental circumstance. In support of this argument, Robinson et al. (1994) found that lower levels of maternal warmth were related to a drop in empathic behavior for girls, but not boys. These authors suggested that a strained mother–child relationship may be particularly damaging for girls. On the other hand, it is possible that temperamental differences, rather than maternal behaviors, would be associated with the development of empathy-related responding for males (see Eisenberg, Fabes, Murphy, et al., 1996). One goal of this study was to determine whether there may be different predictors of toddlers’ empathy-related responding to distress for boys and girls.

The Role of Context in Individual Differences in Empathy-Related Responding to Distress

Another important consideration with respect to understanding toddlers’ empathy-related responding is the context of the distress situation. There is evidence that toddlers are more likely to exhibit prosocial behavior toward the mother than an unfamiliar examiner between 14 and 36 months of age (Robinson, Zahn-Waxler, & Emde, 2001; Zahn-Waxler, Radke-Yarrow, et al., 1992; Zahn-Waxler, Robinson, et al., 1992). Similarly, toddlers’ empathy tends to be higher toward the mother than a stranger between 16 and 22 months (van der Mark et al., 2002; Young et al., 1999). Thus, toddlers are more likely to respond empathically to another’s distress when the victim is familiar.

Few investigators have considered whether the correlates of empathy-related responding differ depending on the toddlers’ relationship to the distressed. If the correlates differ, the findings would imply that empathy is a more situational variable at a young age. Researchers have speculated that socialization influences may more strongly predict empathy-related responding toward the mother, whereas individual differences in empathy toward an unfamiliar person may be influenced by more genetic or temperamental factors (Kiang et al., 2004; Robinson et al., 2001; Young et al., 1999). Indeed, using a twin study design, Robinson et al. (2001) found that heritable differences accounted for concern toward an unfamiliar adult, whereas shared environment influences accounted for concern toward the mother. In addition, because familiar figures might offer a sense of safety to toddlers, proneness to fear might prevent toddlers from acting prosocially in situations involving strangers as opposed to the mother condition (Stanhope, Bell, & Parker-Cohen, 1987; Young et al., 1999).

In this study, we not only examined toddlers’ reactions to the distress of the mother and an unfamiliar adult, but we also measured toddlers’ empathy-related responding toward a crying baby doll. We included a crying baby context because young children may be more likely to demonstrate direct help toward a similar “peer” than an older person (Zahn-Waxler, Iannotti, & Chapman, 1982). It is important to note, however, that comforting the crying doll would still require
approach of a stranger (given that an experimenter was holding the baby doll). Thus, the factors predicting toddlers’ empathy-related responses to the doll were somewhat exploratory.

Purpose and Overview of This Study

The main purpose of this study was to examine the precursors of toddlers’ empathy-related responding to distress using longitudinal data. We measured four features of empathy-related responding to distress, including toddlers’ concerned attention toward the victim, personal distress, negative affect, and prosocial behavior (i.e., helping). There were five research questions driving this work. First, will early socialization factors (measured at 10 months of age) relate to toddlers’ later empathy-related responding to distress? We expected maternal responsivity to be positively related to concerned attention and prosocial behavior and negatively related to personal distress reactions and negative affect.

Second, will infant temperamental proneness to fear or anger be linked with later empathy-related responses? We expected infants who were high in fear would be overwhelmed by another’s distress and would be likely to experience personal distress reactions and negative affect and unlikely to display prosocial behaviors in response to another’s distress. However, these children may show concern for the victim. There is little work on the relation between temperamental anger and empathy-related responding, thus, we explored this direct relation.

Third, will complex relations between maternal behavior and infant fear and anger predict children’s empathy-related responses to distress? We expected that the positive relation between infants’ proneness to fear and toddlers’ personal distress and negative affect to be stronger under conditions of low maternal responsivity. Our examination of the moderating role of maternal behavior on temperamental anger to predict empathy was exploratory.

Fourth, will different processes explain empathy-related responding to distress for boys and girls? We hypothesized that girls’ empathy-related responses would be more strongly influenced by maternal behaviors, whereas boys’ responses would be more strongly influenced by temperamental factors (Robinson et al., 1994).

Finally, will context play a role in toddlers’ empathy-related responding to distress? We expected toddlers to display more concerned awareness and prosocial behavior toward the mother and the baby doll than toward the unfamiliar adult. Although we expected maternal responsivity to predict toddlers’ empathy-related responding in all contexts, it is possible that the findings would be more pronounced in the mother-distress context, indicating that relationship history plays an important role in toddlers’ empathy (Robinson et al., 2001). In addition, we expected that proneness to fear would be linked to lower prosocial responding in situations involving strangers as opposed to the mother condition.
METHOD

Participants

Ninety-eight mother–infant pairs (55 boys, 43 girls) who were part of a longitudinal study of infant temperament were the participants in this study. Flyers describing the study were distributed to mothers in a community hospital in a rural community following the birth of their child, and interested families were contacted by phone to enroll in the study. The sample consisted of healthy, full-term infants. Mother’s age at the infant’s birth was an average of 30.4 years and ranged from 19 to 39. The sample consisted of highly educated families, with mothers averaging 15.7 years of education (range = 12–21 years). The majority of parents were married (94%), and the majority of parents were White (95%). Fifty percent of the infants were firstborns, and birth order did not account for any differences in study variables. All infants were tested within 3 weeks of turning 10 and 18 months of age.

