Sympathy Through Affective Perspective Taking and Its Relation to Prosocial Behavior in Toddlers

Amrisha Vaish, Malinda Carpenter, and Michael Tomasello
Max Planck Institute for Evolutionary Anthropology

In most research on the early ontogeny of sympathy, young children are presented with an overtly distressed person and their responses are observed. In the current study, the authors asked whether young children could also sympathize with a person to whom something negative had happened but who was expressing no emotion at all. They showed 18- and 25-month-olds an adult either harming another adult by destroying or taking away her possessions (harm condition) or else doing something similar that did not harm her (neutral condition). The "victim" expressed no emotions in either condition. Nevertheless, in the harm as compared with the neutral condition, children showed more concern and subsequent prosocial behavior toward the victim. Moreover, children's concerned looks during the harmful event were positively correlated with their subsequent prosocial behavior. Very young children can sympathize with a victim even in the absence of overt emotional signals, possibly by some form of affective perspective taking.

Keywords: sympathy, empathy, prosocial behavior, affective perspective taking

Sympathy (feeling concern for the other) and empathy (feeling as the other feels) regulate much of human social interaction. They are thought to lead to prosocial behaviors such as helping and lead away from antisocial behaviors such as aggression (Batson, 1991, 1998; Eisenberg & Miller, 1987; Hoffman, 1982, 2000; Miller & Eisenberg, 1988). Human infants from soon after birth show reactions to crying or distress that might be considered empathy, or at least some precursor to empathy such as emotional contagion (e.g., Sagi & Hoffman, 1976). Around 14–18 months, as children more clearly differentiate self from other, they show more varied and more other-directed empathic and sympathetic responses to others' distress (see Eisenberg, Spinrad, & Sadovsky, 2006, for a review).

Virtually all research on sympathy and empathy has assessed children's responses to conspicuous emotional cues such as crying or distress, thus tapping children's ability to sympathize either via emotional contagion or by identifying emotional signals. While this route to sympathy and empathy is certainly indispensable and commonly used, it could be entirely based upon reading the victim's overt emotional cues. There has, however, been much

discussion in the literature about the possibility of sympathizing and empathizing in the absence of overt emotional cues, such as by affective perspective taking, that is, by imagining or inferring what the other person is feeling based on various nonemotional and situational cues and by putting oneself in the other's place (Eisenberg, Shea, Carlo, & Knight, 1991; Feshbach, 1978; Hoffman, 1984; Smith, 1759/2006; Thompson, 1987). Moreover, adults have been shown to engage in this latter form of sympathy or empathy in both behavioral and neuroscience work (see Batson et al., 1997; Ruby & Decety, 2004; see Blair, 2005; Decety & Jackson, 2006, for reviews). The question addressed here is whether young children, too, can sympathize in the absence of emotional cues. Despite the relevance of this ability to the understanding of others' minds and experiences, and despite the extensive discussion of this issue in the literature, the development of this route to sympathy has received little attention in research with young children.

The developmental research relevant to this question has been conducted in two areas. First is the assessment of children's affective perspective-taking skills (e.g., Dunn & Hughes, 1998; Harwood & Farrar, 2006; Wellman, Phillips, & Rodriguez, 2000), and second is the investigation of empathy-related responding using picture and story tasks (e.g., Eisenberg-Berg & Lennon, 1980; Feshbach & Roe, 1968; Iannotti, 1985). In both paradigms, children are told or shown stories about protagonists in emotion-eliciting situations and are asked how the protagonists or the children themselves feel. Children from around 3 years of age pass some versions of these tasks. However, both lines of research are limited because they require relatively sophisticated cognitive and linguistic skills, which limits the ages that can be tested (see Eisenberg et al., 2006).

To our knowledge, only one recent study has assessed sympathy without emotion reading. Hobson, Harris, García-Pérez, and Hobson (in press) tested 11-year-olds with autism, 11-year-olds with learning disabilities, and typically developing 6-year-olds (all

groups had verbal mental ages of around 6 years). In their task, participants and two experimenters each drew a picture; then one experimenter (the perpetrator) unexpectedly tore up the other experimenter's (the victim's) drawing (experimental condition) or else tore up a blank sheet of paper (control condition). In both cases, the victim observed the perpetrator neutrally. Children's looks to and concern for the victim were analyzed. In the experimental condition, a significantly higher percentage of children without autism than children with autism looked immediately and spontaneously to the victim and showed concern for the victim. These differences did not emerge in the control condition.

To assess sympathy without emotion reading in toddlers, we adapted Hobson and colleagues' (in press) task for two reasons: First, it does away with the affective cues typically provided in work on sympathy, thus allowing for a test of sympathy in the absence of emotional cues, and second, since the task is nonlinguistic and nonhypothetical, it does away with the difficult task demands placed on children in picture–story and the existing affective perspective-taking tasks. We extended the task by introducing several further scenarios in addition to the drawing situation (hereafter called *sympathy situations*).

Like Hobson and colleagues (in press), along with measuring patterns of children's looks to the victim, we also examined children's concern for the victim. One potential problem with measuring concern is that perhaps children look concerned about the generally negative situation (e.g., someone tearing someone else's picture) without really being concerned for the victim. To address this issue, we took two steps. First, like Hobson and colleagues, we only coded those concerned looks that were directed toward the victim. Second, extending Hobson and colleagues' work, we assessed children's prosocial behavior toward the victim in a subsequent task (hereafter called *prosocial situation*). This step was taken because sympathy is thought to play an important role in motivating altruistic prosocial behavior. Early in the second year, children display prosocial behaviors such as comforting or making helpful suggestions (e.g., Young, Fox, & Zahn-Waxler, 1999; Zahn-Waxler, Robinson, & Emde, 1992), and their empathic and sympathetic responses to victims who show overt emotional cues relate moderately with their prosocial behaviors (e.g., Eisenberg et al., 1989; Eisenberg & Miller, 1987). Thus, to test whether children's expressions of concern represented sympathy for the victim rather than more general concern, we examined whether children's prosocial behavior toward the victim was greater after they had witnessed situations that aroused sympathy for the victim than after situations that were neutral in nature. Finally, to better compare our study with prior work, we also assessed associations between children's concern and their subsequent prosocial behavior.

We predicted that toddlers would show more concern toward an adult when she had been harmed than when she had not. Note that although the victim showed no emotional response, we nevertheless assessed children's emotional response (concern for the victim). Our aim was thus not to assess children's cognitive skills per se but rather to assess whether children could arrive at an affective response without any overt affective input (and thus without emotion reading or emotional contagion). Based upon past work, we also predicted that toddlers would subsequently help the victim more and that there would be an association between concern for and prosocial behavior toward the victim.

