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Examining the Diversity of Prosocial Behavior: Helping, Sharing, and Comforting in Infancy

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Prosocial behaviors are a diverse group of actions that are integral to human social life. In this study, we examined the ability of 18- and 24-month-old infants to engage in three types of other-oriented behaviors, specifically helping, sharing, and comforting. Infants in both age groups engaged in more prosocial behavior on trials in which an unfamiliar adult experimenter required aid (experimental conditions) than on those in which she did not (control conditions) across two of the three prosocial tasks (i.e., helping and sharing). The infants engaged in these behaviors with similar frequency; however, there was no correlation between the tasks. The implications for the construct of prosocial behavior and the presence of a prosocial disposition are discussed.

Prosocial, other-oriented behaviors are an integral part of human life, playing an important role in successful social interactions and peer acceptance (Dekovic & Janssens, 1992; Eisenberg et al., 1996; Hampson, 1984; Raviv, Bar-Tal, Ayalon, & Raviv, 1980). Yet, despite the importance of other-oriented behaviors, little research was conducted on the topic prior to the 1970s (Eisenberg, Fabes, & Spinrad, 2006). Since that time, a number of naturalistic and observational studies have served to significantly advance our understanding of the production and maintenance of other-oriented

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behaviors (e.g., Eisenberg et al., 2006; Schroeder, Penner, Dovidio, & Piliavin, 1995). However, despite a growing interest in the nature of prosocial behavior, the majority of the research has focused on adults, adolescents, or older children, not toddlers or infants (Eisenberg et al., 2006). As a result, the nature of the earliest forms of prosocial behaviors and the developmental trajectory of other-oriented behaviors are still poorly understood.

It is generally accepted that prosocial behaviors emerge within the first 2 years of life and can take a variety of forms including helping, sharing, comforting, and cooperating (Brownell, Svetlova, & Nichols, 2009; Eckerman, Whatley, & Kutz, 1975; Rheingold, Hay, & West, 1976; Svetlova, Nichols, & Brownell, in press; Warneken & Tomasello, 2006; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). However, how the behaviors continue to develop after their initial emergence is less clear. Many researchers have suggested that prosocial behaviors should increase in frequency and complexity as children age (e.g., Eisenberg & Fabes, 1998; Eisenberg et al., 2006) and develop more advanced social cognitive capacities (Brownell & Carriger, 1990; Brownell, Ramani, & Zrewas, 2006; Hoffman, 1982, 2000; Svetlova et al., in press; Zahn-Waxler et al., 1992). In contrast, others hypothesize that following their initial emergence prosocial behaviors should decrease as children's prosocial behaviors become more regulated and selective (e.g., Hay, 1994; Hay, Castle, Davies, Demetriou, & Stimson, 1999).

One explanation for our limited understanding of the early development of prosocial behaviors is the nature of the research methods utilized. Specifically, despite the diverse nature of prosocial behavior (Eisenberg, 1982; Underwood & Moore, 1982), researchers have had a tendency to examine one or two exemplar behaviors and then extrapolate their findings to explain prosocial behavior as a whole (see Eisenberg-Berg & Hand, 1979; Radke-Yarrow et al., 1976; Zahn-Waxler et al., 1992 for notable exceptions). It has been suggested that the lack of differentiation between the multiple types of prosocial behaviors has resulted in inconsistencies within discussions of the development of prosocial behavior (Batson, 1991; Clark, 1991; Eisenberg & Fabes, 1998; Eisenberg et al., 1999; Hay & Cook, 2007). Indeed, different developmental trends (Radke-Yarrow, Zahn-Waxler, & Chapman, 1983) and correlates (Eisenberg-Berg & Hand, 1979) have been observed for different types of prosocial behaviors. Thus, one way to begin to clarify the nature of early prosocial behaviors is to use the results of previous studies to hypothesize the specific behaviors that make up the general category of prosocial behavior, and then systematically examine the presence of multiple modes of prosocial behaviors in early development, as well as their relations to each other.

At the most general level, prosocial behavior can be defined as any behavior that an individual engages in to benefit another. Prosocial behavior can

be differentiated from many other forms of behavior because it is a response based on the observation and interpretation of another individual's demonstration of need. However, not all needs are the same; needs come in a number of forms, requiring different interpretative abilities and different prosocial interventions. In this study we will focus on three main needs to which we believe infants respond, specifically instrumental, emotional, and material needs. Further, we suggest that the general category of prosocial behavior is made up of three specific types of responding that relate to each of the three needs: *helping*, an action that is intended to alleviate an instrumental need (e.g., recognizing and responding to another individual's inability to complete a specific goal-directed action); *comforting*, an action that is intended to alleviate an emotional need (e.g., recognizing and responding to the observation of another individual's negative affective state); and *sharing*, an action that is intended to alleviate a material need (e.g., recognizing and responding to another individual's lack of a desired material good).¹

Importantly, we differentiate each of the three types of prosocial behavior based specifically on the initial situational and emotional interpretations that the child must make in order to identify need and initiate the prosocial behaviors and *not* the subsequent behavior that the child engages in. This is an important distinction because the actual instrumental behaviors that the child engages in may overlap across the different categories of prosocial behavior. For example, an instrumental (e.g., Svetlova et al., in press) or material (e.g., Vaish, Carpenter, & Tomasello, 2009) intervention may alleviate an emotional need; however, because the children were attending to and attempting to address an emotional need, the behavior would be classified as a comforting act as opposed to helping or sharing. Thus, taken together, the general category of prosocial behaviors share the underlying intention to provide a benefit to another individual yet are differentiated based upon the specific need to which the individual is responding.