Procedures and Measures

As part of the larger study, home visits were scheduled when infants were 2 and 6 weeks of age (to measure infants’ physiological and behavioral reactivity), and the laboratory assessments were scheduled when the infants were 5, 10, and 18 months of age. For the purposes of this study, only data collected during the 10- and 18-month laboratory visits were considered to utilize concurrent data points and to reduce the number of analyses. At the 10-month assessment, mothers completed questionnaires regarding their infant’s temperamental fear and anger, and maternal behaviors were observed in a laboratory free-play paradigm. The 18-month laboratory visit was designed to elicit toddlers’ empathy-related responses to distress.

Maternal responsivity. Maternal responsivity was assessed from a videotaped free-play period in the laboratory when the infants were 10 months of age. Mothers were presented with a basket of toys and instructed to play with their infant as they normally would at home. The free-play task lasted 15 min. Coders (independent of toddler coders) rated maternal sensitivity and intrusiveness on a 4-point scale every 15 sec (Fish, Stifter, & Belsky, 1991). Maternal sensitivity scores were based on contingent, infant-centered interactions. Mothers were given a score of 0 if no evidence of sensitivity was observed in the epoch, a 1 if minimal sensitivity was observed, a 2 if there was evidence of moderate sensitivity (indicating that the mother was more than minimally tuned into the infant’s signals), or a score of 3 if the mother was very aware of the infant, contingently responsive to his or her interests and affect, and had an appropriate level of response and stimulation.
Maternal intrusiveness reflected overcontrolling behaviors and ignoring infant signals. Mothers were rated every 15 sec as exhibiting either no intrusiveness (0), low intrusiveness (1), moderate intrusiveness (2), or high intrusiveness (3). High scores for intrusiveness reflected overly stimulating behavior and ill-timed responses, being out of synchrony with infant signals, and making developmentally inappropriate demands on the infant. Scores across the 15-sec segments were averaged. Reliability was assessed by using Pearson correlations on 10% of the sample and was .96 and .92 for sensitivity and intrusiveness, respectively. Because maternal sensitivity was significantly negatively correlated with intrusiveness \( r(95) = -.50, p < .01 \), and other researchers have found it useful to aggregate maternal behaviors (Fish, 2001; Kochanska, Forman, & Coy, 1999), we computed an overall score for maternal responsivity. Thus, a composite score of maternal responsiveness was created by subtracting the total intrusiveness score from the total sensitivity score.

**Infant temperamental fear or anger.** When infants were 10 months of age, mothers completed the Distress to Limitations and Distress to Novelty scales from the Infant Behavior Questionnaire (IBQ; Rothbart, 1981). Twenty items were used to assess distress to limitations (a measure of anger and frustration) on a 7-point scale ranging from 1 (never) to 7 (always); for example, “How often during the last week did the baby protest at being put in a confining place, such as infant seat, play pen, car seat, etc.?”, “When the baby wanted something, how often did he or she become upset when he or she could not get what he or she wanted?”; \( \alpha = .74 \). Using the same questionnaire, 16 items were used to measure distress to novelty (e.g., fear; “How often during the last week did your infant cry or show distress at a loud sound, such as a blender, vacuum cleaner, etc.?” “When introduced to a strange person, how often did the baby cling to parent?”; \( \alpha = .78 \)).

