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Emotion understanding, theory of mind, and prosocial orientation: Relations over time in early childhood

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Abstract

Data were collected when children were 42, 54, and 72 months of age ($N_s=210$, 191, and 172 for T1, T2, and T3, respectively). Children's emotion understanding (EU) and theory of mind (ToM) were examined as predictors of children's prosocial orientation within and across time. EU positively related to children's sympathy across 2.5 years, and T1 EU positively related to parent-reported prosocial orientation concurrently and across 1 year (T2). T2 ToM positively related to parents' reports of sympathy and prosocial orientation concurrently and 18 months later (T3); in contrast, T3 ToM did not relate to sympathy or prosocial orientation. T2 ToM accounted for marginally significant variance ($p<0.058$) in T3 mother-reported prosocial orientation over and above that accounted for by T2 prosocial orientation. Fostering the development of EU and ToM may contribute to children's prosocial orientation.

Keywords

emotion understanding; theory of mind; prosocial behavior; empathy; sympathy

Introduction

Understanding how to promote children's virtues, such as a prosocial orientation and compassion, may have implications for improving our communities, families, and children's abilities to live responsible, dignified lives (Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001). Children's prosocial orientation, including their empathy, sympathy, and prosocial behavior, has been related to high status within the peer group, accomplishing one's own needs, and maintaining positive relationships with others (Eisenberg, Fabes, & Spinrad, 2006; Rose-Krasnor & Denham, 2009). Associations between a prosocial orientation and these aspects of social-emotional competence underscore the importance of understanding factors that may advance prosocial development. Understanding others' emotions and mental states could be two such factors (Eisenberg et al., 2006). In the spirit of understanding processes that contribute to individuals' and groups' positive functioning (Gable & Haidt, 2005), we examined relations of emotion understanding (EU), theory of mind (ToM), and prosocial orientation within and across time during early childhood, a time when EU and ToM are undergoing rapid development.

Prosocial orientation

In an effort to offset the focus on negative aspects of individual's functioning, the positive psychology movement has used a strength-based perspective, highlighting compassion, tolerance, and altruism. Eisenberg et al. (2006) have differentiated *empathy* – 'an affective response that stems from the apprehension or comprehension of another's emotional state or condition, and which is identical or very similar to what the other person is feeling or would be expected to feel' (p. 647) – from other vicarious emotional responses, such as sympathy and personal distress. *Sympathy* entails feeling sorrow or concern for another. Sympathy may stem from empathy, but also can result from cognitive processing such as perspective taking or memory retrieval (Eisenberg et al., 2006; Vaish, Carpenter, & Tomasello, 2009). In contrast to sympathy, which is another-focused response, *personal distress* is 'a self-focused, aversive emotional reaction to the vicarious experiencing of another's emotion' (Eisenberg et al., 2006, p. 647; see also Batson, 1991). Personal distress also may result from empathic arousal (if at a high level and experienced as aversive) during exposure to another's situation or state.

Prosocial behavior is defined as 'voluntary behavior intended to benefit another' (Eisenberg et al., 2006, p. 646). Prosocial behaviors include acts, such as helping, sharing, comforting, and cooperating (regardless of motivation). Eisenberg and colleagues have hypothesized and often found that prosocial behavior, particularly spontaneous, as opposed to compliant, acts (e.g., handing a friend a toy without being prompted versus because he or she asked for the toy), is positively associated with empathy and sympathy but not personal distress (Eisenberg et al., 2006). Thus, in this study, we considered measures of empathy, sympathy, and prosocial behavior to be indices of *prosocial orientation*.

In a meta-analysis, prosocial behavior was found to generally increase across the preschool years and school years (Eisenberg & Fabes, 1998). Age-related changes in prosocial behavior are believed to result from the development of increasingly complex EU and the emergence of ToM, as well as from the development of other abilities, such as improvements in emotion regulation, language, and moral reasoning skills (e.g., Denham, 1998; Eisenberg et al., 2006). Moreover, individual differences in EU and ToM are expected to contribute to dispositional differences in prosocial responding.

Emotion understanding

EU encompasses abilities such as knowing terms for emotions, recognizing facial expressions, and understanding elicitors of emotion. EU is a part of the more global constructs of affective social competence and social effectiveness (Halberstadt, Denham, & Dunsmore, 2001; Saarni, Campos, Camras, & Witherington, 2006).

Performance on EU tasks improves with age. For example, older preschoolers are better than younger preschoolers at naming and recognizing emotional expressions (Denham & Couchoud, 1990a). Receptive EU (pointing to pictures of expressions) appears to develop earlier than expressive EU (generating labels for the expressions; Denham & Couchoud, 1990a), perhaps as a function of language development. Denham (1986) found, on average, 2- and 3-year-olds scored better than chance at identifying emotions using affect labeling and affective perspective-taking tasks. However, children tend to exhibit variability in responding, even at preschool age (Denham, 1986; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991).

Understanding of emotion expressions does not develop at the same rate for all emotions. For example, when angry, sad, fearful, and happy expressions were examined, preschoolers had the easiest time naming and recognizing happiness. They had the most difficult time naming fear (Denham & Couchoud, 1990a; Eisenberg, Murphy, & Shepard, 1997). In a

related manner, Widen and Russell's (2003) results suggested that the frequency with which preschoolers produce expression labels increases with age, and the emotion labels of happy, angry, and sad are used at a younger age than scared. In a sample of 3–6-year-old children, Fabes, Eisenberg, Nyman, and Mischealieu (1991) found that the older children in the sample were better at identifying emotional reactions displayed in a naturalistic setting than were the younger children. In addition, children were better at identifying happy emotional reactions than negative emotional reactions. Researchers have suggested that understanding situations that elicit complex emotions not associated with a particular facial expression, such as jealousy and pride, develop closer to the age of 7 years (Harris, Olthof, Terwogt, & Hardman, 1987).