Since prior work has mostly been conducted with children in the second postnatal year, we too tested 1.5- and 2-year-olds to assess whether at these ages, children can sympathize with a victim not only when she shows overt emotions but even when she does not. We also piloted the procedure with a few 14-month-olds but found that they did not fully grasp the sympathy situations. We therefore did not further test this age group. Finally, given that sympathy and prosocial behavior have sometimes been found to vary by gender, we assessed the effects of gender, but we did not have any specific predictions regarding this variable due to the mixed results from prior work (e.g., Holmgren, Eisenberg, & Fabes, 1998; Eisenberg & Lennon, 1983; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992).

Method

Participants

Participants were 18-month-olds ($n = 32$, 16 girls) between 17 months 1 day and 18 months 28 days ($M = 18;2$; $SD = 11.7$ days) and 2-year-olds ($n = 32$, 16 girls) between 23 months 15 days and 26 months 28 days ($M = 25;16$; $SD = 31.8$ days) from a medium-sized German city. The sample was predominantly White, and all participants were native German speakers. Thirty participants had no siblings, 17 had one or more siblings, and no information was available regarding siblings of the remaining 17. No information concerning parents' education, occupation, or socioeconomic status was collected. Five additional children were tested but were excluded due to fussiness or inattentiveness during the sympathy situations (two 2-year-olds and two 18-month-olds) and equipment failure (one 18-month-old). All participants were tested by the same two female experimenters playing the same role each time.

Materials

Each child saw four sympathy situations in which the following materials were used: two similar-looking necklaces with large, colorful beads; two similar-looking black belts with large, colorful beads; blank sheets of white paper and a color pencil; and a blue and a red ball of clay. Before each sympathy situation, children and one experimenter (E1, who would later play the victim) played together with one of two filler toys: an age-appropriate puzzle or a "climber" toy (consisting of a ladder and a wooden man). During the prosocial situation, three similar-looking colorful balloons were used, one filled with helium and the others filled with air. The helium balloon was E1's balloon and was tied to a piece of string, whereas the two air balloons were the children's and were tied to plastic yellow sticks that were easy for children to hold. Between the last sympathy situation and the prosocial situation, a ball and a stuffed toy served as filler toys.

Setting

During the sympathy situations, children sat on their parent's lap at a 120 × 70 × 75-cm table, facing E1, while a second experimenter (E2, who played the perpetrator) sat beside the children on their right. For the prosocial situation, the child and E1 moved to a red carpet (200 × 140 cm) in the same room while the parent sat on a chair close by.

Procedure

E1 and E2 first played with children in a waiting room for about 10 min, and E1 obtained parents' informed consent. Throughout, E1 wore one of the necklaces and belts described above (in order to make it seem as though these really belonged to her and she enjoyed wearing them). When children were judged to be comfortable, parents and children were taken to the testing room, where everyone took their designated seat. Parents were asked not to provide the children with cues and to look away if children looked at them during the study. The overall experimental procedure was as follows: All children saw four sympathy situations, but half of the children saw them in the harm condition and half saw them in the neutral condition. After the sympathy situations, all children took part in the same prosocial situation.

To get started, E1 and the children played with the climber toy for 2 or 3 min, after which E1 put the toy away and the first of four sympathy situations began. Each situation (in both conditions) began with a phase (45 s) in which E1 acted on one of the four target objects (which, in the harm condition, would later be taken or destroyed by E2). The four situations were as follows:

Necklace. E1 admired and showed off her necklace. This involved looking admiringly at it, taking it off to examine it, commenting on the different beads, stating how much she liked it, and so on. The second, similar-looking necklace lay on a tray to the right of E2, visible but inaccessible to the children.

Belt. E1 admired and showed off her belt in a similar way as with her necklace. The second, similar-looking belt lay on the tray to the right of E2.

Picture. E1 happily and proudly drew a picture of a house and an apple tree, commenting the entire time about what a pretty picture it was, how much she liked it, and how happy it made her. To begin drawing, E1 picked up a stack of blank paper that had been lying out of the children's view, took one sheet for herself, and left the remainder of the stack on the table, visible but inaccessible to the children.

Clay. E1 happily and proudly made a clay bird using either the blue or the red clay ball and commenting as in the picture situation. To begin this task, E1 picked up a small tray that had thus far been lying out of the children's view and that held both balls of clay; she took one of the balls of clay for herself and left the other ball on the tray, visible but inaccessible to the children.

The necklace and belt comprised possession situations, and the picture and clay comprised effort situations. Since this was the first study of its kind with young children, we were unsure about what kinds of situations might elicit sympathy when the victim provided no emotional cues. We thus used two different kinds of situations in order to increase the chances that children would show sympathy in at least one kind. We did not have any predictions about which (if any) type of situation might elicit more sympathy.

In each case, E1 acted on the object for 45 s, during which time she occasionally looked to the child to share her excitement or to reengage the child but was mostly focused on the objects and her actions. During these 45 s, E2 watched E1's actions with mild interest but did not speak and did not look at the child. For each situation, when the 45 s were over, E1 placed the target object (her necklace, belt, picture, or bird) in front of her on the table while still looking admiringly at it. At this point, the experimental manipulation began.

Half of the children in each age group were randomly assigned to the harm condition, and the other half were assigned to the neutral condition. In the harm condition, E2 grabbed the target object as soon as E1 had put it down, said in a mildly aggressive tone, "I'm going to take/tear/break this now," and proceeded to do so mildly aggressively for 15 s. Specifically, E2 put on the necklace or belt and looked at it admiringly, or tore up the picture or broke apart the bird into small bits and threw the bits into a bin lying to her right on the ground. In the neutral condition, E2 said the same words in a neutral tone of voice and produced the same actions in a more neutral way upon the second (similar) object. That is, in the necklace and belt situations, E2 put on the necklace or belt lying on the tray; in the picture situation, E2 tore up a blank sheet of paper; and in the clay situation, E2 broke apart the second ball of clay. Critically, regardless of E2's action or the condition, E1 silently watched E2's actions with a neutral face; she neither spoke to nor looked at the child or anywhere else during this time. E2 also only watched her own actions; she did not look at E1 or at the child during this time. Children's looks to E1 (the victim) were coded during these 15-s periods (see below). After 15 s, E2 stopped acting upon the target object, which indicated the end of the trial to E1; E1 then neutrally picked up a filler toy and engaged children with it for approximately 1 min while E2 neutrally looked away (e.g., at the bin lying near her) and did not engage in the play.

A manipulation check was conducted on a random 25% of participants ($n = 16$; 8 in each age group and in each condition) to ensure that E1 maintained a neutral expression during the 15-s intervals in which E2 acted. A coder who was blind to condition coded E1's facial expression on a 5-point scale, consisting of –2 (*very negative*), –1 (*somewhat negative*), 0 (*neutral*), 1 (*somewhat positive*), and 2 (*very positive*). The scores were 0 in 62 of 64 instances, and 1 in the remaining two instances ($M = 0.03$, $SD = 0.18$), indicating that E1 did indeed maintain a neutral expression.