**Toddlers’ empathy-related responding to distress.** To measure empathy-related responding to distress, toddlers were assessed in three distress simulations at 18 months (all three simulations were part of one laboratory visit with each simulation in the same order). Each distress simulation lasted approximately 90 sec. We began the empathy situations by measuring toddlers’ responses to a stranger. We reasoned that the stranger situation would be the most novel if the child witnessed the distress before acclimating to the laboratory environment. In the first distress simulation, a female examiner (unknown to the child) feigned dropping a basket of toys on her toe. In the first 30 sec, the examiner was instructed to simulate distress. For the next 60 sec, the examiner continued to act distressed, and asked the toddler for help three times by saying “(Toddler’s Name), I dropped the toys on my toe; can you make it feel better?” (requests made at 30 sec, 50 sec, and 70 sec). Mothers were instructed to refrain from interacting with their child during this period.
In the second situation (approximately 15 min after the stranger distress), the experimenter (different from the distressed stranger) carried a crying baby doll. We reasoned that this condition would be most effective after a period when the toddler had some exposure to the experimenter. The doll was approximately 20 in. long, with plastic body, face, arms, and legs. When activated with a switch on the doll’s back (the doll was activated in a separate room from the toddler), the doll would cry realistically when in a prone position and could be lifted upright momentarily to quiet the crying, so that the crying would not sound too repetitive. The doll was realistic in size and was swaddled in a blanket. The doll’s face could not be seen unless the toddler approached the baby doll. The experimenter held the baby in a cradle position and gently bounced the baby in her arms. In the first 30 sec of the segment, the baby cried continuously (with a few quieting periods so as to sound realistic). In the following 60 sec, the experimenter asked the toddler for help with the crying baby three times by saying, “(Toddler’s name), the baby is crying; can you make the baby feel better?” (requests made at 30 sec, 50 sec, and 70 sec). Mothers were again instructed to refrain from interacting with their child during this period. Finally, approximately 25 min after the baby distress situation, the mother was trained to feign injuring her finger while playing with a toy hammer with her child (the child appeared to have caused the mother’s injury). We justified that the children would be more motivated to behave prosocially toward the mother than a stranger (Robinson et al., 2001; Van der Mark et al., 2002); thus, we allowed this procedure to occur in the final segments of the laboratory visit (when some toddlers might be tired) because we expected that the toddlers would still be apt to behave prosocially in this context. The mother was given a script to read that was placed near the mother so she could refer to it during the distress simulation. In the first 30 sec, mothers were instructed to act distressed. In the next 60 sec, mothers continued to act distressed and were instructed to ask their toddlers for help three times. Mothers’ credibility was coded from videotape, reflecting her effectiveness at displaying distress (1 = fake, 2 = moderately effective, 3 = very effective), and the majority of the mothers (87%) were seen as believable (at least a score of 2).

The child’s empathy-related responses were coded from videotapes of the three distress simulations every 10 sec. Interrater reliability was conducted on 20% of the data (Pearson correlations). Several forms of empathy-related behaviors were observed. Positive affect was measured by toddlers’ smiling, positive vocal tone, squealing, and laughing. Positive affect was coded on a 3-point scale ranging from 0 (none) to 1 (minimal, short-duration, or low-intensity smile) to 2 (moderate frequency, longer duration or moderate to high intensity, including laughing or smiling for several seconds; $r = .89$). Negative affect was measured

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1A photo of the baby doll, which was commercially available in the mid-1990s, can be obtained from Tracy L. Spinrad. The brand and model are not currently available.
by toddlers’ frowning, fussing, whimpering, whining, pouting, and crying and was coded on a 3-point scale ranging from 0 (none) to 1 (minimal, short duration, or low intensity) to 2 (moderate frequency, moderate to high intensity, or prolonged negative affect, \( r = .98 \)). Self-comforting behaviors were coded on a 3-point scale ranging from 0 (none) to 1 (some) to 2 (multiple or long instances) and reflected the toddlers’ use of self-regulation strategies such as clasping of hands, hair, or face; sucking fingers; or stroking or rubbing objects \( (r = .66) \).

Proximity to mother was the estimated distance between the toddler and the mother. Proximity was coded on a 3-point scale, with 1 indicating that the child was very close to mother (i.e., bodily contact) for the majority of the period, 2 reflecting the child being moderately close to the mother (i.e., within 1–2 ft) and 3 coding when the toddler was not particularly close to the mother, wandering around the room, or near the victim of distress (in stranger/baby conditions; \( r = .95 \)). Comfort seeking reflected the toddlers seeking support from the mother. Behaviors included holding arms up to the mother to be held, burying head in the mother’s lap, hugging mother, and holding mother’s arms, hands, or legs. Comfort seeking was coded on a 3-point scale ranging from 0 (none) to 1 (low frequency or duration) to 2 (moderate or high frequency or duration; \( r = .75 \)).

Prosocial behavior was coded as present or absent and included any behavior such as offering objects or food, patting, hugging, kissing, and touching hurt object (i.e., stranger’s toe, baby, mother’s finger; \( r = .93 \)). Concerned awareness reflected the degree to which the child seemed to notice the distress of the other and included behaviors such as stopping activity and staring at the distressed. Concerned awareness was coded on a 3-point scale ranging from 0 (none/child unaware) to 1 (awareness for some or part of the period) to 2 (aware for entire period; \( r = .94 \)).

Aggression reflected whether the child was insensitive or aggressive toward the distressed, such as hitting, kicking, and throwing objects toward the distressed \( (r = .64) \). Because aggression was relatively rare, this code was dropped from further analyses. In addition, we did not have hypotheses regarding the prediction of toddlers’ positive affect, and this behavior may have represented insensitive behaviors toward another’s distress (i.e., someone getting hurt is funny) or may have tapped sociability; thus, we did not include positive affect in further analyses. Finally, proximity to mother was dropped from analyses because the mother was the “victim” of distress in the mother condition and the meaning of this variable would differ between the mother and stranger and baby doll conditions. In addition, because many mothers made more than three requests for help during the mother distress condition (although they were instructed to ask only three times), we also coded the number of requests to use as a control variable in these analyses.