In an affective perspective-taking task, Denham and Couchoud (1990b) presented 3- and 4-year-olds with vignettes in which the protagonist's emotion was other than what the child would likely feel in the situation. For example, if the child did not like school, the vignette was about a child who enjoyed school. Older preschoolers were better than younger preschoolers at correctly identifying emotions (see also Gnepp, Klayman, & Trabasso, 1982). In addition, Denham and Couchoud (1990b) found that preschoolers were more accurate at identifying the correct emotion if the two emotions potentially evoked by the situation were of a different valence as opposed to the same valence (e.g., happy and sad versus sad and angry).

Taken together, these results suggest that children's EU improves with age. Children appear to develop the ability to correctly recognize happiness before other expressions, and it is more difficult for young children to distinguish among expressions that are negative in valence.

Theory of mind

ToM is defined as the general ability to understand one's mental states, such as intentions, emotions, and desires, among other functions, that preface our actions, and to comprehend that others possess the same ability (Wellman, Cross, & Watson, 2001). This ability is used to explain and predict the mental states and behavioral outcomes in others (e.g., Astington, 1993; Flavell, 2004; Premack & Woodruff, 1978; Wellman, 1990).

Children's ToM often is examined using false-belief tasks that test the ability to understand (1) the mental states of others, (2) that mental states of others may be different than one's own, and (3) the relation between behavior and mental states. A belief can accurately represent reality and be true, or misrepresent reality and be false. Understanding a false belief requires holding two mental representations in mind at once: the true state of reality and the false mental representation of reality (Hogrefe, Wimmer, & Perner, 1986).

A popular task assessing false-belief understanding is the 'Smarties' task (Perner, Leekam, & Wimmer, 1987). In this task, children are shown a box, such as a candy box, which is demonstrated to contain something unexpected, such as a pencil. Children then are asked to predict what another person who has not seen the contents of the box would think was inside. The correct answer is that the naïve will think there is candy in the box. Although the correct answer is obvious to adults with a mature understanding of beliefs, what is striking is the consistency with which children do not pass the task before approximately age 4 (Perner et al., 1987). Children who do not pass the task will answer that the onlooker will think the unexpected content (a pencil) is inside the box. These children falsely presume that the onlooker has an accurate mental representation of reality, and will know it contains a pencil, without having seen inside.

In a meta-analysis, it was found that children generally pass false-belief tasks between 4 and 5 years (Wellman et al., 2001). Children show signs of ToM earlier in life (Wellman, 2002), but there is a qualitative shift in ToM ability around 4 years. This appears to be robust across cultures, languages, and variations in task demands and premises (Wellman et al., 2001).

Relations between EU and ToM

ToM likely assists in understanding others' emotions, especially when the emotion experienced by the other differs from what the child would feel. For example, ToM might assist a child who likes roller coasters to understand that another child may dislike roller coasters and experience fear on a roller coaster. However, studies in which the relation between EU and ToM has been examined have yielded mixed results. In some cases, they have not been related (e.g., Dunn et al., 1991), whereas they have been positively correlated in other studies (e.g., Cutting & Dunn, 1999; Hughes & Dunn, 1998). Cutting and Dunn (1999, p. 861) suggested viewing false-belief understanding and EU as 'related but distinct aspects of social cognition.' It is possible that the younger age of the participants in Dunn et al.'s (1991; on average 3 years 4 months) study, relative to the ages of the participants in the studies by Cutting and Dunn (1999; on average 4.16 years) and Hughes and Dunn (1998; at T1, 3 years 11 months on average), contributed to the mixed results. Indeed, the vast majority of the participants of the study by Dunn et al. had difficulty passing traditional false-belief tasks. As a result, the measure of false-belief understanding used in analyses relied upon children's explanations for false-belief-based actions rather than on children's predicted actions based on false beliefs (e.g., 'why do you think she's looking in there?' versus 'where do you think she'll look for Band-aids?', respectively).

Relations of EU and ToM to prosocial orientation

Researchers frequently have suggested that understanding one's own thoughts and emotions facilitates an understanding of others' thoughts and emotion and, hence, the capacity for sympathy, empathy, and the motivation for prosocial behaviors (Feshbach, 1978; Roberts & Strayer, 1996). Individuals who tend to understand others' emotions and cognitions are expected to be at an advantage in regard to the level of their moral reasoning and their tendencies to sympathize with and help others (Eisenberg et al., 2006).

Results from a number of cross-sectional studies support a positive relation between EU and aspects of children's prosocial orientation (Eisenberg et al., 2006). Ensor and Hughes (2005) found that toddlers' (on average, 29 months old) EU was positively related to mothers' reports of toddlers' prosocial behavior. Denham (1986) found that 2- and 3-year-olds' EU was positively related to observed prosocial behavior in structured tasks (a composite of tasks with a confederate child and tasks with a female adult), but EU was not related to prosocial behavior observed during free play at daycare. Preschoolers' emotion knowledge has been positively related to prosocial responding toward an adult's sadness (Denham & Couchoud, 1991). Children's (5-, 9-, and 13-year-olds) understanding of their own emotional expression has been positively associated with empathy. Moreover, empathy has been positively associated with prosocial behavior (a composite of reports and observations during structured tasks), although the relation was weaker for girls than boys (Roberts & Strayer, 1996). In Garner, Dunsmore, and Southam-Gerrow's (2008) study, preschoolers' explanations for emotions were coded from observations of mothers and children interacting while 'reading' a wordless book that contained pictures of family members expressing emotions. The frequency of children's explanations of emotions, which likely tapped both language use and EU, was positively related to preschoolers' spontaneous and requested prosocial behavior observed in same-sex triads.