Each child saw all four situations in counterbalanced order, alternating between possession and effort situations, after which E1 and the children moved to the floor to play with filler toys while parents moved to a chair near the carpet and were given something to read. Parents were told that if children offered them a balloon, they could take it but then should put it on the floor and go back to reading.

After 2 or 3 min of play, E2 took out the three balloons and said excitedly, "Look [name of child], look what I found! Balloons!" She handed the two air balloons to the child and the helium balloon to E1. E1 played happily with her balloon and did not engage with the children, and children generally played with their own balloons. About 1 min later, E1 "accidentally" let go of her balloon (which floated to the ceiling), gasped, pointed to her balloon, and said in a shocked voice, "Oh no, my balloon!" She then "attempted" to bring it down, failed, and sat back down. She was then vocally and facially obviously sad. During the next 2 min (from the moment E1's balloon hit the ceiling), children's behavior was coded (see below).

During these 2 min, E1 never looked at children's hands or at their balloons and only very rarely looked at them at all so as to prevent giving them hints or pressuring them to help. After the 2 min, E1 stood on a chair, brought her balloon down, and was obviously happy. The prosocial situation did not last the full 2 min (a) if children became very upset, in which case the study was cut short and E1 brought down her balloon, or (b) if children handed

one or both of their balloons to E1, in which case E1 gratefully took and then handed back the balloon(s) before bringing down her own balloon. For children who had seen the harm sympathy situations, after the entire procedure was completed, E2 apologized to E1 while the children were paying attention, and E1 accepted the apology. This was done so as not to end the session on a negative note, and in order to show children that E2's behavior had been wrong.

Coding and Reliability

In the sympathy situations, the four 15-s intervals during which E2 acted upon the objects were coded. The primary coder (Amrisha Vaish, who was not blind to condition) used Interact (Mangold International GmbH, 2007) to code looks to E1's face, E2's face, E2's actions, and away. (However, looks to E2's face, E2's actions, and away were not analyzed and will not be discussed further.) Reliability was assessed on a randomly selected 25% of children (8 in each age group) by two secondary coders who were blind to condition, one of whom coded 6 children in each age group (3 in each condition), and the other of whom coded 4 children in each age group (2 in each condition). Agreement with the primary coder was excellent: $\kappa = .81$ for 2-year-olds and $\kappa = .80$ for 18-month-olds.

The primary coder also coded the quality of all looks to E1 using three categories (based partially on Hobson et al.'s, in press, categories): concerned, checking, and other looks. Concerned looks were those expressing concern for E1. For a look to be coded as concerned, children's facial expression while looking to E1 had to involve either a furrowing or raising of the brow and sadness or concern in the eyes. In addition, their expression had to be different from that just before they turned to look to E1 as well as different from the overall facial expression that they had shown during E1's presentation. Counting only those looks of concern that were directed at E1 made our measure of concerned looks rather conservative since, of course, a child might experience concern for the victim even when she is looking away from the victim. However, since a concerned expression not directed at the victim might be the result of a general worry or confusion about the situation, we thought it safer to count only those concerned looks specifically directed at the victim.

Checking looks were looks meant to evaluate the situation, E1's response, and what might happen next (somewhat similar to the hypothesis-testing category used by Zahn-Waxler, Radke-Yarrow, et al., 1992). These looks were accompanied by neutral facial expressions or facial expressions that were no different from those just before the children turned to look to E1 and from the children's overall facial expression during E1's presentation. Checking looks were coded to gauge children's expectation of a reaction from E1. We predicted that even if children did not show concern, they would show more checking looks in the harm than in the neutral condition because they perceived the harm condition as affecting E1 more. Finally, other looks were any looks that were not coded as concerned or checking (e.g., looks during which children smiled at E1). However, as almost no significant differences emerged with regard to other looks, and as these looks were not theoretically interesting, they will not be discussed further.

Due to the subjective nature of the coding of quality of looks, two secondary coders who were blind to condition assessed reli-

ability on 100% of children: One secondary coder coded 24 children in each age group (12 in each condition), and the other coded 8 in each age group (4 in each condition). Agreement with the primary coder was excellent: $\kappa = .82$ for 2-year-olds and $\kappa = .80$ for 18-month-olds. Despite the high reliability, we used the blind coders' coding of quality of looks in analyses to avoid any bias in the primary coder's coding.

In the prosocial situation, the primary coder coded the 2 min or, if the trial was shorter, the full trial length, using the following categories, with their associated scores in parentheses (ordered from the highest to lowest level of prosocial or emotional response): helps/shares (3), shows distress (2); describes situation for self or E1 (2), attends to situation (1), or ignores situation (0; see Table 1 for details). *Shows distress* and *describes situation for self or E1* were assigned scores of 2 because we took these to be greater emotional responses to or involvement in the other's situation than *attends to situation* or *ignores situation*. These categories were based partially on prior work (Zahn-Waxler, Radke-Yarrow, et al., 1992).

Although children could show any or all of these prosocial behaviors, for analyses, children's prosocial score consisted of each child's highest score. Since no child's prosocial score was 0 (ignores situation), this category was not included in analyses. Two coders who were blind to condition assessed reliability on 25% of children: One coded 6 children in each age group (3 in each condition), and the other coded 4 children in each age group (2 in each condition). Agreement on the prosocial scores was excellent: $\kappa = .80$ for 2-year-olds and $\kappa = .81$ for 18-month-olds.

Results

We first report results from the sympathy situations, followed by results from the prosocial situation, and finally the correlations between the two. Effect sizes were calculated using partial eta-squared (η_p^2).

Sympathy Situations: Patterns of Looks

To assess patterns of children's looks to E1, we used four dependent measures: number of the four trials in which children looked to E1, average latency of first look to E1, average total duration of all looks to E1, and average number of looks to E1. Average latency and duration were obtained by averaging across only those trials in which children looked to E1.

As a preliminary analysis, we compared patterns of looks in possession versus effort situations and found two significant effects: Children looked to E1 in a significantly higher number of possession than effort trials, $F(1, 60) = 13.74$, $p < .0005$, $\eta_p^2 = .186$, and children also directed a greater number of looks to E1 in possession than effort trials, $F(1, 60) = 8.65$, $p = .005$, $\eta_p^2 = .126$. However, these variables did not interact with condition or age group. Furthermore, average latency and duration of looks did not differ across possession versus effort situations, nor did they interact with condition or age group (all ps > .095). Thus, for analysis of these four dependent measures, we collapsed data across possession and effort situations.