To reduce the number of analyses, all of the behaviors were averaged over the nine coding intervals. In addition, we created a composite of toddler personal distress reactions by averaging scores on comfort seeking and self-comforting behavior. Each of these behaviors was thought to represent toddlers’ self-focused
reactions. Self-comforting was at least marginally positively related to comfort seeking in the baby and mother contexts, \( r_s(96) = .19 \) and \( .24, ps < .06 \) and \( .02 \) for baby and mother, respectively. In sum, the empathy-related behaviors retained for the following analyses were prosocial behaviors, negative affect, concerned attention, and the personal distress composite.

RESULTS

Descriptive data on the 18-month variables are presented in Table 1. At 10 months, mothers were observed to be relatively responsive (\( M = 2.02, SD = .58, \) theoretical range = \(-3\)–\(3\)). In addition, infants were seen as relatively low in their proneness to fear and anger (\( M_s = 3.02 \) and 3.65, \( SD_s = .79 \) and \( .75 \) \[theoretical range = 1–7\], for fear and anger, respectively).

Sex Differences

Because several studies have found girls to be more empathic than boys (Eisenberg & Fabes, 1998; Zahn-Waxler et al., 1992), \( t \) tests were conducted on all study variables to determine sex differences in the variables. No significant sex effects were found for mothers’ reports of infant fear and anger or maternal responsivity. Only one sex difference (out of 12) was found for toddlers’ empathy-related responding to distress: Girls exhibited more concerned awareness toward the stranger (\( M = 1.78 \)) than did boys (\( M = 1.59 \), \( t = 2.28, p < .05 \), Cohen’s \( d = .48 \). Finally, mothers did not differ on the number of requests for help toward their sons versus daughters.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Stranger(^a)</th>
<th>Baby Doll(^a)</th>
<th>Mother(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerned awareness</td>
<td>1.68</td>
<td>1.76</td>
<td>1.37</td>
</tr>
<tr>
<td></td>
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<td>.54</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
<td>98</td>
</tr>
<tr>
<td>Personal distress</td>
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<td>.48</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>.47</td>
<td>.43</td>
<td>.32</td>
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<tr>
<td></td>
<td>87</td>
<td>82</td>
<td>65</td>
</tr>
<tr>
<td>Negative affect</td>
<td>.15</td>
<td>.15</td>
<td>.21</td>
</tr>
<tr>
<td></td>
<td>.35</td>
<td>.23</td>
<td>.41</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>31</td>
<td>37</td>
</tr>
<tr>
<td>Prosocial behavior</td>
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<td>.06</td>
<td>.22</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>20</td>
<td>9</td>
<td>61</td>
</tr>
</tbody>
</table>

Note. \% column refers to the percentage of children who demonstrated each behavior during the episode. Theoretical range for concerned awareness, personal distress, and negative affect, 0–2; prosocial behavior, 0–1.

\(^a_n = 98, ^b_n = 97\).
The Relations Between Maternal Responsivity and Infant Temperamental Fear and Anger

Because mothers reported on their infant’s temperamental fear and anger, it was possible that maternal behavior observed in the free-play situation would be related to their reports of their infant’s temperament. Pearson correlations revealed that maternal responsivity was not related to maternal reports of fear or anger, $r_s(93) = -.01$ and $-.14$, $p_s = ns$. As expected, there was a positive link between maternal reports of anger and fear, $r(93) = .21, p < .01$.

The Relations Among Empathy-Related Behaviors

Prior to testing our hypotheses, we examined the cross-context stability of our outcome variables (see Table 2). Significant correlations were revealed for concerned awareness across all three contexts. In addition, personal distress reactions toward the baby doll were significantly correlated with personal distress during the mother and stranger condition, and personal distress toward the mother was positively related to distress toward the stranger. In terms of negative affect, toddlers who exhibited negative affect during the baby doll condition were also negative during the stranger condition, although negative affect during the mother condition was not associated with negative affect in the other two conditions. Finally, toddlers who were more prosocial toward their mother also were more

<table>
<thead>
<tr>
<th></th>
<th>Stranger$^a$</th>
<th>Baby Doll$^a$</th>
<th>Mother$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerned awareness</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Stranger</td>
<td>1.0</td>
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<td></td>
</tr>
<tr>
<td>Baby doll</td>
<td>.42**</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>.48**</td>
<td>.57**</td>
<td>1.0</td>
</tr>
<tr>
<td>Personal distress</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stranger</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Baby doll</td>
<td>.52**</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>.24*</td>
<td>.47**</td>
<td>1.0</td>
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<tr>
<td>Negative affect</td>
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<td>Baby doll</td>
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</tr>
<tr>
<td>Mother</td>
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<td>Prosocial behavior</td>
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<td></td>
</tr>
<tr>
<td>Mother</td>
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<td>.29**</td>
<td>1.0</td>
</tr>
</tbody>
</table>

$^a_n = 98$, $^b_n = 97$.