How does identifying the variety of forms that prosocial behaviors can take improve our understanding of the early development of prosocial behavior? It has been argued that children as young as 2 years of age possess the cognitive capacity to interpret the physical and emotional states of others, the emotional capacity to experience the affective states of others, and the behavioral repertoire to alleviate discomfort in others (Zahn-Waxler et al., 1992). However, the skills required to recognize each of the three types

¹We have purposefully left out two other behaviors from this discussion, cooperation and altruism. The intention of *cooperation* is to work with a partner toward a shared goal. However, it is not necessary that the individuals intend to provide a benefit to their partner. Relatedly, we reserve the term *altruism* for the specific subset of prosocial behaviors that benefit the recipient at a cost to the donor.

of need and identify an appropriate response may not be equal across all three subtypes of prosocial behavior. For example, in order to engage in instrumental helping, a child must interpret another's instrumental need based on the observation of an individual's incomplete action and identify the obstacle and understand how to overcome it. When we look at related developmental work we can see that helping should be relatively easy; children readily interpret goal-directed action (Csibra, Gergely, Biro, Koos, & Brockbank, 1999; Woodward, 1998), differentiate intentional from accidental actions (Behne, Carpenter, Call, & Tomasello, 2005), and correct unintended outcomes (Meltzoff, 1995). When we look at the prosocial behavior literature, we see that children readily help by 14 months of age (Warneken & Tomasello, 2007) and are motivated to help in variety of contexts (Tomasello, 2009; Warneken & Tomasello, 2006). Indeed, previous research has demonstrated that helping behaviors are some of the earliest emerging prosocial behaviors (Warneken & Tomasello, 2006; Zahn-Waxler et al., 1992).

In contrast, sharing requires the ability to recognize inequality between oneself and another and to overcome the desire to keep the resource for oneself (e.g., Brownell et al., 2009; Hay, 2006; Thompson, Barresi, & Moore, 1997). The challenges posed by sharing are not trivial; and it has been suggested that sharing is relatively rare in comparison to helping (Eisenberg, 2005; Grusec, 1991; Radke-Yarrow et al., 1976). Previous research suggests that infants begin to spontaneously offer goods and toys to both parents and familiar others between 8 and 12 months of age (Hay, 1979; Hay & Murray, 1982; Rheingold et al., 1976) and then share consistently by age 18 months (Rheingold et al., 1976). Other work has found that children were less likely to share when the recipient did not vocalize their desire (Brownell et al., 2009) or when the situation imposed a loss on the sharing child (Thompson et al., 1997). Taken together these findings suggest that our understanding of early sharing behavior is unclear, and that interpreting the material needs of another may pose important challenges for the developing child.

Finally, comforting requires that the child interpret another's emotional display of need, and determine the appropriate response, skills which are, relative to helping, slow to develop (Radke-Yarrow et al., 1976). Further, there are a variety of ways in which infants can respond to the observation of emotional need in others (Eisenberg, Shea, Carlo, & Knight, 1991), the complexity of which demonstrates different levels of social cognitive and prosocial maturity (Hoffman, 1982, 2000) and can vary depending on the familiarity of the individual with whom the child is interacting (Zahn-Waxler et al., 1992). Specifically, Hoffman (1982, 2000) has proposed a four-stage theoretical model of the development of infants' responses to other's emotional distress. Newborn and young infants respond to the observation

of emotional distress in others with self-distress, such as reactive crying, demonstrating a lack of differentiation between their own experiences and experiences of others. By the first year of life, infants have developed an immature differentiation between their own distress that of others, and as a result respond to their personal experience of distress and the observation of distress in another in the same way—seeking comfort for themselves. By early in the second year of life, infants are thought to respond to the emotional needs of others with comforting behaviors that are intended to benefit the other, an ability that develops and matures through the second year of life. Despite the significant challenges posed by comforting behavior, previous research suggests that by 3 years of age sharing and comforting occur with similar frequency (Radke-Yarrow et al., 1976). In sum, there is reason to believe that, although helping, sharing, and comforting can all be observed within the first 2 years of life, there may be rather marked differences in the infant's ability to respond to each of these needs and engage in the various forms of prosocial behavior.

The present study examined these three prosocial behaviors in late infancy and explored the possible relations among them. In addition, we examined the potential age-related changes in the early development of prosocial behavior by considering the three forms of prosocial behavior at both 18 and 24 months of age. Previous empirical and theoretical research both on the specific topic of prosocial behavior and related social cognitive abilities suggest that in the second year of life infants are undergoing a number of important social cognitive changes that may support an increased prevalence of prosocial behavior from 18 to 24 months (e.g., Brownell & Carriger, 1990; Brownell et al., 2006; Hoffman, 1982, 2000; Nichols, Svetlova, & Brownell, in press; Zahn-Waxler et al., 1992). Based on the research described above, we predicted the following: (a) helping behavior will be evident in both age ranges and show little developmental change; (b) sharing will be evident in the older children but will occur less frequently in the younger sample; and (c) comforting will only be apparent in the older sample, where it may take a variety of forms.

Because we were interested in how and when infants begin to respond to a variety of needs with prosocial behavior, it is important to be able to control the specific aspects of the situation that the infant is responding to. Many of the seminal studies on the early emergence of prosocial behavior have been conducted using naturalistic observation which does not allow for control of elements, such as the costs of aiding another, the presence or absence of reward for aiding, and the specific cue that the child is responding to; thus it can be difficult to determine the specific *need* the child is recognizing (for notable exceptions see Brownell et al., 2009; Warneken & Tomasello, 2006). In order to address this limitation, we compared infants'

responses to three situations in which an experimenter either demonstrated a need (the experimental conditions) or did not (the control conditions), allowing for an analysis of the diversity of needs that elicit prosocial responses early in development and the relations between these behaviors.

In sum, the purpose of the present study is threefold. The first goal of this study is to examine the ability of infants to interpret a diversity of needs and produce three distinct subtypes of prosocial behavior, specifically helping, sharing, and comforting. The second goal is to better understand the age-related changes in the production of the three subtypes of prosocial behavior between 18 and 24 months. Finally, the third goal of this study is to explore the relations, if any, between the multiple types of prosocial behavior in early development. If we find that the infants can produce all three behaviors, and that each form of prosocial behavior is related to the others, then we have achieved support for the convention of discussing "prosocial behavior" without reference to specific task. However, if we do not find relations between the tasks, then this may warrant a new approach to the examination and interpretation of prosocial behavior.

