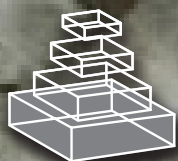# frontiers
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SUGAR AND SPICE, AND EVERYTHING NICE: EXPLORING PROSOCIAL DEVELOPMENT THROUGH INFANCY AND EARLY CHILDHOOD

Topic Editors
Chris Moore, Markus Paulus and Amanda Williams

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SUGAR AND SPICE, AND EVERYTHING NICE: EXPLORING PROSOCIAL DEVELOPMENT THROUGH INFANCY AND EARLY CHILDHOOD

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Amanda Williams, Dalhousie University, Canada

Williams, A. (2014). Sharing a snack, photograph

Prosocial behaviours such as sharing, helping, and comforting begin to emerge early in development. The presence of these prosocial behaviours is important not only in childhood, but throughout one's lifetime, as behaving prosocially is important for social functioning and maintaining social relationships.

For many years researchers have been interested in how and when these behaviours develop, as well as how these behaviours are influenced by a variety of factors. Recently however, exciting new research has shown novel and surprising findings, particularly on the early development and ontogenetic origins of prosocial behaviour.

Research is this area is important, as by understanding what influences prosocial behaviour, we may be better able to sustain and support the development of prosociality. Further, a richer understanding may help us to be better able to mediate factors that impede or negatively influence positive social behaviours, as well as negate triggers that may lead to negative social behaviours.

Many theoretical views guide different streams of developmental research in this field. Here, we will bring together scholars from various theoretical backgrounds, to collectively explore the development of early prosocial behaviours from early infancy to early school

aged children. Contributors will offer insights using a variety of methodologies, from various resource allocation paradigms derived from economist game theorists, to looking time paradigms and more.

Together we seek to broadly explore questions pertaining to prosocial development, for example- at what age do prosocial behaviours, moral understanding, or social selectivity emerge? Contributors will individually address unique research questions across a spectrum of topics. For example, how prosocial behaviours are influenced by underlying mechanisms, such as moral emotions (e.g. guilt and sympathy), will be explored, as will how children's expectations may shape their behaviours, and how they come to care about others. Questions surrounding different contexts will also be investigated. For example, how does empathy influence prosociality? Do children treat partners differently depending on their past behaviours, wealth, or other characteristics? Does whether there is a cost associated with behaving prosocially influence decision-making?

By incorporating the work of numerous researchers in the field of prosocial development, who contribute comprehensive reviews of past research, unique theoretical perspectives and empirical approaches, the proposed research topic endeavours to provide new insights into a breadth of prosocial behaviours. In sum, the proposed research topic will contribute to our understanding of prosocial development in the early years by highlighting the relevant factors and contexts under which prosocial behaviour emerges.

Table of Contents

An introduction to "Sugar and spice, and everything nice: exploring prosocial development through infancy and early childhood"

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Prosocial behaviors begin to emerge at an early age (e.g., Damon, 1975; Rheingold et al., 1976; Eisenberg and Fabes, 1998; Thompson et al., 1997; Paulus, 2014). For example, helping behaviors are demonstrated by infants as young as 18 months of age (e.g., Warneken and Tomasello, 2006) and sharing behavior begins to emerge at around 2 years of age (e.g., Rheingold et al., 1976). Such prosociality is essential to social functioning in many respects. However, while prosocial behavior has long been of interest to developmental researchers, there remains much we do not know about the early development of prosocial behaviors.

This research topic builds on a well-established area of research, and brings together the work of various researchers in the field of prosocial development who have contributed unique theoretical perspectives, insightful reviews, and novel empirical work. The goal of this research topic is to examine broadly how, why, and when a spectrum of behaviors emerge, and enhance our understanding of the beginnings of human prosociality. Here, the existing literature is reviewed, and new insights into the development of prosocial behaviors are offered. A broad range of topics such as helping, cooperation, sharing, inequality aversion, and moral reasoning are covered, and various factors influencing prosociality explored.

As discussed in a theoretical contribution by Keith Jensen, Amrisha Vaish, and Marco Schmidt, prosociality is unique to humans and its development is influenced by a variety of mechanisms such as empathy, other-regarding concerns, and normativity. Importantly, the term prosocial behavior encompasses a multitude of behaviors, however, in her review article, Kristen Dunfield proposes that other-oriented, prosocial actions can be categorized into three specific subtypes; sharing, helping, and comforting, drawing on existing literature to support her proposal.

These subtypes of prosocial behaviors are further explored in this research topic using a variety of approaches. For instance, helping in early childhood is explored in a theoretical contribution by Stuart Hammond. While Hammond discusses the development of early helping behavior using a Piagetian framework, helping is also explored empirically by Sunae Kim, Beate Sodian, and Markus Paulus, who investigate differences in children's expectations regarding instrumental helping and self-helping at different points in development.

Other empirical contributions include work by Martina Vogelsang, Keith Jensen, Sebastian Kirschner, Claudio Tennie, and Michael Tomasello exploring cooperation in 5-year-olds using a public goods game, and a study by Sophia Ongley, Marta Nola, and Tina Malti demonstrating that moral reasoning is a strong predictor of the generosity of children's donations. Ongley and colleagues also explore how moral emotions such as sympathy and guilt relate to children's donating behavior, while several other experiments included in this research topic also explore various aspects of empathy and sympathy in early childhood. For instance, in a longitudinal study exploring the stability of sympathy over time, Jutta Kienbaum demonstrates that sympathy shows strong stability, and increases between the last year of preschool and the first year of school. Meanwhile, Jesse Drummond, Elena Paul, Whitney Waugh, Stuart Hammond and Celia Brownell show that empathic helping in toddlers is predicted by emotion and mental state talk, and Amanda Williams, Kelly O'Driscoll and Chris Moore demonstrate that experiencing empathic concern for another individual affects subsequent prosocial behavior; both decreasing envy, and increasing sharing.

Other factors influencing prosociality and social interactions are also investigated. In a study exploring the motivations underlying preferences for equality in situations of disadvantageous inequality, Amanda Williams and Chris Moore offer evidence that in some situations social comparison concerns—as opposed to fairness norms, influence decision-making. Markus Paulus demonstrates that the wealth of one's sharing partner also influences 5-year-olds sharing behavior with that individual, while Monica Burns and Jessica Sommerville demonstrate that both fairness and race influence 15-month-old infants' selection of social partners. In a study looking at social preferences in an even younger sample, Kiley Hamlin demonstrates that even infants as young as 4.5 months display context-dependent social preferences, and selectivity in prosocial behavior is further discussed in a review paper by Valerie Kuhlmeier, Kristen Dunfield, and Amy O'Neill.

Together this body of research demonstrates and discusses the complexities of a wide range of prosocial behaviors. It makes a significant contribution to the extant literature across a range of age groups, and a wide breadth of topics. It is our hope that the novel ideas, methodologies, and findings

presented here help us better understand the development of early prosocial behavior as a whole, and stimulate and inspire future research.

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"Does he need help or can he help himself?" Preschool children's expectations about others' instrumental helping versus self-helping

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In the present study, we investigated a total of fifty-one 3.5-, 4.5-, and 5.5-year-old children's expectations about another person's helping behaviors. We asked children to complete a story in which one person failed to complete his goal (e.g., because an object was misplaced or put out of his reach) while the other person observed the event. We asked whether the children expected the other person to help the protagonist or whether they expected the protagonist to help himself. Children of 3.5 years expected the other person to provide help in the majority of trials. In contrast, the older children were equally likely to predict that the other person would help the protagonist or the protagonist would help himself.

Keywords: social cognition, children, instrumental helping, reasoning, prosociality

INTRODUCTION

Recent research has shown that very early in development children engage in a variety of prosocial behaviors such as helping, sharing, and comforting (for reviews see Brownell, 2013; Tomasello and Vaish, 2013; Paulus, 2014). Already in infancy children are willing to help others complete a simple action related goal even in the absence of verbal request (Warneken and Tomasello, 2006; Dunfield and Kuhlmeier, 2010; Svetlova et al., 2010; Dunfield et al., 2011; Paulus et al., 2013). For example, 1-year-old children readily helped an adult, who was unable to complete a task because an object was out of her reach, by bringing the object to her (Warneken and Tomasello, 2006), and by 24 months children provided help even when the other did not notice the accident (Warneken, 2013). Three-year-old children provided help specific to goal completion, offering a different object more suitable for others' goal completion rather than a requested object (Martin and Olson, 2013). Interestingly, children provided help even to non-human agents (Kenward and Gredebäck, 2013) suggesting that the inclination to help might be very strong in children. Such prosocial behavioral tendencies are supposed to support the development of stable social relationships (e.g., Eisenberg et al., 1996).

A potentially equally important prerequisite for the engagement in successful social interactions is knowledge about which prosocial behaviors can be expected from others. These expectations further guide one's future interactions with others, at times creating tensions and conflicts if others' behaviors are not consistent with the expectations. It is thus important to understand how children develop expectations of others' prosocial behavior and identify the situations in which these behaviors do or do not occur.

An early study examining children's expectations about others' prosocial behavior comes from Berndt (1981). He showed that children of ages 5–10 indeed expected others to display prosocial

behaviors, but equally toward friends vs. non-friends. Recent findings show that expectations about others' prosocial behaviors are present early in development and become more sophisticated with increasing age. Even 15-month-old infants seem to expect someone to share equally with others (e.g., Sloane et al., 2012). Children of ages 4–5 years, but not 3 years, expected others to share more with friends than disliked peers (Paulus and Moore, 2014).

Although these findings deepen our understanding of how children conceive of others' sharing, only little is known about their expectations of others' instrumental helping. In light of recent findings that the different types of prosocial behavior (i.e., helping, sharing, comforting) do not relate to each other (e.g., Dunfield and Kuhlmeier, 2013) and that even different neurophysiological activations are related to instrumental helping vs. comforting (Paulus et al., 2013), we should be cautious about generalizing findings from children's expectations about others' sharing to their expectations about others' helping. That is, children's prosocial behaviors in terms of helping beyond toddlerhood are not entirely understood. Only one recent study examined children's reasoning about others' (non)helping. Sierksma et al. (2013) found that children between the ages of 8–13 years approved someone's refusal to help when helping is costly to a helper and a potential helpee's need of help is low. Nevertheless, because this study focused on school-aged children, it remains an open question how preschool children reason about others' instrumental helping. The present study aimed to examine preschool aged children's expectations about others' helping behaviors when helping involved low cost to the helper. We chose the low cost helping scenarios in order to maximally facilitate children's reasoning about helping. Young children's helping emerges earlier in low-cost helping situations than costly helping situations (Svetlova et al., 2010). Given that we were interested in the early emergence of reasoning about others' helping behaviors, we presented low-cost helping scenarios to children.

To this end, we assessed children's expectations about others' helping behaviors in a third party context. We presented children with six scenarios in which one person was in need of help to complete his/her simple action related goals and the other person could offer help. The helping scenarios were similar to tasks used in prior research in which children faced another person who was in need of help in completing his/her simple action related goals (e.g., Warneken and Tomasello, 2006). We were interested in children's naturally occurring expectations of others' helping behaviors – whether a potential helpee would receive help by the other person or solve his problem without help. Therefore, we asked children open-ended questions to predict what would happen in the given scenarios. Given infants' strong tendency for instrumental helping (e.g., Warneken and Tomasello, 2006) we expected that our youngest age group would respond that the helpee would receive help from the other person. Moreover, as children's prosocial behaviors are explicitly encouraged by parents and teachers their expectations of others' helping may become increasingly strong with age. Alternatively, older children may consider other factors such as someone's action capability to complete his goals himself and underlying intentions for an incomplete action (e.g., being genuinely in need of help or being playful or tricky). Children's understanding of others' action goals and intentions (Barresi and Moore, 1996; Paulus and Moore, 2011; Paulus et al., 2011) and their theory of mind (see Perner, 1991) develop during preschool years. In addition, children's increasing development of autonomy may contribute to their expectations about others' helping behaviors. As children gain independence and autonomy they are likely to enjoy carrying out actions on their own. This may lead them to expect others to be equally autonomous. If so, as compared to the youngest age group, older children may be more likely to respond that the potential helpee would solve his problem on his own.

MATERIALS AND METHODS
PARTICIPANTS
The sample included fifteen 3.5-year-old children (3;4 years–3; 11 years; 10 males), twenty 4.5-year-old children (4;7 years–4;8 years; 11 males), and sixteen 5.5-year-old children (5;6 years–5;11 years; nine males). Children were native German speakers

from heterogeneous socioeconomic backgrounds. Informed consent for participation was given by the children's caregivers. The participants received travel compensation and a small present for their participation. We followed the guidelines of the 1964 Declaration of Helsinki and the German Psychological Association.

DESIGN AND PROCEDURE
Children were tested individually in a laboratory setting. Every child received a total of six tasks in one of the two predetermined (and thus pseudo-randomized) orders. In each task children saw two puppets (each operated by a different female experimenter) one of whom failed to complete his/her simple action goal (e.g., attempting to grab an object out of his/her reach) while the other was watching it and could offer help. For example, after the puppets greeted each other ("Hi"), one puppet indicated his intention to hang clothes on a clothesline, "Now I have to hang my clothes on a clothesline," and successfully hung one piece of clothes on the clothesline with a clothespin. Then, as he hung another piece of clothes on the line, he accidentally dropped the clothespin on the floor and said, "Oops!" The puppet attempted to grab the clothespin out of his reach. He repeated his attempts to grab the clothespin but failed again. During the event, the other puppet was present without providing any remarks. See **Table 1** for an overview on six tasks and **Figure 1** for an overview on the stimuli used. Then, children were asked to predict what would happen immediately afterward ("How do you think the story should go on?"). If children did not respond for the first 10 s they were asked again, "Do you have any ideas what would happen next?" No child failed to respond. Children were also asked to justify their responses (e.g., "Why do you think she will pick up the clothespin?"). Children's responses were videotaped and audio-recorded for the purpose of coding. Children saw the same pair of puppets across six tasks. Which of the two puppets served as a potential helpee was counterbalanced across the participants but fixed across tasks for any given child.

CODING AND DATA ANALYSES
Children's open-ended responses were coded into three main categories: *Self-action*: response indicating that the helpee would

Table 1 | A complete list of all the tasks used in the study.

Task	Problem
Clothespin	While hanging clothes on a clothesline, the puppet accidentally dropped a clothespin on a floor. He tried to grab the clothespin but failed.
Cabinet	While the puppet was putting books on the shelf in a cabinet, the cabinet door was accidently closed. He tried to open the door with his hands full of books but failed to open it.
Box with a hole	While carrying his favorite toy, the puppet accidentally dropped it into the hole in the box. The puppet tried to grab it by putting his hand into the hole but failed.
Book	While the puppet was stacking books on a table, one of the books slipped from the stack and fell on the floor. The puppet tried to grab the book but failed.
Pencil	While trying to draw a picture with a pencil, the puppet dropped the pencil on the floor. The puppet tried to grab the pencil but failed.
Ball	While putting a ball into a box, the puppet accidentally dropped it on the floor. The puppet tried to grab the ball but failed.
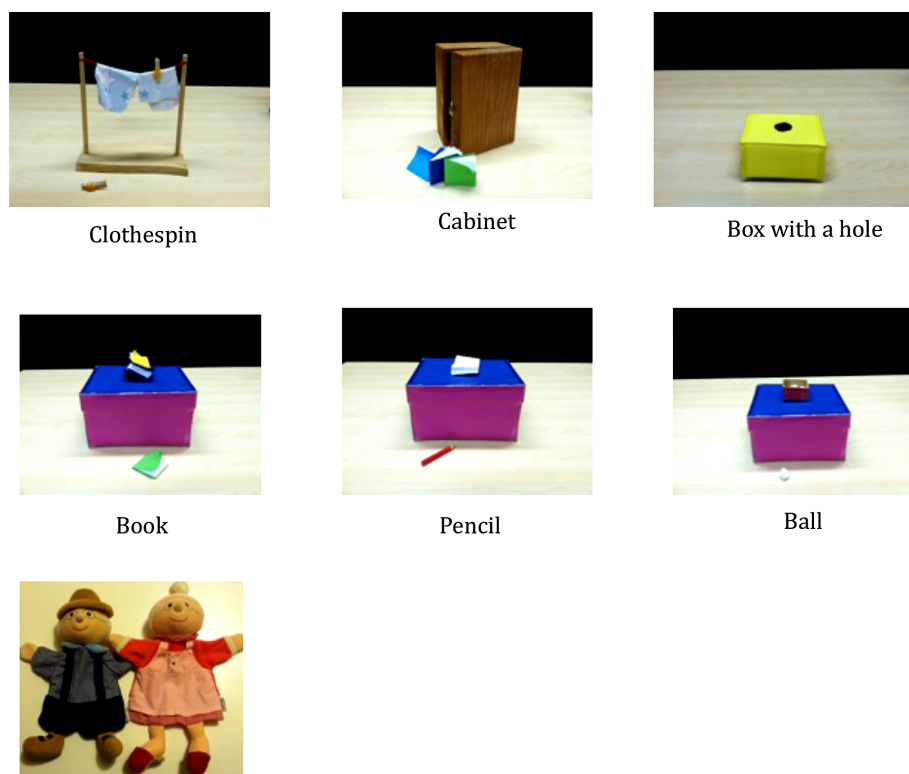
FIGURE 1 | Photograph of stimuli used in the study.

try (or manage) to complete the goal himself [e.g., "She (helpee) will pick up the clothespin"]; *Other-helping*: response indicating that the other puppet would offer help [e.g., "He (helper) will pick up the clothespin and give it to her"]; and *Other*: the remaining responses that did not fall into either one of the first two categories (e.g., "A bird will fly and take away the clothespin"). The coding categories were mutually exclusive; thus, none of the children's response fell into more than one category. A second coder who was blind to the study hypotheses independently coded approximately 30% of the participants' response randomly selected. Interrater reliability was 96% agreement; disagreements were resolved via discussion. We analyzed the number of trials (in percentages) in which children's response fell into the *self-action*, the *other-helping*, and the *other* response. Children's justifications were coded into two main categories: (1) *Desire*: response referring to the protagonist's desire to fulfill the action (e.g., "He wants to draw the picture"); (2) *Capability*: response referring to the protagonist's capability (e.g., "He can/cannot reach but she can/cannot"). There were unclassifiable statements (e.g., "Because the clothespin fell on the ground" or "So that he can say thank-you") and no responses (e.g., "I don't know"). Due to experimenter errors, 6 5.5-year-old children's justifications were not asked. These children were excluded from the final analyses. A second coder independently coded the entire data. Interrater reliability was 90% agreement; disagreements were resolved via discussion.

RESULTS

Across age groups, children provided on average the other-helping response in 44.0% of the trials; the self-action response in 44.4% of the trials; and, other comments in 11.6% of the trials. For further analyses we omitted the other comments and focused on the self-action and other-helping responses. To this end, we calculated for every participant the percentages of the trials in which the other-helping responses were provided out of both response types. **Figure 2** presents the mean proportion of Other–helping response (as opposed to self-action) as a function of Age groups. Children's responses of Other-helping were analyzed by means of a 2 (Gender: Male, Female) × 2 (Age Groups: 3.5, 4.5, 5.5) ANOVA with both variables as between subjects factors. There was only a significant effect of Age groups, $F(2,45) = 4.182$, $p < 0.05$, $\eta^2 = 0.16$ (all other $ps > 0.09$).

3.5-year-old children provided the other-helping response more frequently than the 4.5-year-old children, $t(33) = 2.512$, $p = 0.02$. A similar trend was observed between 3.5- and 5.5-year-old children, $t(29) = 1.902$, $p = 0.07$. There was no difference between the 4.5- and 5.5-year-old children, $t(34) = 0.668$, $p = 0.51$.

The youngest age group of children tended to provide the other-helping response more frequently than the self-action response, $t(14) = 2.426$, $p < 0.05$. There was no significant effect for the 4.5- and 5.5-year-old children, $t(19) = 1.362$, $p = 0.19$, and $t(15) = 0.416$, $p = 0.68$, respectively.

Next, we asked whether children's justifications differed by the age groups and the response types. **Figure 3** presents the number
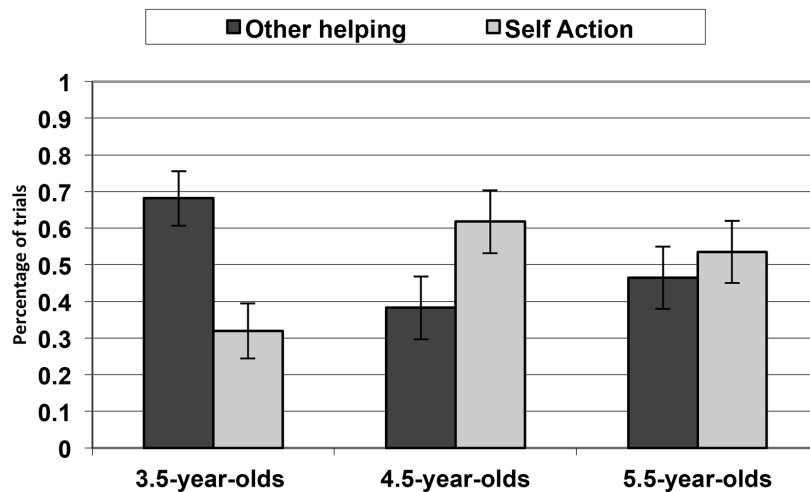
FIGURE 2 | Children's expectations about others' helping behaviors (as opposed to self-action) as a function of age groups. The error bars indicate standard error.
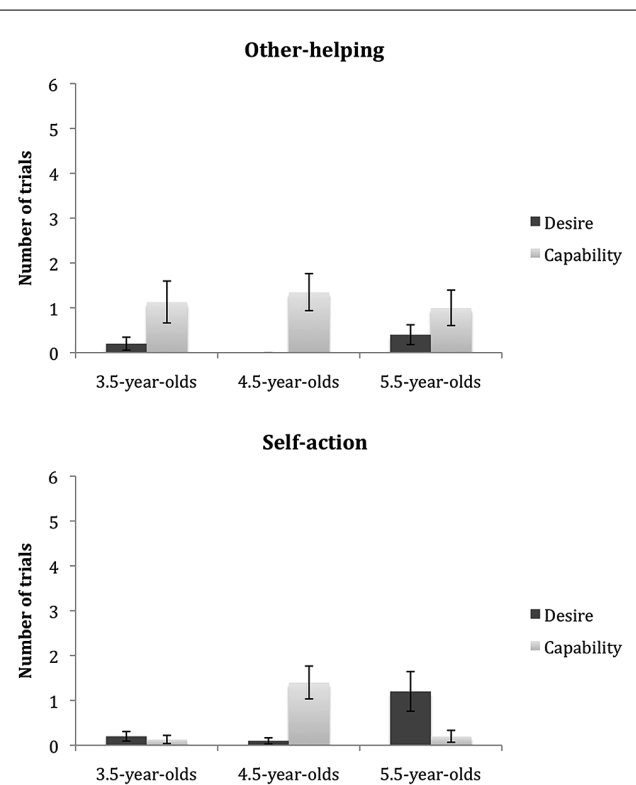
FIGURE 3 | The number of trials in which children's justification fell to each category as a function of age groups and response types. The error bars indicate standard error.

of trials in which children's justifications fell to each category (desire vs. capability) as a function of age groups and response types.