*p < .05, **p < .01.
prosocial toward the baby doll. Prosocial behavior during the stranger condition was not related to prosocial behavior during the other two conditions.²

To determine associations among empathy-related behaviors within context, Pearson correlations were conducted (see Table 3). Findings revealed that concerned awareness was positively related to personal distress within all three conditions and was positively related to prosocial behavior within the mother condition. Concerned awareness was unrelated to negative affect. Personal distress was positively related to negative affect within all three conditions and was negatively related to prosocial behavior within the baby doll condition (but not within the stranger or mother conditions). Negative affect was unrelated to prosocial behavior in any condition.

Primary Analyses

To determine the extent to which maternal responsivity observed in infancy and mothers’ reports of infant temperamental fear and anger predicted toddlers’

²Because negative affect was low occurring in the baby and stranger contexts, we also computed a chi-square analysis on the presence or absence of negative affect in these contexts. This test was significant, $\chi^2 (1, n = 98) = 7.20, p < .01$, indicating that the majority of toddlers who did not express negative affect in the baby condition, also did not express any negative affect toward the baby doll (63% of the sample). In addition, chi-square analyses on prosocial behavior during the stranger and baby contexts showed that the majority of toddlers did not express prosocial behavior in both contexts, $\chi^2 (1, n = 98) = 3.52, p < .06$ (75% of the sample).
empathy-related responding to distress, hierarchical regressions were performed for concerned attention and personal distress for each context and for negative affect in the mother condition and prosocial behavior in the mother condition (negative affect and prosocial behavior in the other two conditions were low occurring and discussed later). In the first step, sex, infant distress to novelty (e.g., fear), infant distress to limitations (anger), and maternal responsivity were entered (mothers’ number of requests also was entered in the first step in regressions predicting mother-context empathy-related responding). The two-way interactions were entered in the next step (e.g., Fear × Sex, Anger × Sex, Responsivity × Sex, Fear × Responsivity, and Anger × Responsivity). In the third step, the three-way interaction terms were entered (e.g., Fear × Responsivity × Sex). To create the interaction terms, all variables were centered (including sex, which was centered using weighted effects coding; Cohen, Cohen, West, & Aiken, 2003) and the product term was used. Because no three-way interactions were found and few two-way interactions were found in predicting toddler empathy-related responding to distress, we report main effects from the first step, unless an interaction was found.

It should be noted that there was a low occurrence of negative affect, particularly in the stranger and baby doll conditions (occurring in only 15.31% and 30.61% of the toddlers), and a low occurrence of prosocial behavior in the stranger and baby doll contexts (occurring in only 9.18% and 20.41% of the toddlers). Thus, we chose to recode these behaviors as binary, 0 (did not occur) or 1 (exhibited the behavior at least one time). In predicting toddlers’ negative affect and prosocial behavior during the stranger and baby doll contexts, logistic regressions were computed to predict these categorical variables. These regressions were conducted using parallel predictors as in the hierarchical regressions.

Research Question 1: Will maternal responsivity predict toddlers’ empathy-related responding to distress? We predicted that maternal responsivity would be positively related to prosocial behavior and concerned attention and negatively related to personal distress and negative affect. Findings showed that, as expected, maternal responsivity was positively related to concerned attention in the stranger and mother conditions. In addition, maternal responsivity was negatively related to toddlers’ personal distress in the baby doll and mother conditions (see Table 4). Maternal responsivity did not predict negative affect or prosocial behavior.

Research Question 2: Will infant fear or anger reactivity predict toddlers’ empathy-related responding to distress? We predicted that infants high on fear would be lower on prosocial behavior and concerned attention and higher on personal distress and negative affect. Contrary to expectations, findings revealed that infant fear was at least marginally positively related to concerned attention during the stranger and mother conditions. In addition, fear was positively related
### TABLE 4
Partial Regression Coefficients for the Relations of Sex, Temperamental Fear, Temperamental Anger, and Maternal Responsivity to Toddlers' Empathy-Related Responses to Distress

<table>
<thead>
<tr>
<th>Variable</th>
<th>Stranger</th>
<th>Baby Doll</th>
<th>Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concern</td>
<td>PerDis</td>
<td>Prosoc</td>
</tr>
<tr>
<td>Number of mom requests</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.23*</td>
<td>.01</td>
<td>.30*</td>
</tr>
<tr>
<td>Maternal responsivity</td>
<td>.23*</td>
<td>-.13</td>
<td>1.15</td>
</tr>
<tr>
<td>Infant fear</td>
<td>.19+</td>
<td>.12</td>
<td>1.71</td>
</tr>
<tr>
<td>Infant anger</td>
<td>.04</td>
<td>.09</td>
<td>.78</td>
</tr>
</tbody>
</table>

Note. Sex–weighted effects coded as girls = .56; boys = -.44; Concern = Concerned awareness, PerDis = personal distress; Prosoc = prosocial behavior; Neg = negative affect.