METHOD

Participants

Twenty-four 18-month-olds ($M\ age = 18.16$ months, range = 17.48–19.02 months, 11 females) and twenty-four 24-month-olds ($M\ age = 23.94$ months, range = 23.54–24.49 months, 11 females) participated in this study. Eighteen additional infants were excluded due to parental interference ($n = 4$), experimenter error ($n = 6$), computer/video malfunction ($n = 4$), and fussiness ($n = 4$). Three 18-month-olds and two 24-month-olds were excluded only from the comforting control analysis because they did not receive sufficient time to respond. Participants were recruited through birth announcements, local festivals, and local advertising in a midsize southeastern Ontario city and were predominantly Caucasian. The infants received a small gift for their participation, and parents were compensated \$10 for their travel.

Procedure

Infants in this study were recruited as part of a larger study that examined the development of social cognitive skills. Participation in the study took 1 hr and the prosocial tasks were interspersed between joint attention, imitation, intentional understanding, and standardized measures of cognitive and language development. The tasks were presented in four different

counterbalanced orders with the only stipulation being that two experimental trials could not occur in direct succession. This procedure allowed us to include the prosocial tasks in a manner that appeared natural and occurred relatively infrequently as compared to the other tasks. The first prosocial task was administered after at least 5 min of interaction with the experimenter in the testing room.

The infants were seated at a table in the middle of the room. The experimenter sat across the table from the infant and a parent sat behind the infant. Parents were encouraged not to interfere with the infant's responses; if a parent did provide any prompts, the participant was excluded from the analysis. The infants were presented with six test trials (two helping, two sharing, and two comforting), half of which were experimental (i.e., the experimenter demonstrated need) and half of which served as control trials (i.e., no need was demonstrated; Figure 1). The experimental and control trials were matched as closely as possible on perceptual characteristics, ensuring that the infants were responding specifically to the experimenter's need. That is, in both the experimental and control trials, the participant observed the experimenter engage in very similar actions, over the same period of time, with a similar amount of eye contact and attention toward the infant, but the trials differed in regard to whether or not the experimenter demonstrated a state of need. For example, in the comforting trial in both the experimental and control conditions, the experimenter hit her knee on the table, and then sat down, alternating between looking down and looking toward the infant; however, in the experimental condition she displayed negative affect and commented on her pain (demonstrating an emotional *need*), whereas in the control condition she simply maintained a neutral expression. Because each participant participated in both experimental and control trials for every prosocial task, we were able to examine the differences between the trial types within participants. These formed the primary comparisons of interest.

Helping Task

The "out of reach" task closely replicated the methods used by Warneken and Tomasello (2006). In the experimental trial, the experimenter picked up a small plastic toy, playfully "walked" it across the table, but then dropped it over the far edge while vocalizing "Oops!" Previous research (Carpenter, Akhtar, & Tomasello, 1998) has demonstrated that comparably aged children can use the vocalizations "Oops!" versus "There!" to distinguish accidental from intentional actions. The experimenter then reached toward the toy with an outstretched arm and hand. For the first 5 sec after the toy fell, the experimenter focused her gaze on the toy. After 5 sec, she alternated gaze between the toy and the infant until the infant provided a response or

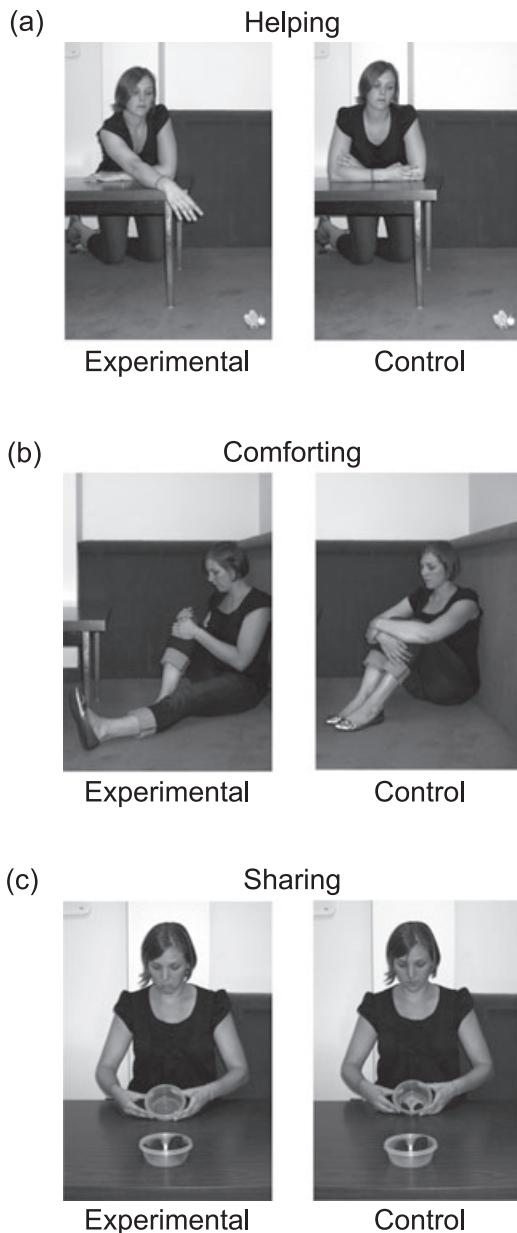


Figure 1 Depictions of experimental and control trials for each task (a) helping, (b) comforting, and (c) sharing.

the trial ended. Trials ended when 10 total seconds had elapsed. The experimenter never directly asked for help. In the control trial, the experimenter walked the toy across the table, but instead of dropping the toy off the edge of the table, she deliberately placed the toy on the floor. The experimenter said “There!” and folded her arms on the edge of the table, looking toward the participant with a neutral expression, waiting for 10 sec before moving onto the next task.

Comforting Task

In the experimental comforting trial, the experimenter hit her knee on the edge of the table, which in turn hit a metal brace, making a loud noise. The experimenter then sat down with a look of distress on her face. She rubbed her knee, vocalizing pain (e.g., “Oh! My knee, I banged my knee”). For the first 5 sec, the experimenter focused on her knee followed by a period of gaze alternation (5 sec) between her knee and the participant. The experimenter never directly requested aid. In the control trial, the experimenter again banged her knee on the edge of the table, creating a loud noise, but instead of vocalizing and rubbing her knee, she simply sat down and looked toward the participant with a neutral expression on her face (10 sec).