There was a trend among 3.5-year-olds to refer to capability more frequently than desire with respect to the other-helping response, $t(14) = 1.86$, $p = 0.08$, whereas their reference to desire and capability did not differ from one another with respect to the self-action response, $t(14) = 0.44$, $p = 0.67$. 4.5-year-old children referred to capability more frequently than desire both with respect to the self-action, $t(19) = 3.51$, $p = 0.002$ and the other-helping response, $t(19) = 3.28$, $p = 0.004$. There was a trend for 5.5-year old children to refer to desire more frequently than capability with respect to the self-action response, $t(9) = 1.94$, $p = 0.08$ whereas no significant difference was observed with respect to the other-helping response $t(9) = 1.77$, $p = 0.11$.

DISCUSSION

The present research investigated young children's expectation of others' instrumental helping in a third party context. To this end, 3.5- to 5.5-year-old children were presented with the scenarios in which one person was in need of help in the presence of another person and were asked to complete the stories. As compared to 4.5- and 5.5-year-old children, 3.5-year-old children were more likely to expect another person to help someone who was in need of help. Moreover, with age children seem to consider different reasons for why one might or might not help someone. As compared to younger children, the oldest group of children equally referred to the characters' desire and capability to complete an action related goal. These findings point to developmental changes in preschool children's reasoning about others' helping.

The present findings extend research on young children's instrumental helping to young children's reasoning about other people's helping behavior. In particular, prior research showed that young children voluntarily helped someone complete goal directed actions (Warneken and Tomasello, 2006; Dunfield et al., 2011). In line with these findings, our results showed that 3.5-year-old children expected others to help another person who was in need of help. Note that in the present study children were not

prompted by questions about helping. Instead, they were simply asked to predict what would happen in the stories. Nevertheless, the majority of 3.5-year-old children expected others to provide help to those who were in need of help. This suggests that by 3.5 years children have developed strong expectations about others' helping.

How can we explain this finding? According to simulation theories of social cognition, people use their own behaviors and mental states to understand those of others (Goldman, 1989; Harris, 1989; Gallese and Goldman, 1998). Thus, 3.5-year-old children in the present research may rely on their own behavioral tendency to help others in order to predict others' helping behaviors. Alternatively, they may detect regularities about others' actions and use this information to predict future behaviors. Indeed, even 9-month-old infants expect others' future action to be consistent with the most frequently performed action sequence in the past (Paulus et al., 2011). Children may be also able to detect the regularities of behaviors across different people. Additionally, it could be that the 3.5-year-old children are more likely to be helped by others than older children. Thus, 3.5-year-olds might have used prior experience and observation (e.g., a mother helping her child) to conclude that those in need of help are often likely to receive it from others.

Interestingly, as compared to 3.5-year-olds, older children displayed a different pattern of responses. Children of 4.5 and 5.5 years were equally likely to predict that the helpee would receive help or solve his problems on his own. One possible explanation for the age difference is that children's ideas about, and underlying motives of, helping change during preschool years (see Hay and Cook, 2007). Older children may think that helping should be directed toward those who are indeed in need of help. Thus, whereas younger children provide help indiscriminately to others, older children may be selective in choosing who is or is not capable of solving one's problems. Moreover, with age children may have a better understanding of a person's capabilities in relation to the completion of his action goals. Indeed, Paulus and Moore (2011) demonstrated that preschool children's understanding of others' action capabilities develop between 2.5 and 5 years of age. Thus, it is plausible that as compared to 3.5-year-old children older children were more likely to reason that the protagonist's action goals in the scenarios were within the range of his capabilities and thus he would not need help. Children's justifications provide some support for this account. Older group of children, especially 4.5-year-old children, tended to refer to one's capability to complete an action. Moreover, with age children's justifications became more differentiated. The oldest group of children equally considered characters' capabilities and desire to complete actions.

The present findings join a few recent studies (Sierksma et al., 2013; Paulus and Moore, 2014) in demonstrating that children hold a set of expectations about other people's prosocial behaviors. Children expect others to share (Berndt, 1981) but more with friends than with disliked peers (Paulus and Moore, 2014). The present study showed that expectations of others' instrumental helping are present in children as young as 3.5 years old.

Because one's expectations of others' social behaviors are closely related to evaluative behavioral judgments, the present findings have an implication for children's moral and social judgments of others' prosocial behaviors. In the present research, the youngest age group displayed the strongest expectation of others' prosocial behaviors. This may be consistent with the findings that children of ages 2 and 3 years have strong expectations of others' rule following (Rakoczy et al., 2008). With increasing age, however, children may become more lenient toward others' lack of prosocial behaviors. Indeed, Sierksma et al. (2013) demonstrated that children of ages 8–13 years approved the refusal to help someone if helping was costly to the helper and the helpee's need of help was low. Thus, it may be plausible that as compared to older children younger children may evaluate those who do not voluntarily offer help as more negatively. It is possible that children's developing ideas of individual autonomy differentiated from their ideas about social and moral behavioral rules (e.g., Nucci and Turiel, 1978; Smetana et al., 1991; Smetana and Asquith, 1994) may also influence children's reasoning about whether someone would receive help or independently solve his own problems.

Future research should address which principles and motives young children consider in reasoning about others' instrumental helping. Specifically, children's reasoning about different forms of helping needs to be further investigated. Although older children did not expect others to provide instrumental helping in the present study, it is possible that they may expect others to provide empathetic helping. Moreover, more research is needed to investigate whether and how children's ideas about one's autonomy in terms of action capabilities affect their own prosocial behaviors as well as reasoning about others' prosocial behaviors. In general, how closely children's developing ideas about others' helping behaviors become related to their own helping behaviors, and what mechanisms support this relationship will improve our understanding of children's prosociality.

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Preschoolers are sensitive to free riding in a public goods game

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Despite the benefits of cooperation, selfish individuals often produce outcomes where everyone is worse off. This "tragedy of the commons" has been demonstrated experimentally in adults with the public goods game. Contributions to a public good decline over time due to free-riders who keep their endowments. Little is known about how children behave when confronted with this social dilemma. Forty-eight preschoolers were tested using a novel non-verbal procedure and simplified choices more appropriate to their age than standard economic approaches. The rate of cooperation was initially very low and rose in the second round for the girls only. Children were affected by their previous outcome, as they free rode more after experiencing a lower outcome compared to the other group members.

Keywords: prosocial behavior, moral development, cooperation, fairness, free-riding

INTRODUCTION

People are remarkably cooperative, engaging in joint ventures from cooperative hunting in small groups to large-scale institutions such as elected governments. What makes this cooperation remarkable is that non-contributors can benefit from the efforts of the contributors without paying the costs. A classic example is the tragedy of the commons (Hardin, 1968) in which everyone has equal access to a shared resource. The best group outcome is if no one overutilises the resource, such as overgrazing the commons, but the best short-term outcome for each individual is to have as large a herd as possible. Every rational, self-centered individual knowing this, and suspecting that others will know this too, will focus on present gains, which are certain, rather than future gains which are not. As a result, the resource—fish populations, for example—will be depleted, with species harvested to extinction (Gordon, 1954; Clark, 1973). Public goods that cannot be depleted, so-called non-rivalrous goods, such as elected governments and public television, are still vulnerable to free-riding (Feeny et al., 1990), i.e., people can exploit investments of others while not investing themselves. In Germany, for example, there is a fee people need to pay for public television, but you can also watch it if you don't pay your fee. If a lot of people free-ride and only few pay the fee, fees will likely go up in the future. Public goods, then, pose a social dilemma between individual and group interests (Kollock, 1998); yet, despite the temptation to free-ride and the prevalence of free-riders, cooperation can, and does, exist (Ostrom, 1990).

A useful tool to probe this social dilemma is the public goods game (Marwell and Ames, 1979, 1980; see Ledyard, 1995 and Camerer, 2003 for reviews). In the public goods game, participants (players) are given an endowment (usually money). Each

player can contribute a portion of this endowment to a public pot. The amount in the public pot is multiplied by the experimenter by some factor and then divided equally amongst all players, and the game is repeated over several rounds. As a result, the best group outcome is for all players to cooperate, namely to contribute their entire endowment in each round. However, the best individual strategy is to contribute nothing—to keep all of the personal endowment—while also collecting a share of the public pot. The temptation to free-ride on the contributions of others should be common knowledge, and strictly rational players should therefore not contribute anything from the first round. As a result, everyone would only get his or her personal endowment, despite the possibility of a greater benefit for everyone if all contributed. This is not what people typically do. Participants (typically Western university undergraduates) contribute about 40–60% of their endowment on the first round, but the presence of non-contributors causes a decline in contributions across rounds, while never reaching zero (the Nash equilibrium). The decline in cooperation is likely due to the fact that most people are *conditionally cooperative*, i.e., they cooperate if others cooperate as well (Fischbacher et al., 2001). In addition, after having experienced free-riding group members, conditional cooperators will also defect. Why people contribute at all in the first round is surprising to economists. How cooperation can persist in the face of free-riding is puzzling to evolutionary theorists. To psychologists, questions remain as to what motivates those who contribute and those who free-ride.

Despite the importance of social dilemmas in the evolution of human sociality (Bowles and Gintis, 2011; Tomasello et al., 2012), there has been relatively little attention devoted to how responses to these develop in early childhood. There has been,

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minimal verbal instruction and no reference to game strategy. The advantage of using an apparatus with clear contingencies rather than standard verbal game instructions is that the cognitive demands are lower. Children could therefore focus on the outcomes resulting from their actions rather than holding in mind the hypothetical outcomes that are needed in planning. Apparatus-based studies have been successfully used on younger children in economic experiments such as the ultimatum game (Takagishi et al., 2010; Wittig et al., 2013) and non-human primates (e.g., Jensen et al., 2007). The apparatus used here is modified from a study on peer helping in 4-year-old children (Kirschner and Tomasello, 2010). Furthermore, like Alencar et al. (2008), we used food rewards instead of money since food has a clear value as a commodity (Lucas and Wagner, 2005).

With this approach, we wished to see if preschool children will act like adults in a four round mini-public goods game. Specifically, we wanted to see if children would initially behave cooperatively, namely by donating their endowment on the first round. Second, would children respond conditionally in subsequent rounds, namely by decreasing their likelihood of cooperation if others did not cooperate? Our expectation was that with a more age-appropriate procedure, preschool children, like adults, would initially cooperate then quickly learn to free-ride on the contributions of others.

METHODS

PARTICIPANTS

Children whose parents had previously given consent were recruited from and tested in 10 kindergartens in a medium-sized city in Germany. Children were selected at random from this list for participation in this study. Forty-eight children of 5–6 years of age took part in this study (24 girls, 24 boys), which made up twelve same-sex groups of four children each. Each group was composed of children from the same kindergarten. The children's age ranged from 66 to 76 months with a mean age of 70 months (standard deviation 2.96 months). The children came from mixed socio-economic backgrounds.

STUDY DESIGN

Twelve groups of four children each were tested on two consecutive days. On the first day, the group was familiarized individually with the general procedure and on the second day (1–2 days later), they were tested in groups. The task was established as a "distributing gumballs game". We avoided terms such as "sharing," "cooperate" and "public goods" to avoid priming the children, and also because we could not assume that they fully understood these terms. Every trial consisted of three phases: the distribution phase, the collecting phase, and the evaluation phase. In the distribution phase, children could use an apparatus to distribute resources (gumballs) to themselves or the group. In the collecting phase, children would place the resources in the corresponding collecting containers. Finally, in the evaluation phase, children accumulated their resources in their evaluation tubes, and information on outcomes was shared as a group. Consistent with economic experiments, there was no use of deception in this study: the children played against other children for real resources under conditions of full anonymity; there was no opportunity for

them to doubt the integrity of the study, as could potentially be the case when they play against absent partners (e.g., Fehr et al., 2008).

STUDY MATERIALS

Gumballs were used because their round shape allowed them to roll down the ramps in the apparatus. They were also attractive to the children. However, for hygienic reasons, as well as to satisfy parental preferences, we replaced the gumballs with gummy bears when giving the rewards to the children at the end of the game. The gumballs, then, served as in-kind tokens, and because both were sweets, they would have presented similar inhibitory control issues (as opposed to using a non-food token for food).

The first part of the game involved a distributing apparatus (distributor) that dispensed gumballs into boxes (**Figure 1A**). The distributor was a wooden table (88 × 65 × 30 cm) covered with a Plexiglas lid to prevent direct access to the gumballs inside. Emerging from the sides of the length of the table were two ropes. Pulling either rope caused a slider to move any gumballs on it to the ends of the table, and at the same time caused any gumballs on a platform to be tipped off. The gumballs would then drop through holes into either a box or a trashcan. The apparatus was designed to make it obvious that choices of either the private or public side were mutually exclusive and that the non-chosen gumball became unavailable. The spring-loaded slider would return to the starting position; this not only allowed for easy rebating after each trial, but also made it impossible for anyone to see which rope had been pulled. Each child had his or her own "private" box, distinguished by a picture (tree, flower, umbrella, balloon), and only knew the identity of his or her own box; this assured subject anonymity in choices made (**Figure 1B**). Another box had all four images on it ("box for everybody"), and this was the public good. Gumballs that fell into the trashcans went to no one. If the rope on the "private" side was pulled, the two gumballs moved on the slider to the private side of the apparatus and fell into the private box, whereas the two gumballs on the platform on the "public" side fell into the trashcan[1]. Pulling the rope on the public side caused the two gumballs on the slider to move to the public side, and these, plus the two on the platform, fell into the public box; none went to the private box. The apparatus was designed such that either side could be public or private, and this was counterbalanced across subjects to avoid any potential side preferences. In short, the children could choose a private outcome that resulted in two rewards falling into their private box alone, or a public outcome that resulted in no rewards going into their private box, but four gumballs going to the public box (so their investment of two gumballs was doubled), resulting in one gumball for each participant.

The accumulated gumballs would be transferred from the private and public boxes into collecting containers. These were eight plastic containers with small slits at the top and clear plastic tubes inside (**Figure 1C**). Four of them were public containers and were labeled with all four symbols corresponding to the public

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[1]The terms "private" and "public" were never used to avoid confusing or priming the children. Instead, they were referred to as belonging either to the child or to everybody.
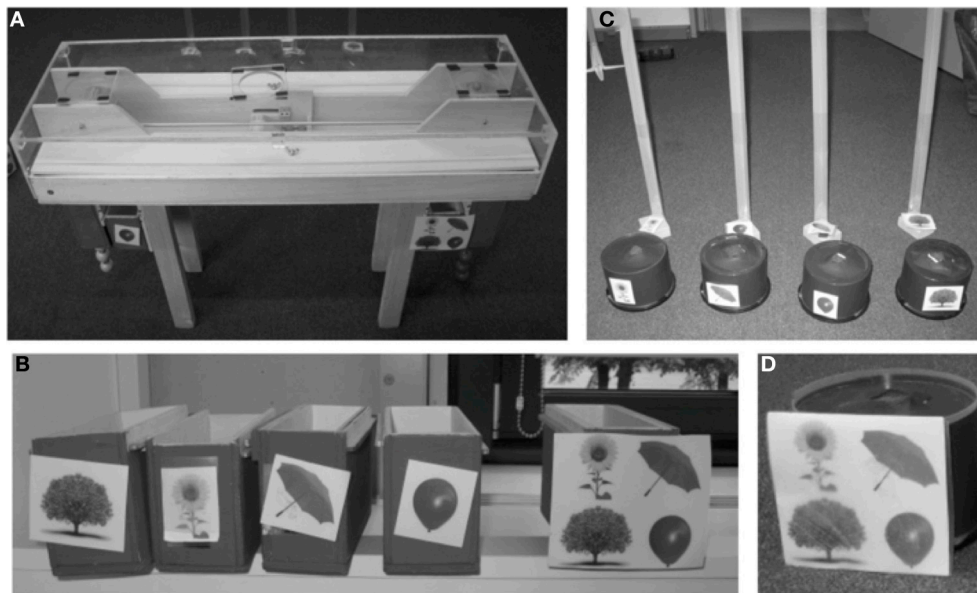
FIGURE 1 | (A) Distributing apparatus (distributor). Two ropes can be pulled, resulting in gumballs to roll off the apparatus into private or public boxes. Choosing the private option causes two gumballs to fall into the private collection box (shown on the left) and two gumballs to fall into a trashcan (not shown). Choosing the public option causes all four gumballs to fall into the public box (right). **(B)** The four private boxes with a different symbol for each child and the public box with all four symbols. **(C)** Private collecting containers held accumulated rewards that would be put into evaluation tubes (background), allowing easy visual determination of each child's payoffs. **(D)** One of four identical public collecting containers.

container (**Figure 1D**) and four of them were individually labeled with a tree, flower, umbrella or balloon, according to the individual boxes (**Figure 1C**). The eight containers could be opened, leaving the gumballs visibly stacked in transparent plastic tubes, allowing for quick and easy comparison of the amounts in each. Additional study material consisted of a curtain that was used as a visual barrier between the distributing apparatus on the one side and the private collecting boxes and the evaluation tubes on the other side to assure anonymity of choices.

PROCEDURE

Familiarization

Familiarization took place on the first day. Children were brought from their nursery in groups of four. They were first introduced to the apparatuses and procedure as a group by E1. Half of the groups were shown public choices first and half were shown private choices first. The children saw all possible outcomes that could arise when all children cooperate (choose the public box) to where none do, with all intermediate options (**Table 1**).

In the individual familiarization, one child stayed with E1 while the others left the room with E2 where they drew pictures (this kept the children from discussing the game amongst each other). E1 assigned one private box to the child, stressing that he or she was not supposed reveal to the others which box was his or hers. Hence, only the child and E1 would know which box was his or hers. The private and public boxes were attached to the distributor. The child followed E1s instructions as to which rope to pull after the distributor was baited, and then answered how many gumballs fell into the respective boxes as a result of his or her action. That is, children were asked to pull the rope to the private

Table 1 | Overview of the possible payoffs for a single round.

Player 1 chooses public			Player 1 chooses private		
Number choosing public	Number choosing private	Player 1 payoff	Number choosing public	Number choosing private	Player 1 payoff
3	0	4	3	0	5
2	1	3	2	1	4
1	2	2	1	2	3
0	3	1	0	3	2

Four children could choose between the public option and the private one. Payoffs (number of gumballs) for each player depended on the choices made by the other three players. Here, all possible outcomes for one round for one player are shown on the basis of whether he or she chose the public outcome, and the number of players choosing public or private. The highest possible payoff in a round was five gumballs and the lowest was one.

and public sides over the course of the familiarization phase and to comment of the results of these actions. After each choice, the child detached both boxes from the distributor and then put the gumballs into the appropriate collecting containers. E1 explained that the child would get all the gumballs that he or she accumulated in the private container and that the gumballs would be distributed evenly among the four public containers, one of which would go to the child. After each child had his or her turn, the evaluation phase started. All four children returned to the room with E2, who was blind to which symbol belonged to which child and to which direction they had pulled. E1 left the room. Now,

children saw the effect their decision had on their own and the others' outcomes. First, the public containers were opened. E2 explained to the children what these outcomes meant (for example, how many children had chosen to pull the private side). Then, the private containers were opened. The content of the public and private containers were put into the evaluation tubes, allowing everyone to see how many gumballs they and the others got, without knowing whose tube was whose apart from their own. Outcomes were never described in normative or moral terms such as right or wrong, good or bad. At the end of each familiarization trial, E2 asked one of the children how the outcomes had come about, specifically, whether the number of gumballs in each collection tube was the result of either a public or private choice ("Where did the gumballs come from?"). Children were generally able to do so. Only a few required additional prompting, namely by comparing the amounts in the different tubes (i.e., the tube that had less was from a child who chose the public option and the one that had more was from a child who chose the private one).

At the end of the familiarization, the group was told that today had just been practice and that on the next day, they would get to come again and make their own choices and get to take the rewards home with them.

Testing

The four test rounds were carried out one or two days after the familiarization. The study setup was kept the same, except that the private collecting containers and the evaluation tubes now stood behind the curtain; as well, the evaluation tubes were occluded by an opaque bar to ensure that choices were anonymous. All children carried out their decision in the testing room together with E1 while the other children waited outside with E2.

Before the test started, each child was asked whether he or she still remembered how the apparatus and procedure worked and was then asked to demonstrate the correct use of the distributor, collecting containers and evaluation tubes. Sixteen children (33%) were initially unable to explain the apparatus. Specifically, while they recalled the features of the apparatus, i.e., that there was a private and public side, they sometimes forgot how many gumballs were involved and hence needed an additional demonstration of at least one side of the distributor by the experimenter. Children were then able to recall what happened to the gumballs. E1 pointed out the occlusion of the collecting containers and evaluation tubes and the anonymity that this ensured. E1 also reminded the child that this was not a practice, and that they would all take their rewards home with them at the end.

After this reminder, E1 initiated the first distribution round by telling the child that today he or she would get to decide where he or she wanted to pull and that no one but the child would know what he or she chose. E1 then stood aside in another corner of the room with her back turned. After choosing, the child announced he or she was done and E1 returned and guided the child to put the gumballs from the target boxes into the designated collecting containers. Finally, the experimenter returned the boxes back to the table or shelf.

After each child had had his or her turn, all four children returned into the room for the evaluation round. However, unlike the familiarization day, the private collecting containers were kept closed and only the public collecting containers were opened by E2. One by one, the children took one of the public collecting containers, went behind the curtain, and put the gumballs from their private collecting container plus their share from the public container into their evaluation tubes. Because this evaluation phase took place in private behind the curtain, the other children could not know how much each child had received. However, each child could conclude from the public collecting containers how many children had contributed to the public good. Children sometimes needed assistance with opening their private collecting containers and placing the gumballs into the evaluation tubes, so E1 sat behind the curtain and could help them. After each child had put his or her gumballs away, all four children left the room with E2 and a new round started. In total, four rounds were completed.

CODING AND RELIABILITY ANALYSIS

All of the children's actions were videotaped and their decision (pulling to their private target box or to the public target box) was coded from video by E1 with 0 corresponding to a choice of the public side and 1 to a choice of the private side. A randomly selected sample of 25% of trials (3 groups) was analyzed by a second evaluator for choices (private vs. public). Interobserver reliability was perfect (Cohen's $\kappa = 1$).

STATISTICAL TESTS

To test whether children's choices of the private or public option would depend on the outcome they had observed in the previous round, we used a Generalized Linear Mixed Model (GLMM; Baayen, 2008) with fixed effects of gender, familiarization order, round and previous outcome, and random effects of individual and group membership.

Further, we used non-parametric tests, i.e., Cochran's Q and McNemar's change tests. Cochran's Q tested for significant changes in the choice behavior across the four rounds of the game, whereas the McNemar test compared the behavior between two consecutive rounds. As the latter is a change test, children who chose the same option in two rounds were excluded from this *post-hoc* analysis. To test whether gender and type of familiarization had an effect on the children's choice behavior, we used a Mann-Whitney-Test. All statistical analyses were 2-tailed and assumed an alpha-level of $p < 0.05$ for significant results.

RESULTS

All children passed the familiarization phase. The results of the GLMM showed that gender and round had an effect on the number of choices for the private side, with boys choosing the private side more often (estimate $\pm SE = 1.45 \pm 0.66$, $z = 2.21$, $p = 0.027$) and the amount of private choices increasing over the course of the test (0.04 ± 0.02, $z = 2.08$, $p = 0.038$). Most importantly, the decision for either the private or public side was determined by the previous outcome: having a worse outcome then the rest of the group members led to a decision for the private side (-1.45 ± 0.40, $z = -3.65$, $p = 0.0003$). There were no interaction effects (see **Table 2**). Random effects were controlled (individual, variance = 2.34; group membership < 0.001).

Table 2 | Overview of the GLMM analysis.