*p < .10, *p < .05, **p < .01.
to personal distress in the mother condition, but was not related to personal distress in the other two conditions (see Table 4). Negative affect and prosocial behavior could not be predicted by infant fear. In terms of the relations of anger to toddlers’ empathy-related responding, results showed no main effects for anger on toddlers’ concerned awareness, prosocial behavior, or personal distress reactions. However, proneness to anger decreased the probability that toddlers would express negative affect toward the baby doll (see Table 4).

**Research Question 3: Will temperamental fear or anger and maternal responsivity interact to predict toddlers’ empathy-related responding to distress?** We expected that the positive relation between infants’ proneness to fear and toddlers’ personal distress would be stronger under conditions of low maternal responsivity. These expectations were not met; out of 12 interactions tested, no interactions between fear and responsivity were found in predicting any of the toddler empathy behaviors.

Moreover, there was little evidence that responsivity interacted with infant proneness to anger to predict toddlers’ empathy-related responses to distress. Out of 12 possible interactions, only 1 was significant. The interaction between anger and responsivity predicted toddlers’ prosocial behavior toward the mother, β = .28, p < .01. These relations are depicted in Figure 1. Findings revealed that there was a negative relation between anger and prosocial behavior when mothers were low in responsivity (slope = −.09, t = −2.04, p < .05). However, when mothers were high in responsivity, this relation was positive (slope = .09, t = 1.81, p < .10).

**Research Question 4: Will temperamental fear or anger and responsivity interact with infant sex to predict toddlers’ empathy-related responding to distress?** We hypothesized that girls’ empathy-related responses would be more strongly influenced by maternal behaviors, whereas boys’ responses might be more strongly influenced by temperamental fear. Out of 12 possible interactions between fear and sex, there were no significant interactions; however, 1 marginal interaction emerged between fear and sex to predict toddlers’ personal distress reactions toward the mother. Fear was positively related to personal distress reactions for boys (slope = .77, t = 2.93, p < .01), but this relation was not significant for girls (slope = −.02, t = −.07, p = ns). However, because this interaction effect did not reach conventional levels of significance, this finding must be treated with caution. There were no interactions between anger and sex to predict toddlers’ empathy-related responses to distress.

We also tested whether sex interacted with maternal responsivity to predict toddlers’ empathy-related responses to distress. Out of 12 possible interactions, only 2 significant interactions emerged. Toddler sex and maternal responsivity interacted to predict toddlers’ personal distress in the mother condition, β = −.25, p < .05. Responsivity was negatively related to personal distress reactions for girls
Research Question 5: What role will context play in toddlers’ empathy-related responding?

Repeated measures analyses of variance were conducted with context (mother, baby, stranger) as a within-subjects factor. Significant context effects were found for all of the contexts, $F$s(2, 94) = 35.79, 21.45, 27.78, 5.88, $ps < .01$, for concerned awareness, personal distress, negative affect, and prosocial behavior, respectively. Follow-up paired $t$ tests revealed that toddlers exhibited more concerned attention toward the baby doll than in the mother and stranger conditions, $t$s(96) = 8.55 and 1.93, $ps < .01$ and .05, and toddlers showed more concern toward the stranger than toward the mother, $t$(96) = 5.83, $p < .01$. In terms of personal distress reactions, toddlers exhibited less personal distress toward the mother than toward the baby doll or stranger, $t$s(96) = −5.62 and −6.09, $ps < .01$, and toddlers showed marginally more personal distress toward the stranger than the baby doll, $t$(96) = 1.87, $p < .06$. Follow-up tests also indicated that toddlers displayed less negative affect during the baby doll condition than during the stranger or mother conditions, $t$s(96) = 3.02 and 2.33, $ps < .01$ and .05. Finally, toddlers were more likely to exhibit prosocial behavior toward the mother than toward the stranger and baby, $t$s(96) = 7.76 and 5.43, $ps < .01$, and toddlers were more prosocial toward the baby than the stranger, $t$(96) = 2.39, $p < .05$. Because we explored whether the antecedents of empathy-related responding...
differed by situational context in the previous sections, we do not reiterate the findings here.

DISCUSSION

The focus of this study was on understanding the origins of children’s empathy-related responding to distress. The results indicate that infant proneness to fear and maternal behavior observed in infancy predict toddlers’ later empathy-related responding to distress. Infant distress to novelty predicted higher concerned attention to adults and self-focused reactions to the mother. Moreover, maternal responsivity predicted concerned attention and distress reactions.

Relations of Maternal Responsivity to Toddlers’ Empathy-Related Responding to Distress

The results of this study support the contention that maternal behavior observed in infancy plays a role in children’s later empathy-related responding. As predicted, mothers high in responsivity were more likely to have toddlers who exhibited high levels of concerned attention toward the mother and stranger and low levels of personal distress reactions toward the baby doll (and the mother, for girls only). Previous work has found that maternal sensitivity promoted toddlers’ empathy (Kiang et al., 2004; Kochanska et al., 1999; Robinson et. al., 1994) and prosocial behaviors (van Ijzendoorn, 1997; Zahn-Waxler et al., 1979). It is likely that mothers who are responsive to their infants’ cues model supportive behaviors to their children, and these children learn by example to care for others in need. This relation also might be due to the role of the mother–child relationship (i.e., attachment security) in the development of empathy-related responding. The negative relation between maternal responsivity and personal distress reactions in the mother condition was found only for girls, suggesting that the mother–child relationship (or at least maternal responsivity) may be more important for girls.