Sharing Task

Prior to each sharing trial, the infant was told that it was “snack time.” A research assistant brought in two small plastic containers with either cheese-flavored or graham crackers (based on the parent’s prior selection). The research assistant always gave the experimenter her snack first, holding the container out so both the participant and the experimenter could see what was inside. Upon receiving her snack, the experimenter showed her container to the infant and said, “Look what I have.” The child was then given his or her container. In the experimental trial, the experimenter received an empty container and the participant received four crackers. The experimenter then made a sad face and placed her hand out, palm facing up, whereas in the control condition the experimenter used her hand only to eat her treats. The outstretched arm in the experimental condition was thought to supply information regarding the desires of the experimenter, similar to the outstretched arm in the helping condition. Infants only shared the crackers (not other items on the table), demonstrating that their interpretation of the cue was appropriate within the context of the sharing task. For the first 5 sec, the experimenter looked down at her hand; after this, she alternated gaze between her hand and the infant until the infant either shared or finished his or her snack, or 10 sec had elapsed. The experimenter never

verbally requested food. In the control trial, the experimenter and the child received two crackers each. The experimenter waited for the child to receive her crackers before she began to eat her crackers and looked at the child with a neutral expression (10 sec). Across all three prosocial tasks (helping, sharing, and comforting) and both trial types (experimental and control), the infants were not rewarded for their responses. The experimenter acknowledged the receipt of items with a neutral “Thank you.”

Coding

Each session was video-taped and coded by a research assistant who was blind to the purpose and hypotheses of the study. Each prosocial trial (experimental and control) was coded for the target behavior. In the helping task, the target behavior was retrieving the toy from the ground and placing it in the experimenter’s hand. Nontarget behaviors included ignoring the toy, picking up the toy and playing with it, or explicitly refusing to help (e.g., shaking head or verbally saying “No”).

Given the theoretical background of Hoffman (1982, 2000), we expected that the participants in our study may still be developing their comforting abilities, and as such we were interested in examining the variety of empathic responses that infants of this age engage in during the comforting task. In addition, it has been proposed that empathic responses, such as those observed in comforting situations, can take two related forms (Eisenberg et al., 1991): sympathy (which results in feelings of concern for the other), or personal distress (which results in the motivation to alleviate one’s own distress). Thus, we coded for two sets of target behaviors. First, we coded for appropriate other-oriented interventions including approaching the experimenter (e.g., patting, hugging, or kissing), giving items to the experimenter (e.g., toys), or concerned vocalizations (e.g., asking about the experimenter’s welfare “You okay?”). We also coded the infant’s self-soothing behaviors (e.g., approaching their parent for comfort, sucking their thumb, touching their own knee). Nontarget behaviors included staring at the experimenter, ignoring the experimenter, or engaging in negative behavior toward the experimenter (e.g., hitting). Because other-oriented comforting behavior is proposed to be developmentally more mature than self-soothing behavior, an infant who engaged in both forms of behavior would have been coded as producing other-oriented comforting. For example if an infant both sucked their thumb and approached the experimenter, that infant would be coded as engaging in *other-oriented* comforting. Due to the short trial duration and low frequency of multiple codes we believed this to be the most accurate representation of the infant’s comforting (other-oriented or self-soothing) behavior.

In the sharing trials, the target behavior entailed the infant taking a cracker from his or her container and giving it to the experimenter. The nontarget behaviors included ignoring the experimenter, eating *all* the crackers at once, taking the crackers away from the table, or saying "No" (i.e., verbally or through a head shake).

A second blind coder coded a subset of the videos (24 videos, 50%) to establish interobserver reliability. Cohen's Kappa was computed (Cohen, 1960), and across all tasks, interrater agreement was very high, $\kappa = .92$ (Helping, $\kappa = .95$, Comforting, $\kappa = .88$, Sharing, $\kappa = .93$).

RESULTS

There was no effect of gender (χ^2 s < 1.5, p s > .22) or order (i.e., experimental first versus control first; χ^2 s < 2.18, p s > .14) on any of the prosocial tasks at either 18 or 24 months. All subsequent analyses collapse across gender and order.

Helping

Both the 18- and 24-month-olds were significantly more likely to provide aid in the experimental (experimenter displays need) versus the control trials (McNemar test: 18 months $p = .02$; 24 months $p = .001$; Figure 2a,b). Eight of the 18-month-olds engaged in helping behavior in the experimental condition, yet only one participant helped in the control condition. Half of the 24-month-olds (12) engaged in helping behavior in the experimental condition, but none did so in the control condition. For infants who engaged in helping behavior, 75% of both the 18- and 24-month-olds initiated their helping response within the first 5 sec of the experimental condition (i.e., before the experimenter made eye contact with the participant). The other 25% of the participants helped after 5 sec but before 10 sec had elapsed.

Sharing

Both age groups were more likely to share in the experimental than control condition (McNemar test: 18-month-olds, $p = .002$; 24-month-olds, $p = .001$; Figure 2a,b). Ten of the 18-month-olds and 14 of the 24-month-olds shared in the experimental conditions, yet none shared in the control conditions. Like helping, the sharing behavior occurred very quickly; nine of the 18-month-olds and 13 of the 24-month-olds shared within the first 5 sec of the trial. Only one of the 18-month-olds and one of the 24-month-olds took longer than 5 sec to initiate their response.