Term	Estimate	SE	z	p
(Intercept)	−0.188	0.714	−0.263	0.793
Previous outcome	−1.451	0.397	−3.650	< 0.001
Gender	1.454	0.658	2.209	0.027
Familiarization	0.352	0.663	0.531	0.595
Round	0.036	0.018	2.080	0.038
Gender * Round	−0.030	0.040	−0.700	0.486
Previous outcome * Gender	0.590	0.800	0.730	0.464

There were only main effects for previous outcome, gender and round. Hence, children's choices of the private side were influenced by their outcome in the previous round (coded as difference between the amount they had obtained and that of the other group members, being worse off than other group members increased choices of the private side), their gender (boys tended to choose the private side more often), and which round was played (choices of the private side generally increased). Familiarization, i.e., whether the private or public option was demonstrated first did not influence the children's choices. Also, there were no interaction effects of gender and round or previous outcome and gender.

Post-hoc analyses show that there was no effect of order of presentation of public or private choices during familiarization (Mann-Whitney-Tests, Round 1: $z = -1.533$, $p = 0.245$, Round 2: $z = -1.159$, $p = 0.38$, Round 3: $z = -0.864$, $p = 0.666$, Round 4: $z = -0.66$, $p = 0.74$). Choices of public vs. private outcomes differed across the four rounds of the experiment (Cochran's $Q = 13.269$, $p = 0.004$, $N = 48$, $df = 3$). From the McNemar's change test, children chose the public side more often in the second round than the first ($N_{Round\ 1\ only} = 20$, $N_{Round\ 2\ only} = 8$, $p = 0.036$). In the third round, they chose the public side less often than in the second ($N_{Round\ 2\ only} = 5$, $N_{Round\ 3\ only} = 19$, $p = 0.007$), while the last round (round 4) did not differ from the third ($N_{Round\ 3\ only} = 10$, $N_{Round\ 4\ only} = 4$, $p = 0.18$). First round choices were 17% public, peaked at 42% in round 2 and ended at 25% (**Figure 2**).

A *post-hoc* analysis of gender showed that boys chose the private option more often than the public one, and did so equally often in each round (range = 75–88%; Cochran's $Q = 1.5$, $N = 24$, $df = 3$, $p = 0.795$). Girls, unlike boys, did sometimes make public donations (range = 12–58%), primarily by choosing the private option less often in the second round (**Figure 3**). Chi-square analyses showed that boys always preferred the private option over the public option: Round 1: $\chi^2 = 8.167$, $df = 1$, $p = 0.007$; Round 2: $\chi^2 = 6$, $df = 1$, $p = 0.023$; Round 3: $\chi^2 = 13.5$, $df = 1$, $p < 0.001$; Round 4: $\chi^2 = 10.667$, $df = 1$, $p = 0.002$. Girls, on the other hand, only preferred the private option in Rounds 1 and 3: Round 1: $\chi^2 = 13.5$, $df = 1$, $p < 0.001$; Round 2: $\chi^2 = 0.667$, $df = 1$, $p = 0.541$; Round 3: $\chi^2 = 13.5$, $df = 1$, $p < 0.001$; Round 4: $\chi^2 = 2.667$, $df = 1$, $p = 0.152$. Overall, boys and girls show different choices: Cochran's $Q = 15.375$, $N = 24$, $df = 3$, $p = 0.001$; McNemar tests confirm that the amount of private choices in Round 2 differs from Round 1 and 3, while girls chose the private option equally often in Rounds 3 and 4; $N_{Round\ 2\ only} = 3$,
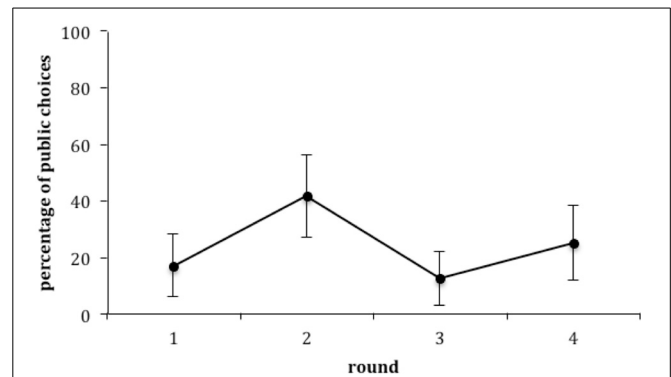
FIGURE 2 | Percentage of choices of public outcome for the four rounds of the game (mean ± 95% CI).
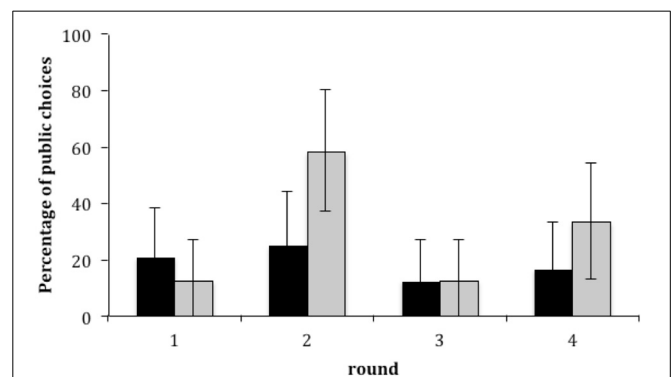
FIGURE 3 | Percentage of choices of public outcome for the four rounds of the game for boys (black bars) and girls (gray bars) shown as mean ± 95% CI.

$N_{Round\ 1\ only} = 14$, $p = 0.013$; $N_{Round\ 2\ only} = 3$, $N_{Round\ 3\ only} = 14$, $p = 0.013$; $N_{Round\ 3\ only} = 7$, $N_{Round\ 4\ only} = 2$, $p = 0.18$.

DISCUSSION

When presented with a simplified version of the public goods game, children made strategic choices. Five year-old children—the youngest yet tested in a public goods game—were, to some degree, conditional cooperators. These results are consistent with House (2013a) who found contingent cooperation in children beginning at 5.5 years of age. Adults playing the public goods game typically contribute 40–60% of their endowment in the first round of play, then reduce their contributions to near zero by the end of the game in response to selfish free-riders (Camerer, 2003). Children in our study initially started out with low contributions, but then increased these in the second round to what is typically seen in adults in the first round, before reducing their contributions to the public good. Some children, then, free-ride while others adjust their contributions conditionally. We did not find the steady decline in contributions over the four rounds; more trials—in adults, there are typically 10 rounds—would be needed to see if children became consistently more selfish over time. Children only had the opportunity to play four rounds due to time constraints; it was time-consuming to make choices for

four players successively. Future studies could have multiple appa-ratuses, allowing children to make simultaneous choices. It may be the case that some children were signaling a willingness to cooperate in a manner consistent with generous tit-for-tat which is an evolutionarily stable strategy in repeated play in a prisoner's dilemma (Nowak and Sigmund, 1992). It may also be that chil-dren, who would not have encountered strategic interactions of this sort before, were still exploring the structure of the game to determine what strategies the others were using.

Gender differences typically do not emerge in economic stud-ies on adults, but there are exceptions, such as men being more likely to punish out of principle (Eckel and Grossman, 1996), women under 50 donating more to charity than their male peers (List, 2004) and men being more likely to signal their tendency to defect in a prisoner's dilemma while women signal coopera-tiveness when being observed (Charness and Rustichini, 2011). While relatively small sample sizes make it difficult for us to draw firm conclusions, we found that boys and girls played the mini-public goods game differently. Boys were consistently selfish in their contributions from the first round to the last, whereas girls behaved in a manner more consistent with contingent cooper-ation, specifically generous tit-for-tat. Gender differences have shown up in other studies. For instance, boys more than girls were more sensitive to group membership when responding to disad-vantageous inequity (Fehr et al., 2008), although in another study, while girls were more prosocial, sexes did not differ in their con-tingent reciprocity (House et al., 2013a). Boys and girls tend to interact in same-sex groups, leading to different subcultures with different types of play and ways of communicating (Maccoby, 2002). Interactions between girls generally focus on interpersonal closeness, nurturing, and talking, with boys' play being more task-oriented and competitive. The gender differences in this study reflect differences in preschoolers' play behavior. Boys seemed to have interpreted the task as a competition game, while girls seem to have interpreted it as a cooperative one. (Girls tend to be more prosocial in resource distribution studies; e.g., Gummerum et al., 2008; Blake and Rand, 2010; House et al., 2013a). Both boys and girls played the mini-public goods game strategically, albeit with different strategies.

Reducing the game to binary choices (public vs. private), using an apparatus that made the outcomes of choices visible, while assuring subject and experimenter anonymity allowed us to find both a willingness to cooperate as well as a conditional response when confronted with free-riders. The fact that these results reflect what is seen in studies on adults suggests that these ten-dencies appear earlier in development than had previously been found using verbal instructions akin to standard economic exper-iments on adults. Harbaugh and Krause (2000) found that only older children learned to free-ride, and that there was a gen-eral rise in contributions over 10 rounds, contrary to studies on adults. As they suggest, it may be that the generous contri-butions may have been due to mistakes rather than altruistic tendencies. Alencar et al. (2008) did find free-riding and a con-comitant decline in cooperation in children with a mean age of 8 years in large groups (more than 12 children) but not in small groups (5–7 children). By simplifying the task demands in our study, notably by using an apparatus-based approach that has

been successful in other studies of fairness and prosociality in children (e.g., Kirschner and Tomasello, 2010; Wittig et al., 2013) as well as great apes (e.g., Jensen et al., 2007; Kaiser et al., 2012), we were able to get the children to understand—and demon-strate an understanding—of the consequences of their actions for themselves and for the group. Children might still have made mistakes; they might have also been "testing the waters" to see what others would do. But the fact that participants—notably boys—did free-ride and that girls, at least, did respond con-ditionally to this, despite a willingness to cooperate, suggests that by 5 years of age, children—in a Western, industrialized society, at least (Henrich et al., 2010)—are capable of condi-tional cooperation as well as free-riding (see also House et al., 2013a).

Future research could use a similar non-verbal approach to test great apes and other species to determine whether these compet-itive and cooperative tendencies appear earlier phylogenetically. This approach could also be applied to children in other parts of the world where terms such as "public" and "private" may not be understood in the way they are in a Western country; to date, little work on social decision-making has been done cross-culturally (Rochat et al., 2009; Zebian and Rochat, 2012; House et al., 2013b). It might also be possible to test even younger children to better ascertain when social preferences and strategic decision making emerge. One important innovation that could be applied in future studies would be to add a punishment option since in adults, at least, this effectively discourages free-riding (Fehr and Gächter, 2002). We maintained anonymity in this study, but it would be valuable to allow children to know what the others contribute to see if reputation positively influences cooperation (Milinski et al., 2002). It is not immediately obvi-ous that these factors would influence children. For instance, in a mini-ultimatum game in which children could choose between selfish outcomes or alternatives of varying degrees of fairness, 5-year-olds were more selfish and less strategic than adults, despite sitting next to each other (Wittig et al., 2013). Streamlining the paradigm will be important for future work, so that more tri-als can be conducted over a shorter period of time. This could serve to heighten the competitive elements of the game while reducing demands on the children's patience, and it would allow more rounds to be conducted to better determine whether chil-dren reach equilibrium. Children could also be tested in same sex groups and have these results contrasted with mixed-sex groups to better determine what role, if any, gender plays in social dilemmas.

Already by 5 years of age children will have learned to share (e.g., Moore, 2009), are averse to disadvantageous inequity (e.g., Wittig et al., 2013), but are not yet averse to advantageous inequity (Blake and McAuliffe, 2011). Children will have learned norms of sharing when in pairs, but will likely have had less experience and less instruction on how to interact in groups, par-ticularly when decisions are private though outcomes are not. It is not surprising that children explore their options, but it is impres-sive that they learned the game as quickly as they did, particularly by free-riding early on. The children did appear to understand the strategic nature of their choices, namely that the amount they received depended on what the others did. The ability to

engage in strategic social interactions—to the detriment of the group—is already evident by 5 years of age. The ability to respond contingently to non-cooperators, and to free-ride on others, allows humans to cooperate in large groups, and yet fail spectacularly to do so even when it is in the best interests of the group (as in the tragedy-of-the-commons; Hardin, 1968). Whether this ability—and shortcoming—is uniquely human remains to be seen. To answer this question, the nonverbal approach to the public goods game, as used here, might be suitable for testing on our closest living relatives.

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Children's giving: moral reasoning and moral emotions in the development of donation behaviors

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This study investigated the role of moral reasoning and moral emotions (i.e., sympathy and guilt) in the development of young children's donating behavior ($N = 160$ 4- and 8-year-old children). Donating was measured through children's allocation of resources (i.e., stickers) to needy peers and was framed as a donation to "World Vision." Children's sympathy was measured with both self- and primary caregiver-reports and participants reported their anticipation of guilt feelings following actions that violated prosocial moral norms, specifically the failure to help or share. Participants also provided justifications for their anticipated emotions, which were coded as representing moral or non-moral reasoning processes. Children's moral reasoning emerged as a significant predictor of donating behavior. In addition, results demonstrated significant developmental and gender effects, with 8-year-olds donating significantly more than 4-year-olds and 4-year-old girls making higher value donations than boys of the same age. We discuss donation behaviors within the broader context of giving and highlight the moral developmental antecedents of giving behaviors in childhood.

Keywords: giving, moral emotions, moral reasoning, donating, childhood

INTRODUCTION

Giving is one of the key social behaviors that distinguishes our species from others (Knafo and Plomin, 2006) and fosters care and cooperation in social interactions (Staub, 1979). It takes many forms, from the reciprocal sharing of toys with friends in preschool, to the anonymous donation of money to a charity, to our society's centralized division and allocation of resources as part of the social welfare system. Because of its roots in early childhood and its importance to large-scale fairness and care (Malti et al., 2012), a rich body of research in psychology has focused on understanding the development and motivation of children's giving behaviors (Eisenberg et al., 2014). It is often the case, however, that little distinction is drawn between different subtypes of giving. As a result, a lack of conceptual clarity surrounding subtypes of giving behavior exists and many questions remain regarding their potentially distinct affective and cognitive moral antecedents.

Giving behaviors can be differentiated along multiple dimensions, including anonymity (of either the giver or the recipient), the recipient's level of need, the cost of the giving behavior, and the degree of reciprocity in the relationship between the giver and the recipient. Sharing, as one type of giving, for example, is often examined in research using the dictator game (Kahneman et al., 1986; Gummerum et al., 2010) in which a single player chooses how many (if any) of a set number of items to allocate to an anonymous other. Sharing is completed privately and there is no opportunity for the recipient to respond, retaliate, or form an evaluation of the (non)sharer (Gummerum et al., 2010). In this way, sharing in the dictator game is anonymous, unreciprocated, and costly (the shared items are typically selected so that they are valuable to the giver and there is no opportunity for the allocated items

to be returned). Researchers may vary the contextual features of the dictator game, but in the simplest version, there is no explicit need ascribed to the recipient. Donating, like sharing, is also typically anonymous, costly, and unreciprocated. Unlike sharing, however, givers in donation tasks are confronted with potential recipients who exhibit clear need, often on the basis of poverty (Dlugokinski and Firestone, 1973; Rushton and Wheelwright, 1980), injury (Knight et al., 1994), illness (Boe and Ponder, 1981), or disability (Isen and Noonberg, 1979).

Although a number of studies (Eisenberg and Miller, 1987; Malti et al., 2012; Ongley and Malti, 2014) have investigated the relationship between giving behaviors in general and their affective and cognitive moral antecedents, many questions remain about the moral antecedents of distinct giving behaviors, such as sharing and donating. In particular, existing developmental studies have found that the association between giving behaviors and morality differs on the basis of: (1) the type of giving behavior considered (and its dimensions of anonymity, cost, reciprocity, and need of the recipient), (2) the specific aspect of morality measured (e.g., moral reasoning vs. moral emotions, self-evaluative vs. other-oriented moral emotions, and responses to moral transgressions committed by the self or by others), and (3) the measures used in assessing children's giving and their cognitive and affective moral development (e.g., self-reports, teacher/parent-ratings, anonymous vs. public giving). In the current study, we therefore consider an important distinction between the giving behaviors of sharing and donating: the absence or presence of explicit need. We also investigate the developmental trajectory and affective-moral antecedents specific to donation behaviors of 4- and 8-year-olds. We then discuss our findings on children's donating in light of previous, related work on sharing, comparing

the motivational factors that may be at play in these two distinct types of giving.

In the current study, we chose to examine sympathy, guilt, and moral reasoning as potential motivators of young children's donation behaviors. Each of these processes has been highlighted in the existing developmental literature as playing an important role in the development of morally relevant, prosocial behavior.

The affective experience of sympathy stems from the apprehension of another's emotional state and arouses feelings of concern for others (Eisenberg, 2000). A rich body of research has demonstrated that the experience of sympathy may serve to motivate prosocial, other-oriented behavior through concern for others' wellbeing and the desire to reduce others' distress (see Eisenberg et al., 2014). Existing research also suggests that the affective experience of sympathy early in childhood may lead to a general tendency to consider the needs of others and the development of norms of fairness and care (Malti et al., 2007, 2012; Knafo et al., 2008; Ongley and Malti, 2014).

In addition to sympathy, the moral emotion of guilt has also been identified as a key affective process in children's prosocial moral development (Hoffman, 2000; Malti and Latzko, 2012; Malti and Ongley, 2014). While sympathy is considered to be an other-oriented emotion, guilt is oriented towards the self and towards one's own actions in relation to moral norms (Malti and Ongley, 2014). Guilt has been defined as a painful feeling of regret over wrongdoing (Ferguson and Stegge, 1998) and arises when one acts in violation of one's own moral standards (Tangney et al., 2007). The experience of guilt feelings reflects the awareness that one has transgressed his or her own internalized moral rules and takes responsibility for these actions (Malti and Ongley, 2014). When one anticipates that feelings of guilt will accompany potential moral rule violations, such as the failure to help or give to those in need, this anticipation of (and desire to avoid) future guilt encourages a commitment to live up to internalized moral standards (Ferguson and Stegge, 1998; Hoffman, 2000; Carlo et al., 2012; Ongley and Malti, 2014). Existing research has suggested that children's anticipation of guilt is positively related to actions that are consistent with prosocial moral norms such as helping those in need and sharing fairly with others (Chapman et al., 1987; Gummerum et al., 2010; Ongley and Malti, 2014).

The use of moral reasoning to justify actions or resolve moral dilemmas, as compared to reasoning based on sanctions, hedonistic or self-serving considerations, has also been demonstrated to predict specific types of prosocial responding in children, such as sharing, helping, and cooperation (Larrieu and Mussen, 1986; Miller et al., 1996; Stewart and McBride-Chang, 2000; Hinnant et al., 2013). Together, moral reasoning and moral emotions, such as sympathy and guilt, have been theorized to play an important role in the early development of moral action tendencies and the consideration of others' welfare (Hoffman, 2000; Arsenio, 2014; Malti and Ongley, 2014).

In light of the theoretical perspectives outlined above and specific findings relevant to giving behavior, we made a series of hypotheses regarding the potential associations between children's donating behavior and sympathy, guilt, and moral reasoning. Based on findings from previous studies showing that sympathy predicts donating in middle childhood (Knight et al., 1994) and

other forms of giving (i.e., sharing) in early childhood (Ongley and Malti, 2014), we hypothesized that sympathy would emerge as a significant predictor of donating across our two age groups. We also expected that the anticipation of moral guilt would be positively associated with donating. This hypothesis was drawn from related research demonstrating a positive relationship between guilt and overt prosocial behavior (Malti and Krettenauer, 2013) and between guilt and other forms of giving (i.e., sharing) in young children (Gummerum et al., 2010; Ongley and Malti, 2014). Finally, we predicted that moral reasoning would also emerge as a significant predictor of donating in early childhood. Though existing research has yielded conflicting findings as to the role of moral reasoning in various forms of giving in childhood, there is existing evidence to suggest that moral reasoning is positively associated with donating in middle childhood (Knight et al., 1994) and with costly giving behaviors (i.e., sharing) in early childhood (Eisenberg-Berg and Hand, 1979; Eisenberg et al., 1985; see however, Gummerum et al., 2008).

MATERIALS AND METHODS

PARTICIPANTS

The participants in the current study were a community sample of 160 children and their primary caregivers from a suburban area of a major Canadian city. Participants were 78 4-year-olds [M age = 4.44 years, SD = 0.27; 38 girls (49%)] and 82 8-year-olds [M age = 8.49, SD = 0.24, 43 girls (52%)]. Participating children and their primary caregivers were fluent in English and the majority of primary caregivers were mothers (79%). As a proxy for socioeconomic status (SES), we asked primary caregivers to report their highest level of education. Fifty-five percent of primary caregivers reported that they had completed a university degree, followed in frequency by the completion of a college degree (23%), graduate degree (14%), and high school diploma (8%). As compared to data from the 2006 Census (Statistics Canada, 2007), the education of participants' primary caregivers is representative of the general education level in the city from which our sample was drawn. The sample for the current study was ethnically diverse. Ethnic backgrounds reported by primary caregivers include Western European (34%), South Asian (14%), Eastern European (11%), East Asian (4%), Caribbean (3%), West and Central Asian (3%), Southeast Asian (3%), African (3%), Central and South American (3%), and other/multiple origins (18%). Four percent of the primary caregivers chose not to report their ethnic background.

PROCEDURE

Children and their primary caregivers visited the research laboratory once. At the onset of the session, primary caregivers provided written informed consent for their child's participation and children provided informed verbal consent. Each child was tested independently in a separate room while his or her primary caregiver filled out a questionnaire on the child's moral and social development and family demographic information. Each session lasted approximately 45 min and consisted of interview questions on moral and social development, nine variations of the dictator game, and a donation task. All sessions were recorded on video. The testers were undergraduate psychology students who

had been extensively trained in interview techniques. As pilot testing did not indicate order effects, tasks were administered in a fixed order, with the measurement of self-reported sympathy following the measurement of guilt feelings, moral reasoning, and the dictator game (though the latter is not discussed as part of the current study). The donation task was the final task in the study. All procedures conformed to APA ethical standards for research with children and were approved by the university's Research Ethics Board.

MEASURES

Donating

Donating was measured through children's allocation of resources (i.e., stickers) to needy peers and was framed as a donation to "World Vision." The donation task was adapted from those used in previous research (see Knight et al., 1994). In a task conducted earlier in the experiment as part of a larger study, children participated in nine variations of the dictator game in which they received stickers from the experimenter and decided whether or not to share any number of these with a hypothetical peer. These sharing tasks were conducted privately and with no feedback from the experimenter. For the donation task itself, participants were then left with a number of stickers (ranging from 0 to 54, described below) and they were told that the experimenter was "collecting stickers for poor children." The experimenter showed the participant a donation box upon which was displayed a World Vision poster composed of the World Vision logo, motto (i.e., "Lend a hand"), and a photograph of three sad and economically disadvantaged children. Participants were then told that poor children would be happy to receive stickers and they were invited to donate any number of stickers they wished. The experimenter clearly stated the participants' ownership of the stickers and their option to not donate (i.e., "You don't have to give away any of your stickers if you don't want to. These are your stickers"). To allow for ostensibly anonymous donations, the experimenter left the room.