It was surprising that maternal responsivity did not directly predict toddlers’ prosocial behaviors, as has been found in other work (Kiang et al., 2004; Zahn-Waxler et al., 1979). The lack of findings may be due to the fact that prosocial behaviors are relatively rare at this age. Thus, it is important to examine these relations as children age, when prosocial behaviors would be expected to increase (Zahn-Waxler, Radke Yarrow, et al., 1992; Zahn-Waxler, Schiro, Robinson, Emde, & Schmitz, 2001). In support of this notion, Van der Mark et al. (2002) found a link between maternal sensitivity and toddler empathy (a global score including prosocial behavior) at 22 months, but not at 16 months of age.
Although there were few findings predicting toddlers’ prosocial behavior, maternal responsivity predicted girls’ (but not boys’) prosocial reactions toward the mother. As expected, girls seem to be more sensitive to their mother’s behaviors than boys, and it is interesting to note that these results were only obtained in the mother condition. Thus, girls who have a positive and warm relationship with their mother (as indexed by maternal responsivity) may be more likely to try to help their mother’s injury (especially given that mothers feigned that the child may have caused the injury) and not become overwhelmed by the mother’s distress. Because there were very few interaction effects, further research is needed to replicate these findings.

Relations of Temperament to Toddlers’ Empathy-Related Responding to Distress

The findings of this study also point to the importance of examining the role of temperamental negative emotionality on toddlers’ empathy-related responses to distress. Similar to the findings of Rothbart et al. (1994), infant distress to novelty (fear) predicted higher concerned attention toward both the mother and the stranger 8 months later. Perhaps infants who are reactive themselves are more sensitive to another person’s distress, and thus express more empathic concern. Indeed, other researchers have suggested that a certain level of arousal is important for the development of empathy (Hoffman, 1982; Zahn-Waxler et al., 1979; Zahn-Waxler, Radke-Yarrow, et al., 1992). Alternatively, perhaps toddlers’ concerned attention, as measured in this study, was indicative of fearful behavior, rather than empathic responding. That is, fearful toddlers may have frozen and may not have been able to avert their gaze from the situation. Although this behavior was considered a primary measure of sympathy and empathy, we cannot rule out the possibility that it may assess toddlers’ fear. Our finding that concerned attention was positively related to prosocial behavior and responsive mothering, however, is consistent with the interpretation of this behavior reflecting empathy and sympathy.

Fearful infants also tended to display more personal distress reactions in the mother condition. Children who are high on fear may be so sensitized to emotion that they become overwhelmed by another’s distress. It is possible that the mother’s distress is more upsetting to toddlers than the distress of an unfamiliar adult. In addition, because toddlers were seen as “causing” the distress in the mother condition, it is possible that guilt played a role in toddlers’ responses (Rothbart et al., 1994).

Interestingly, although the finding did not reach conventional levels of significance, the relation between fear and personal distress was found only for boys in the mother condition. Boys high in fear may be particularly at risk for overarousal because witnessing their mother’s distress may be especially novel for them.
Brody (1993, 1996) suggested that mothers express emotions differently toward their sons and daughters, such that mothers are thought to expose their daughters to a range of emotions and restrict their expressions with sons (see also Dunn, Bretherton, & Munn, 1987). Thus, daughters who were high in fear may not have found the situation as concerning as sons who had similar temperaments.

We also found in exploratory analyses that temperamental anger and maternal behavior interacted to predict toddlers’ prosocial behavior in the mother condition. A negative relation between anger and prosocial behavior emerged when mothers were low in responsivity. When mothers were highly responsive, high proneness to anger predicted relatively high levels of prosocial behavior. Few investigators have examined the role of anger on children’s prosocial behavior. Although Strayer and Roberts (2004) found a negative relation between anger and empathy in 5-year-olds; other research with younger children has shown that aggressive children (generally thought to be prone to anger) were more responsive to others’ distress than nonaggressive children (Gill & Calkins, 2003). Our findings suggest that these contradictory findings may be due to differences in maternal responsivity. Maternal responsivity seems to act as a buffer for children high in anger. When mothers are sensitive, it is expected that they are able to comfort their children effectively and perhaps teach important lessons about regulating emotions, and this skill may be particularly important for children who are prone to anger. These children may be more likely to feel aroused when the mother is hurt and may respond to this arousal by trying to repair the situation. On the other hand, children who are prone to anger but either do not receive comfort from their mothers or who do not have a sense of connection with their mother are unlikely to respond with prosocial behavior. In other words, they may not feel aroused by her distress or may be too unregulated to respond prosocially. Because these analyses were exploratory, future research should address these issues and include measures of toddlers’ regulatory capacities.