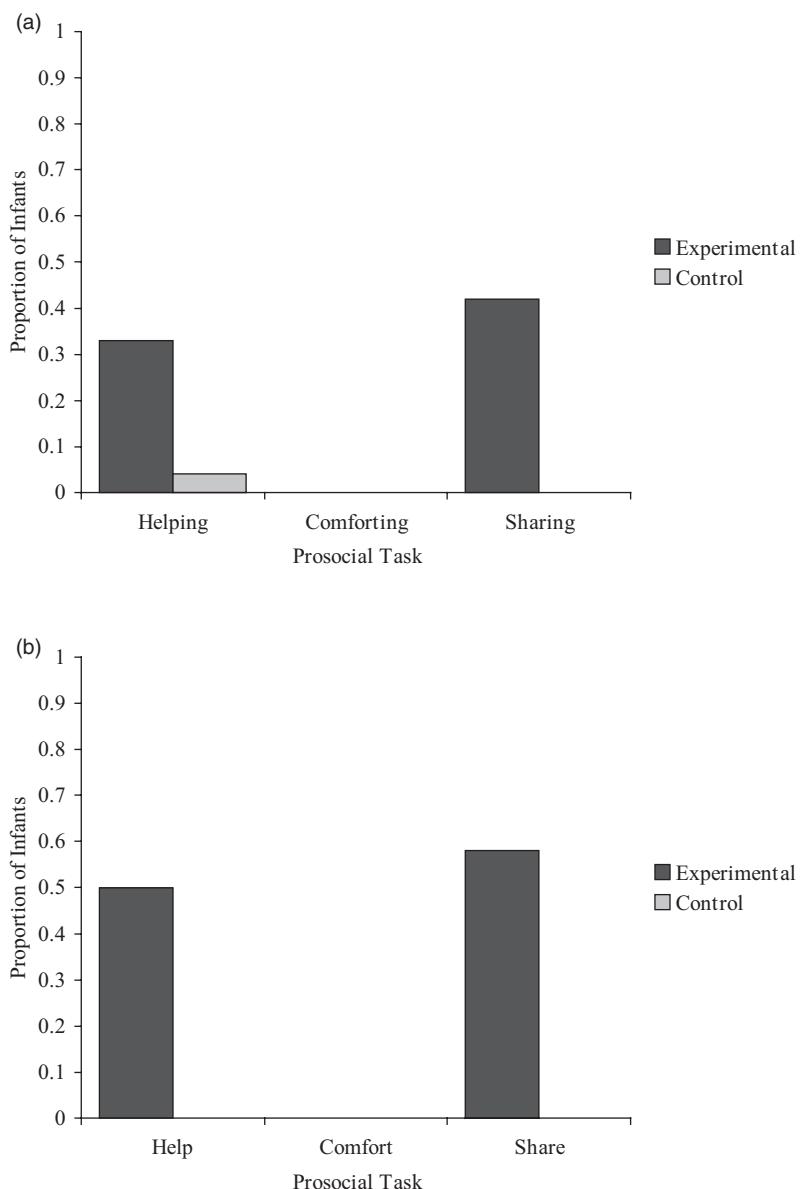


Figure 2 (a) The proportion of 18-month-olds who produced the target behavior in each of the prosocial tasks across both experimental and control trials. (b) The proportion of 24-month-olds who produced the target behavior in each of the prosocial tasks across both experimental and control trials. None of the infants in either age group engaged in other-oriented comforting behavior.

Comforting

None of the infants spontaneously engaged in other-oriented comforting behavior. That is, none of the infants in either of the age groups either verbally reassured or questioned the injured experimenter, or approached her to provide physical reassurance. Further, when we examined other comfort-related behaviors that the infants could have engaged in, specifically self-soothing behavior (i.e., approaching parent for reassurance), we found that although some of the infants were acknowledging the experimenter's injury with personal distress, there was no significant difference between the number of infants responding with personal distress in the experimental and control conditions in either age group (McNemar test: 18-month-olds: $p = 1.0$; 24-month-olds: $p = .219$). At 18 months, two participants engaged in self-soothing behaviors in the experimental condition while one additional participant self-soothed in the control condition. At 24 months, six of the participants self-soothed in the experimental condition while two did so in the control condition. Of the infants who engaged in self-soothing behaviors, all began to self-soothe after 5 sec but before 10 sec had elapsed. Because none of the infants engaged in *other-oriented* comforting, subsequent analyses were conducted only on the prosocial behaviors that the infants reliably engaged in, specifically helping and comforting.

Relations Between Prosocial Tasks

At 18 months of age, there was no difference in the number of participants engaging in helping and sharing (McNemar test, $p = .77$). At 24 months of age, the pattern was similar to the younger age group; there was no difference in the number of infants engaging in helping and sharing behavior (McNemar test, $p = .77$).

One possible explanation for the similar rates of prosocial behavior across the helping and sharing tasks is that the same infants may be providing aid in both situations. However, this was not the case. Participants in this study received three opportunities to engage in prosocial behavior and thus could receive a score of 0–3 on number of prosocial behaviors produced (in practice because none of the infants engaged in comforting behavior, they could receive a score of 0–2). The most common response in both age groups was to produce a single prosocial behavior (50% of 18-month-olds; 54% of 24-month-olds; Figure 3a,b). Further, when examining the relations between the two tasks for which infants demonstrated an ability to respond appropriately to need (i.e., helping and sharing), there was no association at either 18 ($\phi = -.06$, $p = .77$) or 24 months ($\phi = .00$, $p = 1.0$).