The donation measure was scored as the proportion of stickers in each child's possession at the start of the donation task that was placed in the donation box. Although all participants received the same number of stickers in the dictator game (all participants received 54 stickers in total over 9 variations of the dictator game), participants shared varying proportions of these with hypothetical recipients. Therefore, at the start of the donation task, the number of stickers in participants' possession ranged from 0 to 54 (see **Table 1**, which displays descriptive statistics by age group for the number of stickers children possessed at the start of the donation task and the proportion of stickers donated). To

ensure that children's donating was not influenced by the number of stickers in their possession at the start of the donation task, we tested the correlation between the number of stickers possessed and the proportion of these stickers donated to World Vision, $r(157) = -0.34$, $p < 0.001$. This resulting negative association indicates that children with fewer stickers in their possession were not influenced away from donating by their relatively small amount of stickers, but instead donated more than their "richer" peers. It is important to note that this negative association between the number of stickers possessed and the proportion of stickers donated is what would be expected, given that the children with fewer stickers in their possession were those who shared more in earlier tasks. To further ensure that there were no systematic associations between the number of stickers in participants' possession at the start of the donation task and other key variables in the study, we tested for potential correlations between the number of stickers possessed and each of the key study variables (i.e., moral reasoning, child-reported sympathy, caregiver-reported sympathy, and guilt). No significant correlations emerged.

Sympathy

Children's sympathy was measured using children's self-reports and ratings by primary caregivers.

Self-reported sympathy. Children's self-reported sympathy was measured with five items from Zhou et al.'s (2003) child-report sympathy scale, which is used widely in research with children (see, for example, Malti et al., 2009; Catherine and Schonert-Reichl, 2011; Ongley and Malti, 2014). A sixth reverse-coded item from Zhou et al.'s (2003) child-report sympathy scale was included in testing ("I don't feel sorry for other children who are being teased or picked on"), but was excluded from analyses due to low reliability. Participants heard each statement read aloud (e.g., "I often feel sorry for other children who are sad or in trouble") and after each was asked whether the sentence describes him/her or not, and if so, how strongly. Participants were asked to answer spontaneously and not think too long about their answers. Responses were scored as follows: *this is not like me* was scored as 0, *this is sort of like me* was scored as 1, and *this is really like me* was scored as 2. Cronbach's α for the child-reported sympathy scale was .69 for 4-year-olds and .68 for 8-year-olds.

Caregiver-reported sympathy. Primary caregiver-reports of their child's sympathy were obtained using all five items from Zhou et al.'s (2003) parent-report sympathy scale (e.g., "My child gets

Table 1 | Descriptive statistics by age group for number of stickers children possessed at start of donation task and proportion of stickers donated.

Age group	Number of stickers in possession			Proportion of stickers donated		
	Minimum	Maximum	*M* (SD)	Minimum	Maximum	*M* (SD)
4-Year-Olds	0	54	31.68 (14.59)	0	1.00	0.27 (0.32)
8-Year-Olds	12	48	28.49 (7.00)	0	1.00	0.53 (0.28)

upset when he/she sees another child being hurt"). Primary caregivers responded to the five statements as part of the questionnaire package. Responses were scored as follows: *not at all true* was scored as 1, *often not true* was scored as 2, *somewhat not true* was scored as 3, *somewhat true* was scored as 4, *often true* was scored as 5, and *always true* was scored as 6. Cronbach's α for the caregiver-reported sympathy scale was. 0.85 and. 0.89 as reported for 4- and 8-year-old children, respectively.

Guilt feelings and moral reasoning

To measure children's anticipation of guilt feelings and moral reasoning (i.e., justifications for anticipated emotions that refer to moral norms or empathic concern for the victim), participants listened and responded to two vignettes depicting moral rule violations (Malti, 2011). The vignettes were adapted from those used in previous research examining the development of moral emotions in the happy-victimizer paradigm (see Malti and Krettenauer, 2013; Arsenio, 2014). Both vignettes represented a situation in which a child has failed to perform a prosocial action, specifically helping or sharing. The two vignettes were read aloud with accompanying illustrations as follows: (1) "Toby's mom makes two cupcakes, one for Toby, and one for Kevin. Toby decides to eat the two cupcakes and give none to Kevin"; and (2) "One of the boys in Luke's class was sick when the rest of the class learned a new song that all the students must learn. The boy asks Luke if he could teach him the song but Luke says 'no'." The gender of the characters in each vignette was matched to that of the participant and the wording of the vignettes was slightly modified to be appropriate for each age group. After hearing both vignettes, participants were asked to describe how they would feel if they had performed the action in the vignette (i.e., moral emotion) and why they would feel this way (i.e., moral reasoning). These verbal responses were transcribed verbatim by the experimenter. This procedure is consistent with previous research using the happy-victimizer paradigm (Malti et al., 2009; Arsenio, 2014).

Coding for guilt. Participants' first spontaneously mentioned emotion in response to each vignette was coded as anger, fear, sadness, happiness, pride, guilt, disgust, anxiety/worry, embarrassment/shame, neutral, feeling good, feeling bad, describing a psychosomatic complaint, or other. The anticipation of feeling guilty, sad, or bad was coded as representing the anticipation of guilt (see Malti et al., 2009). Other immoral or amoral negative emotions (e.g., anger, fear, or disgust), along with positive emotions and neutral states were coded as not representing guilt. This coding system was based on those used previously in related research (e.g., Malti et al., 2009) and it includes the basic emotional correlates of guilt so that guilt expectancies can be examined in young children who may not be able to explicitly label complex emotions (i.e., guilt) but can already name their basic emotional correlates (Tracy et al., 2005; Malti and Ongley, 2014; Ongley and Malti, 2014). Inter-rater reliability for the coding of guilt was κ = 0.99 based on 15% of the data.

Proportional scores for guilt were created by aggregating the scores from the two vignettes: 0 = no anticipation of guilt in response to either vignette, 0.50 = anticipation of guilt in response to one of the two vignettes, and 1.00 = anticipation of guilt in response to both vignettes. The aggregation of scores was justified as there was a significant association between the guilt scores for the two vignettes, $r_\Phi(146) = 0.24$, $p = 0.004$.

Coding for moral reasoning. Participants' justifications for their anticipated emotions were coded as either moral reasons (i.e., those which refer to moral norms and empathic concern for the victim, such as "It is not fair to steal" or "The other child will be sad") or non-moral reasons (i.e., those which refer to sanctions by an authority, such as "The teacher might find out and get angry," hedonistic or self-serving reasons, such as "I just like cupcakes so much," unelaborated reasons, such as "It isn't nice"), or other, unclassifiable reasons.

Proportional scores for moral reasoning were created by aggregating the scores from the two vignettes: 0 = moral reasoning was not used to justify emotions in response to either vignette, 0.50 = moral reasoning was used to justify emotions in response to one of the two vignettes, and 1.00 = moral reasoning was used to justify emotions in response to both vignettes. The aggregation of scores was justified as there was a significant association between the moral reasoning scores for the two vignettes, $r_\Phi(128) = 0.27$, $p = 0.002$.

RESULTS

PRELIMINARY ANALYSES

Table 2 displays the means and standard deviations of the study variables by age group and gender.

Table 3 displays the correlations between study variables and between study and control variables (i.e., child age, gender, and primary caregiver's level of education). As can be seen, donating was positively correlated with child-reported sympathy, moral reasoning, and child age. Donating was also negatively correlated with child gender (gender was dummy coded, girls = 0, boys = 1), with girls donating more than boys. In addition, child-reported sympathy was positively correlated with moral reasoning, child age, and primary caregiver's level of education. Caregiver-reported sympathy was negatively correlated with primary caregiver's level of education and children's use of moral reasoning was positively correlated with their age.

Age and gender differences were also analyzed for each of the central study variables. First, four 2 (age group) × 2 (gender) between-subjects analyses of variance (ANOVAs) were conducted to examine age and gender differences in moral reasoning and in each of the emotion variables. Means and standard deviations of moral reasoning, child-reported sympathy, caregiver-reported sympathy, and guilt for boys and girls within each age group are reported in **Table 2**, as are significant gender differences within each age group and age effects for boys and girls. Next, differences in donating across age groups and gender were examined using a 2 (age group) × 2 (gender) between-subjects ANOVA. Main effects of both age group and gender were found for children's donating behavior, $F(1,153) = 28.82$, $p < 0.001$, $\eta_p^2 = 0.16$ and $F(1,153) = 5.59$, $p = 0.019$, $\eta_p^2 = 0.04$, respectively, with 8-year-olds donating more than 4-year-olds and girls donating more than boys (**Table 2**). Although there was only a marginally significant interaction between age group and gender, $F(1,153) = 3.66$,

Table 2 | Means and standard deviations of study variables by age group and gender.

Variable	4-Year-olds ($n = 78$)		8-Year-olds ($n = 82$)	
	Girls M (SD)	Boys M (SD)	Girls M (SD)	Boys M (SD)
Donating	0.37 (0.34)*,a	0.17 (0.27)*,A	0.54 (0.26)b	0.52 (0.31)B
Child-reported sympathy	0.59 (0.52)a	0.63 (0.51)A	1.52 (0.42)*,b	1.21 (0.48)*,B
Caregiver-reported sympathy	4.49 (0.77)a	4.59 (0.85)A	5.05 (0.50)*,b	4.53 (1.04)*,A
Guilt	0.61 (0.44)a	0.62 (0.38)A	0.64 (0.37)a	0.56 (0.40)A
Moral reasoning	0.03 (0.13)a	0.00 (0.00)A	0.26 (0.33)b	0.17 (0.31)B

Asterisks indicate significant gender differences ($p < 0.05$) within age group.
a,b Different lower case letter superscripts indicate significant age differences ($p < 0.05$) for girls. A,B Different upper case letter superscripts indicate significant age differences ($p < 0.05$) for boys.

Table 3 | Correlation matrix of study and control variables.

Variable	1	2	3	4	5	6	7
1. Donating	–						
2. Child-reported sympathy	0.30***	–					
3. Caregiver-reported sympathy	0.10	0.12	–				
4. Guilt	0.14†	0.04	−0.05	–			
5. Moral reasoning	0.35***	0.34***	0.04	0.10	–		
6. Child age	0.39***	0.62***	0.15†	0.00	0.36***	–	
7. Child gender	−0.18*	−0.14†	−0.14†	−0.04	−0.14	−0.03	–
8. Primary caregiver's level of education	0.12	0.18*	−0.18*	−0.04	0.05	0.12	0.12

Child age is measured in years. Child gender is dummy-coded (girls = 0, boys = 1).
*† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

$p = 0.058$, $\eta_p^2 = 0.02$, tests of simple effects indicate that gender differences in donating are significant for 4-year-olds only (**Table 2**).

PREDICTION OF DONATING BEHAVIOR BY SYMPATHY, GUILT, AND MORAL REASONING

To test our hypotheses regarding the predictive effects of sympathy, guilt, and moral reasoning on donating, a hierarchical multiple regression analysis was performed using donation as the dependent variable. As previous research has found associations between giving behavior and age (Benenson et al., 2007; Malti et al., 2012; Ongley and Malti, 2014), gender (Benenson et al., 2007; Leman et al., 2009), and SES (Carlo et al., 2011), we entered child's age group, gender, and primary caregiver's level of education as control variables in step 1 of the regression model. Child-reported sympathy, caregiver-reported sympathy, guilt, and moral reasoning were entered in step 2, and interaction terms between all control variables, study variables, and between control and study variables were entered in step 3. All predictor variables were centered at the mean, with the exception of gender and age group. Interaction terms were created by calculating the products of the mean-centered variables (Aiken and West, 1991). In preliminary analyses, we tested all possible interactions but non-significant

interaction terms were not retained in the final model. The final model was examined for multicollinearity using the tolerance statistic. Tolerance values for the regression model ranged from 0.40 to 0.98, safely exceeding 0.20, the guideline described by Menard (1995) as the point below which multicollinearity may be biasing a model.

Table 4 displays the results of the final analysis. Results indicated that donating behavior was predicted by child's age, moral reasoning, and an interaction between child-reported sympathy and gender, $R^2 = 0.26$, $F(8,129) = 5.72$, $p < 0.001$. R^2 of 0.26 indicates a large effect size (Cohen, 1988). Thus, older children and children more frequently using moral reasoning donated more. To interpret the interaction between child-reported sympathy and gender, we used the procedure recommended by Aiken and West (1991) and the worksheet created by Dawson (n.d.) for plotting interactions between an unstandardized variable and a binary moderator. We performed t tests on two simple slopes, which represented the regression of donating on child-reported sympathy for boys and girls, to determine if they differed significantly from zero. For both genders, simple slopes were evaluated at low and high levels of sympathy. The low and high values of sympathy correspond to the response anchors from Zhou et al.'s (2003) child-report sympathy scale. A mean sympathy score (participant's

Table 4 | Hierarchical multiple regression analyses predicting children's donating behavior.

Predictor	$\Delta R^2 / \Delta F^2$	β
Step 1	0.17/8.98***	
Age group		0.35***
Gender		−0.15[†]
Primary caregiver's level of education		0.10
Step 2	0.07/2.75*	
Age group		0.27**
Gender		−0.11
Primary caregiver's level of education		0.12
Child-reported sympathy		0.00
Caregiver-reported sympathy		0.08
Guilt		0.13[†]
Moral reasoning		0.21*
Step 3	0.03/5.14*	
Age group		0.29**
Gender		−0.11
Primary caregiver's level of education		0.09
Child-reported sympathy		−0.15
Caregiver-reported sympathy		0.11
Guilt		0.14[†]
Moral reasoning		0.20*
Child-reported sympathy x gender		0.23*
Total R^2		0.26***
N		138

[†] $p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

average score across 5 items) of 0 indicates weak or no identification with sympathetic statements ("this does not sound like me") and a mean sympathy score of 2 indicates strong identification with sympathetic statements ("this is really like me"). Neither simple slope was significantly different from zero, with gradients of −0.08 and 0.11, *ns*, and *ns*, for girls and boys, respectively. The simple slopes for girls and boys, were, however, significantly different from each other, with higher levels of sympathy trending towards a slight increase in donation for boys, while no such increase in donation occurred with higher levels of sympathy in girls.

DISCUSSION

The present study investigated the development of donating, a specific subtype of giving, in early and middle childhood, as well as the role of affective-moral and cognitive-moral variables as antecedents of donation behaviors. The act of giving can take many forms and previous research has left many questions unanswered regarding the distinctions between subtypes of giving and their moral antecedents in childhood. We believe that it is important to consider whether the factors that motivate children to donate to needy strangers are the same factors that motivate children to share with their peers, and if not, what affective and cognitive

processes are important in each. By examining different subtypes of giving, we can enrich our understanding of the factors that motivate children to give in different contexts and this understanding can, in turn, enable researchers, parents, and educators to better understand, foster, and diversify young children's emerging prosociality.

To test our hypotheses regarding the role of affective-moral and cognitive-moral antecedents of donation behaviors in early and middle childhood, we tested the predictive effects of sympathy, guilt, and moral reasoning on donating. We found that donating was predicted by children's age, moral reasoning, and an interaction between gender and child-reported sympathy. Existing research on sharing has found that the moral emotions of sympathy and guilt are important motivators of sharing behavior (Gummerum et al., 2010; Malti et al., 2012; Ongley and Malti, 2014). Interestingly, in the present examination of donation behaviors, we did not find that moral emotions played a central role (although guilt was a marginally significant predictor). Although child-reported sympathy was associated with donating at the bivariate level, it did not emerge as a strong predictor of donating when other morally relevant processes (i.e., guilt and moral reasoning) were controlled for. In this case, moral reasoning emerged as a stronger predictor of children's donating than either sympathy or guilt. This contrast between the current findings on donating and previous studies on sharing suggests that different moral-developmental antecedents may vary in the strength with which they motivate different types of giving. More specifically, the present findings suggest that children's donation behaviors may be more strongly related to the cognitive process of reasoning about others' needs while deciding to donate than to the donor's tendency to experience sympathy and guilt.

Although both donating and sharing behaviors are anonymous, costly, and unreciprocated forms of giving, they differ in the level of need demonstrated by the recipient. In particular, the recipients of donations typically demonstrate clear, explicit need. The findings of the present study suggest that this clear need on the part of donation recipients may be a key factor in this specific type of prosocial behavior. In previous work, researchers have argued that sharing is motivated by moral emotional processes through the affective comprehension of and concern for others' emotional states (i.e., sympathy) or through the anticipation of one's own negative affective state after the violation of a moral norm (i.e., guilt; Gummerum et al., 2010; Malti et al., 2012; Ongley and Malti, 2014). Taken together, these results support the importance of moral emotions in children's development of sharing behaviors. It may be the case that moral reasoning is less important in the motivation of sharing than moral emotions because there is no clear moral imperative to share with those who are not in need. Our results show that in donation behaviors, however, children's giving is also likely to depend upon a cognitive process in which one attends to and appreciates specific characteristics of the recipient (i.e., explicit need) and the consequences of a decision not to donate. Therefore, higher levels of moral reasoning may produce an increased tendency to donate because children realize that it is their duty towards individuals in need. This mechanism could lead to the important role of moral reasoning in the motivation of donation behaviors, although being sympathetic

with a recipient and feelings of guilt upon the transgression of a moral norm maintain relevance in children's orientation towards others. Nevertheless, other, related interpretations of the current results could consider additional inter-individual differences and their potential role in predicting children's donation behaviors, such as the role of personality, temperament, the level of children's knowledge and consideration of conventions and social norms in general, and their theory of mind.

In addition to our main findings, we found developmental and gender differences in moral reasoning, moral emotions, and donating. Gender differences in the current study suggest that school-aged girls report higher levels of sympathy than boys of the same age and caregivers report age-related increases in sympathy for girls only. Higher levels of donating were found in school-aged than in preschool-aged children, and, amongst preschoolers, girls donated more than boys. We also found that both sympathy and moral reasoning increased with age, which is consistent with previous research (for reviews, see Eisenberg et al., 2014; Malti and Ongley, 2014). Although existing studies have yielded conflicting findings regarding young children's ability to provide moral reasons for specific actions and decisions, the age-related increases in moral reasoning found in the current study support the idea that complex moral reasoning only emerges once children have learned to integrate the often conflicting perspectives of the self and others and have acquired interpretative understanding (Malti et al., 2010; Sokol et al., 2010).

The current study has several limitations. Firstly, we used a cross-sectional design, which does not allow for the examination of intra-individual differences and associations between moral reasoning, moral emotions, and donating across time. Therefore, we recognize that our data are correlational in nature and prevent us from being able to interpret results in terms of causal effects. Future studies on the development of giving behaviors and their cognitive and affective moral antecedents across time would benefit from longitudinal designs. Secondly, although the sample for this study was ethnically diverse and representative of the general socio-economic status of the city from which our sample was recruited, participants' families were largely from mid- to high-levels of socio-economic status. Thus, findings from the current study cannot be generalized to less advantaged children. As donating involves the recognition of a recipient's need, less advantaged children may be more likely to empathize with the recipient and their pattern of donations may differ from those of more advantaged children. Future work should include a broad sample of children that represents more diverse levels of socio-economic status. The current study also relied upon responses to a short set of hypothetical scenarios to measure guilt and moral reasoning. Future research would benefit from the use of multiple methods of assessing moral emotions and reasoning, including children's responses to their own experienced moral conflicts, and a more extensive set of scenarios. As multiple variables that were not investigated in this study have been found to be associated with children's global prosocial behavior, such as theory of mind, inhibitory control, and peer acceptance/rejection (Kochanska et al., 1997; Caputi et al., 2012), they may play also role in children's donation behaviors. Future work should seek to address this issue by adding measures of children's socio-cognitive

ability (e.g., theory of mind tasks), temperament (e.g., inhibition), and knowledge about (and consideration of) social norms in general to investigations of children's giving. Finally, two marginal effects in the current study (i.e., the prediction of donation behavior by guilt and the prediction of boys' donations by self-reported sympathy) suggest that future studies with a larger sample, and thus greater predictive power, may help to clarify the role of moral emotions in donation behaviors.

Despite these limitations, the present study has several notable strengths. Most importantly, this study investigated a relatively unexplored issue – the differentiation between specific types of giving behaviors and their moral-developmental antecedents in childhood. The current study explored this issue in an ethnically diverse sample across two different age groups and demonstrated that children's donating is motivated by developmental and cognitive moral processes, specifically, children's use of moral reasoning. These results differ from previous work on sharing, which suggests that sharing is strongly motivated by affective-moral processes such as the moral emotions of sympathy and guilt. As a result, the present study provides valuable contributions to our knowledge about the development of children's giving behaviors and why children are motivated to give costly resources to others.

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The development of sympathy from 5 to 7 years: increase, decline, or stability? A longitudinal study

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In the present study the development of sympathy in a group of 85 children (43 girls) was investigated over a 3-year period, starting with the last year of child care, when the children were 5 years-old. Sympathy was measured via different measures: two standardized observations, where the children were observed as they witnessed the distress of a puppet in two different situations; two follow-up interviews with the children immediately after the observations; a self-report questionnaire and two other-report questionnaires by parents and teachers. At all three periods the observations and the children's self-reports (interviews, questionnaire) were intercorrelated. The teachers' and the parents' reports were not significantly correlated with any of the other measures at time 1. At times 2 and 3, a few low but significant correlations emerged. As a consequence, the other reports were dropped from further analyses and a composed sympathy measure consisting of observations and self-reports was created. Rank-order stability of this composed measure over the course of the 3 years proved to be high; suggesting that interindividual differences maintained stability. Mean-level differences showed a significant increase over the course of the study with the highest increase in the initial 2 years. Neither gender nor the interaction between gender and time were significant. In conclusion, the measurement of sympathy has proven valid for the childrens' observations and self-reports. To the question of age-correlated development, stability in sympathy is firstly high and secondly sympathy increases mainly during the time between the last year in child care and the first year in elementary school.

Keywords: sympathy, empathy, concern, prosocial behavior, childhood

INTRODUCTION

The ability to sympathize with another person's pain or distress may be the most important bases for interpersonal relationships. Knowledge about the development of this ability in children is therefore crucial for our understanding of human social interaction, especially for the motivation of prosocial behavior (Paulus, 2014). Advances in the understanding of the relations between sympathy and prosocial behavior have been obtained in part by a conceptual differentiation between terms like sympathy, empathy, personal distress, perspective taking, etc., (Batson, 1991; Bischof-Köhler, 2012; Eisenberg et al., 2014).

Sympathy has been defined by Eisenberg et al. (2007) as "an emotional response stemming from the apprehension of another's emotional state or condition, that is not the same as the other's state or condition but consists of feelings of sorrow or concern for the other" (p. 546). Empathy, in contrast, is defined by Bischof-Köhler (2012) as "a process in which an observer vicariously shares the emotion or intention of another person and thereby understands what this other person feels or intends" (p. 41). In this sense, being empathetic means to be aware that the source of the shared emotion is in the other person. Thus, empathy should not be confused with emotional contagion, a state that "...occurs when the vocal, facial and gestural cues of one individual generate a similar state in the perceiver" (Decety and Svetlova, 2012, p. 8) – like, for example, contagious laughter or mass panic.

Empathy can occur not only as a reaction to another person's mishap, but also to positive emotions like joy (Singer, 2006; Light et al., 2009; Sallquist et al., 2009). It is value-neutral (Eisenberg et al., 2014).

The motivational consequences of empathy to other's negative emotions can be quite different, sympathy is but one possibility. Another possible reaction is distress, which means that for example a child is more self- than other-focused and experiences feelings of tension (Batson, 1991). Finally, empathy can also lead to schadenfreude – a feeling that could not be enjoyed without empathy (Bischof-Köhler, 2012; Schulz et al., 2013).

A final point concerning definition is the relation between sympathy and prosocial behavior. Sympathy is not necessarily related to prosocial behaviors, since behaviors like sharing or donating can, for example, also be motivated by social norms. Yet relations with altruistic behavior such as comforting are found frequently, so that comforting behavior is often used as an indicator for sympathy (Kienbaum, 2001; Eisenberg et al., 2014).