The Role of Context in Understanding Toddlers’ Empathy-Related Responses

There were notable contextual differences in toddlers’ responses to distress. Toddlers displayed more concerned attention and less negative affect toward the baby doll than in the other two conditions and were more prosocial toward the baby doll than the unfamiliar adult. Although the use of a baby doll to measure empathy-related responding in toddlers was somewhat exploratory, these findings indicate that toddlers indeed may be more responsive and helpful toward peers than toward unfamiliar adults (Zahn-Waxler et al., 1982). Moreover, consistent with previous work, toddlers were more prosocial toward the mother (Robinson et al., 2001; Zahn-Waxler, Radke-Yarrow, et al., 1992; Zahn-Waxler, Robinson, et al., 1992) than the other two victims, suggesting that familiarity with the
distressed and relationship history may play a role in toddlers’ willingness to help. Finally, toddlers also exhibited more concerned awareness toward the stranger than the mother. Although some studies have found contrasting results (Young et al., 1999; Zahn-Waxler, Radke-Yarrow, et al., 1992), Van der Mark et al. (2002) found that greater empathy toward the mother (vs. unfamiliar adult) was more pronounced as children approached 2 years of age.

Predictions to toddlers’ empathy-related responses to distress also varied by context. Findings revealed that concerned awareness to the mother and stranger had the same predictors and were stable across contexts. These findings suggest that concerned attention represents a more dispositional aspect of empathy and is less influenced by contextual factors. Prediction of concerned attention to the baby doll, however, was not found. Perhaps other factors not measured in this study are more important to predicting empathy toward the baby doll such as experience with peers or infants or sociability. In addition, because concerned attention toward the baby doll was relatively high compared to the other two conditions, a ceiling effect may have occurred, limiting the variability in concerned attention to the baby.

In terms of personal distress responses, predictors differed among the three contexts. Mother-directed personal distress was linked to temperament, maternal behavior, and sex, whereas stranger-directed personal distress could not be predicted by any of the variables. Personal distress toward the baby doll was linked to lower maternal responsivity. Thus, personal distress seems to be a more complex variable with more situational influences, even though it was stable across all contexts. Finally, the predictors to prosocial behavior were found only in the mother condition, indicating that prosocial behavior is highly sensitive to relationship history.

Conclusions and Future Directions

This study adds to previous work on the socialization of empathy in several ways. First, we used longitudinal methods to find unique prediction of maternal responsivity and temperamental fear and anger in infancy to later empathy-related responding. This method allowed us to understand the antecedents of prosocial behavior and empathy in very young children, just as children’s empathy is emerging. In addition, maternal responsivity was observed during an unrelated task (i.e., free play). This feature gives us confidence that mothers’ early responding to infant cues is important in understanding later behavior. Another strength of this study is that we measured specific features of empathy-related responding to distress, rather than using a global empathy code, as is often done in research with young children. Finally, few researchers have differentiated among various types of negative emotionality in association with empathy-related responding, and our findings reveal that these aspects of negative emotionality (particularly fear) predict toddlers’ empathy-related responding to distress.
This study is limited in several ways. First, we were limited by a small sample size. It is possible that a larger sample would have provided more powerful results. In addition, the sample was composed of predominantly middle-class White families, and we used a sample of children who were not “at risk.” Children’s personal attributes may have stronger links to later empathy-related responding in at-risk samples; therefore, it is important that our findings are replicated in other groups and settings. Moreover, although we were able to predict toddler empathy-related responding from earlier temperamental fear and anger and maternal behavior, we did not obtain data on maternal behavior or temperament at 18 months. Because these behaviors are likely to be stable over time, we cannot necessarily attribute toddlers’ empathy-related responding to earlier maternal and child characteristics. Next, the methods used to assess empathy-related responding to distress may have been problematic. Because the first portion of the simulations enacted distress and the last minute included requests for help, these portions may not be comparable, although responses were coded over the entire segment. Thus, responses that are spontaneous, rather than those that are induced by a request, may have different correlates and outcomes. Future work should disentangle these processes. Finally, other developmental transitions, such as self–other differentiation, may account for differences in empathy-related responding at this young age. Although unmeasured in this study, it is possible that toddlers’ emerging self-recognition could play a role in toddlers’ abilities to show concern for another and to act on that concern in a prosocial manner.

In summary, the results of this study support the view that individual differences in toddlers’ empathy-related responding to distress are directly associated with both temperamental fear and parental behaviors. In addition, the pathways to the development of empathy-related responding may differ for boys and girls. The results of this study suggest that temperamental proneness to fear or anger can have negative implications (particularly if mothers are low in responsivity or for boys). Further research on the role of other environmental influences, such as fathers, child care, and marital quality on children’s empathy-related responding is needed.

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