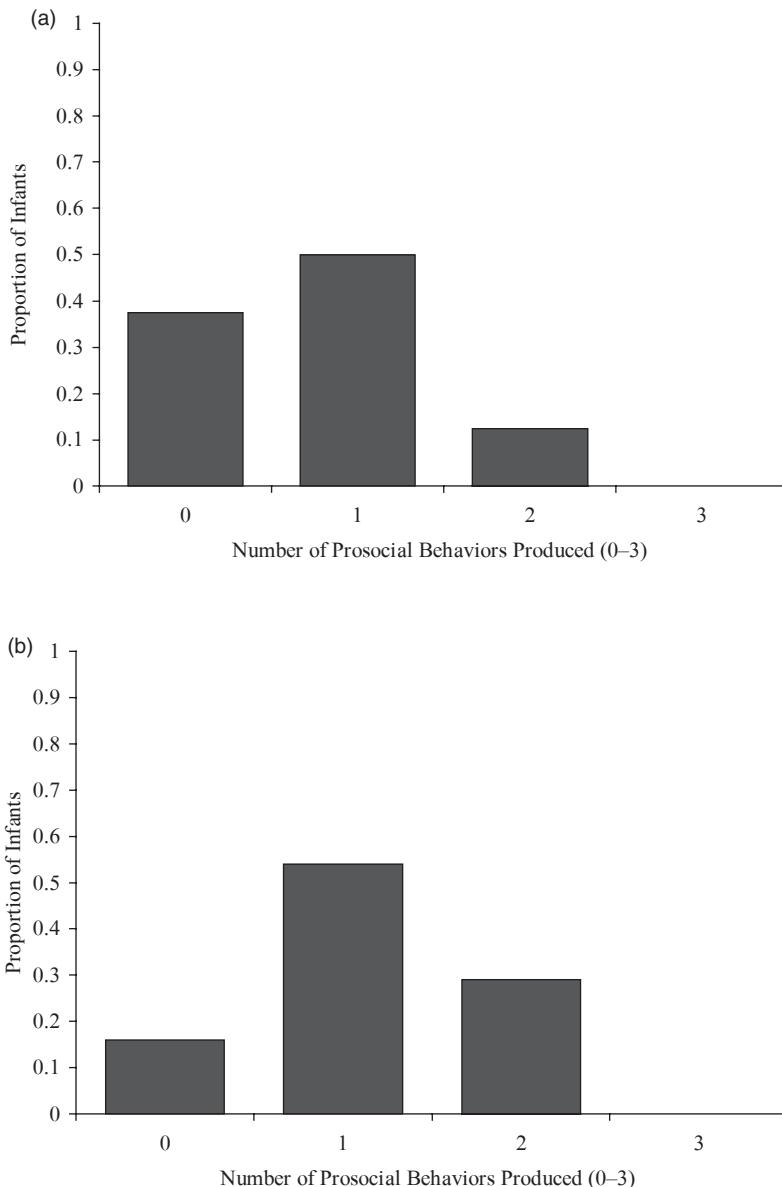


Figure 3 (a) The proportion of 18-month-olds who produced 0, 1, 2, or 3 target behaviors in total across the tasks. (b) The proportion of 24-month-olds who produced 0, 1, 2, or 3 target behaviors in total across the tasks.

Developmental Changes

To examine possible age-related changes in the frequency of prosocial behavior, chi-squared analyses were conducted to compare the production of target behaviors in the experimental trials. There was no difference between the age groups in the production of target behaviors in either of the two prosocial tasks: helping, $\chi^2(1, n = 48) = 1.34, p = .24$ or sharing $\chi^2(1, n = 48) = 1.33, p = .25$. However, when we collapse across the two subtypes of prosocial behavior and look simply at the amount of prosocial behaviors produced we see a trend toward a significant difference, $t(46) = 1.92, p = .06$, with 18-month-olds producing somewhat fewer prosocial behaviors ($M = .75, SD = .67$) than 24-month-olds ($M = 1.13, SD = .68$).

DISCUSSION

The present study suggests that despite the underlying challenges, by at least 18 months of age, infants are able to recognize a diversity of needs and are beginning to show the ability to spontaneously engage in two of three proposed subtypes of prosocial behavior, specifically, helping and sharing. This is the case even when the recipient of aid is an adult whom they had just met and the behavior provides no immediate benefit to themselves. Importantly, although only a minority of infants engaged in these prosocial behaviors, those that did, did so more often in contexts in which there was actually a need (experimental trials) than in contexts in which the surface characteristics were similar, yet no aid was required by the experimenter (control trials). Each of the prosocial behaviors will be discussed individually below. Additionally, the potential relations between the behaviors, and how the consideration of such relations speaks to the larger construct of prosocial behavior, will be considered.

Replicating previous work by Warneken and Tomasello (2006, 2007), we found that by 18 months, infants are beginning to identify the situations in which helping behavior is required; that is, they will aid instrumentally by retrieving an item that is out of a person's reach, thus fulfilling another's unmet goal. Further, the present study found a similar frequency of helping behavior to Warneken and Tomasello (2006), even though in the current study participants only received one experimental helping trial as opposed to the three trials they received in the previous paradigm. In light of previous studies, helping behavior may also be seen as young as 14 months, though the contexts in which it occurs are less flexible, owing perhaps to an emerging understanding of goal-directed activities (Warneken & Tomasello,

2007), recognition of the means by which certain unmet goals can be fulfilled, and the physical ability to mediate the completion of the goal.

The present study also suggests that both 18- and 24-month-old infants are willing to share their own resources with an adult who has none, yet desires some, in comparison to a situation in which both infant and adult have resources. Importantly, and contrasting with previous experimental research on sharing (Brownell et al., 2009), the task demanded that infants sacrifice some of their own valued goods, a task characteristic that has been found to reduce sharing frequency in studies with older, preschool children (e.g., Thompson et al., 1997). However, one aspect of our methodology that differed from previous paradigms may explain the increased sharing behavior: the experimenter extended her hand to the infant when she had no food of her own. The extended hand in our sharing paradigm serves as a non-verbal cue that may assist the infant in disambiguating the appropriate response to the experimenter's material need. Infants seemingly interpreted this behavior as a desire for the food as they did not provide the experimenter with an empty tray, a toy, or other nonfood object. Indeed, using a different methodology, Brownell et al. (2009) recently found that infant sharing behavior occurred only when the recipient expressed her desire for the resource, and thus it is possible that sharing in the present task was bolstered by the overt expression of desire. It remains unclear whether 18- and 24-month-olds would share in conditions in which only the inequality of resources was apparent (i.e., a situation in which adults usually precede sharing with an inquiry regarding desire: "Would you like some?").

In contrast to the helping and sharing tasks, infants did not engage in comforting behavior more frequently in situations in which an unrelated adult exhibited distress and pain than in superficially similar situations in which she did not express emotional need. In light of previous findings, it is not entirely surprising that we did not observe much comforting behavior in our young sample; Hoffman (1982, 2000) theory of empathic development proposes that true comforting, which he terms veridical empathic distress, does not emerge until infants pass their second birthday. Thus, the infants in our sample may have been too young to possess the capability to interpret others' emotional distress and produce an accurate response. Further, previous work by Zahn-Waxler et al. (1992) demonstrates that children's initial comforting behaviors are first directed to caregivers, then to other family members, and then eventually directed to unfamiliar others. As a result, the infants in our study may have possessed the *capacity* to engage in "true" comforting behaviors (Hoffman's veridical empathic distress) but were overwhelmed by the requirement of directing them to an unfamiliar adult.