The first empathy-like phenomenon that can be observed in development is the so-called reactive newborn cry. Newborns start to cry as soon as they hear another baby cry (Simmer, 1971; Sagi and Hoffman, 1976; Dondi et al., 1999). This is not yet empathy because of course the newborns lack the awareness that the feeling originates in another baby and not in themselves; it's an example of emotional contagion.

When does empathy appear for the first time? What is required for its full-blown experience is the self-other distinction of subjective experience. This ability to distinguish between self and other emerges during the second year of life and is usually measured by children's ability to recognize themselves in a mirror (Rouge Test, Amsterdam, 1972). The middle of the second year of life, when self-recognition usually occurs, is also the time when the first sympathetic-comforting actions in children have been reported (e.g., Zahn-Waxler et al., 1992; Svetlova et al., 2010).

In order to test empirically whether self-recognition is a prerequisite of compassionate behavior, Bischof-Köhler (2012) conducted a series of investigations with more than 120 children between 16 and 24 months. She found that only children who recognized themselves in the mirror showed concern and compassion toward a sad playmate. Yet not all recognizers showed sympathy, so it was concluded that self-recognition is a necessary but not sufficient precondition for empathy (but see Zahn-Waxler et al., 1992; Kärtner et al., 2010, for less clear relations). In a recent publication by Roth-Hanania et al. (2011), the idea that this is the time when sympathy first occurs has been challenged. The authors investigated the responses of 37 infants from 8 to 16 months to the distress of their mother and a videotaped peer. "Concerned affect" was operationalized mainly in terms of sadness in face or voice and appeared in 8- and 10-months-olds already, an age when the above described self-other distinction cannot be assumed. Prosocial behavior occurred very seldom in this age group; self-recognition was not assessed. Whether these results can be interpreted in terms of an earlier onset of other-oriented empathic responding or whether the sad vocal and facial reactions of the infants would better be interpreted as a form of emotional contagion is open to discussion at this point; of course more empirical evidence with children younger than 1 year has to be accumulated before any generalizations can be made (Davidov et al., 2013).

Is there a normative development of sympathy? The most popular theory concerning this question has been formulated by Hoffman (2000). He postulates an age-correlated increase of sympathy brought about by progress in social-cognitive development. According to him, individuals make progress ". . .as they grow up in understanding the causes, consequences, and correlates of an increasingly complex array of emotions" (p. 80). Hoffman describes five "stages" in the development of sympathy. Four of them take place in infancy; beginning with the already mentioned "reactive newborn cry" and ending in the middle of the second year of life, when the children realize that the other has inner states independent of their own (called "veridical empathic distress" by Hoffman). The fifth and last stage pertains already to school-age-children, who are able to experience sympathy beyond the immediate situation; for example they can feel sympathy for an entire group that is not present (e.g., "poor children") and realize that the lives of others may be generally sad or happy.

Although Hoffman does not offer his own empirical data to test this theory, there is some empirical support for his assumptions. Yet, the vast majority of research has been conducted in the infant years. For example, the twin studies by Knafo

et al. (2008), and Zahn-Waxler et al. (2001) found longitudinally an increase of empathic concern and prosocial behavior between 14 and 36 months and so confirmed a gradual transition from strong self-concern to empathic concern for others in early childhood.

In contrast to Hoffman's position, Hay (1994) proposes a decline in prosocial reactions from infancy to childhood because, for example, children learn rules about who deserves help, and so ". . .prosocial behavior becomes less of a general social impulse and more of a considered decision" (p. 38). Volland et al. (2004) found support for the effect of the postulated rules: 4- to 8-year-old children were more willing to offer help to another child if her damage was high, if she was not to blame for it, if the child was younger and familiar and if she had also helped before. The importance of these attributes increased with increasing age of the children. Although Hay's theory pertains to prosocial behavior, it can easily be applied to the development of sympathy as well, since statements like "it's his own fault" clearly indicate that this person does not deserve our sympathy. For example, van der Mark et al. (2002) found an increase of empathic concern for the mother's distress from 16 to 22 months in girls, but a decrease for the distress of a stranger, thus supporting the rule that a familiar person is more worthy of sympathy than an unfamiliar one.

Recently, a third position was outlined by Davidov et al. (2013). These authors propose that empathic concern may not grow over time at all because ". . .it cannot be assumed that the affective core of empathy qualitatively changes with age" (p. 129). Empirical support for this assumption comes from studies that did not find age-correlated increases in sympathy, like Light et al. (2009) in a cross-sectional study with 6- and 10-year-old children, Vaish et al. (2009) with a cross-sectional comparison of toddlers aged 18 and 25 months and Volbrecht et al. (2007) with a longitudinal study of nearly the same age group (19–25 months).

Whereas many of the studies cited so far investigated infants or toddlers, empirical evidence especially in terms of longitudinal data about the development of sympathy during the *childhood* years is sparse. Eisenberg and Fabes (1998), cited in Eisenberg et al. (2014) conducted a meta-analysis using studies published from 1983 until about 1996 and ". . .found an age-related increase in empathy and sympathy across childhood and adolescence, at least for observational and self-report indices (but not for solely facial or physiological indices). However, they did not examine when in childhood the age-related changes were most evident" (p. 187). Since then, only a few longitudinal studies have addressed the question of age-related changes in sympathy during childhood. Hastings et al. (2000) examined concern for others in children from ages 5 to 7. Observable concern was stable for children at low or moderate risk of clinical behavior problems, but decreased significantly for children at high risk. Malti et al. (2013) investigated a sample of Swiss children at 6, 7, and 9 years of age. 47% of the children reported increasing sympathy over time, 43% stayed stable on a high level and 10% reported consistently low levels of sympathy over the course of the study. In general, self-reported sympathy increased between 6 and 7 as well as between 7 and 8 years (Tina Malti, e-mail message to author, February 5, 2014).

Hence, there is empirical support for each of the three positions outlined above: increase, decrease, and no changes of sympathy with age. One severe problem in comparing and evaluating the different studies is that most of them rely on only one single measure, either self-report or observation, thus limiting the explanatory power of the results. Any single measure is only a partial assessment of the underlying construct, and at the same time it incorporates error and bias. What is urgently needed (apart from a new meta-analysis) is longitudinal data that relies on multiple methods from multiple sources. A welcome supplement effect of such a study would be that information on the methods validity could be gathered by investigating whether they converge or not.

Another aspect concerning development is that despite possible age-related changes in children, there is the possibility that interindividual differences emerge in early childhood and stay stable thereafter. The existence of an altruistic personality has been debated for many years mainly in the social psychological, but also in the developmental literature (Eisenberg et al., 1999; Knafo et al., 2008; Paulus et al., 2013). According to Eisenberg et al. (2006), there is evidence of modest stability among measures of prosocial or empathy-related responding. For example, Hastings et al. (2000) found evidence of modest stability between observed concern for others at 5 and 7 years. Malti and Buchmann (2010) report modest stability for self- and other sympathy reports within informant (child, mother, and teacher) from 6 to 7 years. More longitudinal data, based on multiple methods from multiple sources is needed to make sure that we can generalize the conclusion that interindividual differences tend to stay stable from the preschool-years onward.

Finally, methods also play a role in the question of gender differences. Sympathy is a gender-sensitive topic; it is a widely held view that females are more sympathetic than males. Yet, the empirical evidence is mixed: the largest divergences favoring girls have been found for self- and other-report measures, whereas only few differences occurred in studies using physiological responses to evocative stimuli (Eisenberg et al., 2014). In a recent meta-analytic review on gender differences in emotion expression in children, Chaplin and Aldao (2013) found a small effect size for girls showing more sympathy expressions than boys. In the present study, several methods will be used with the same sample over a period of 3 years. Thus, it can be tested whether gender differences are method-dependent and whether this pattern changes with age or stays the same across the whole time period.

The goal of the present study was to assess the developmental trajectories of sympathy in middle childhood in a three-wave longitudinal study, using a multi-method multi-informant approach including observations in standardized situations, different types of self-reports and reports by mothers and teachers. Specifically, it was examined

(a) whether the different methods would converge or not, so that conclusions about their validity could be drawn,
(b) whether there would be a significant increase in sympathy, as hypothesized by Hoffman (2000), or a decrease, as postulated by Hay (1994) or no changes (Davidov et al., 2013), and

(c) whether interindividual differences in sympathy would be stable over the 3 year period of the study.

MATERIALS AND METHODS
PARTICIPANTS
The data were collected in South Tyrol, a rural, touristy area in the mountains of northern Italy, where the majority of the population speaks German as their first and Italian as their second language. South Tyrol has a comparatively low level of unemployment (about 3% in 2011). The capital Bozen-Bolzano is the biggest town with about 100.000 inhabitants (Autonomous Province of South Tyrol, 2013).

Data collection started in 2009 with 85 children (43 girls, $M = 70.25$ months or 5.85 years, $SD = 3.79$ months). Out of these, 12 (14%) visited a child care center in Bozen-Bolzano, the rest attended child care centers in and around Brixen-Bressanone, a small town with about 20.000 inhabitants. In 2010, one girl moved; the mean age of the remaining 84 children was $M = 79.58$ months or 6.67 years ($SD = 3.77$ months). In 2011, 83 children (41 girls, 42 boys), with a mean age of $M = 91.75$ months or 7.6 years ($SD = 3.83$ months) remained in the study. Consent was received from school authorities and parents.

Mothers ($N = 76$ at T1, $N = 77$ at T2 and T3), 33 child care teachers and 31 first and second grade teachers completed questionnaires concerning the children's dispositional sympathy (see below).

The children were mostly from middle-class families. 70 mothers and 67 fathers provided information about their highest educational achievement. Of the mothers, 30% reported that they had completed high school, followed in frequency by the completion of university (27%), vocational training (27%), middle school (9%), and others (7%). Concerning the fathers, 36% reported that they had completed a vocational training, followed in frequency by the completion of university (33%), high school (21%), middle school (9%), and others (1%).

Information concerning siblings was available for 73 of the participating children; of these, 44 (60%) had one sibling, 18 (25%) had two siblings, one had three siblings (1%) and 10 (14%) had no siblings.

PROCEDURES AND MEASUREMENTS
Sympathy was measured via the following methods:

(a) two standardized observations, where the children were observed when they witnessed the distress of a puppet in two different situations;
(b) two follow-up interviews with the children immediately after the observations;
(c) a German version of the child-report sympathy scale (Zhou et al., 2003);
(d) a German version of the parents' and the teachers' reports of children's sympathy (Zhou et al., 2003).

During the *observational trials*, the children were videotaped as they witnessed the distress of a puppet in two different situations (Kienbaum et al., 2001). The puppet was about 60 cm tall and was controlled by a trained student.

In the first situation, called "sadness," at T1 the child and puppet played with two balloons that had been blown up ahead of time and

then watched a short film together. During the film, the puppet's balloon bursts and the puppet "cries" for 30 s, followed by 30 s in which there is a gradual subsiding of the distress.

In the second situation, called "pain," at T1 the child and puppet were sitting together drawing pictures. When the puppet decided to stand up and get some new coloring pencils, it bumped into a chair and feigned injury for 30 s, followed again by 30 s in which there was a gradual subsiding of the distress.

The observations took place in a separate room in the child care center or school; the order was counterbalanced. There was a minimum of one day between the two observations. The reactions of the child were videotaped by two cameras and coded by two trained, independent observers, each on a scale from 0 (does not occur at all) to 5 (very strong). The criteria used for the evaluations were similar to those used by Eisenberg et al. (1988, p. 303) as well as those used in other research groups (Kienbaum and Trommsdorff, 1997). The behavior of a child was labeled as "sympathetic-comforting" when she interrupted her activity, softened her face, oriented her attention toward the puppet by looking at it, talked to it in a soft comforting voice and/or caressed the puppet or offered her own balloon.

Interrater reliabilities were established for the whole sample by means of Cohen's weighted kappas[1] (Cohen, 1968). Discrepancies between ratings were decided in conference. The final rating was the conferenced rating. The resulting values were $k_w = 0.92$/"pain" and $k_w = 0.91$/"sadness" at T1, $k_w = 0.92$/"pain" and $k_w = 0.95$/"sadness" at T2 and $k_w = 0.82$/"pain" and $k_w = 0.80$/"sadness" at T3, all $p < 0.001$.

The simulations for pain and sadness were different every year. At T2, the puppet simulated pain when a big book fell on her leg. The simulation of sadness took place when the doll wanted to paint a picture with water colors and the water flowed over her image. At T3, the puppet simulated pain when she bumped her head while she tried to pick up a puzzle piece from the ground. She simulated sadness after she had "accidentally" torn a picture with an animal photo.

Shortly after the observations, the children were *interviewed*. The puppet yawned and "went to sleep," whereupon the student proposed to clean up the room together with the child. Meanwhile, the student asked what had happened and why the puppet cried. Finally, the child was asked if she felt sorry for the puppet and if so, how much on a scale from 1 (not at all) to 3 (very much).

On a different day, we interviewed the children using the five positively formulated items from the child-report sympathy scale (Zhou et al., 2003; e. g. "I often feel sorry for other children who are sad or in trouble"). Items were translated into German and read aloud. If the children answered that they felt sorry, they were asked how much (a little bit or a lot; 1 = do not feel sorry; 3 = do feel sorry a lot). Cronbach's alphas from T1 to T3 were 0.82, 0.84, and 0.69.

Finally, two questionnaires – the *Parents' Reports on Children's Sympathy* and the *Teachers' Reports on Children's Sympathy* (Zhou et al., 2003) – were administered to the children's parents and teachers, respectively. Out of the five items, only those four that

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[1] The weights were assigned by the formula $v_{ij} = |i\text{-}j|$.

were positively formulated were used for all further analyses, since the negatively formulated item lowered reliability. Four items remained (e.g., "My child/this child usually feel sorry for other children who are upset or sad"; 1 = child is not sympathetic, 3 = child is very sympathetic). Items were translated into German. Cronbach's alpha for the mothers from T1 to T3 were 0.67, 0.78, and 0.80. For the teachers, the corresponding values were 0.86, 0.92, and 0.93.

Observations of and interviews with the children took place either in the child care center (T1) or the school (T2 and T3) in a quiet, separate room. The parents' questionnaires were handed out to the children with an envelope to be sent back. Child care teachers and school teachers were given the questionnaires in the institution.

RESULTS

In the following, descriptive analyses for the different measures of sympathy are presented first. Secondly, intercorrelations at the three time intervals are presented. Finally, the results from the rank-order stability analyses (correlations) and the mean-level stability analyses are presented.

Means and standard deviations for the different measures are depicted in **Table 1**.

As can be seen in **Table 1**, sympathy either increased or stayed stable. Repeated measures ANOVAs were run for each method with the three times as the within-subjects factor and the gender of the child as the between-subjects factor in order to test whether differences in values were significant or not. For three of the methods – the follow-up interview pain, the child-report sympathy scale and the teachers' reports of children's sympathy scale – the assumption of sphericity had been violated, therefore the degrees of freedom were corrected using the Greenhouse–Geisser estimate of sphericity. Omega squared (ω^2), a correction of η-squared, is reported as measure of effect size, since it is a population estimate and less biased than η-squared (Field, 2009).

Concerning the *observation sadness*, neither the main effect of time, $F_{(2,156)} = 0.97$, *ns*, $\omega^2 = 0.00$, nor gender, $F_{(1,78)} = 0.12$, *ns*, $\omega^2 = 0.00$, nor the interaction between gender and time, $F_{(2,156)} = 0.95$, *ns*, $\omega^2 = 0.00$, proved significant. For the *observation pain*, the main effect of time was significant, $F_{(2,162)} = 7.12$, $p < .001$, $\omega^2 = 0.02$, whereas the main effect of gender, $F_{(1,81)} = 0.32$, *ns*, $\omega^2 = 0.00$, and the interaction between gender and time, $F_{(2,162)} = 1.05$, *ns*, $\omega^2 = 0.00$, were not. Regarding the *follow-up interview sadness*, again the main effect of time proved significant, $F_{(2,142)} = 7.12$, $p < 0.001$, $\omega^2 = 0.03$, whereas the main effect of gender, $F_{(1,71)} = 0.77$, *ns*, $\omega^2 = 0.00$, and the interaction between gender and time, $F_{(2,142)} = 0.50$, *ns*, $\omega^2 = 0.00$, were not. As to the *follow-up interview pain*, the main effect of time was significant, $F_{(1.81,128.81)} = 11.84$, $p < 0.001$, $\omega^2 = 0.06$, in contrast to the main effect of gender, $F_{(1,71)} = 0.16$, *ns*, $\omega^2 = 0.00$, and the interaction between gender and time, $F_{(1.81,128.81)} = 2.60$, *ns*, $\omega^2 = 0.00$. For the *child-report sympathy scale*, the main effect of time was highly significant, $F_{(1.83,147.82)} = 17.00$, $p < 0.001$, $\omega^2 = 0.08$, whereas the main effect of gender just fell short of significance, $F_{(1,81)} = 3.58$, $p < 0.07$, $\omega^2 = 0.02$. The interaction between gender and time was not significant,

Table 1 | Means and standard deviations of methods measuring sympathy.

	M (SD)		
	T1	T2	T3
Observation sadness	1.71 (2.11)	1.96 (1.92)	1.96 (1.74)
Girls	1.67 (2.14)	1.97 (1.88)	2.18 (1.64)
Boys	1.76 (2.10)	1.95 (1.99)	1.73 (1.83)
Observation pain	0.89 (1.50)[ab]	1.36 (1.80)[a]	1.53 (1.79)[b]
Girls	0.76 (1.32)	1.17 (1.72)	1.59 (1.75)
Boys	1.02 (1.68)	1.55 (1.88)	1.48 (1.85)
Follow-up interview sadness	2.10 (0.79)[c]	2.25 (0.67)	2.40 (0.59)[c]
Girls	2.17 (0.76)	2.26 (0.66)	2.49 (0.51)
Boys	2.03 (0.82)	2.24 (0.69)	2.32 (0.64)
Follow-up interview pain	2.05 (0.80)[de]	2.37 (0.70)[d]	2.43 (0.55)[e]
Girls	1.91 (0.72)	2.40 (0.68)	2.46 (0.50)
Boys	2.18 (0.86)	2.34 (0.72)	2.40 (0.60)
Child-report sympathy scale	2.10 (0.60)[fg]	2.44 (0.52)[f]	2.40 (0.43)[g]
Girls	2.14 (0.60)	2.56 (0.46)	2.48 (0.39)
Boys	2.05 (0.60)	2.32 (0.55)	2.33 (0.45)
Parents' reports of children's sympathy	2.43 (0.45)[h]	2.47 (0.47)	2.59 (0.44)[h]
Girls	2.56 (0.37)	2.60 (0.43)	2.76 (0.29)
Boys	2.30 (0.47)	2.35 (0.49)	2.42 (0.50)
Teachers' reports of children's sympathy	2.18 (0.61)	2.27 (0.63)	2.26 (0.64)
Girls	2.46 (0.48)	2.50 (0.54)	2.52 (0.56)
Boys	1.90 (0.62)	2.04 (0.64)	2.00 (0.62)

Whole sample sizes range from 77 to 84 subjects due to missing values. [abcd...]
Values in a row marked with the same characters differ significantly (p < 0.05).
Observations scales were from 0 to 5; all other scales from 1 to 3.

$F(1.83, 147.82) = 0.74$, *ns*, $\omega^2 = 0.00$. For the *parents' reports of children's sympathy scale*, both main effects of time, $F(2,136) = 3.85$, $p < 0.05$, $\omega^2 = 0.02$, and gender, $F(1,68) = 11.48$, $p < 0.001$, $\omega^2 = 0.10$, were significant, whereas the interaction between gender and time was not, $F(2,136) = 0.44$, *ns*, $\omega^2 = 0.00$. Finally, for the *teachers' reports of children's sympathy scale*, the main effect of time was not significant, $F(1.48, 115.48) = 0.85$, *ns*, $\omega^2 = 0.00$, whereas the main effect of gender was highly significant, $F(1,78) = 27.10$, $p < 0.001$, $\omega^2 = 0.19$. The interaction between gender and time was not significant, $F(1.48, 115.48) = 0.20$, *ns*, $\omega^2 = 0.00$.

In sum, there was no significant interaction between time and gender in any of the methods. For two of the methods, time had no significant main effects (observation sadness, teachers' reports); whereas in all the other methods, values of children's sympathy increased with increasing age. Results of the *post hoc* Bonferroni tests are shown in **Table 1**.

Concerning the two observations, sympathetic reactions were significantly higher in the simulation of sadness as compared to the simulation of pain at all three times [$t(81) = -3.45$, $p < 0.001$, $t(83) = -3.56$, $p < 0.001$ and $t(82) = -2.43$, $p < 0.05$ at T1, T2 and T3, respectively).

Next, the gender differences were inspected more closely. *Post hoc* Bonferroni tests revealed that at all three time intervals, mothers and teachers rated girls as more sympathetic than boys ($ps < 0.05$ for T1 and T2 and $p < 0.001$ at T3 for the maternal ratings and $ps < 0.001$ at T1, T2, and T3 for the teacher ratings). Concerning the other five methods, only one single difference emerged: at time 2, girls described themselves as more sympathetic on the child-report sympathy scale ($p < 0.05$).

In order to test the validity of the different measures, their intercorrelations were computed at the three intervals in a next step; results can be seen in **Tables 2–4**.

The correlations showed quite a clear pattern: at time 1, the observations and the children's self-reports were intercorrelated, whereas the parents' and teachers' reports were not significantly correlated with any of the other measures. The same held true for time 2, although parents' reports were significantly correlated for at least two of the measures. At time 3, the pattern is the same, but at this interval the parents' rating also significantly correlated with all the other measures, though coefficients were not as high as for the other correlations.

In a next step, the rank-order was examined with correlations for the three different time points. Results are shown in **Table 5**.

Since the reports from the mothers, child care and elementary school teachers did not correlate continuously with the other methods, they were dropped from all further analyses. The remaining five methods (observations and self-report-measures of sympathy) were standardized and aggregated; the means and standard deviations at T1, T2, and T3 are depicted in **Table 6**. Afterward, a repeated measurement ANOVA with the three intervals as the within-subjects factor and the gender of the child as the between-subjects factor was computed. A significant effect of time emerged, $F(2,162) = 23.95$, $p < 0.001$, $\omega^2 = 0.05$, whereas neither gender, $F(1,81) = 0.08$, *ns*, $\omega^2 = 0.00$, nor the interaction between gender and time, $F(2,162) = 2.03$, *ns*, $\omega^2 = 0.00$, turned out to be significant. *Post hoc* Bonferroni tests showed that the difference between time 1 and the two later time intervals was significant (both $ps < 0.001$).

The rank-order of the aggregated measure was computed again by means of the Spearman's rank correlation coefficient; the resulting values were $r = 0.65$, $p < 0.001$ for T1–T2, $r = 0.63$, $p < 0.001$ for T1–T3 and $r = 0.73$, $p < 0.001$ for T2–T3.

DISCUSSION

The aim of the present study was to examine the mean-level change and rank-order stability of sympathy during middle childhood in a three-wave longitudinal study, using a multi-method multi-informant approach including observations in standardized situations, different types of self-reports and reports by mothers and teachers. There was evidence of rank-order stability and mean-level change in nearly all of the methods.

To begin with, mean level change over the study's 3 years run appeared in one of the standardized observations ("pain"), both follow-up interviews, the child-report sympathy scale and

Table 2 | Intercorrelations of the methods measuring sympathy T1.