The main analysis consisted of a multivariate analysis of variance using the same four dependent measures. The fixed factors were condition (harm, neutral), age group (18 months, 2 years),

Table 1
Coding Scheme For Prosocial Situation

Prosocial score	Category	Behaviors
3	Helps/shares	Gives own balloon to E1: Fully approaches E1 and clearly offers her one or both balloons
		Puts balloon near E1 or throws it toward E1; may then move away: Tosses balloon(s) in E1's direction or places it/them near her and then retreats, usually still watching her. If it was clear during testing that the child intended to give the balloon(s) to E1, E1 picked up the balloon(s) and the 2 minutes were cut short, but if E1 was unsure about what the child intended, she continued displaying sadness
		Comforts E1: Hugs or pats E1
		Describes the situation to parent: verbal or gestural descriptions about the situation (e.g., "The balloon is gone") directed to parent in an effort to draw the parent's attention to the situation; akin to Zahn-Waxler, Radke-Yarrow, et al.'s (1992, p. 129) "indirect helping"
		Makes suggestions to E1: Suggests ways to retrieve balloon (e.g., "ladder") or to cheer E1 up (e.g., "ball," referring to the ball that E1 had previously enjoyed playing with)
2	Shows distress	Shows distress: including whimpering or crying
	Describes situation for self or E1	Describes situation verbally (e.g., "Balloon is up") or gestures (e.g., pointing to balloon at ceiling), while looking not to parent but to situation or E1; akin to Zahn-Waxler, Radke-Yarrow, et al.'s (1992, p. 129) "hypothesis testing"
		Points out to self or E1 that s/he has balloon(s): Verbal (e.g., "I have a balloon") or gestural communication (e.g., pointing to own balloon[s]) while looking not to parent but to situation or E1
1	Attends to situation	Watches E1 and situation in a serious way; stops play
		Goes to parent or moves away but continues watching E1
0	Ignores situation	Shows no involvement or interest in the situation
		Goes to parent and tries to engage him/her

and gender. There was a significant multivariate effect of condition, Wilks's $\lambda = .520$, $F(4, 50) = 11.53$, $p < .0005$, $\eta_p^2 = .480$. Univariate tests revealed striking condition differences in all four variables: Compared to the neutral condition, children in the harm condition looked to E1 in a significantly higher number of trials, more quickly, for longer, and more often (see Table 2).

The multivariate analysis of variance also revealed a nearly significant Condition × Gender interaction, Wilks's $\lambda = .833$, $F(4, 50) = 2.50$, $p = .054$, $\eta_p^2 = .167$. Univariate tests revealed that this interaction was only significant for average duration of looks, $F(1, 53) = 8.77$, $p = .005$, $\eta_p^2 = .142$. Simple main effects (Bonferroni corrected) showed that girls in the harm condition looked to E1 for a significantly longer duration ($M = 2.32$ s, $SD = 0.75$) than did girls in the neutral condition ($M = 1.05$ s, $SD = 0.47$), $F(1, 53) = 31.0$, $p < .001$, whereas duration of boys' looks did not differ across conditions (harm: $M = 1.93$ s, $SD = 0.76$; neutral: $M = 1.59$ s, $SD = 0.56$, $p = .48$). The multivariate

analysis of variance did not reveal any other significant main effects or interactions (all $ps > .288$).

Sympathy Situations: Quality of Looks

To assess the quality of looks to E1, we analyzed (a) the number of children who showed concerned and checking looks, (b) the number of the four sympathy situations in which children showed concerned and checking looks, and (c) the proportion of individuals' looks that were concerned and checking looks. The means for the second measure (the number of situations) are presented in Figure 1.

Concerned looks. As predicted, children showed more concern for E1 in the harm than in the neutral condition. Specifically, more children showed concerned looks in the harm (13 of 32, or 40.6%) than in the neutral (4 of 32, or 12.5%) condition, $\chi^2(1, N = 64) = 6.49$, $p = .011$, with no difference between type of situation

Table 2
Means and Standard Deviations for Various Measures of Children's Looks in ihe Sympathy Situations

Dependent measure	Neutral condition		Harm condition		η_p^2
	M	SD	M	SD	
Number of trials child looked to E1	2.13	1.14	3.16	1.0**	.20
Average latency to look to E1	9.67 s	2.71	6.19 s	2.94***	.28
Average duration of looks to E1	1.40 s	0.54	1.71 s	0.66***	.29
Average number of looks to E1	0.79	0.64	1.44	0.83**	.17

Note. E1 = Experimenter 1, who played the victim.
** $p < .005$.   *** $p < .0005$.

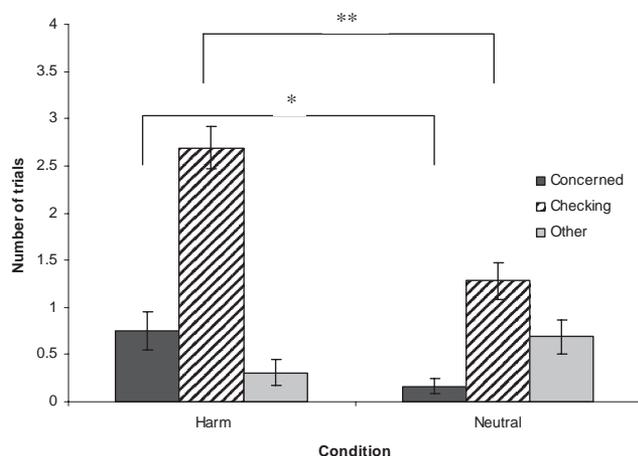*Figure 1.* Mean number of trials (±*SE*, denoted by the error bars) in which children showed each type of look. * $p < .05$. ** $p < .0005$.

(possession vs. effort), age group, or gender (all $ps > .395$). Children also showed concerned looks in a significantly greater number of the four harm situations ($M = 0.75$, $SD = 1.11$) than the four neutral situations ($M = 0.16$, $SD = 0.45$), independent-samples $t(62) = 2.81$, $p = .008$. However, this difference might be explained by the fact that children simply looked to E1 much more in the harm than in the neutral conditions. To control for this difference, for each child we calculated the number of situations in which the child showed concern as a proportion of the number of situations in which the child looked to E1. Thus, if a child looked to E1 in two of the four situations and showed concern in one of those situations, the child received a proportion of 50. Using these proportions revealed the same result: Children showed concerned looks in a greater proportion of harm ($M = 20.97$, $SD = 29.57$) than neutral ($M = 7.22$, $SD = 21.3$) situations, $t(59) = 2.09$, $p = .041$. Finally, analyses of the proportion of individuals' looks that were concerned looks revealed a similar albeit nonsignificant pattern (harm: $M = 15.70$, $SD = 23.23$; neutral: $M = 6.44$, $SD = 20.23$), $t(59) = 1.66$, $p = .102$. Note that 3 children (1 in the harm condition and 2 in the neutral condition) were excluded from the last two analyses because they did not look to E1 in any of the four trials.