Cognitive perspective taking – the ability or tendency to understand another's cognitions (see, e.g., Eisenberg et al., 1997) – is implicated in ToM and aspects of EU. For example, the capacity for ToM provides skills useful for perspective taking (Flavell & Miller, 1998) and EU in complex contexts. Although it is possible that understanding one's circumstance and internal states (including emotions) directly leads to prosocial behavior, some researchers believe it indirectly leads to prosocial behavior through its influence on empathy, sympathy, and/or moral reasoning (Eisenberg, Zhou, & Koller, 2001; Roberts & Strayer, 1996; Strayer & Roberts, 1989). Aspects of perspective (or role) taking have been positively associated with empathy, sympathy, and/or prosocial behavior (e.g., Batson et al., 2003; Eisenberg & Miller, 1987; Eisenberg et al., 2006; FitzGerald & White, 2003; Hoffman, 1982; Roberts & Strayer, 1996). Moreover, sympathy and empathy, especially the former, have been found to correlate with and predict prosocial behavior (Eisenberg et al., 2006).

The capacity for ToM has been linked theoretically to children's social competence, positive peer relationships, and prosocial behavior. As children become aware of others' thoughts, beliefs, and intentions, they are likely better able to predict others' responses and interactions, and are better able to modify their own thoughts, beliefs, and intents to optimize social interactions. Children with a sophisticated understanding of others' cognitive states should also be better able to form higher quality relationships early on with their peers and adults, which are likely to contribute to social and emotional well-being. Furthermore, children's mental understanding of others allows a deeper knowledge of others' difficulties and condition, which may engender feelings of empathy and sympathy and, hence, foster prosocial behavior.

Results from a growing body of research suggest that ToM may relate to aspects of prosocial orientation. Lalonde and Chandler (1995) found that preschoolers who performed better on ToM tasks tended to play cooperatively more and engaged in longer play episodes than preschoolers with poorer ToM performance. In many cases, children's prosocial orientation has not been examined on its own, but rather as a part of the larger construct of social competence. For example, ToM has been positively related to 3- to 6-year-olds' teacher-rated social skills (Watson, Nixon, Wilson, & Capage, 1999). Preschoolers' ToM also has been found to correlate with social interactions, such as talking with others about mutual interests or engaging in joint play proposals, imaginative play, and role assignment (Astington & Jenkins, 1995; Lalonde & Chandler, 1995). These forms of play likely facilitate cooperative behavior. Nonetheless, aspects of a prosocial orientation have not always been found to relate to ToM (Badenes, Estevan, & Bacete, 2000; Ruffman, Slade, Devitt, & Crowe, 2006). For example, Astington and Jenkins (1995) did not find a relation between preschoolers' ToM and empathic concern.

In several studies, EU and ToM both have been examined in relation to prosocial orientation. For example, Cassidy, Werner, Rourke, Zubernis, and Balaraman (2003) found 37- to 65-month-old preschoolers' EU and ToM each to be positively related to teacher-rated social skills (which included positive social and prosocial skills) and to observed prosocial behavior (e.g., cooperation, helping, and sharing) in the classroom. In addition, ToM and EU of positive emotion were positively related to teacher-rated prosocial behavior in a sample of Israeli kindergartners (Diesendruck & Ben-Eliyahu, 2006). In a longitudinal study, Dunn et al. (1991) found that most of the 40-month-olds in their sample did not pass the false-belief task as traditionally administered. Children also were presented with a puppet's behavior that was based on a false belief and children were asked to offer explanations of the behavior. False-belief explanations as well as EU at 40 months of age were positively associated with cooperative interactions with an older sibling observed in the home at 33 months of age. It is possible that cooperative interactions promoted social-cognitive development or vice versa.

False-belief explanations and EU were assessed only at 40 months, and cooperation was assessed only at 33 months; thus, relations controlling for earlier levels of the outcomes could not be assessed.

In summary, EU and ToM are theoretically expected to relate to prosocial orientation and a number of studies support this assumption, although there have been exceptions. Furthermore, there are few studies in which EU and ToM have been examined longitudinally with respect to prosocial orientation.

This study

Children's EU and ToM were examined as predictors of a prosocial orientation within and across 42, 54, and 72 months of age (T1, T2, and T3). The design allowed for the examination of relations across time and permitted analyses in which prosocial behavior could be predicted from EU or ToM while controlling for earlier levels of prosocial behavior. Furthermore, multiple methods were used, thereby eliminating problems of shared-method variance in the relations of primary interest. Children's EU and ToM were observed, whereas children's prosocial orientation was self-, mother-, and/or father-reported.