Although there are a number of theoretical explanations to account for our failure to observe other-oriented comforting behaviors, we were

surprised that few of our infants engaged in self-soothing behaviors. There are three methodological considerations that may have affected our ability to observe self-soothing behaviors in our young sample. First, studies which have observed empathic responses in children as young as ours provided significantly more scaffolding, aiding the infants in interpreting the experimenter's need and determining the appropriate response (Phinney, Feshbach, & Farver, 1986; Spinrad & Stifter, 2006; Svetlova et al., in press). Relatedly, in both the helping and sharing tasks, subtle behavioral cues, such as an outstretched arm, provided the infant with information regarding the appropriate intervention that would alleviate the experimenter's need; there was no comparable cue available in the comforting task. As a result, the infants may not have had a clear idea as to how they would be able to aid the experimenter. Finally, we provided the infants with a very short trial duration. Given that the comforting task required that the infants regulate their own arousal and then determine and direct an appropriate response to an unfamiliar other, 10 sec may not have provided the infant with a sufficient amount of time. In support of this consideration, we note that three infants in our sample did eventually approach the injured experimenter, but their response could not be included in the final analysis because it occurred only after the trial cutoff time had been exceeded. Indeed, previous research that has observed comforting at a comparably young age provided the infants with considerably longer response periods (e.g., Phinney et al., 1986; Spinrad & Stifter, 2006; Svetlova et al., in press). Taken together, these three considerations suggest an important role for a more focused examination of the development of comforting and self-soothing behaviors in early development, with a specific focus on the role of cues and trial duration in the expression of this behavior.

We have referred to the helping and sharing behaviors observed here as occurring *spontaneously* because: (a) in the current design the experimenter made no verbal request for aid, (b) there is no suggestion made as to the correct behavior that will alleviate the need, (c) the parent did not encourage the provision of aid within the session, and (d) there was no reward (tangible or praise) for prosocial behavior. Further, the majority of the infants began to respond within the first 5 sec of the trial, before the experimenter directed her gaze to the infant. The only acknowledgment that the infants received for their appropriate prosocial responses was a verbal "thank you." It is unlikely that this experimenter response interfered with the spontaneous nature of the infant's prosocial responses for two reasons. First, there was only a single trial of each subtype of prosocial behavior, thus knowing the appropriate response in one task was unlikely to carry over to subsequent tasks. Second, there were no order effects in the infant's prosocial behavior. Infants were no more likely to engage in prosocial behavior after a successful prosocial trial

than after an unsuccessful prosocial trial. The infants' behavior thus supports previous claims that "very young children have a natural tendency to help other persons solve their problems, even when the other is a stranger and they receive no benefit at all" (Warneken & Tomasello, 2006, p. 1302). This is not to deny that the production of other-oriented behaviors is an early and consistent goal of childhood socialization; a "natural tendency" may include a preparedness to learn and generalize to various novel situations rapidly, and indeed, parental encouragement and teaching itself can be argued to be further indicative of a human tendency to engage in these behaviors.

That said, the present study raises important questions as to whether a tendency to benefit others should be construed as something akin to a "pro-social disposition" in infancy that encompasses all three behaviors examined here. While acknowledging the dangers of arguing from a null effect, it is the case that although the majority of the participants engaged in at least some prosocial behavior, there were no correlations between the various prosocial behaviors. Further, the most common pattern of response was to engage in only one type of prosocial behavior (helping or sharing). Although the tendency to engage in prosocial behavior in general tended to increase across our two timepoints, the increase was not the result of systematic development within or between the various subtypes of prosocial behavior. Thus, we have no evidence in the present study for "across the board" prosocial behavior within individuals in these two age groups. With future research that explores the consistency both within and between the multiple specific types of behavior, and that considers enduring behavior over time in a longitudinal manner (Eisenberg et al., 1999), it may be the case that helping, comforting, and sharing do not cluster together within an individual's repertoire and perhaps should not be grouped together as one general category of unified behavior in infancy.

In conclusion, given the present results and those from other studies, it is clear that the human ability to engage in a diverse range of other-oriented behaviors begins early in development. However, the manner in which we characterize the construct of prosocial behavior, considering the variety of diverse actions that can be considered "prosocial," should be further examined. This further research should assist in the identification of the developmental trajectories, cognitive mechanisms and other operational underpinnings, and even the species-uniqueness of other-oriented behavior.

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REFERENCES

- Batson, C. D. (1991). *The altruism question: Towards a social-psychological answer*. Hillsdale, NJ: Erlbaum.
- Behne, T., Carpenter, M., Call, J., & Tomasello, M. (2005). Unwilling versus unable: Infants' understanding of intentional action. *Developmental Psychology, 41*, 328–337.
- Brownell, C. A., & Carriger, M. S. (1990). Changes in cooperation and self-other differentiation during the second year of life. *Child Development, 61*, 1164–1174.
- Brownell, C. A., Ramani, G. B., & Zrewas, S. (2006). Becoming a social partner with peers: Cooperation and social understanding in one- and two-year-olds. *Child Development, 77*, 803–821.
- Brownell, C., Svetlova, M., & Nichols, S. (2009). To share or not to share: When do toddlers respond to another's needs? *Infancy, 14*, 117–130.
- Carpenter, M., Akhtar, N., & Tomasello, M. (1998). Fourteen- through 18-month-old infants differentially imitate intentional and accidental actions. *Infant Behavior & Development, 21*, 315–330.
- Clark, M. S. (1991). *Review of personality and social psychology: Prosocial behavior* (Vol. 12). Newbury Park, CA: Sage.
- Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20*, 37–46.
- Csibra, G., Gergely, G., Biro, S., Koos, O., & Brockbank, M. (1999). Goal attribution without agency cues: The perception of 'pure reason' in infancy. *Cognition, 72*, 237–267.
- Dekovic, M., & Janssens, J. M. A. M. (1992). Parents' child-rearing style and children's socio-metric status. *Developmental Psychology, 28*, 925–932.
- Eckerman, C. O., Whatley, J. L., & Kutz, S. L. (1975). Growth of social play with peers during the second year of life. *Developmental Psychology, 11*, 42–49.
- Eisenberg, N. (1982). The development of reasoning regarding prosocial behavior. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 219–249). New York: Academic Press.
- Eisenberg, N. (2005). The development of empathy-related responding. *Nebraska Symposium on Motivation, 51*, 71–117.
- Eisenberg, N., & Fabes, R. A. (1998). Prosocial development. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed., pp. 701–778). New York, NY: Wiley.
- Eisenberg, N., Fabes, R. A., Karbon, M., Murphy, B. C., Wosinski, M., Polazzi, L., ... Juhnke, C. (1996). The relations of children's dispositional prosocial behavior to emotionality, regulation, and social functioning. *Child Development, 67*, 974–992.
- Eisenberg, N., Fabes, R. A., & Spinrad, T. (2006). Prosocial development. In N. Eisenberg (Ed.), *Handbook of child psychology: Social emotional, and personality development* (6th ed., Vol. 3, pp. 646–718). Hoboken, NJ: John Wiley & Sons.