Given that children were presented with four sympathy situations in succession, it is conceivable that children's concern was primarily evident in the first few harm situations and faded with repeated presentation. However, a repeated-measures analysis indicated no significant difference across the four harm situations ($p = .985$): In all four situations, the proportion of looks that were concerned looks ranged between 15.56% and 18.89%. Thus, children's concerned looks did not fade across the four harm situations despite E1's lack of response.

Checking looks. As with concerned looks, and as would be expected, more children showed checking looks toward E1 in the harm (97%) than in the neutral (75%) condition ($p = .026$, using Fisher's exact test because of low expected count in some cells). However, this effect was mediated by situation type and age. That is, significantly more children showed checking looks to E1 in the possession (77%) than in the effort (55%) situations, McNemar

test, $\chi^2(1, N = 64) = 6.50$, $p = .009$. Still, in both types of situations, more children showed checking looks in the harm than in the neutral condition (possession: 28 of 32 in harm vs. 21 of 32 in neutral, $\chi^2[1, N = 64] = 4.27$, $p = .039$; effort: 22 of 32 in harm versus 13 of 32 in neutral, $\chi^2[1, N = 64] = 5.11$, $p = .024$).

In addition, more 18-month-olds (97%) than 2-year-olds (75%) showed checking looks ($p = .026$, Fisher's exact test). Analyzing the age groups separately revealed that among the 2-year-olds, whereas 15 of 16 (94%) showed checking looks in the harm condition, only 9 of 16 (56%) did so in the neutral condition ($p = .037$, Fisher's exact test). There was no difference between conditions for the 18-month-olds (16 of 16 in the harm condition and 15 of 16 in the neutral condition showed checking looks; $p = 1.000$, Fisher's exact test). The number of children who showed checking looks did not differ by gender ($p = .148$).

Children in the harm condition also showed checking looks in a significantly greater number of the four sympathy situations ($M = 2.69$, $SD = 1.23$) than did children in the neutral condition ($M = 1.28$, $SD = 1.05$), $t(62) = 4.91$, $p < .0005$. To control for the baseline difference in amount of looking to E1 across conditions, we again calculated proportion scores (i.e., the number of situations in which a child showed checking looks as a proportion of the number of situations in which the child looked to E1). This more conservative measure revealed the same result (harm: $M = 88.17$, $SD = 21.17$; neutral: $M = 64.72$, $SD = 40.69$), $t(59) = 2.84$, $p = .007$. Finally, a similar pattern emerged in the proportion of individuals' looks that were checking looks (harm: $M = 79.22$, $SD = 25.53$; neutral: $M = 66.54$, $SD = 39.43$), but this difference was not significant, $t(59) = 1.50$, $p = .14$. Again, the 3 children who did not look to E1 in any of the four trials were excluded from the last two analyses.

The Effect of Condition on Subsequent Prosocial Behavior

The distribution of children's prosocial scores across condition, age group, and gender are presented in Table 3. As expected, significantly more children helped or shared with E1 (i.e., received a prosocial score of 3) if they had previously experienced the harm rather than the neutral condition (harm: 21 of 32, or 65.6%; neutral: 12 of 32, or 37.5%), $\chi^2(1, N = 64) = 5.07$, $p = .024$. The number of children who helped or shared did not differ by age group or gender (both $ps = .802$).

An additional analysis of the effect of condition on prosocial behavior consisted of a univariate analysis of variance using prosocial scores as the dependent measure and condition, age group, and gender as fixed factors. This revealed a main effect of condition, $F(1, 56) = 5.16$, $p = .027$, $\eta_p^2 = .084$: Children who had previously seen E1 in the harm condition had higher prosocial scores toward her ($M = 2.47$, $SD = 0.80$) than did children who had seen her in the neutral condition ($M = 2.00$, $SD = 0.88$). The analysis of variance also revealed a nearly significant Age Group × Gender interaction, $F(1, 56) = 3.88$, $p = .054$, but simple main effects (Bonferroni corrected) revealed no significant gender differences in prosocial scores in either age group (both $ps > .117$). There were no further main effects or interactions (all $ps > .100$).

Table 3
Percentage of Children Who Received Each Score as Their Highest Prosocial Score

Category	Score	Condition previously experienced		Age group		Gender	
		Harm	Neutral	18 months	2 years	Girls	Boys
Helps/shares	3	65.6	37.5	53.1	50.0	53.1	50.0
Shows distress or describes situation	2	15.6	25.0	15.6	25.0	25.0	15.6
Attends to situation	1	18.8	37.5	31.3	25.0	21.9	34.4
Ignores situation	0	0	0	0	0	0	0

Relations Between Individual Children's Concerned Looks and Prosocial Behavior

To assess the association between degree of concern in the sympathy situations and subsequent prosocial behavior, we conducted nonparametric correlations using the number of the four sympathy situations in which children showed concern and children's prosocial scores. As predicted, the two factors were positively correlated (Kendall's $\tau = .24$, $p = .036$). This correlation was specific to concerned looks; a similar analysis conducted using children's checking looks was not significant ($p = .514$).

Since prosocial scores varied by condition (see above), the correlations between concerned looks and prosocial scores were also conducted separately for each condition. As predicted, in the harm condition, the correlation between number of situations with concerned looks and prosocial scores was positive (Kendall's $\tau = .26$), although this was a nonsignificant trend ($p = .097$). In the neutral condition, the number of situations with concerned looks was not associated with prosocial scores (Kendall's $\tau = .015$, $p = .928$). Note that correlational analyses conducted using the more conservative measure of proportion of situations (i.e., number of situations in which a child showed concerned looks divided by the number of situations in which the child looked to E1) revealed very similar results, as did correlational analyses using proportions of individuals' looks that involved concern.

One possible alternative interpretation of this correlation is that what we coded as concern actually indexed emotional arousal caused by the perpetrator's aggressive behavior in the harm condition (since, in order for the conditions to be believable, the perpetrator did behave mildly aggressively in the harm but not in the neutral condition). Furthermore, perhaps those children who experienced this emotional arousal were then more susceptible to the victim's distress cues in the prosocial situation. This is potentially problematic given that children received a higher prosocial score for showing distress (a score of 2) than for only attending to the situation (1) or showing no response (0). Thus, perhaps the increased emotional arousal during sympathy situations and the resulting increased distress in the prosocial situation created a spurious correlation that does not index a sympathy–prosocial behavior link at all. However, this alternative interpretation of the correlation does not hold because, even when showing distress was excluded from the coding scheme and those 3 children who showed distress were assigned their next highest score (they all received a 1 for attending to the situation), the correlation between the number of trials in which children showed concerned looks and children's prosocial behavior persisted (Kendall's $\tau = .23$, $p = .045$).