Spearman correlation coefficient, one-tailed						
	2	3	4	5	6	7
1. Observation sadness	0.38***	0.29**	0.24*	0.25*	0.02	−0.11
2. Observation pain	—	0.10	0.21*	0.12	−0.04	0.06
3. Follow-up interview sadness		—	0.74***	0.44***	0.06	0.07
4. Follow-up interview pain			—	0.48***	−0.03	0.10
5. Child-report sympathy scale				—	0.05	0.14
6. Teachers' reports of children's sympathy					—	0.17
7. Parents' reports of children's sympathy						—

*Sample sizes range from 70 to 85 subjects due to missing values; *p < 0.05, **p < 0.01, ***p < 0.001.*

Table 3 | Intercorrelations of the methods measuring sympathy T2.

Spearman correlation coefficient, one-tailed						
	2	3	4	5	6	7
1. Observation sadness	0.74***	0.51**	0.33**	0.35**	0.16	0.10
2. Observation pain	—	0.52***	0.45***	0.25*	0.06	0.23*
3. Follow-up interview sadness		—	0.70***	0.61***	−0.01	0.08
4. Follow-up interview pain			—	0.63***	−0.07	0.20*
5. Child-report sympathy scale				—	0.02	0.18
6. Teachers' reports of children's sympathy					—	−0.03
7. Parents' reports of children's sympathy						—

*Samples sizes range from 77 to 84 subjects due to missing values; *p < 0.05, **p < 0.01, ***p < 0.001.*

Table 4 | Intercorrelations of the methods measuring sympathy T3.

Spearman correlation coefficient, one-tailed						
	2	3	4	5	6	7
1. Observation sadness	0.68***	0.43***	0.46***	0.40***	0.18*	0.34**
2. Observation pain	—	0.40***	0.48***	0.43***	0.12	0.41***
3. Follow-up interview sadness		—	0.64***	0.51***	0.06	0.29**
4. Follow-up interview pain			—	0.55***	0.10	0.31**
5. Child-report sympathy scale				—	0.20*	0.21*
6. Teachers' reports of children's sympathy					—	0.27*
7. Parents' reports of children's sympathy						—

*Sample sizes range from 71 to 83 subjects due to missing values; *p < 0.05, **p < 0.01, ***p < 0.001.*

the parents' reports of children's sympathy scale. The means of the teachers' reports of children's sympathy scale were quite high and stayed stable over the course of the study. The means of the sadness-simulation were significantly higher as opposed to the pain-simulation and also stayed stable during the 3 years of assessment. Thus, in five of the seven different methods that were administered, there was an increase in sympathy. A decrease was not observed at all, and stability occurred only in two of the methods. In sum, this pattern of results gives support to the theory by Hoffman (2000) where an increase in empathic responding over the childhood years is assumed.

But before generalizing these results, the validity of the different measures was assessed by computing intercorrelations between them in every year. Here, a very clear pattern emerged: the observations and self-reports were significantly intercorrelated at

Children's giving: moral reasoning and moral emotions in the development of donation behaviors

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This study investigated the role of moral reasoning and moral emotions (i.e., sympathy and guilt) in the development of young children's donating behavior ($N = 160$ 4- and 8-year-old children). Donating was measured through children's allocation of resources (i.e., stickers) to needy peers and was framed as a donation to "World Vision." Children's sympathy was measured with both self- and primary caregiver-reports and participants reported their anticipation of guilt feelings following actions that violated prosocial moral norms, specifically the failure to help or share. Participants also provided justifications for their anticipated emotions, which were coded as representing moral or non-moral reasoning processes. Children's moral reasoning emerged as a significant predictor of donating behavior. In addition, results demonstrated significant developmental and gender effects, with 8-year-olds donating significantly more than 4-year-olds and 4-year-old girls making higher value donations than boys of the same age. We discuss donation behaviors within the broader context of giving and highlight the moral developmental antecedents of giving behaviors in childhood.

Keywords: giving, moral emotions, moral reasoning, donating, childhood

INTRODUCTION

Giving is one of the key social behaviors that distinguishes our species from others (Knafo and Plomin, 2006) and fosters care and cooperation in social interactions (Staub, 1979). It takes many forms, from the reciprocal sharing of toys with friends in preschool, to the anonymous donation of money to a charity, to our society's centralized division and allocation of resources as part of the social welfare system. Because of its roots in early childhood and its importance to large-scale fairness and care (Malti et al., 2012), a rich body of research in psychology has focused on understanding the development and motivation of children's giving behaviors (Eisenberg et al., 2014). It is often the case, however, that little distinction is drawn between different subtypes of giving. As a result, a lack of conceptual clarity surrounding subtypes of giving behavior exists and many questions remain regarding their potentially distinct affective and cognitive moral antecedents.

Giving behaviors can be differentiated along multiple dimensions, including anonymity (of either the giver or the recipient), the recipient's level of need, the cost of the giving behavior, and the degree of reciprocity in the relationship between the giver and the recipient. Sharing, as one type of giving, for example, is often examined in research using the dictator game (Kahneman et al., 1986; Gummerum et al., 2010) in which a single player chooses how many (if any) of a set number of items to allocate to an anonymous other. Sharing is completed privately and there is no opportunity for the recipient to respond, retaliate, or form an evaluation of the (non)sharer (Gummerum et al., 2010). In this way, sharing in the dictator game is anonymous, unreciprocated, and costly (the shared items are typically selected so that they are valuable to the giver and there is no opportunity for the allocated items

to be returned). Researchers may vary the contextual features of the dictator game, but in the simplest version, there is no explicit need ascribed to the recipient. Donating, like sharing, is also typically anonymous, costly, and unreciprocated. Unlike sharing, however, givers in donation tasks are confronted with potential recipients who exhibit clear need, often on the basis of poverty (Dlugokinski and Firestone, 1973; Rushton and Wheelwright, 1980), injury (Knight et al., 1994), illness (Boe and Ponder, 1981), or disability (Isen and Noonberg, 1979).

Although a number of studies (Eisenberg and Miller, 1987; Malti et al., 2012; Ongley and Malti, 2014) have investigated the relationship between giving behaviors in general and their affective and cognitive moral antecedents, many questions remain about the moral antecedents of distinct giving behaviors, such as sharing and donating. In particular, existing developmental studies have found that the association between giving behaviors and morality differs on the basis of: (1) the type of giving behavior considered (and its dimensions of anonymity, cost, reciprocity, and need of the recipient), (2) the specific aspect of morality measured (e.g., moral reasoning vs. moral emotions, self-evaluative vs. other- oriented moral emotions, and responses to moral transgressions committed by the self or by others), and (3) the measures used in assessing children's giving and their cognitive and affective moral development (e.g., self-reports, teacher/parent-ratings, anonymous vs. public giving). In the current study, we therefore consider an important distinction between the giving behaviors of sharing and donating: the absence or presence of explicit need. We also investigate the developmental trajectory and affective-moral antecedents specific to donation behaviors of 4- and 8-year-olds. We then discuss our findings on children's donating in light of previous, related work on sharing, comparing

across time within methods. Correlations were highest for the aggregated measure of sympathy. Thus, considerable evidence for differential stability over the course of the 3 years of the study was obtained, supporting the idea of an overall sympathy disposition. Apparently, the so called "altruistic" personality tends to develop quite early, even before the entry into school, and is highly consistent over time. The reasons for this stability are probably due to a number of factors, which include both genetic contributions and continuity of socialization influences. Concerning the genetic contributions, the already mentioned twin studies obtained evidence of heritability of empathy-related responding (Zahn-Waxler et al., 2001; Knafo et al., 2008). Furthermore, there is evidence that sympathy is linked to temperamental traits like inhibition (e.g., van der Mark et al., 2002), that likely have a constitutional basis (but are also influenced by the environment; Kienbaum et al., 2001). As to socialization, continuity in the childrearing environment like a secure attachment relationship, parental warmth and support, parental modeling of sympathetic emotions, parental encouragement of children's expressions of emotion and an inductive child-rearing style most likely also contribute to consistency in sympathetic responding over time (see Eisenberg et al., 2014, for an overview of studies).

Because of the aforementioned reasons, self-reports and observations were aggregated. The mean-level differences of this aggregated measure confirmed the above mentioned depiction concerning age differences; revealing a significant increase in sympathy over the course of the study with the most increase between the first 2 years. These 2 years cover the transition from preschool to elementary school, a time that can be characterized as a critical life event for the children. The new context of socialization seems to stimulate increases not only in the development of cognitions, but also of emotions. Progress in cognitive development may, as outlined by Hoffman (2000), make children understand better what lies behind other's feelings, thus stimulating also an increase in empathetic responses.

Furthermore, children are confronted with new expectations from parents, but also from new significant adults in their lives – the teachers. The developing relationships between elementary school teachers and children may be an important factor for the development of sympathy. As has been demonstrated elsewhere for child care teachers (Kienbaum, 2001), children are more sympathetic when they attend a classroom with a warm and supporting teacher.

Thus, the conclusion concerning the question of age-correlated development is first that *stability in sympathy is high* and secondly that there is an *increase in sympathy*, mainly during the time between the last year in child care and the first year in elementary school. The obtained effect size (omega squared) for time in the aggregated sympathy-variable can be interpreted as medium, since according to Cohen (1988, p. 286–287), values of 0.01, 0.06, and 0.14 can be used to indicate small, medium or large associations between the variables, respectively (see also Field, 2009, p. 390). The data therefore confirm the position of Hoffman (2000) who had postulated an increase of sympathy over the childhood years. But what about the rules described by Hay (1994) that should produce a decline in empathic responding, since children learn

who does and who does not deserve sympathy? Maybe these rules contribute to the interindividual differences between children, since some children may hear them more frequently than others or are taught more of them than others. Thus, Hay's theory may be more useful in explaining the emergence of interindividual differences between children, whereas Hoffman's theory can better explain age-correlated development. A third possibility besides increase and decline had recently been expressed by Davidov et al. (2013), suggesting that empathic concern may not grow over time at all because it is an emotion, and the authors suppose that emotions do not develop like cognitions or behaviors. But are emotions and cognitions really that different? If a person feels fear, this is a prerational way of saying "this object can be dangerous to me" (Bischof, 1989). Thus, emotions and cognitions are closely related, being the two sides of a coin, whereas emotions and rationality surely have to be differentiated. The phenomenon of feeling may not change with age. This is something that cannot be taught and is part of our nature. But the intensity, the frequency, the situations in which we show our feeling or not and the actions that might follow or not, this may all change with cognitive maturation and experience. So, in sum, it makes sense that we actually found an increase in our aggregated measure of sympathy.

There are several limitations to the present study. The sample was not very large and came from one cultural subgroup: children living in Europe in a comparatively wealthy, rural environment. So the results may not be generalizable to other socioeconomic or ethnic groups. The limited number of participants also impeded the application of other ways to analyze the validity of the methods, like multitrait-multimethod-analysis (Campbell and Fiske, 1959). Further, we do not know whether the quality of the teacher's rating might have been dependent on the type of their education. In Italy, by the time this study was conducted, part of teachers (both child care and elementary school) had a University degree, but another part started to work right after the completion of a so called pedagogical high school. Testing whether there is a relation between quality of rating and length/quality of education would be a topic for further research.

Irrespective of these constraints, the present research highlights the importance of the methods we use in our studies. The claim for longitudinal design using a multi-method multi-informant approach is not new, but rarely realized. Relying on the aggregated measure of children's sympathy that had been derived from the observations and self-reports, we can conclude with quite high confidence that sympathy does increase during the transition from childcare to elementary school and that interindividual differences are of high stability during the childhood years.

One more question left unanswered by the data presented so far is which variables contribute to the interindividual differences between the children. The teacher-child relationships mentioned earlier are but one possibility. The child's relationship with his or her parents (e.g., Spinrad and Stifter, 2006), his or her temperament (e.g., Eisenberg et al., 2007), the cultural context in which the children are rised (e.g., Trommsdorff et al., 2007) are but a few possibilities (see Eisenberg et al., 2006, for an overview). More research will show how this important motivator of prosocial behavior can best be promoted.

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Here, there and everywhere: emotion and mental state talk in different social contexts predicts empathic helping in toddlers

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A growing body of literature suggests that parents socialize early-emerging prosocial behavior across varied contexts and in subtle yet powerful ways. We focus on discourse about emotions and mental states as one potential socialization mechanism given its conceptual relevance to prosocial behavior and its known positive relations with emotion understanding and social-cognitive development, as well as parents' frequent use of such discourse beginning in infancy. Specifically, we ask how parents' emotion and mental state talk (EMST) with their toddlers relates to toddlers' helping and how these associations vary by context. Children aged 18- to 30-months ($n = 38$) interacted with a parent during book reading and joint play with toys, two everyday contexts that afford parental discussion of emotions and mental states. Children also participated in instrumental and empathic helping tasks. Results revealed that although parents discuss mental states with their children in both contexts, the nature of their talk differs: during book reading parents labeled emotions and mental states significantly more often than during joint play, especially simple affect words (e.g., happy, sad) and explanations or elaborations of emotions; whereas they used more desire talk and mental state words (e.g., think, know) in joint play. Parents' emotion and mental state discourse related to children's empathic, emotion-based helping behavior; however, it did not relate to instrumental, action-based helping. Moreover, relations between parent talk and empathic helping varied by context: children who helped more quickly had parents who labeled emotion and mental states more often during joint play and who elicited this talk more often during book reading. As EMST both varies between contexts and exhibits context-specific associations with empathic prosocial behavior early in development, we conclude that such discourse may be a key form of socialization in emerging prosociality.

Keywords: socialization, prosocial behavior, emotion and mental state talk, helping, toddlers

HERE, THERE AND EVERYWHERE: EMOTION AND MENTAL STATE TALK IN DIFFERENT SOCIAL CONTEXTS PREDICTS EMPATHIC HELPING IN TODDLERS

Young children, even in their early years, exhibit a remarkable capacity to act prosocially toward others. Starting in their second year, infants show concern for and comfort others in distress (Dunn, 1988; Zahn-Waxler et al., 1992), help others complete goal-directed actions (Warneken and Tomasello, 2007; Svetlova et al., 2010), cooperate with others (Rheingold, 1982; Brownell et al., 2006; Warneken et al., 2006), and share information and resources with others (Lizkowski et al., 2008; Brownell et al., 2009, 2013). Infants often perform these actions spontaneously and with great enthusiasm (Rheingold, 1982) and with greater frequency and facility as they approach childhood (see Hay and Cook, 2007; and Drummond et al., in press, for reviews). Although some of these behaviors are simply action- or goal-based, many require the child to read and react to the emotions and mental states of others in distress, such as comforting a sad peer by bringing him a toy. This more advanced form of helping relies on a child's attention to the desires and needs of others,

understanding of these abstract subjective states, and motivation to address them. Toddlers begin to exhibit this more advanced form of helping around 18 months (Zahn-Waxler et al., 1979; Dunn, 1988) and are fairly proficient at 30 months (Svetlova et al., 2010). Although the positive slope of this trajectory may be expected, the general time-frame is more puzzling: these behaviors emerge when children's social-cognitive abilities and motivational systems are still immature (Svetlova et al., 2010), raising questions about developmental mechanisms. Theoretical tradition and recent empirical work have established the importance of parental socialization in the development of prosocial functioning, but understanding of the relevant processes and how they operate in the very early development of prosociality remains rudimentary. The purpose of the current paper is to inform this understanding by examining parent discourse about emotions and mental state as one such process.

PARENTAL SOCIALIZATION OF PROSOCIAL BEHAVIOR
Socialization plays a central role in many theories of prosocial development, from modeling of empathic and responsive

behavior to direct instruction, guided participation in everyday chores (Rheingold, 1982; Hammond, 2011), and affectively-laden guilt inductions (Hoffman, 2000). These and other processes have been shown to promote prosocial responding in preschool- and school-aged children (see Grusec et al., 2002; and Hastings et al., 2007, for reviews). A small body of literature suggests that parents begin to socialize prosocial behavior in infancy through both global and specific mechanisms. Warm and sensitive responding to a child's needs has been established as a robust contributor to empathic concern and prosocial behavior in 1- and 2-year-olds (Zahn-Waxler and Radke-Yarrow, 1990; Zahn-Waxler et al., 1992; Moreno et al., 2008) and has been shown to predict the trajectory of prosocial behavior into childhood (Robinson et al., 1994). Parents also socialize prosociality by scaffolding their children's participation in everyday household tasks and chores (Rheingold, 1982), which is associated with greater toddler helping and sharing in subsequent prosocial tasks (Hammond, 2011; Pettygrove et al., 2013).

PROSOCIAL BEHAVIOR AND DISCOURSE ABOUT EMOTIONS AND MENTAL STATES

One potentially important contributor to early prosocial behavior may be parents' discourse about others' emotions and mental states with their young children (henceforth referred to as emotion and mental state talk, EMST). Parents use a wide variety of emotion and mental state vocabulary in conversation with young children, including simple affect (e.g., happy, sad), desire (e.g., want, need), and mental state terms (e.g., think, know) (Beeghly et al., 1986; Dunn et al., 1987; Ensor and Hughes, 2008), and they shape their EMST to match the child's developmental level (Fivush et al., 2006; Taumoepeau and Ruffman, 2006, 2008; Brownell et al., 2013). Developmentally sensitive discourse about emotions and mental states provides children a framework within which to objectify and reflect on abstract subjective concepts, as well as recognize their role in motivating behavior (Bartsch and Wellman, 1995; Taumoepeau and Ruffman, 2006; Ensor and Hughes, 2008). Beginning in late infancy, children use these conversations to gradually construct a more complete understanding of emotions and mental states (Carpendale and Lewis, 2004; Fivush et al., 2006; Taumoepeau and Ruffman, 2006).

A wealth of empirical findings supports the assertion that discourse about emotions and mental states contributes to social and emotion understanding, measured either concurrently or longitudinally, among both preschoolers (Dunn et al., 1991a; Denham et al., 1994; Denham and Auerbach, 1995; Garner et al., 1997; Hughes and Dunn, 1998; Garner, 2003; Ensor and Hughes, 2008) and toddlers (Dunn et al., 1991a,b; Laible and Thompson, 2000; Laible, 2004; Taumoepeau and Ruffman, 2006, 2008; Ensor and Hughes, 2008). A handful of experimental studies have demonstrated the causal link by training parents to use EMST and finding increased emotion understanding or false belief reasoning in their children relative to controls (Guajardo and Watson, 2002; Lohman and Tomasello, 2003; Gavazzi and Ornaghi, 2011; Ornaghi et al., 2011). Thus, it is clear that EMST is a mechanism by which parents socialize normative social understanding beginning in the second year of life.

There is also evidence that the role of EMST extends to prosocial behavior, especially insofar as prosocial responses rely on the ability to attend to, understand, and respond to the emotions and desires of others. Parent-child discourse about emotions and mental states is positively related to prosocial behavior in preschoolers and older children (Denham et al., 1992; Laible and Thompson, 2000; Ruffman et al., 2006; Garner et al., 2008; Ensor et al., 2011) and the research with younger children, albeit limited, suggests similar associations. Zahn-Waxler et al. (1979) reported that children whose mothers accompanied the explanations of their distress with intense feelings, reactions, and disappointments were more likely to show concern toward another in distress and attempt to comfort him. Similarly, Garner (2003) found that toddlers whose parents used more mental state talk when caring for a distressed doll were more likely to subsequently attend to and make sympathetic comments toward an adult whose favorite toy broke. Recently, Brownell et al. (2013) found that parents who used more EMST when reading a wordless picture book with toddlers had children who helped and shared more quickly and more often with an adult in need.

Beyond these general relationships, certain patterns of EMST may play unique roles in prosocial development. Brownell et al. (2013) found that affect terms (e.g., happy, sad) and mental state terms (e.g., think, know) were more strongly related to prosocial behavior than were desire terms (e.g., want, need). Moreover, they found that, over and above the amount of parent talk about emotions and mental states, how much parents *elicited* EMST from children by asking open ended questions about emotions and mental states (e.g., "how does he feel?"), rather than simply labeling and explaining these concepts, predicted subsequent prosocial behavior; actively engaging a child in conversation about emotions appears to provide especially fertile opportunities for the child to attend to these mental states, learn about them, and/or understand how to respond. In fact, parents' use of this elaborative and engaging style may be a crucial process within general parent-child discourse that provides both the required information to the child and a framework within which the child can co-construct social understanding with her parent (for a review, see Fivush et al., 2006).

Finally, EMST may contribute to the development of some aspects of prosocial behavior more than others. Prosocial behavior is a multidimensional construct comprised of many distinct behaviors that rely on different capabilities and stem from different developmental mechanisms (Svetlova et al., 2010; Dunfield et al., 2011; Paulus et al., 2013). Brownell et al. (2013) found that EMST predicted emotion-based helping, which requires an understanding of the recipient's internal state (e.g., bringing a crying friend a toy to cheer her up), but not simple goal-directed helping that does not rely on the same recognition and understanding of affect (e.g., handing someone a marker he has dropped while coloring). These findings suggest that the role of EMST in socializing early helping behavior may be especially relevant for emotion-based prosocial behavior. The primary goal of the current study is to further elucidate the nature of the specific relations between parental EMST and prosocial behavior in infancy when prosocial behavior is first emerging.

EMOTION AND MENTAL STATE TALK IN CONTEXT

Parents use discourse about emotions and mental states in many interactive contexts, ranging from pretend play (Dunn et al., 1987; Hughes and Dunn, 1997), conversation about past events (Dunn et al., 1987; Laible and Thompson, 2000; Lagattuta and Wellman, 2002; Laible, 2004), and meal preparation (Ensor and Hughes, 2008) to book reading (Ruffman et al., 2006; Taumoepeau and Ruffman, 2006, 2008; Brownell et al., 2013) and free play (Degotardi and Torr, 2007; Slaughter et al., 2008; Laranjo et al., 2010). Although all offer opportunities to explore emotions and mental states, some situations may better support EMST or more effectively foster the development of social understanding and behavior than others (de Rosnay and Hughes, 2006; Howe et al., 2010). For example, EMST is more frequent and elaborate when parents discuss negative rather than positive emotions (Lagattuta and Wellman, 2002; Fivush et al., 2006), read books (Sabbagh and Callanan, 1998), or eat a snack (Beeghly et al., 1986), and play together with toys rather than without toys (Laranjo et al., 2010). Parents' use of particular subtypes of EMST (e.g., emotion terms vs. mental state terms) also vary by context. For example, Howe et al. (2010) found that parents used more emotion talk with their preschoolers while discussing affectively-charged pictures (similar to those found in picture-books) than during naturally-occurring conversations in the home; but they used more cognitive terms during positively-valenced conversations in the home than while discussing the pictures.

These context differences may be due, in part, to different goals. Parents may use ordinary conversation to help their children learn and adopt socially-appropriate behaviors, while they may be more likely during book-reading to actively try to help their children identify and understand the emotions and internal states depicted in the story (Howe et al., 2010). Additionally, picture books may especially afford emotion talk by introducing an assortment of emotions that are rarely confronted otherwise: the average book for 3–4 year olds contains 17 textual references to mental states, about one reference every three sentences, with nine unique mental states or emotions introduced (Dyer et al., 2000). Particularly evocative illustrations can make abstract mental states more tangible and may be one reason why picture books are helpful in facilitating emotion-related discussions with infants whose limited language capacities might otherwise preclude them from engaging in such conversation (Taumoepeau and Ruffman, 2006, 2008; Slaughter et al., 2007; Brownell et al., 2013).