Based on prior research and the hypothesized role of EU and ToM in children's empathy, sympathy, and prosocial behavior, we expected that EU and ToM would positively relate to prosocial orientation within and across time. However, we expected that individual differences in EU and ToM would be more predictive when children were experiencing periods of developmental change in EU and ToM. That is, while children's EU and ToM abilities continue to develop with age, we expected more variability in children's performance on EU and ToM tasks at the earlier time points and less variability at the latest time point when most children had achieved a fairly high level of competence. Specifically, we expected that EU at T1 and T2 would be more predictive of prosocial orientation than EU at T3 due to greater variability in EU at younger ages. Moreover, we expected ToM at T2 to be more predictive of prosocial orientation than ToM at T3 because we believed the latter age would be prone to a ceiling effect. We also predicted that EU and ToM would predict later prosocial orientation while controlling for earlier prosocial orientation during this period of development.

Method

Sample

Children and parents were participants of a longitudinal study (Spinrad et al., 2007). Participating families were recruited from three hospitals in a major metropolitan area and met the criteria of a full-term birth with no serious medical conditions, parents over the age of 18, and the expectation to remain in the area for at least 2 years. Parents completed at-home questionnaires and mothers accompanied their children to a lab session when their children was approximately 18, 30, 42, and 54 months of age. At 72 months, typically, data were collected in the participants' homes (see below for further detail). In this study, only data from the 42-, 54-, and 72-month collections were used, and are referred to as T1, T2, and T3, respectively.

At T1, the sample included 93 girls (M age in months=41.70, SD =0.51) and 117 boys (M age in months=41.79, SD =0.75). T2 included 84 girls (M age in months=53.88, SD =0.83) and 107 boys (M age in months=53.90, SD =0.78). T3 included 76 girls (M age in months=72.88, SD =1.40) and 96 boys (M age in months=73.19, SD =1.55).

At T1, T2, and T3, respectively, ethnicity for the participants was non-Hispanic (77.6%, 78.5%, and 77.9%) and Hispanic (22.4%, 21.5%, and 22.1%). In terms of race, participants

were Caucasian (82.9%, 83.2%, and 85.5%), African American (6.2%, 6.3%, and 5.8%), Asian (2.4%, 2.1%, and 2.3%), Native American (5.7%, 6.3%, and 4.7%), two or more minority races (1.4%, 1.0%, and 0.6%), another race (1.0%, 0.5%, and 0.6%), or race was unknown (0.5%, 0.5%, and 0.6%). Households were two-parent (84.8%, 83.2%, and 83.1%), single-parent (13.3%, 15.7%, and 11.0%), or were missing household status data (1.9%, 1.0%, and 5.8%). Parents' highest level of education ranged from completion of grade school to a PhD, JD, or MD. Median education was some college/2-year college for mothers and for fathers at T1 (education data were not collected at T2 or T3). Family income ranged from less than \$15,000 to over \$100,000 per year at each time point, with a median of \$45,000–60,000 at T1 and \$60,000–\$75,000 at T2 and T3.

Attrition

In this study, 24 and 41 families had data at T1, but did not have data at T2 and T3, respectively. Differences in characteristics between families participating at T1 and at T2 or T3 versus families participating at T1 but not at T2 or T3 were calculated using Pearson χ^2 tests for children's sex, race (Caucasian or non-Caucasian), ethnicity, and household status and using *t*-tests for income. No differences were found between attrited and non-attrited families.

Study variables at T1 were examined for differences in means for children with data at T1 and T2 or T3 versus with data at T1 but without data at T2 or T3 using *t*-tests. Only one significant difference was detected. Children participating in T1 but not T3 had significantly lower EU than those participating at T1 and T3, $t(190)=2.23$, $p<0.05$, $LL=0.34$, $UL=5.51$ (attrited $M=11.09$, $SD=7.13$, non-attrited $M=14.01$, $SD=6.79$).

Procedure

Children's EU was assessed during laboratory/home sessions and prosocial orientation was assessed with questionnaires at all time points. ToM was assessed during sessions at T2 and T3. Graduate students and trained undergraduate research assistants conducted and videotaped each session. Consent was obtained and a number of observed tasks were completed at sessions, although only those pertinent to this study are described.

At T1 and T2, sessions were conducted in the laboratory. Mothers completed questionnaires but did not participate in tasks used in this study. At T3, sessions were conducted at the participants' homes ($n=122$), but in some instances were conducted in the laboratory at the family's request ($n=27$). Participants were compensated at all assessments.

Measures

Materials were selected to measure children's EU, ToM, and prosocial orientation. Measures were completed by children and their parents.

Emotion understanding

EU at 42 months: At T1, children's expressive EU (affect labeling) and emotion knowledge in stereotypical and non-stereotypical situations (affective perspective taking) were tested using Denham's (1986) tasks. Presentation order of emotion/vignettes for EU tasks was counterbalanced across children.

In the expressive emotion task, children were presented with four puppet faces (happy, sad, mad, scared) and asked how each face was feeling. Children's responses were recorded by experimenters as 0=incorrect and 1=correct. Scores were summed to form an expressive EU score. At the end of the task, experimenters identified the correct emotions of each puppet, regardless of children's performance.

Children then were tested on emotion knowledge in stereotypical situations through eight vignettes, expressing happy, sad, mad, or scared emotions. Experimenters enacted each vignette with puppets using vocal and facial affective cues. The protagonist's gender and approximate skin color were matched to the child's. The children were asked to verbally identify the correct emotion. For example, 'I'm Johnny. Here is my sister. She gave me some ice cream. YUM, YUM!!' The children were asked how the character feels (happy), and were prompted for a verbal response. If none was given or they offered a non-emotion word (e.g., good), the children were asked to point to the correct emotion using puppet faces. Responses were recorded by experimenters as 0=incorrect and 1=correct. Scores were summed across eight situations to form a stereotypical situation EU score.