Discussion

We examined whether children can, even in the absence of emotional cues, sympathize with a victim. Extending the study by Hobson and colleagues (in press), we tested significantly younger children in multiple situations and, in addition, examined the relation between children's sympathy and prosocial behavior. We found that as early as 18 months of age, children show concern for an adult stranger who is in a hurtful situation but shows no emotion. What is striking about these results is not that such young children showed sympathy, which was to be expected given past work (e.g., Bischof-Köhler, 1991; Young et al., 1999; Zahn-Waxler, Radke-Yarrow, et al., 1992); what is striking is that this is, to our knowledge, the first demonstration that such young children can sympathize with a sufferer even in the absence of overt emotional cues. This study thus also extends past work on sympathy in toddlers, which had, up to this point, mostly focused on children's empathy and sympathy in response to a sufferer's overt emotional signals.

Our claim that children were concerned for the sufferer (rather than, say, about the generally negative situation or the victim's potentially angry response) gains support from two additional findings. First, children in the harm condition later helped E1 significantly more than did children in the neutral condition. Our interpretation of this finding is that observing someone experiencing negative situations increases the likelihood of children helping that person, presumably by inducing sympathy, which has been both theoretically and empirically linked to prosocial behavior (see, e.g., Batson, 1991; Eisenberg & Miller, 1987). This proposal is strengthened by a second finding: the correlation between children's concerned looks and their subsequent prosocial behavior toward the sufferer, which indicates that individual children who expressed concern for E1 were also more likely to help E1. Together, these findings substantiate our claim that we have measured sympathy and support our conclusion that the early ability to sympathize does not require overt emotional cues: In the absence of such cues, children can use situational cues to sympathize with another person.

One open question concerns the mechanism(s) children employed to arrive at sympathy. Obviously, sympathy in the present study did not result directly from exposure to the victim's affective cues (e.g., via mechanisms such as mimicking the emotional cues, emotional contagion, etc.), as such cues were not provided. We thus argue that sympathy in our study resulted at least partially

from cognitive processes.[1] Several cognitive processes can contribute to empathy-related responses (see Eisenberg et al., 2006; Feshbach, 1978; Hoffman, 1982, 1984). Simpler processes include direct association (e.g., seeing another's blood elicits distress in the observer due to blood being linked to the observer's own past distress) and classical conditioning. However, sympathy results from more sophisticated processes that involve an analysis of the source of the vicarious feeling and therefore a focus on the other (Eisenberg et al., 1991).

One such sophisticated cognitive process is affective perspective taking, that is, making inferences about the other's affective state by putting oneself in the other's place and basing one's responses on those inferences (Eisenberg et al., 1991; Hoffman, 1984). In the absence of emotional cues, one way to make this inference is via simulation, which involves imagining oneself in another's situation (e.g., Decety & Sommerville, 2003; Harris, 1995). An alternative but related possibility (and the one preferred by Hobson et al., in press) is that the observer can feel her way into the experience of and feel for the other person because she identifies with that person's attitudes. According to Hobson and colleagues (in press), in their study, children with autism did not identify with the victim's attitudes and could therefore not experience concern for the way the victim would be expected to feel, whereas children with learning disabilities and typically developing children did not have difficulties with identification and could thus experience concern for the victim. Importantly, whether via simulation, identification, or some other mechanism(s), one eventually takes the other's perspective and apprehends the other's affective state, which can activate affective responses such as sympathy and can thereby motivate prosocial behavior (Batson, Fultz, & Schoenrade, 1987; Feshbach, 1978; Krebs & Russell, 1981). Plausibly, then, in our study, children apprehended the victim's state by taking her affective perspective, which stimulated their sympathy and prosocial behavior.

This might be surprising given that thus far, affective perspective taking has only been demonstrated in the 3rd year and beyond (Denham, 1986; Wellman et al., 2000). However, tasks used in prior work required children to display relatively sophisticated cognitive and linguistic skills, such as comprehending hypothetical situations and answering questions about their own feelings. These skills might not amply develop until the 3rd year. It is thus possible that children younger than 3 years possess some affective perspective-taking abilities, but the methods used in prior work have not been sensitive enough to tap these abilities. Relevant here is recent work on children's theory of mind, in which the use of sensitive, implicit measures shows that, rather than emerging around 4 years of age, as previously believed, a basic theory of mind is already present during the 2nd year (Onishi & Baillargeon, 2005; Southgate, Senju, & Csibra, 2007). We thus believe that when appropriate measures are used, children in their 2nd year could well demonstrate some affective perspective-taking skills as well.

Depending on how familiar children were with situations like our sympathy situations, they might additionally have relied on their past experiences to infer the victim's affect. That is, if children had previously directly or vicariously experienced such situations on multiple occasions, perhaps they had formed scripts about people's responses to such situations and, in our study, were partially relying on these scripts to infer the victim's affect. On the other hand, if the situations were novel for children, then children likely engaged in perspective taking (see Blair, 2005; Eisenberg et al., 1991; Karniol, 1982). It is possible that our sympathy situations were somewhat familiar to children, especially to those with siblings and those in day care. Thus, perhaps some children in the harm condition (those familiar with such situations) relied less on affective perspective taking and more on scripts than did children who were unfamiliar with such situations. However, even if the situations were to some degree familiar to children, it is highly unlikely that children had ever witnessed precisely the situations that they witnessed in our study (e.g., an adult tearing up another adult's drawing), and so although they might have had some scripts to rely on, they also had to engage in some affective perspective taking. In any case, children did sympathize, indicating that they can arrive at sympathy without expression reading or emotional contagion.

It is noteworthy that in our harm condition, only some children (40%) showed concerned looks (although this proportion is similar to proportions reported in studies in which the victim provided emotional signals; e.g., Zahn-Waxler, Radke-Yarrow, et al., 1992). One possible explanation for this might be that the degree of sympathy aroused is related to the level of observer–sufferer attachment (Batson, 1987). As E1 was a relative stranger, fewer children may have experienced sympathy than they would have if the sufferer had been their parent (van der Mark, van IJzendoorn, & Bakermans-Kranenburg, 2002; Young et al., 1999). There are also likely differences in individuals' tendency to outwardly express sympathy. Thus, some children might have experienced sympathy but not expressed it facially. Indeed, given that all but 1 child in the harm condition showed checking looks, perhaps some checking looks were in fact sympathetic looks but without the accompanying overt expressions. However, concerned but not checking looks correlated with prosocial behavior, indicating that the two kinds of looks tapped into distinct responses and that checking looks were not simply sympathetic looks without the overt expressions.