In addition to context differences in parents' use of EMST, child outcomes may be differentially associated with EMST in particular contexts (Fivush et al., 2006). Discussion of children's emotions in response to past transgressions, for example, may relate more strongly to the development of conscience than discussion of emotions in neutral contexts (Laible and Thompson, 2000, 2002). Moreover, such discussions predicted children's conscience development when the discussions occurred in the lab, but not when they occurred in the home (Laible and Thompson, 2002). Whether context similarly moderates relations between EMST and prosocial development is still unknown. In the current study, we address this gap by comparing parent EMST during book reading and joint play, two ubiquitous parent-child activities during which parents have ample opportunity to discuss

emotions and mental states, and examining their unique associations with prosocial behavior. As emotions and mental states are perhaps more tangible and accessible to children when they are visually depicted in a picture book (as noted above), we tentatively hypothesize that conversations about these abstract concepts will be more impactful, and consequently more strongly associated with prosocial behavior, in the context of book-reading as compared to joint play.

THE CURRENT STUDY

The current study aims to build on the conceptual and empirical work outlined above by evaluating EMST as a predictor of prosociality during the period when emergent prosocial behaviors are undergoing rapid change. We expect that children whose parents more frequently use EMST, and in particular who elicit EMST from their children, will be more helpful; and we expect findings to be stronger for empathic helping than for instrumental helping. A secondary aim is to compare parental EMST across two distinct interactive contexts, i.e., joint picture-book reading and joint play, and to determine whether relations with prosocial behavior vary by context. We expect parents to use EMST more frequently during book reading than joint play, and we expect EMST in book reading to be more strongly associated with helping than EMST during toy play.

METHODS
PARTICIPANTS

Forty-four parent-child dyads participated in a larger study of prosocial behavior; 21 18- and 23 30-month-olds. Data from six children were not usable because of procedural error ($n = 2$) or the child's refusal to complete the book-reading task ($n = 4$). The final sample consisted of 38 parent-child dyads; 16 with 18-month-olds ($M = 18.73$; 10 boys and 6 girls) and 22 with 30-month-olds ($M = 28.87$; 13 boys and 9 girls). The sample size, although somewhat small, is consistent with those in other recent studies of early prosocial behavior (e.g., Warneken and Tomasello, 2006; Over and Carpenter, 2009; Brownell et al., 2013). Children were healthy and typically-developing, from working- and middle-class families recruited from a medium-sized mid-Atlantic city and surrounding suburbs. Thirty-five children (92%) were Caucasian; remaining children (one each) were Hispanic, biracial, or unspecified.

GENERAL PROCEDURE

Procedures took place in a large playroom. Video was captured from behind a one-way mirror and audio was recorded by an in-room multi-directional microphone hung from the ceiling. The sessions began with a short warm-up to familiarize the child with the lab setting and with the experimenter (E) and an assistant experimenter (AE). Two tasks measuring parental EMST were administered: joint parent-child book reading and parent-child joint play with a standard set of age-appropriate toys. Two helping tasks were administered, one instrumental or action-based, and one empathic or emotion-based, adapted from Svetlova et al. (2010). The parent-child book-reading task was always administered between the two helping tasks (to maximize child participation), which were counterbalanced for order, and

the free-play task was always administered last. Parents signed informed consent forms prior to the start of the session. They remained with their children at all times and completed questionnaires while the children engaged in the helping tasks with E. Questionnaires included standard demographic information and the MacArthur Communicative Development Inventory, a well-validated and widely-used measure of early language development (Fenson et al., 2000), which was used as a covariate. All procedures conformed to SRCD ethical standards for research with children and were approved by the university's Institutional Review Board.

PARENT EMOTION AND MENTAL STATE TALK TASKS

Book reading
E gave a book to the parent, encouraged the parent to read the book as she normally would at home, and left the room. The book was read by the child's regular daytime caregiver who accompanied them to the lab, most often mothers ($n = 35$) but occasionally fathers ($n = 3$). Supplemental analyses showed no differences as a function of who read the books. The book used in this task (Alborough, 2000) included rich emotional content as well as multiple scenes and objects that parents could talk about in addition to or instead of emotions; furthermore, the paucity of words in the book (only three words appear) encouraged parents to speak naturally and without external influence. The content of the book therefore permitted the expression of individual differences in parents' predilection to discuss emotions with their children.

Joint play
The parent and child were presented with a basket of age-appropriate toys and given 7 min to play as they typically would at home. E did not give the parent any specific instructions on how to play with the child; this context thus approximates the many unstructured everyday interactions parents have with their children and provides a complement to the more structured interactions captured in the book-reading context.

Coding
Parents' language during book reading and joint play was transcribed verbatim from the video records and separated into distinct utterances. As defined by Slaughter et al. (2007), an utterance was considered an uninterrupted stream of language, and utterances were distinguished based on lengthy pauses, grammatical structure, and changes in vocal intonation. Talk unrelated to the book or play, such as correcting a misbehaving child, was not included in transcriptions. Transcription reliability was established on 34% of records; percent agreement was 80%.

Transcripts were coded for six different *content* categories of EMST based on previous research (Ruffman et al., 2006; Symons et al., 2006; Brownell et al., 2013): simple affect talk (e.g., happy, sad, angry), desire talk (e.g., he wants), emotion explanations/elaborations (e.g., he's sad *because he is alone*), other internal state talk (e.g., sick, tired, hungry), mental state talk (e.g., think, know, remember), and empathy statements (e.g., poor guy) (see Supplementary Materials for details).

An additional distinction was made based on the *function* of the talk. Parents' *production* of EMST (labeling or explaining; e.g., "the monkey is sad") was distinguished from parents' *elicitation* of EMST (asking the child to label or explain' e.g., "how does the monkey feel?"). These different forms of EMST serve different functions (primarily to communicate or elicit information, respectively), make different demands on children's understanding, and may differentially predict outcomes (Ninio, 1980, 1983; Martin and Green, 2005; Brownell et al., 2013).

Thus, each transcript was coded for: total number of utterances; simple affect talk (produced vs. elicited); desire talk (produced vs. elicited); emotion explanations/elaborations (produced vs. elicited); other internal state talk (produced vs. elicited), mental state talk (produced vs. elicited), and empathy statements (produced; no elicitations occurred). Interrater reliability between the first and second authors was established using Cohen's kappa and was excellent for both book reading ($\kappa = 0.92$; calculated on 21% of records) and joint play ($\kappa = 0.95$; 18% of records). Disagreements were resolved by consensus.

Several composite variables were created to serve as the measures for analysis. Total frequency of EMST utterances was summed within each context, yielding *total EMST book-reading* and *total EMST joint-play*. Total production (sum of simple affect, desire, emotion explanation/elaboration, other internal state, mental state, and empathy statement productions) and total elicitation (sum of simple affect talk elicitation, etc.) were calculated separately, yielding four composite variables: *EMST production book-reading*, *EMST production joint-play*, *EMST elicitation book-reading*, and *EMST elicitation joint-play*. Content categories of EMST (simple affect, desire, emotion explanations/elaborations, other internal states, mental states, and empathy statements) were also summed within each context, yielding composite variables for *simple affect talk: book-reading*, *simple affect talk: joint-play*, *desire talk: book-reading*, and so on. These measures were converted to proportions of total utterances to control for the slightly different amounts of time spent reading the book and playing with the toys. Additionally, the number of different content categories used by each parent was calculated, yielding a score for *number of different content categories,* ranging from 0–6 in each context. Finally, the total number of utterances for each parent in each context was converted to a per-minute rate to account for slight differences in total time spent reading and playing; this *total utterance* rate was used to capture parents' general talkativeness.

HELPING TASKS
Children engaged in two tasks with E designed to measure different types of helping behavior: an instrumental helping task and an empathic helping task. These tasks have been used effectively to measure helping behavior in children between 18 and 30 months of age (Warneken and Tomasello, 2006; Over and Carpenter, 2009; Svetlova et al., 2010). The instrumental helping task was designed to measure children's helping behavior with respect to goal-directed actions (picking up sticks accidentally dropped on the floor) and did not require a complex understanding of the recipient's emotional mental state. The empathic helping task required the child to read and understand E's internal state in order to comprehend his need and assist him in alleviating his

distress (bringing E a blanket when he shivered with cold, which E had previously modeled by wrapping in a blanket after suddenly shivering). In both tasks, E experienced a distressing event (dropping sticks or becoming cold). After each event, E delivered four cues about his need that communicated progressively more information about what the distress was and how the child could alleviate it. The first cue (E says "oops" or begins to shiver) conveyed the distress. The next cue (E says "I dropped my stick" or "I'm cold") included a more explicit description of the nature of the distress. The third cue (E says "I dropped my sticks, I need them back/I'm cold, I need my blanket" and reaches twice palm-down for the target object) provided a more explicit description of the need and a way to alleviate it. The fourth and final cue (E reaches palm-up for the target object and asks the child "[child's name], can you help me get my sticks/blanket?") was the most direct communication about how to help. The child was given 10 s after each cue to help. Cues were stopped after a child helped.

Helping was scored when the child gave the target object to E. Children received a helping score of 0–5 for each task according to the cue at which they helped (0 = did not help; 1 = helped at the last cue; 5 = helped immediately upon E's first cue). High scores thus indicated earlier, more skilled helping, with fewer cues. Percent agreement was calculated between each coder and the primary coder on 20% of the video records, with 100% agreement.

RESULTS

The primary goal of the current study was to examine associations between parents' EMST and children's instrumental and empathic helping, considered as a function of interactive context. We present the results first for context and age effects on parental EMST, followed by analyses for associations between helping and EMST within each context.

CONTEXT AND AGE DIFFERENCES IN EMOTION AND MENTAL STATE TALK

To examine context and age differences in the *function* and *content* of EMST, a series of three-way repeated-measures ANOVAs was conducted on the measures of EMST with context (book-reading; free-play) as the within-subjects factor, and age (18; 30 months) and gender as between-subjects factors (see **Table 1** for descriptive statistics and significance tests). Analyses revealed a few unsystematic two- or three-way interactions among gender, age, and context (eight significant interactions out of 68 possible) and will not be reported here (results available from corresponding author). In particular, there were no systematic interactions with age.

There were no significant age differences for the rate of total utterances or the proportions of total EMST, EMST elicitations, or EMST productions (see **Table 1**), indicating that parents discussed emotions and mental states at similar rates with 18- and 30-month old children. However, there were main effects of age in the *content* of mental state talk (simple affect, desires, etc.): parents of 30-month-old children used a significantly higher proportion of mental state terms (e.g., think, know) than did parents of 18-month-olds. No gender differences emerged for the overall

Table 1 | Descriptive statistics for EMST Proportions as a function of gender, age, and context.

	Gender differences			Age differences			Context differences		
	Males (n = 23)	Females (n = 15)	F	18-mos (n = 16)	30-mos (n = 22)	F	Book reading	Free-play	F
Total utterances (rate per minute)	15.21 (4.27)	17.15 (3.81)	1.98	15.08 (4.43)	16.62 (3.91)	1.77	19.36 (5.20)	14.58 (4.45)	35.26***
Total EMST (proportion)	0.16 (0.07)	0.21 (0.08)	4.11[†]	0.15 (0.07)	0.19 (0.08)	1.67	0.18 (0.11)	0.17 (0.08)	1.41
FUNCTION (PROPORTIONS)									
EMST elicitations	0.09 (0.06)	0.13 (0.05)	4.83*	0.09 (0.05)	0.11 (0.06)	0.41	0.09 (0.08)	0.11 (0.07)	0.73
EMST productions	0.07 (0.04)	0.08 (0.05)	0.50	0.06 (0.03)	0.09 (0.05)	1.68	0.09 (0.07)	0.06 (0.04)	10.98*
CONTENT (PROPORTIONS)									
Simple affect	0.03 (0.03)	0.04 (0.02)	2.57	0.03 (0.02)	0.05 (0.03)	2.83	0.07 (0.05)	0.01 (0.02)	55.37***
Desire talk	0.05 (0.03)	0.06 (0.04)	2.64	0.06 (0.04)	0.05 (0.03)	0.40	0.03 (0.03)	0.07 (0.05)	20.81***
Explanations	0.01 (0.01)	0.02 (0.02)	3.94[†]	0.01 (0.01)	0.01 (0.01)	0.61	0.02 (0.03)	0.00 (0.00)	21.21***
Mental states	0.03 (0.03)	0.06 (0.03)	5.84*	0.03 (0.03)	0.05 (0.03)	9.81**	0.03 (0.04)	0.05 (0.04)	4.94*
Other internal states	0.04 (0.03)	0.02 (0.02)	1.16	0.03 (0.03)	0.03 (0.03)	0.22	0.03 (0.03)	0.03 (0.03)	0.57
Empathy statements	0.00 (0.01)	0.00 (0.01)	0.01	0.00 (0.01)	0.00 (0.01)	0.04	0.01 (0.01)	0.00 (0.01)	1.73
Number of different content categories	3.04 (1.23)	3.60 (1.06)	1.52	3.06 (1.15)	3.41 (1.21)	1.01	3.55 (1.75)	2.97 (1.05)	6.697*

[†]$p = < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Proportions were calculated per total number of parental utterances.

rate of parental utterances, but parents used a higher proportion of EMST when talking to girls than when talking to boys. Regarding *function* (productions; elicitations), parents of girls elicited EMST proportionally more than did parents of boys. Regarding *content*, parents of girls used a significantly higher proportion of mental state terms and a marginally higher proportion of emotion explanations/elaborations (e.g., he is sad *because he is alone*) than did parents of boys.

There were several significant context differences (see **Table 1**). Parents generated utterances at a significantly higher rate during book reading than during joint play, but the proportion of EMST did not differ between contexts. Regarding *function*, parents produced a significantly higher proportion of EMST in the book-reading context than in the free-play context, but there was no significant context difference for EMST elicitations. Regarding the *content* of mental state talk, parents used significantly higher proportions of simple affect talk (e.g., happy/sad) and emotion explanations/elaborations in the book-reading than the free-play context. In contrast, parents used significantly higher proportions of desire talk (e.g., want/need) and mental state talk during joint play than during book reading. Parents also used more distinct content categories in book reading than in joint play.

To examine consistency of EMST across contexts, partial correlations, controlling for age and gender, were conducted to examine associations between EMST productions, EMST elicitations, and total EMST across the two contexts. Analyses revealed significant relations for production of EMST across contexts (partial $r = 0.33$, $p < 0.05$), but not elicitation of EMST (partial $r = 0.02$, *ns*) or total EMST (partial $r = 0.21$, *ns*). There were no significant correlations across contexts for the *content* of EMST. However, the number of different content categories used was significantly correlated across contexts (partial $r = 0.40$, $p < 0.05$).

In sum, parents talked more while reading books with their toddlers than while playing together with toys, although they used the same proportion of EMST in both contexts. They produced proportionally more emotion and mental state labels and explanations during book reading than during joint play, but they asked their children to discuss mental states and emotions to the same degree in both contexts. Parents talked about more distinct EMST *content* categories during book reading than while playing with toys, and those parents who talked about a wider variety of EMST content in one context also did so in the other.

HELPING IN RELATION TO DISCOURSE ABOUT EMOTIONS AND MENTAL STATES

To examine associations between parental EMST and children's helping, partial correlations, controlling for age and gender, were

calculated between children's instrumental and empathic helping scores and the measures of parental EMST (see **Tables 2** and **3**). Because age was correlated with children's vocabulary (MacArthur CDI total score; $r = 0.60$, $p < 0.001$), controlling for age also controlled for language differences and other unmeasured characteristics associated with age such as attention, compliance, amount of exposure to books, and so on. Analyses were conducted separately by context to detect any context-specific patterns. Significant correlations were found between empathic helping scores and total EMST during book reading but not joint play. No significant correlations were found between instrumental helping scores and total EMST in either context.

Regarding *function* of EMST (productions; elicitations): empathic helping scores were correlated significantly with EMST elicitation and marginally with EMST production in the book-reading context (see **Table 3**). The reverse was true for the joint play context: empathic helping scores were significantly

Table 3 | Partial correlations, controlling for age (in months) and gender, between proportions of EMST and helping scores.

	Instrumental	Empathic
BOOK READING		
Total EMST	−0.26	0.48**
Function		
EMST elicitations	−0.26	0.36*
EMST productions	−0.11	0.31[†]
Content		
Simple affect	−0.34*	0.26
Desire talk	−0.06	0.08
Emotion explanation	−0.15	0.33[†]
Mental state	−0.12	0.59***
Other internal state	0.01	−0.02
Empathy statements	−0.11	0.37*
JOINT PLAY		
Total EMST	−0.33[†]	0.10
Function		
EMST elicitations	−0.25	−0.13
EMST productions	−0.23	0.43*
Content		
Simple affect	−0.26	0.25
Desire talk	−0.14	−0.16
Emotion explanation	−0.16	−0.05
Mental state	−0.21	0.13
Other internal state	−0.28[†]	0.26
Empathy statements	0.03	0.11

[†]$p = < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 2 | Descriptive statistics and significant tests for helping scores as a function of gender, age.

	Gender			Age		
	Males (*n* = 23)	Females (*n* = 15)	*F*	18-mos (*n* = 16)	30-mos (*n* = 22)	*F*
Instrumental	2.39 (1.64)	2.60 (1.81)	0.14	1.63 (1.67)	3.09 (1.44)	8.38**
Empathic	1.35 (1.30)	1.5 (1.35)	0.12	0.53 (1.13)	2.00 (1.07)	16.09***

[†]$p = < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

correlated with EMST production, but not with EMST elicitation. No significant correlations were found between instrumental helping scores and elicitation or production of EMST in either context. Regarding *content* of EMST (simple affect, desires, etc.) in the book-reading context, empathic helping scores were significantly positively related to proportion of mental state talk and empathy statements (e.g., poor guy), and marginally with emotion explanations/elaborations; instrumental helping scores were significantly negatively related to simple affect talk (see **Table 3**). For EMST in the joint play context, empathic helping scores were not significantly related to any content category, while instrumental helping scores were marginally negatively related to proportion of other internal state talk (e.g., hungry).

To determine if eliciting children's talk about emotions during book reading was uniquely associated with children's helping over and above parents' production of EMST (following Brownell et al., 2013), hierarchical linear regression analysis was conducted predicting children's empathic helping scores. As instrumental helping was not significantly related to EMST production or elicitation, no model was run for instrumental helping scores. Age and gender were entered on the first step, followed by parents' EMST production, then parents' EMST elicitation. The full model explained 42% of variance in empathic helping scores, $F_{(4, 32)} = 5.90$, $p < 0.01$, with 27% due to age and gender, $F_{\text{change}}(2, 34) = 6.26$, $p < 0.01$. EMST production did not account for significant additional variance, but EMST elicitation increased the variance explained by 9%, $F_{\text{change}}(1, 32) = 4.81$, $p < 0.05$. Thus, parental *eliciting* of children's EMST while reading books together contributed uniquely to toddlers' empathic helping, predicting it above and beyond child age, gender, and parental *production* of EMST.

A parallel regression analysis was conducted on parental EMST in the free-play context. The full model again explained 42% of the variance in empathic helping scores, $F_{(4, 32)} = 5.83$, $p < 0.01$, with 27% due to age and gender, $F_{\text{change}}(2, 34) = 6.26$, $p < 0.01$. *Production* of EMST increased the variance explained by 14% $F_{\text{change}}(1, 33) = 7.94$, $p < 0.01$, but *elicitation* of EMST did not add significant variance to empathic helping scores. Thus, parental *production* of EMST during joint play contributed uniquely to toddlers' empathic helping, predicting it above and beyond child age and gender, while parental *elicitation* of EMST from their children during joint play was not predictive.

DISCUSSION

The goals of the current study were to explore parent-child talk about emotions and mental states in two interactive contexts and to examine such discourse as a potential socialization mechanism in the development of prosocial behavior in 18- and 30-month olds, when prosociality is emerging and undergoing dramatic change. Parent talk was measured while parents and their children read picture books and played with toys, activities chosen for their ecological validity and the opportunities they provide for discussion of emotions and mental states.

Several findings are worth noting. First, parents discussed emotions and mental states with their children at both ages and in both contexts to the same degree, with nearly 20% of their discourse comprised of EMST. Thus, even when their children are

very young and likely have a tenuous grasp on abstract mental states, parents devote a significant proportion of their conversation to these concepts. Second, the nature of parents' talk differed in the two contexts. Although they asked children to label or explain emotions and mental states equivalently in both contexts, parents themselves labeled and explained emotions and mental states significantly more while reading a picture book with their children than when playing together with toys. They also varied the content of their EMST more while reading books than playing with toys, discussing more distinct internal states than they did while playing with toys. Conversely, when playing with toys parents used more desire talk (e.g., want, need) and mental state words (e.g., think, know) than they did while reading books with children. Converging with these findings are the abundance of overt affective cues and emotional terms in children's books (Dyer et al., 2000), reflected in our data by a significantly higher proportion of simple affect talk and emotion explanations in the book-reading than the free-play context. These results indicate that toddlers are exposed to a greater overall amount and variability of EMST while reading books with their parents than while engaged in joint toy play. They suggest that although book reading may provide a richer and denser scaffolding experience for the young child, EMST during joint play complements children's exposure to EMST in book reading; this may be especially important for families in which play constitutes a more regular aspect of parent-child interaction than does book reading. Moreover, the nature of parents' talk in one context was generally unrelated to their talk in the other, suggesting that parents tailor their conversational approach to the current interactional setting with toddlers, just as they do with older children (Fivush et al., 2006; Howe et al., 2010).

Importantly, parents' discourse about emotions and mental states in each context was positively related to toddlers' empathic helping. Furthermore, when taken together, EMST production and elicitation during book reading accounted for the same proportion of variance in children's empathic helping scores as when it occurred during joint play. However, associations were more consistent for EMST during book reading, and specific associations varied by context: children who helped more quickly in the empathic helping situation had parents who *elicited* emotion or mental state talk more often from children while they read books together (see also Brownell et al., 2013), but who *labeled* emotions or mental states more often while playing with toys together. Conversely, parents' talk about emotions and mental states was mostly unrelated, and in one case negatively related, to children's goal-directed, instrumental helping. The few unsystematic associations with instrumental helping may result from the ubiquity and relative ease with which toddlers at this age can accomplish goal-based helping tasks (Svetlova et al., 2010; Brownell et al., 2013); alternatively, they may reflect underlying qualitative differences between distinct prosocial behaviors that stem from different mechanisms and rely on different capabilities (Svetlova et al., 2010; Dunfield et al., 2011; Paulus et al., 2013).

This is the first empirical examination, to our knowledge, to evaluate potential context-specific associations between EMST and early-appearing prosocial behavior. The findings add to current understanding by suggesting that both the quantity and

quality of EMST play important roles in socializing empathic prosocial behavior, and further, that this depends on the context in which the discussions take place.

SOCIALIZING PROSOCIAL BEHAVIOR BY DISCUSSING EMOTIONS AND MENTAL STATES

Toddlers' prosocial behavior toward an adult in distress, in this case offering something to alleviate the distress, was associated with parents' emotion and mental state discourse with their children both while reading books together and while playing with toys together. The specific pathways through which discourse about emotions and mental states may operate to encourage prosocial behavior remain unknown. Emotion understanding, given its robust associations with EMST, is one logical pathway (de Rosnay and Hughes, 2006; Thompson, 2006). Greater emotion understanding promoted by frequent parental EMST may help children infer the other's need and generate an appropriate prosocial response in a complex, affectively charged situation (Denham et al., 2007; Ensor et al., 2011; Brownell et al., 2013). Emotion and mental state discourse may also operate on children's prosocial motivations by facilitating empathy inductions, leading to internalized moral dispositions that underlie prosocial behavior toward those in distress (Hoffman, 2000). A third possibility is that parents' EMST encourages toddlers to attend to the emotions and mental states of others, which in turn provides more exposure and, consequently, more opportunity to construct meaning. Further work is necessary to determine which pathway is the most likely; but regardless of the pathway or pathways through which it operates, discourse about emotions and mental states appears to play an important role in the early socialization of prosocial behavior.