Children then were tested with 12 non-stereotypical situations. In order to hear the last six non-stereotypical stories, children had to get at least two of the first six non-stereotypical stories correct. The children who were doing poorly often had great difficulty continuing with this task. Based on mothers' reports of their children's likely responses to situations given on the Typical Emotion Questionnaire (Denham, 1986), vignettes were altered. For example, if a mother reported that going to preschool would make her child sad, the experimenter would enact the happy preschool vignette, 'Here comes Johnny and his Mommy. We are coming to school. *I like it here—we have so much fun!*' The children were asked how the character feels (happy), and were prompted for a verbal response. If none was given or they offered a non-emotion word (e.g., good), the children were asked to point to the correct emotion using puppet faces. Experimenters recorded responses as 0=incorrect and 1=correct. Scores were summed across 12 situations to form a non-stereotypical EU score.

The three EU measures were positively correlated, range of $r_s(190)=0.41$ to 0.76 , $p_s<0.001$. They were summed to form a composite of T1 EU.

EU at 54 months: At T2, EU was assessed with only the stereotypical situation task. See above for procedure and scoring. The measure of non-stereotypical situations was not administered due to time constraints.

EU at 72 months: At T3, children's EU in situations was tested (Izard, 1971; Izard, Haskins, Schultz, Trentacosta, & King, 2003; Izard et al., 2008). Experimenters read 12 vignettes and presented four photographs of children expressing different emotions. Children were asked to identify the emotion the protagonist was feeling. For example, 'Show me the one whose puppy just got lost and did not come home. How does that child feel?' (sad). Verbal responses were coded as 0=incorrect and 1=correct and were summed.

Theory of mind—Two tasks measuring false-belief understanding were used. The first, an adapted Smarties task (Perner et al., 1987), was administered at T2 and T3. Children were presented with a crayon box and asked what they thought it contained. The box was opened and a toy car was taken out for the child to observe and touch. After placing the car back into the box, children were asked control questions: (1) 'What kind of box is this?' and (2) 'What is inside the box now?' Children were told to pretend the experimenter had a friend, Suzie, waiting outside, who had never seen the inside of the box. Children were asked, 'When she first looks at the box, before she opens it, does she know what's in there?' Then they were asked the false-belief question, 'Will she think there is crayons or a car inside?'. The order of presentation of 'crayons' or 'car' in the false-belief question was counterbalanced across children.

The second ToM task was a false-belief story task administered at T2 (Pyers & de Villiers, 2003). Three different stories and accompanying pictures were presented to children. For

example, children were told that there is a boy who loves chocolate chip cookies and that he is afraid of the big dog next door. His neighbor brings a dog into the boy's house as the boy is outside on a swing (and unable to see the neighbor). His mother then calls him inside for some chocolate chip cookies, and the boy runs inside, thinking about the cookies. After each story, children were asked a false-belief question (e.g., 'Where does the boy think the dog is?'). The order in which the three stories were presented was counterbalanced across children. Experimenters recorded children's false-belief responses as 0=incorrect or 1=correct. At T2, the false-belief Smarties and story tasks were positively correlated, $r(156)=0.39, p<0.001$, and were averaged to form a composite of T2 ToM.

Prosocial orientation—Questions from the empathy subscale of the Infant–Toddler Social and Emotional Assessment (ITSEA; Carter & Briggs-Gowan, 1999) assessed empathy, sympathy, and prosocial behavior in children at T1 and T2 through parents' reports (henceforth called *prosocial orientation*). Parents were asked to rate the children on seven items (e.g., *Tries to make you feel better when you are upset*) using a 3-point scale (1=*not true* to 3=*very true*). Three items were dropped from the original subscale because they appeared to assess constructs other than prosocial orientation (e.g., EU – *Is aware of other people's feelings*, and personal distress – *Is worried or upset when someone is hurt*). The remaining 4 items were averaged within reporter to form prosocial orientation composites (T1 α s=0.70 and 0.75 and T2 α s=0.73 and 0.77 for mothers and fathers, respectively). At T1 and T2, mother- and father-reported prosocial orientation were positively correlated, r s(132, 116)=0.33 and 0.29, p s<0.001 and 0.01, and were averaged within time to form parent-reported prosocial orientation composites.

At T3, prosocial orientation was assessed with the Children's Social Behavior Scale (CSBS; Crick, 1996), completed by mothers. The questionnaire consisted of 4 items, for example, this child tries to cheer up peers when they are sad or upset about something, rated on a 5-point scale (1=*never true* to 5=*never false*; α =0.91).

Sympathy at T1 and T3 were assessed with Eisenberg et al.'s sympathy items (e.g., 1996, 1998; some adapted from Bryant, 1982). Mothers rated seven items (e.g., feels sorry for other children who are being teased) on a 4-point scale (1=*really false* to 4=*really true*). Items were averaged to form T1 and T3 sympathy composites (α s=0.72 and 0.82, respectively).

At T3, children rated sympathy items (1=*not like me* to 3=*really like me*) from an adapted version of the mother-reported scale that was read aloud by the experimenter (parents were not in the same room as the child; Eisenberg et al., 1996). The six items were averaged (e.g., I feel sorry for other kids who don't have toys and clothes; α =0.75). Items assessed sadness or concern for others. Previous studies have supported the use of the self-reported measure with young school-age children. For example, Eisenberg et al. (1996) found that 6- to 8-year-olds' self-reports on very similar items correlated with teachers' reports of sympathy and children's and teacher's reports of sympathy correlated with emotionality, regulation, and social functioning in a similar manner (see also Eisenberg et al., 2007).