A related possibility for why more children did not show concern might have to do with the fact that concerned looks were only coded as such when they were directed at the victim. Our measure of concern was thus quite conservative, and perhaps some children experienced concern for the victim but were not coded as doing so because they did not meet our conservative criterion. One way to get around this problem in the future might be to use physiological measures such as heart rate and skin conductance, which are less vulnerable to such coding decisions (see, e.g., Eisenberg & Fabes, 1990, 1998; Hastings, Zahn-Waxler, & McShane, 2006).

Even so, we found a correlation between sympathy and prosocial behavior, the strength of which is comparable to some prior work in which the victim presented emotional cues (e.g., .20 in Zahn-Waxler, Robinson & Emde, 1992) and is consistent with the

---

[1] Our claim is not that cognitive processes are entirely distinct and separable from affective processes. On the contrary, our claim would be that cognitive and affective processes are interdependent such that a cognitive construal of someone else's situation or state can arouse an affective response (such as the sympathy aroused in our study), affective appraisal can give rise to cognitive construal, and that the two work closely together to jointly give rise to behavior (see Pessoa, 2008).

general finding that the relation between sympathy and prosocial behavior exists but is not very strong (see Eisenberg & Miller, 1987; Eisenberg et al., 2006). This correlation could represent a causal link such that sympathy for a person leads to prosocial behavior toward that person, but it could also be due to a third variable such as temperament or emotion regulation (see Batson, 1998; Eisenberg & Miller, 1987; Hoffman, 1976, 1982). For instance, Young and colleagues (1999) found that inhibited children show less prosocial behavior and less empathy toward an unfamiliar experimenter (see also Eisenberg, 2005; Radke-Yarrow & Zahn-Waxler, 1984; van der Mark et al., 2002). A similar factor might also partially explain our correlation. Along similar lines, it could be argued that the correlation between children's concern and their subsequent prosocial behavior was actually a spurious correlation between the increased emotional arousal during sympathy situations and the resulting increased distress in the prosocial situation. However, this alternative interpretation of the correlation does not hold since we obtained the correlation even when showing distress was excluded from the coding scheme.

An interesting aspect of our results was that 4 of the 32 children in the neutral condition showed concern for E1. At first glance, this seems strange considering that E1 was in no way affected by E2's actions in this condition, but our sense during testing was that some children nevertheless worried that E2's behavior might be threatening to E1. For instance, after E1 had just finished drawing a picture, E2 tore up a blank piece of paper for no reason, and perhaps some children perceived this as a threat to E1's drawing, which was lying within easy reach of E2. Our aim in designing the neutral condition was to make it as similar as possible to the harm condition. This might, however, have led some children in the neutral condition to interpret E2's actions as negative for E1.

It is worth mentioning that we found almost no gender differences in our dependent measures and only one age difference in checking looks. Importantly, there were no age differences in children's show of concern, which suggests that the ability to sympathize without overt emotional cues from the sufferer is present by 18 months. On the one hand, this is striking considering the kinds of cognitive and affective experiences and abilities that are likely needed to sympathize in the absence of emotional signals. On the other hand, it is unsurprising given that even 14-month-olds have been shown to sympathize when a sufferer displays emotions (e.g., Zahn-Waxler, Radke-Yarrow, et al., 1992). Future work could further simplify our sympathy situations to test whether 14-month-olds also show concern without the aid of the victim's emotional signals.

One caveat about our findings is that children might have been influenced by their parents. Parents were instructed not to provide any cues and they were generally very good at following these instructions. Nevertheless, future work might have parents sit to the children's side to prevent them from potentially subtly influencing their children's responses. A more fundamental caveat concerns the generalizability of our findings. What, for example, is the range of situations within which young children can sympathize without emotion reading? We found that children sympathized in two kinds of situations: possession and effort. These categories cover many of the situations that children experience regularly. However, it is implausible that young children would sympathize in entirely novel categories of situations that they had no way to understand and in which they had no affective cues to

guide them (e.g., hearing that someone did not get the job that he wanted). Clearly, the ability to sympathize, especially in the absence of emotional cues from the sufferer, rests on one's knowledge and understanding of the world, both of which develop with age. There might also be cultural variation in the kinds of situations that elicit sympathy. Our possession situations, for instance, might not elicit sympathy in a culture in which belongings tend to be shared and not to be the sole property of one person. Finally, sympathy might vary depending on children's attachment to the victim or the victim's gender and race (see, e.g., Eisenberg & Lennon, 1983; Young et al., 1999). Thus, our findings certainly do not generalize to all situations and all cultures. How and why children's sympathy varies are fascinating questions that deserve much more attention.

In sum, even 18-month-old children can sympathize with someone who is in a negative situation but shows no affective cues. Moreover, the sympathy thus experienced follows the patterns that true sympathy is expected to follow: It increases the likelihood of prosocial behavior and, within individuals, it correlates with prosocial behavior. These findings show that we feel for and help people who are in hurtful situations, and we do so robustly and flexibly from very early in development.

References

Batson, C. D. (1987). Prosocial motivation: Is it ever truly altruistic? In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 20, pp. 65–122). San Diego, CA: Academic Press.

Batson, C. D. (1991). *The altruism question: Toward a social-psychological answer.* Hillsdale, NJ: Erlbaum.

Batson, C. D. (1998). Altruism and prosocial behavior. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, pp. 282–316). Boston: McGraw-Hill.

Batson, C. D., Fultz, J., & Schoenrade, P. A. (1987). Adults' emotional reactions to the distress of others. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 163–185). Cambridge, England: Cambridge University Press.

Batson, C. D., Sager, K., Garst, E., Kang, M., Rubchinsky, K., & Dawson, K. (1997). Is empathy-induced helping due to self–other merging? *Journal of Personality and Social Psychology, 73,* 495–509.

Bischof-Köhler, D. (1991). The development of empathy in infants. In M. E. Lamb & H. Keller (Eds.), *Infant development: Perspectives from German speaking countries* (pp. 245–273). Hillsdale, NJ: Erlbaum.

Blair, R. J. R. (2005). Responding to the emotions of others: Dissociating forms of empathy through the study of typical and psychiatric populations. *Consciousness and Cognition, 14,* 698–718.

Decety, J., & Jackson, P. L. (2006). A social-neuroscience perspective on empathy. *Current Directions in Psychological Science, 15,* 54–58.

Decety, J., & Sommerville, J. A. (2003). Shared representations between self and other: A social cognitive neuroscience view. *Trends in Cognitive Sciences, 7,* 527–533.

Denham, S. A. (1986). Social cognition, prosocial behavior, and emotion in preschoolers: Contextual validation. *Child Development, 57,* 194–201.

Dunn, J., & Hughes, C. (1998). Young children's understanding of emotions within close relationships. *Cognition and Emotion, 12,* 171–190.

Eisenberg, N. (2005). The development of empathy-related responding. In G. Carlo & C. P. Edwards (Eds.), *Nebraska symposium on motivation: Vol. 51. Moral motivation through the life span* (pp. 73–117). Lincoln: University of Nebraska Press.