- Eisenberg, N., Guthrie, I. K., Murphy, B. C., Shepard, S. A., Cumberland, A., & Carlo, G. (1999). Consistency and development of prosocial dispositions: A longitudinal study. *Child Development*, 70, 1360–1372.
- Eisenberg, N., Shea, C. L., Carlo, G., & Knight, G. (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-Berg, N., & Hand, M. (1979). The relationship of preschoolers’ reasoning about prosocial moral conflicts to prosocial behavior. *Child Development*, 50, 356–363.
- Grusec, J. (1991). Socializing concern for others in the home. *Developmental Psychology*, 27, 338–342.
- Hampson, R. B. (1984). Adolescent prosocial behavior: Peer group and situational factors associated with helping. *Journal of Personality and Social Psychology*, 46, 153–162.
- Hay, D. (1979). Cooperative interactions and sharing between very young children and their parents. *Developmental Psychology*, 6, 647–658.
- Hay, D. (2006). Yours and mine: Toddlers talk about possessions with familiar peers. *British Journal of Developmental Psychology*, 24, 39–52.
- Hay, D. F. (1994). Prosocial development. *Journal of Child Psychology and Psychiatry*, 35, 29–71.
- Hay, D. F., Castle, J., Davies, L., Demetriou, H., & Stimson, C. A. (1999). Prosocial action in very early childhood. *Journal of Child Psychology and Psychiatry*, 40, 905–916.
- Hay, D. F., & Cook, K. V. (2007). The transformation of prosocial behavior from infancy to childhood. In C. A. Brownell, & C. B. Kopp (Eds.), *Socioemotional development in the toddler years: Transitions & transformations* (pp. 100–131). New York, NY: Guilford.
- Hay, D. F., & Murray, P. (1982). Giving and requesting: Social facilitation of infants’ offers to adults. *Infant Behavior and Development*, 5, 301–310.
- Hoffman, M. L. (1982). Development of prosocial motivation: Empathy and guilt. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 281–313). New York, NY: Academic Press.
- Hoffman, M. L. (2000). *Empathy and moral development*. New York, NY: Cambridge University Press.
- Meltzoff, A. N. (1995). Understanding the intentions of others: Re-enactment of intended acts by 18-month-old children. *Developmental Psychology*, 31, 838–850.
- Nichols, S. R., Svetlova, M., & Brownell, C. (in press). Toddlers’ understanding of peer emotions. *Journal of Genetic Psychology*.
- Phinney, J. S., Feshbach, N. D., & Farver, J. (1986). Preschool children’s response to crying. *Early Childhood Research Quarterly*, 1, 207–219.
- Radke-Yarrow, M., Zahn-Waxler, C., Barrett, D., Darby, J., King, R., Pickett, M. & Smith, J. (1976). Dimensions and correlates of prosocial behavior in young children. *Child Development*, 47, 118–125.
- Radke-Yarrow, M., Zahn-Waxler, C., & Chapman, M. (1983). Children’s prosocial dispositions and behavior. In P. Mussen (Series Ed.) & E. M. Hetherington (Vol. Ed.), *Handbook of child psychology: Vol. 4. Socialization, personality and social development* (4th ed., pp. 469–545). New York, NY: Wiley.
- Raviv, A., Bar-Tal, D., Ayalon, H., & Raviv, A. (1980). Perceptions of giving and receiving help by group members. *Representative Research in Social Psychology*, 11, 139–150.
- Rheingold, H. L., Hay, D. F., & West, M. (1976). Sharing in the second year of life. *Child Development*, 47, 1148–1159.
- Schroeder, D. A., Penner, L., Dovidio, J. F., & Piliavin, J. A. (1995). *The psychology of helping and altruism: Problems and puzzles*. New York, NY: McGraw-Hill.

- Spinrad, T. L., & Stifter, C. A. (2006). Toddlers' empathy-related responding to distress: Predictions from negative emotionality and maternal behavior in infancy. *Infancy*, *10*, 97–121.
- Svetlova, M., Nichols, S. R., & Brownell, C. A. (in press). Toddlers' prosocial behavior: From instrumental to empathic to altruistic helping. *Child Development*.
- Thompson, C., Barresi, J., & Moore, C. (1997). The development of future-oriented prudence and altruism in preschoolers. *Cognitive Development*, *12*, 199–212.
- Tomasello, M. (2009). *Why we cooperate*. Cambridge, MA: MIT Press.
- Underwood, B., & Moore, B. (1982). Perspective-taking and altruism. *Psychological Bulletin*, *91*, 143–173.
- Vaish, A., Carpenter, M., & Tomasello, M. (2009). Sympathy through affective perspective taking and its relation to prosocial behavior in toddlers. *Developmental Psychology*, *45*, 534–543.
- Warneken, F., & Tomasello, M. (2006). Altruistic helping in human infants and young chimpanzees. *Science*, *311*, 1301–1303.
- Warneken, F., & Tomasello, M. (2007). Helping and cooperation at 14 months of age. *Infancy*, *11*, 271–294.
- Woodward, A. L. (1998). Infants selectively encode the goal object of an actor's reach. *Cognition*, *69*, 1–34.
- Zahn-Waxler, C., Radke-Yarrow, M., Wagner, E., & Chapman, M. (1992). Development of concerns for others. *Developmental Psychology*, *28*, 1038–1047.