Note that we consider sympathy to be a part of prosocial orientation. Mother-rated sympathy at T1 and T3 were positively correlated with the ITSEA prosocial measure at T1 and the CSBS prosocial measure at T3, r s(186, 163)=0.38 and 0.36, p s<0.001, respectively. However, we did not combine the measures to maintain consistency between T1 and T2 measures.

Results

Statistical analyses were conducted using SPSS version 17. Descriptive statistics, correlations within time, correlations across time, and prediction across time controlling for earlier levels of prosocial orientation are discussed.

Descriptive information

Means, standard deviations, and possible ranges of T1, T2, and T3 study variables are presented in Table 1. No variables exhibited excessive skew or kurtosis. Sex differences in mean levels of the study variables were examined using *t*-tests. Significant sex differences, in which girls always had higher means than boys, also are presented in Table 1.

Correlations were computed in which relations within construct were examined (Table 2). Measures of EU were positively related across time. Measures of ToM were not significantly related from T2 to T3, perhaps because most (about 80%) children passed at T3. With regard to prosocial orientation and sympathy, all measures were positively related within and across time with a few exceptions. T3 child-reported sympathy did not relate to adult-reported prosocial orientation or sympathy measures. Thus, individual differences in prosocial orientation and EU, but not ToM, were somewhat related over time.

Relations between EU and ToM

EU and ToM sometimes were positively related within and across time (Table 2). T1 EU was positively related to T2 and T3 ToM. T2 ToM was positively related with T2 and T3 EU.

Relations between social-cognitive and prosocial orientation variables

Relations of EU and ToM with prosocial orientation also are presented in Table 2.¹ Within time, T1 EU did not significantly relate to mother-reported sympathy but was positively related to parent-reported prosocial orientation. T2 EU was unrelated to T2 parent-reported prosocial orientation. T3 EU was positively related with children's T3 self-reported sympathy, but was unrelated to T3 mother-reported prosocial orientation and sympathy.

In terms of across-time correlations (with EU relating to later prosocial orientation), T1 EU positively related to T2 parent-reported prosocial orientation and T3 child-reported sympathy. T2 EU positively related to T3 mother- and child-reported sympathy.

Within time, T2 ToM was positively related to parent-reported prosocial orientation. T3 ToM was unrelated to T3 prosocial orientation or sympathy. Across time, T2 ToM was positively related to T3 mother-reported sympathy and mother-reported prosocial orientation.

In addition, prosocial orientation sometimes was related to later EU or ToM. T2 parent-reported prosocial orientation was positively related to T3 EU. T1 mother-reported sympathy and T1 parent-reported prosocial orientation were positively related to T2 ToM.

Longitudinal prediction of prosocial orientation from EU or ToM controlling for prior level of prosocial orientation

To assess prediction of prosocial orientation, hierarchical multiple regressions were computed in which longitudinal prediction of prosocial orientation from earlier EU or ToM

¹We explored if correlations between EU or ToM and prosocial orientation differed by children's sex. Fisher *R* to *Z* tests indicated no significant differences in correlations between boys and girls.

was examined while controlling for earlier prosocial orientation. The control variable was entered in the first step and the predictor was added in the second step of the regression. In some cases, identical earlier and later prosocial orientation/sympathy measures were not available (e.g., for child-reported sympathy). Thus, longitudinal regressions only were computed if a similar measure could be used as a control variable.

Thus, five longitudinal regressions were computed (T2 parent-reported prosocial orientation predicted from T1 EU controlling for T1 parent-reported prosocial orientation [regression 1]; T3 mother-reported sympathy predicted from T1 EU controlling for T1 mother-reported sympathy [regression 2]; and T3 mother-reported prosocial orientation predicted from T1 EU, T2 EU, or the T2 ToM composite controlling for T1 or T2 mother-reported prosocial orientation [regressions 3–5]).

In all five regressions, earlier prosocial orientation/sympathy was a positive and significant predictor of later prosocial orientation/sympathy. The following are the overall *F*-statistics and standardized *B*s for the control variables from the first steps of Regressions 1 through 5: *F*s(1, 164; 1, 151; 1, 149; 1, 144; and 1, 144)=107.69, 24.19, 8.58, 13.41, and 13.41, *ps*<0.001, 0.001, 0.01, 0.001, and 0.001, *B*s=0.63, 0.37, 0.23, 0.29, and 0.29, *ps*<0.001, 0.001, 0.01, 0.001, and 0.001, respectively. This finding suggests a degree of stability in children's prosocial orientation/sympathy. This stability likely made it difficult to obtain significant prediction of later prosocial orientation/sympathy from EU or ToM.

Of the five regressions, one included prediction of later prosocial orientation/sympathy over-and-above earlier prosocial orientation/sympathy.² Specifically, the T2 ToM composite accounted for marginally significant variance in T3 mother-reported prosocial orientation over-and-above that accounted by T2 mother-reported prosocial orientation, $R^2\Delta=0.02$, *p*=0.06, *F*(2, 143)=8.66, *p*<0.001. T2 mother-reported prosocial orientation and T2 ToM positively predicted T3 mother-reported prosocial orientation, *B*s=0.26 and 0.16, *ps*=0.002 and 0.058, respectively.