Eisenberg, N., & Fabes, R. A. (1990). Empathy: Conceptualization, measurement, and relation to prosocial behavior. *Motivation and Emotion, 14,* 131–149.

Eisenberg, N., & Fabes, R. A. (1998). Prosocial development. In N. Eisenberg (Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed., pp. 701–778). New York: Wiley.

Eisenberg, N., Fabes, R. A., Miller, P. A., Fultz, J., Shell, R., Mathy, R. M., et al. (1989). Relation of sympathy and personal distress to prosocial behavior: A multimethod study. *Journal of Personality and Social Psychology, 57,* 55–66.

Eisenberg, N., & Lennon, R. (1983). Sex differences in empathy and related capacities. *Psychological Bulletin, 94,* 100–131.

Eisenberg, N., & Miller, P. A. (1987). The relation of empathy to prosocial and related behaviors. *Psychological Bulletin, 101,* 91–119.

Eisenberg, N., Shea, C. L., Carlo, G., & Knight, G. P. (1991). Empathy-related responding and cognition: A "chicken and the egg" dilemma. In W. Kurtines & J. Gewirtz (Eds.), *Handbook of moral behavior and development: Vol. 2. Research* (pp. 63–88). Hillsdale, NJ: Erlbaum.

Eisenberg, N., Spinrad, T. L., & Sadovsky, A. (2006). Empathy-related responding in children. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 517–549). Mahwah, NJ: Erlbaum.

Eisenberg-Berg, N., & Lennon, R. (1980). Altruism and the assessment of empathy in the preschool years. *Child Development, 51,* 552–557.

Feshbach, N. D. (1978). Studies of empathic behavior in children. In B. A. Maher (Ed.), *Progress in experimental personality research* (Vol. 8, pp. 1–47). New York: Academic Press.

Feshbach, N. D., & Roe, K. (1968). Empathy in six- and seven-year-olds. *Child Development, 39,* 133–145.

Harris, P. L. (1995). From simulation to folk psychology: The case for development. In M. Davies & T. Stone (Eds.), *Folk psychology: The theory of mind debate* (pp. 207–231). Oxford, England: Blackwell.

Harwood, M. D., & Farrar, M. J. (2006). Conflicting emotions: The connection between affective perspective taking and theory of mind. *British Journal of Developmental Psychology, 24,* 401–418.

Hastings, P. D., Zahn-Waxler, C., & McShane, K. (2006). We are, by nature, moral creatures: Biological bases of concern for others. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 483–516). Mahwah, NJ: Erlbaum.

Hobson, J. A., Harris, R., García-Pérez, R., & Hobson, P. (in press). Anticipatory concern: A study in autism. *Developmental Science.*

Hoffman, M. L. (1976). Empathy, role taking, guilt, and development of altruistic motives. In T. Lickona (Ed.), *Moral development and behavior* (pp. 124–143). New York: Holt, Rinehart, & Winston.

Hoffman, M. L. (1982). Development of prosocial motivation: Empathy and guilt. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 281–338). New York: Academic Press.

Hoffman, M. L. (1984). Interaction of affect and cognition in empathy. In C. E. Izard, J. Kagan, & R. B. Zajonc (Eds.), *Emotion, cognition, and behavior* (pp. 103–131). Cambridge, England: Cambridge University Press.

Hoffman, M. L. (2000). *Empathy and moral development: Implications for caring and justice.* Cambridge, England: Cambridge University Press.

Holmgren, R. A., Eisenberg, N., & Fabes, R. A. (1998). The relations of children's situational empathy-related emotions to dispositional prosocial behavior. *International Journal of Behavioral Development, 22,* 169–193.

Iannotti, R. J. (1985). Naturalistic and structural assessments of prosocial behavior in preschool children: The influence of empathy and perspective taking. *Developmental Psychology, 21,* 46–55.

Karniol, R. (1982). Settings, scripts, and self-schemata: A cognitive analysis of the development of prosocial behavior. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 251–278). New York: Academic Press.

Krebs, D., & Russell, C. (1981). Role-taking and altruism: When you put yourself in the shoes of another, will they take you to their owner's aid? In J. P. Rushton & R. M. Sorrentino (Eds.), *Altruism and helping behavior* (pp. 137–165). Hillsdale, NJ: Erlbaum.

Mangold International GmbH. (2007). Interact (Version 8.0) [Computer software]. Arnstorf, Germany: Author.

Miller, P. A., & Eisenberg, N. (1988). The relation of empathy to aggressive and externalizing/antisocial behavior. *Psychological Bulletin, 103,* 324–344.

Onishi, K. H., & Baillargeon, R. (2005, April 8). Do 15-month-old infants understand false beliefs? *Science, 308,* 255–258.

Pessoa, L. (2008). On the relationship between emotion and cognition. *Nature Reviews Neuroscience, 9,* 148–158.

Radke-Yarrow, M., & Zahn-Waxler, C. (1984). Roots, motives, and patterns in children's prosocial behavior. In E. Staub, D. Bar-Tal, J. Karylowski, & J. Reykowski (Eds.), *Development and maintenance of prosocial behavior: International perspectives on positive behavior* (pp. 81–99). New York: Plenum Press.

Ruby, P., & Decety, J. (2004). How would *you* feel versus how do you think *she* would feel? A neuroimaging study of perspective-taking with social emotions. *Journal of Cognitive Neuroscience, 16,* 988–999.

Sagi, A., & Hoffman, M. L. (1976). Empathic distress in newborns. *Developmental Psychology, 12,* 175–176.

Smith, A. (2006). *The theory of moral sentiments.* Mineola, NY: Dover Publications. (Original work published 1759)

Southgate, V., Senju, A., & Csibra, G. (2007). Action anticipation through attribution of false belief in two-year-olds. *Psychological Science, 18,* 587–592.

Thompson, R. A. (1987). Empathy and emotional understanding: The early development of empathy. In N. Eisenberg & J. Strayer (Eds.), *Empathy and its development* (pp. 119–143). New York: Cambridge University Press.

van der Mark, I. L., van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2002). Development of empathy in girls during the second year of life: Associations with parenting, attachment, and temperament. *Social Development, 11,* 451–468.

Wellman, H. M., Phillips, A. T., & Rodriguez, T. (2000). Young children's understanding of perception, desire, and emotion. *Child Development, 71,* 895–912.

Young, S. K., Fox, N. A., & Zahn-Waxler, C. (1999). The relations between temperament and empathy in 2-year-olds. *Developmental Psychology, 35,* 1189–1197.

Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concern for others. *Developmental Psychology, 28,* 126–136.

Zahn-Waxler, C., Robinson, J. L., & Emde, R. N. (1992). The development of empathy in twins. *Developmental Psychology, 28,* 1038–1047.