Discussion

Rather than focusing on children's maladjustment, in this study we examined aspects of children's positive functioning. That is, children's EU and ToM were examined as predictors of caring reactions across T1, T2, and T3 (42, 54, and 72 months). We predicted EU and ToM would be positively related to prosocial orientation within and across time. We also expected EU and ToM at earlier, compared to later, time points to be more predictive of prosocial orientation. Many correlations within and across time supported these expectations. When correlations were significant, EU and ToM positively related to prosocial orientation and sympathy.

EU did not consistently relate to all measures of sympathy or prosocial orientation. EU rarely related to mother-reported sympathy; however, T2 EU positively related to mother-reported sympathy 18 months later (T3). EU at all three time points was positively related to T3 child-reported sympathy. To our knowledge, this is the first study in which EU has been found to relate to young children's self-reports of sympathy. This result was interesting because the child-reported measure of sympathy did not relate to other measures of prosocial orientation or sympathy. The vast majority of the items assessing prosocial orientation inquired about affect or behavior that would be visible to others. Conversely, the sympathy items assessed sadness or concern for others that may have been less visible to parents or parents may not have differentiated their children's sympathy from personal distress. Thus,

²Results were very similar when age or sex was controlled.

for the sympathy scale, it is possible that children were more accurate reporters of sympathy than their mothers. This may explain why EU had consistent relations with sympathy when reported by children but not mothers (although mother- but not child-reported sympathy related to ToM at T2).

T1 EU was positively related to parent-rated prosocial orientation at T1 and T2, although later EU did not relate to concurrent or later prosocial behavior. T1 EU had a greater number of significant relations with measures of prosocial orientation (prosocial behavior, sympathy) than did T2 or T3 EU. The variance of T1 EU exceeded that of T2 and T3 EU, and the T1 EU composite contained a greater number and variety of EU components than T2 and T3 EU. EU of the emotions assessed is likely developing more rapidly at 42 months than at later ages. It is possible that our measures of EU are better suited for 42-month olds than older children.

As reviewed, other researchers have found positive associations between EU and prosocial behavior in children (Denham, 1986). Taken together with results from previous studies, our results support the idea that EU likely assists in being aware of and interpreting emotional responding of others in need and this may lead children to feel sympathetic (the correlations between EU and child-reported sympathy) and may prompt prosocial responding.

Consistent with previous research (e.g., Cassidy et al., 2003), ToM at T2 was consistently related to measures of sympathy and prosocial orientation within and across time. However, T2 ToM was unrelated to child-reported sympathy. T2 ToM nearly significantly predicted mother-reported prosocial behavior 18 months later (T3), when controlling for T2 mother-reported prosocial behavior. The relation appeared to be fairly robust, and, unlike for EU, a trend for prediction of later prosocial behavior was obtained. In contrast to the T2 measure, T3 ToM did not relate to sympathy or prosocial measures. This may be due to a ceiling effect; 115 of 143 children (80%) passed the task at T3. Thus, ToM at T2, but not T3, appeared to be predictive of parent-reported sympathy and prosocial behavior. Moreover, the marginally significant relation between ToM and later prosocial orientation when controlling for initial levels of the latter increases our confidence that ToM might have some causal effects on prosocial orientation.

The false-belief task assesses understanding of others' beliefs or behaviors as affected by their beliefs. Comprehending why others behave as they do may aid children in responding positively toward others. It is possible that this type of behavior was reflected in the parent-reported prosocial orientation measures, and possibly even somewhat with the mother-reported sympathy measures used in this study. Perhaps because child-reported sympathy was a purer assessment of emotional empathic arousal and concern for others as opposed to assessing an understanding of behavior, similar relations between ToM and child-reported sympathy were not found.

This study also allowed for the examination of relations between earlier prosocial orientation and later EU or ToM. A significant relation was detected between earlier prosocial orientation and later EU. Parent-reported prosocial orientation at T2 was positively related to EU at T3. Dunn et al. (1991) also found a positive association between cooperative behavior and later EU (33 and 40 months, respectively). In this study, measures of sympathy and prosocial orientation at T1 also were positively related to T2 ToM. Dunn et al. (1991) similarly found cooperation to predict later ToM (33 and 40 months). Thus, there may be bidirectional relations between false-belief understanding and prosocial behavior or ToM. Prosocial behavior has been related to positive peer relations and being liked by others (Eisenberg et al., 2006; Rose-Krasnor & Denham, 2009). It is possible that having frequent positive exposure to others (e.g., conversations with peers, playing with others in

cooperative groups) gives children more experience with their own and others' emotions and the situations that elicit them, as well as others' mental states and how behavior is guided by them.

Preschoolers' EU and ToM have been inconsistently correlated (e.g., Cutting & Dunn, 1999; Dunn et al., 1991). In this study, T1 EU was positively related to T2 and T3 ToM (despite the ceiling effect for T3 ToM). In addition, T2 ToM was positively related with T2 and T3 EU. Results support that EU and ToM are separate but related skills (Cutting & Dunn, 1999).

Limitations and summary

Despite strengths of the study, such as using longitudinal data as well as multiple reporters, the study had limitations. Perhaps the most significant limitation was that not all measures were collected at all time points. Measurement of the constructs changed over time, in part due to change in children's abilities. This limited what analyses could be performed with these data and perhaps most importantly, minimizes what can be said about stability and change in EU, ToM, and prosocial orientation. For example, the measure of prosocial orientation changed at T3. Thus, in regressions predicting T3 prosocial orientation, the control variable (T1/T2 prosocial orientation) differed somewhat from the outcome.

Having observed measures of prosocial orientation would have strengthened the study and likely minimized any influence of social desirability. In addition, EU often is assessed through vignettes. Using observed measures of children's understanding of naturally occurring emotion, as some researchers have done in the past (Denham, 1986; Fabes et al., 1991), also would have strengthened the study and contributed to higher ecological validity.

It is possible that a 'third variable' is influencing EU or ToM and prosocial orientation. For example, children's effortful control has been related to ToM and empathy-related responding (e.g., Carlson & Moses, 2001; Eisenberg, 2010).

Despite the limitations, this study contributes to our knowledge of relations among EU, ToM, and prosocial orientation. Promoting children's EU and ToM may facilitate development of prosocial orientation. Results from previous studies may suggest ways of doing so. For example, aspects of parenting, such as explaining emotions and supportive reactions to children's affect expression, have been related to children's EU (see Eisenberg, Cumberland, & Spinrad, 1998). Researchers have suggested that socialization by older siblings may relate to ToM understanding (e.g., Ruffman, Perner, Naito, Parkin, & Clements, 1998). Exploring methods of socialization which help develop understanding of others' emotions and minds and how, in turn, this understanding relates to prosocial orientation over time might be an interesting future direction. Nurturing children's capabilities and positive traits may improve the quality of children's lives and the lives of those surrounding them (Seligman & Csikszentmihalyi, 2000).

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Table 1

Descriptive statistics.

Construct	Variable	N	Potential range	M	SD
Prosocial orientation	T1 M prosocial	205	1–3	2.48	0.41
	T1 F prosocial ^a	135	1–3	2.46	0.44
	T1 P prosocial composite	206	1–3	2.47	0.37
	T1 M sympathy ^b	192	1–4	2.93	0.46
	T2 M prosocial	189	1–3	2.41	0.40
	T2 F prosocial ^c	119	1–3	2.41	0.44
EU	T2 P prosocial composite	190	1–3	2.41	0.37
	T3 M prosocial	165	1–5	3.75	0.80
	T3 M sympathy	165	1–4	3.13	0.48
	T3 C sympathy	150	1–3	2.21	0.56
	T1 expressive puppets EU ^d	192	0–4	1.84	1.37
	T1 stereotypical puppets EU	192	0–8	4.89	2.39
ToM	T1 non-stereotypical puppets EU	192	0–12	6.78	4.15
	T1 puppets EU composite	192	0–24	13.51	6.92
	T2 stereotypical puppets EU	168	0–8	6.86	1.35
	T3 Izard stories EU	150	0–12	8.84	1.74
	T2 ToM smarties	158	0–1	0.34	0.48
	T2 ToM stories	168	0–0	0.31	0.33
	T2 ToM composite	168	0–1	0.33	0.33
	T3 ToM false belief	143	0–1	0.80	0.40

Notes: P, parent-reported (average of mother- and father-reported data); M, mother-reported; F, father-reported; C, child-reported; T1, 42-months; T2, 54-months; T3, 72-months; M, mean; SD, standard deviation, LL, lower limit, and UL, upper limit.

^a Sex difference: $t(133) = -2.04, p = 0.04, LL = 0.30, UL = -0.01$, boys' $M = 2.38$, girls' $M = 2.53$;

^b sex difference: $t(190) = -2.52, p = 0.01, LL = -0.29, M = -0.04$, boys' $M = 2.86$, girls' $M = 3.02$;

^c sex difference: $t(117) = -2.54, p = 0.01, LL = -0.36, UL = -0.05$, boys' $M = 2.32$, girls' $M = 2.53$;

^d sex difference: $t(190) = -2.66, p = 0.01, LL = -0.91, UL = -0.13$, boys' $M = 1.61$, girls' $M = 2.13$.

Table 2

Within and across time correlations.

Variable	1	2	3	4	5	6	7	8	9	10	11
1 T1 EU puppets Co	–	0.47***	0.20*	0.22**	0.19*	0.04	0.13	0.30***	0.24**	0.16*	0.13
2 T2 EU styp puppets		–	0.30***	0.16*	0.05	0.01	0.29***	0.19*	0.13 ⁺	0.05	0.11
3 T3 Izard EU			–	0.18*	0.10	0.02	–0.04	0.18*	0.11	0.17*	–0.01
4 T2 ToM Co				–	0.11	0.18*	0.23**	0.02	0.21**	0.20**	0.22**
5 T3 ToM false belief					–	–.10	0.09	0.05	0.04	–0.02	0.12
6 T1 M sympathy						–	0.37***	0.02	0.38***	0.43***	0.23**
7 T3 M sympathy							–	0.11	0.40***	0.44***	0.36***
8 T3 Ch sympathy								–	0.13	0.03	–0.05
9 T1 P prosocial Co									–	0.59***	0.17*
10 T2 P prosocial Co										–	0.27***
11 T3 M prosocial											–

Notes: P, parent-reported (average of mother- and father-reported data); M, mother-reported; Ch, child-reported; styp, stereotypical; Co, composite; T1, 42-months; T2, 54-months; and T3, 72-months. Degrees of freedom ranged from 118 to 188.

* $p < 0.05$,

** $p < 0.01$, and

*** $p < 0.001$;

⁺ $p < 0.10$ (all two-tailed).