However, this role varies by context. We largely replicated the findings from Brownell et al. (2013) that it is parents' elicitation of children's own EMST in the context of book reading (e.g., "how is he feeling?" "is he sad?"), rather than parents' labeling and explaining, that relates to toddlers' empathic prosocial behavior. Replication of these findings with different parent-child dyads, different adults in need of help, and different picture books strengthens the conclusion that discourse about emotions and mental states is likely to influence early prosocial development most effectively when parents ask children themselves to think about and explain others' emotions. Findings from the joint-play context of the current study expand and refine this conclusion, adding to our understanding of the role of EMST in relation to developing prosociality. Specifically, we found that parents' labeling and explaining of emotions and mental states in that context (e.g., "he wants to go in the barn," "you must like that toy"), rather than elicitation of children's talk, was related to empathic prosocial behavior. Thus, although the relation between parent-infant discourse about emotions and mental states and early prosocial behavior is a general one, the particular features of the discourse that appear to matter are context-specific.

There are several potential explanations for these context differences. As compared to joint play with toys, reading a picture book provides the child with specific emotion referents as well as overt cues to help her identify and piece together characters' internal states, often including exaggerated emotional facial expressions and a plot or narrative that helps place the character and the emotion-eliciting events in meaningful context. These cues can be made salient to the child by the parent, especially by asking the child to attend to and reflect on them, and may help her understand the character's mental state, the factors that led to that state, any consequences of that state, and how the state can be alleviated. When asked questions that require the child to recruit her rudimentary social understanding, she may need and utilize all of these cues to make sense of the question. Without such cues, questions about internal states may be meaningless or overwhelming; with them, children may be able to find answers, and construct social knowledge in the process.

Additionally, the referent of parents' EMST may differ between contexts, with parents more often talking about the emotions and mental states *of others* (i.e., characters) during book reading and *of the child* during joint play (e.g., "Oh, you want to play with that"). Although we did not measure the parents' referents, previous work has found precisely this difference, with parents using more EMST about their child during joint play and about others while reading a book (Beeghly et al., 1986). At this age, a toddler's immature ability to reflect on herself and regulate her emotions may preclude her from being able to respond to questions about what she is feeling or thinking while in the midst of playing (Thompson and Goodvin, 2007); discussing the emotions of others pictured on the pages of a book, on the other hand, may be an easier task as it does not depend on reflective self-awareness and emotion regulation to the same degree. Consequently, parents' commentary about emotions and mental states may be more effective in scaffolding young children's emerging social understanding when references are made to the child's own mental states, while parents' attempts to elicit the child's talk would be more effective when references are made to the mental states of others. An alternative view is that children's understanding of the mental states of others derives from understanding of their own mental states, suggesting that conversation about one's own mental states may be easier for toddlers (Taumoepeau and Ruffman, 2006, 2008), hence that toddlers are more equipped to answer questions about their own mental states than about others'. Our data is more consistent with the former interpretation than the latter (see Carpendale and Lewis, 2004, for a discussion of potential problems with the latter interpretation), but as we did not measure the referents of parent EMST talk we are unable to address this question directly. Future work is needed to assess which of these interpretations more accurately explains associations between parent talk and early prosocial competence.

LIMITATIONS AND CONCLUSIONS

Findings from this study are subject to several limitations. The correlational design precludes firm causal inferences about the effects of EMST on prosocial development, and the cross-sectional design precludes inferences about the long-term and cumulative effects of greater relative EMST use. Although our findings are consistent with conceptual frameworks positing the causal influence of parental socialization, experimental and/or longitudinal designs are required to make such inferences with confidence. Additionally, the current study included only parents' talk. To fully understand and appreciate the contextual

differences in these joint activities, the child's input must be considered. It will also be important in future work to explore differences between mothers and fathers in EMST use and corresponding relations with prosocial behavior. The generalizability of the findings is also limited. We hoped to capture snapshots of parent-child interactions as they would unfold in the home during ecologically valid dyadic activities like joint play and book reading, but this may have been constrained by the lab atmosphere. Naturalistic work conducted in the home would provide converging evidence. Finally, it is unknown whether the patterns we have identified generalize across cultures or across families differing in education, family income, or other socioeconomic indicators.

The findings of the current study contribute to the growing literature examining discourse about emotions and mental states as a mechanism through which parents are likely to socialize prosocial behavior. Parent- child interaction dominates children's first few years, providing many opportunities for discussing emotions and mental states beginning very early in life (Dunn, 1988; Meins et al., 2001). The structure and tone of these interactions vary widely, but each conversation offers the child a context in which to explore and begin to understand the complexities of subjective states. In the current study we have shown that discourse about emotions and mental states in two different contexts is related to children's prosocial behavior. Although parents use different types of EMST depending on the context, developmentally appropriate usage, with sufficient scaffolding, appears to be an effective way for parents to promote other-oriented prosocial responding in their very young children.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: http://www.frontiersin.org/journal/10.3389/fpsyg. 2014.00361/abstract

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The influence of empathic concern on prosocial behavior in children

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This research explored the influence of empathic distress on prosocial behavior in a resource allocation task with children. Children were randomly assigned to one of two conditions before engaging in a sticker sharing task; watching either a video of a girl upset that her dog had gone missing (emotion induction condition), or a video of the same girl preparing for a yard sale (control condition). In study one, 5–6 year old children in the emotion induction condition rated the emotional state of both the protagonist and the self more negatively, and also exhibited more prosocial behavior; sharing more in advantageous inequity (AI) trials, and less often withholding a benefit in disadvantageous inequity trials, than the control group. Prosocial behavior was significantly correlated with ratings of the emotional state of the protagonist but not with own emotional state, suggesting that empathic concern rather than personal distress was the primary influence on prosocial behavior. In study two, 3-year-olds were tested on AI trials alone, and like the 5 and 6-year-olds, showed more prosocial behavior in the emotion induction condition than the control.

Keywords: empathy, prosocial behavior, children

INTRODUCTION

It is well established that prosocial behavior such as helping and sharing emerges early in development (e.g., Rheingold et al., 1976; Warneken and Tomasello, 2006). A common approach to the study of sharing is to examine children's resource allocation to self and others under various conditions. Preschool aged children will share valued resources and before long seek to establish fair allocations of resources across individuals (Thompson et al., 1997; Fehr et al., 2008; Brownell et al., 2009; Moore, 2009; Blake and McAuliffe, 2011). Although we know that preschool children will share, little is known about the mechanisms underlying such prosocial behavior (Hepach et al., 2013). By understanding these mechanisms, it should be possible to support and encourage the development of these highly valued, and critically important social behaviors.

Here we examine the role of empathic distress on young children's decisions to allocate resources to another person. It is important to note that definitions of empathy in previous research have varied considerably across laboratories. Generally, however, empathy is believed to be a complex, and multifaceted construct consisting of a variety of components such as perspective taking, empathic concern, and personal distress (Davis, 1980). While empathic concern refers to the individual's other oriented feelings of sympathy and concern for someone in distress, personal distress refers to experiencing unpleasant feelings oneself, in response to witnessing another in distress (Davis, 1980, 1983). In the context of this research, by empathic distress, we are referring to both personal distress and empathic concern. Our measure of personal distress is children's own emotional reactions in response to a fictitious character's situation (i.e., the tendency to experience the same negative emotion as another who is observed to be in distress). Our measure of empathic concern

is children's attributions of emotion to another who is observed to be in distress, without necessarily experiencing sadness themselves.

Empathy emerges early on, with infants exhibiting simple forms of global empathy by responding with reactive or contagious crying to observed distress in others (Sagi and Hoffman, 1976). At this young age, however, children lack the ability to differentiate between their own and others feelings (Hoffman, 1975, 1977). With time, however, children learn to distinguish and separate their own reactions from another individual's distress. Around 2 years of age, children begin to develop the ability to understand the emotional states of others, experience and share their emotions, and make attempts to alleviate observed distress (Zahn-Waxler and Radke-Yarrow, 1990). As children continue to develop, they become increasingly sophisticated in their ability to understand and respond to the psychological states of others (Selman, 1980), and cultivate the ability to empathize with others in a more complex manner (Hoffman, 1975, 1977).

A large body of research has explored relationships between empathic distress, and various social behaviors or characteristics, and results have been mixed, varying in part according to how empathy and the behaviors or characteristics in question have been measured (Eisenberg and Miller, 1987). There is, however, evidence for a relation between empathic distress, or experiencing concern for others and prosocial behavior in children (e.g., Eisenberg et al., 1988; Zahn-Waxler and Radke-Yarrow, 1990; Strayer and Roberts, 1997; Malti et al., 2009; Vaish et al., 2009; see Eisenberg et al., 2006 for a review). For example, a relation has been found between children's degree of facial sadness while watching a video of a child falling and hurting themselves, and later spontaneous sharing behavior with a partner (Eisenberg et al., 1988). In one study, empathy was found to be positively related to prosocial

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this study, therefore, envious behavior in DI trials was defined as making decisions in a way that prevents one's partner from receiving a larger reward than the self, or withholding a benefit from one's partner (e.g., when offered a choice between one sticker each or one for self and two for partner, the participant chooses the former option). By not exhibiting envy in DI trials, one would be exhibiting prosocial behavior. Our hypothesis was that children who were primed to feel empathy for their partner would be more likely to deliver a benefit to their partner in AI trials, and less often withhold a benefit from their partner in DI trials.

METHOD
Participants
Fifty typically developing, 5 and 6-year old Canadian children drawn from a predominately white middle-class neighborhood participated in this study, which was approved by the University's research ethics board. Children were randomly assigned to the emotion induction or control conditions, with 16 males, and 9 females in each group. The emotion induction group ranged in age from 61 months, 6 days, to 81 months, 29 days ($M = 68$ months, 24 days). The control group ranged in age from 60 months, 6 days, to 81 months, 25 days ($M = 68$ months, 26 days).

Emotion induction manipulation
Two videos were constructed for the purposes of this study. Both videos begin with a young girl, Jenny, playing in the backyard with her dog. In the emotion induction video, the dog runs away, and Jenny makes "lost dog" posters, which she hangs around her neighborhood. Jenny narrates in a sad tone and is visibly upset. In the control video Jenny is called inside, and makes and distributes "yard sale" posters for an upcoming yard sale while narrating in a neutral tone, and maintaining neutral facial expressions. The videos were matched on a number of pertinent factors: both were roughly 130 s in length, contained similar scenes and scene sequences, and were narrated according to scripts with almost identical structures and word counts. The prominent difference between the videos is the negative emotion displayed by the protagonist in the emotion induction video.

Procedure
Parental consent was obtained for each participant prior to testing. All children were tested in the laboratory in a session lasting roughly 20–25 min. The session included two phases: emotion induction followed by a resource-allocation task.

Emotion induction. Children sat in front of a 15-inch computer screen. The experimenter then briefly introduced the video's content. Children were asked to focus on how Jenny felt, and how her story made them feel. They then watched the video.

At the end of the video, children were asked to express how Jenny felt during the video. Children were then shown the Facial Affective Scale (FAS; McGrath et al., 1985 as cited in Perrott et al., 2004). The FAS is a 9-point measure that includes a range of happy and sad facial expressions, with a neutral face at its center point. Children were asked to point to a face that

showed how they felt while viewing the video (emotion rating for self, providing a measure of personal distress) and a face that showed how they thought Jenny felt (emotion rating for Jenny, providing a measure of empathic concern). Potential scores on the FAS ranged from zero (happiest face) to eight (saddest face).

Resource-allocation task. This task adopted the method used by Fehr et al. (2008) and Moore (2009). The task consisted of 17 trials; one practice trial in which children could choose one or two stickers for themselves (demonstrating the format of the task), followed by four repetitions of each test trial, which offered the child a forced choice between two alterative distributions of stickers. AI and DI trials were blocked and counterbalanced with blocks separated by a distracter task (coloring a picture). In AI no cost trials, children chose between the allocation (1, 1) and (1, 0) – (one sticker for themselves and one for Jenny or one for themselves and none for Jenny). In AI cost trials, children chose between (1, 1) and (2, 0), in DI no cost trials, between (1, 1) and (1, 2), and in DI cost trials between (1, 1) and (2, 3). In all trials, the experimenter presented the choices by asking, "*Would you like one sticker for yourself and one sticker for Jenny or would you like {x} sticker(s) for yourself and {x} sticker(s) for Jenny?*" Upon completion, children in the emotion induction condition were told that Jenny's dog returned home in order to neutralize any feelings of sadness.

RESULTS
Manipulation check
To ensure the emotion induction video was producing the desired effect, FAS scores for Jenny and self were compared across conditions (see **Figure 1** for mean scores). Independent samples *t*-tests showed that children in the emotion induction condition rated both Jenny's and their own emotion as more negative than those in the control group (Jenny's emotion, $t(48) = 12.21$, $p < 0.01$; own emotion $t(48) = 3.11$, $p < 0.01$). The mean score for Jenny's emotion was 6.92 (SD = 1.18) in the emotion induction group and 1.6 (SD = 1.8) in the control group, while the mean score for own emotion was 3.96 (SD = 2.5) in the emotion induction group and 1.96 (SD = 2.0) in the control group.
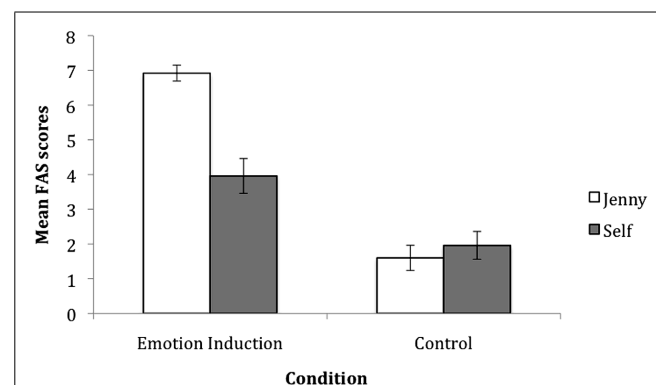

FIGURE 1 | Mean ratings for Jenny and self on the Facial Affective Scale (FAS), with standard error bars, for the emotion induction and control group in study one (5–6 year-olds). Possible scores ranged from "0" (very happy) to "8" (very sad).

The differences between groups in both self-reported emotion, and perceptions of Jenny's emotion show that the manipulation was successful, and empathy was induced by the emotion induction video. Further, a Pearson correlation between ratings for Jenny and self-showed a strong positive relationship, $r = 0.529$, $p < 0.01$, demonstrating that children who rated Jenny's emotion as negative also rated their own emotion more negatively.

Main analysis

Children received one point for each prosocial choice made in the resource allocation task. A preliminary analysis of performance on cost versus no cost trials showed no difference between these trials so they were pooled for subsequent analysis (No cost mean = 4.68, SD = 2.02; Cost mean = 4.30, SD = 2.08). For sharing trials, prosocial responses were (1, 1) choices; for envy trials, prosocial responses were choices in which the partner received more than the self. Children thereby received a score ranging from "0" to "8" for each trial type (see **Figure 2** for mean scores).

A 2×2 mixed model repeated measures ANOVA with trial type (AI vs. DI) as the within subjects factor, and condition (emotion induction vs. control) as the between subjects factor revealed a significant effect of condition, $F(1,48) = 4.074$, $p < 0.05$, $\eta_p^2 = 0.078$, with children making overall more prosocial allocations in the emotion induction condition ($M = 10.00$, SD = 3.32) compared to the control ($M = 7.96$, SD = 3.80). A main effect of trial type, $F(1,48) = 5.995$, $p < 0.05$, $\eta_p^2 = 0.111$ was also observed, with children making more prosocial allocations in AI trials, as opposed to DI trials. No interaction between trial type and condition, $F(1,48) = 0.062$, $p = 0.804$, $\eta_p^2 = 0.001$, was observed.

Finally, to examine associations among prosocial decisions, personal distress, and empathic concern, bivariate and subsequent partial correlational analyses were conducted. An initial bivariate correlational analysis showed that while there was no relationship between prosocial decisions and emotion ratings for self, $r = 0.079$, $p = 0.588$, there was a significant relation between prosocial decisions and ratings of Jenny's emotional state, $r = 0.388$, $p = 0.005$.

FIGURE 2 | Mean prosocial choices on the resource allocation task with standard error bars, for the emotion induction, and control group, in AI and DI trials in study one (5–6 year-olds). Possible scores ranged from "0" (no prosocial behavior) to "8" (consistent prosocial behavior).

When controlling for rating of Jenny's emotion there was no relation between overall prosociality and personal distress (emotional ratings for self), $r = -0.062$, $p = 0.266$. However, when controlling for emotion ratings for self, the significant relation between prosociality and empathic concern (ratings of Jenny's emotional state), $r = 0.409$, $p = 0.003$, remained.

DISCUSSION

The goal of the current study was to explore experimentally the effects of empathic distress on resource allocation in children. Following work with adults by Barraza and Zak (2009), we predicted that children would exhibit more prosocial behavior toward a protagonist when they were primed by a movie showing the protagonist in distress than when the prime was a neutral movie involving the protagonist. Specifically, we predicted that children in the emotion induction condition (who were primed to experience empathy for their sharing partner) would share more in AI trials, and exhibit less envy in DI trials, thereby showing more generosity in both kinds of trials.

A significant effect of condition in the resource allocation task demonstrated that as hypothesized, children in the emotion induction condition exhibited more prosocial behavior. Children who had been primed with the emotion induction movie shared more in AI trials (more often delivering a benefit), and exhibited less envious behavior in DI trials (less often withholding a benefit), than children in the control condition. Although there was a main effect of trial type with more prosocial behavior in AI trials compared to DI trials, this effect may well reflect the near ceiling response rate in AI trials with no cost to self (the only trial type in which delivering an equitable amount of resources to Jenny was both prosocial, and at no cost to oneself). Significantly, there was no interaction between condition and trial type.

The effect of emotion induction on prosociality appeared to be unaffected by type of decision (AI vs. DI). In other words, the positive effects of the emotion induction on prosocial behavior seems to be consistent across all trial types; having both a positive impact in AI trials – leading to increases in sharing behavior – as well as a neutralizing effect, or negative impact on non-prosocial behavior and consequently producing a decrease in envious behavior in DI trials.

It was important to verify that the specially constructed videos did elicit differences in empathy. Our manipulation check showed that indeed children who watched the emotion induction video reported feeling sadder themselves (evidence of personal distress) and also rated the protagonists emotional state more negatively in comparison to children who viewed the control video (evidence of empathic concern). The relationship between FAS ratings for own emotion, and Jenny's emotion provide further support that the emotion induction video did elicit empathy, however, the finding that prosociality was correlated with ratings of Jenny's emotional state, but not with emotional ratings for self suggests that empathic concern more so than personal distress was driving decision making. Despite showing an elevated level of distress after watching the emotion induction video compared to the control video, children's own level of distress was not significantly related to resource allocation. In contrast, their rating of the

protagonist's distress was. Previous research has also found that personal distress and outward expressions of empathic concern differ in terms of their relation to prosociality – specifically that prosocial intentions and behavior are linked to empathic concern, but not personal distress (e.g., Batson et al., 1981; Eisenberg et al., 1989).

STUDY 2

The results of study one demonstrated that experiencing empathy for another individual increased subsequent prosocial behavior toward them in children of 5–6 years of age. As a next step, we were interested in exploring whether younger children would show a similar effect. It has been argued that earlier in development, there is a less clear differentiation of personal distress and empathic concern (e.g., Hoffman, 1975, 1982) in situations in which children observe another person in distress. According to Hoffman's theory, it is around 2–3 years of age that children begin to understand that others have thoughts and feelings different from their own. To explore whether empathy also increases prosocial behavior in younger children, and also whether this potential relationship is linked to personal distress or empathic concern, study one was replicated with 3-year-old children, which is the youngest age for which the task demands of the resource allocation task are appropriate. Pilot testing revealed that 3-year-olds had a difficult time understanding the DI trials, and therefore these trials were excluded.

METHOD
Participants

Fifty typically developing, 3-year old Canadian children were drawn from a predominately white middle-class neighborhood and randomly assigned to the emotion induction or control conditions. Like the 5–6 year-olds, there were 16 males, and 9 females in each group. The emotion induction group ranged in age from 36 months to 47 months and 28 days ($M = 43$ months, 17 days). The control group ranged in age from 36 months and 1 day to 47 months, 30 days ($M = 43$ months, 10 days).

Procedure

The protocol was identical to study one, with one exception. In this study, the DI trials were excluded from the resource allocation task as some younger children struggled with these trial types. Therefore the 3-year-olds participated in a total of eight trials; four AI with cost, and four AI with no cost.

RESULTS: STUDY 2
Manipulation check

To assess the effectiveness of the emotion induction video FAS scores for Jenny and self were compared across conditions (see **Figure 3** for mean scores). Independent samples t-tests showed that children in the emotion induction condition rated Jenny's emotion more negatively than children in the control, $t(48) = 9.464$, $p < 0.01$. In contrast to the 5–6 year-olds, no difference between ratings for own emotion was observed, $t(48) = 0.973$, $p > 0.05$. The mean score for Jenny's emotion was 6.24 (SD = 1.27) in the emotion induction group and 1.56 (SD = 2.12) in the control group, while the mean score for own

FIGURE 3 | Mean ratings for Jenny and self on the FAS, with standard error bars, for the emotion induction and control group in study two (3-year-olds). Possible scores ranged from "0" (very happy) to "8" (very sad).
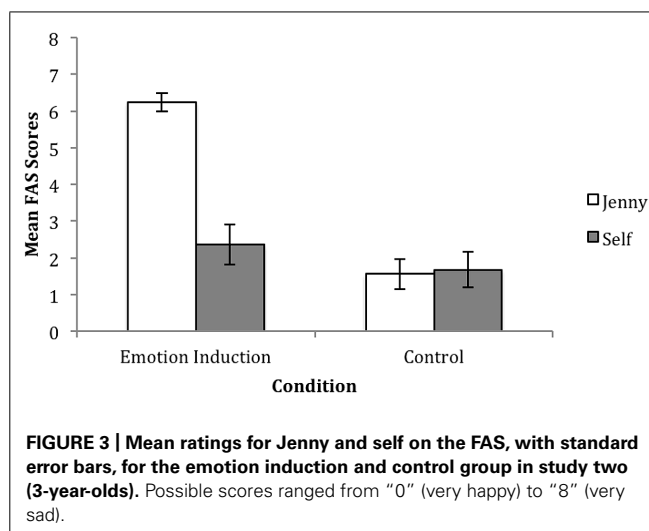
emotion was 2.36 (SD = 2.77) in the emotion induction group and 1.68 (SD = 2.13) in the control group.

Unlike the older children, a Pearson correlation showed no relationship, $r = 0.153$, $p > 0.05$, between emotion ratings for Jenny and self.

Main analysis

Children received one point for each prosocial choice made in the resource allocation task (1, 1 in both AI trials). Children thereby received a score ranging from "0" to "4" for each trial type, and an overall prosocial score ranging from "0" to "8" (see **Figure 4** for mean scores).

A 2 × 2 mixed model repeated measures ANOVA with trial type (cost vs. no cost) as the within subjects factor, and condition (emotion induction vs. control) as the between subjects factor revealed a significant effect of condition, $F(1,48) = 6.869$, $p < 0.05$, $\eta_p^2 = 0.125$, with children making overall more prosocial allocations in the emotion induction condition ($M = 4.8$, SD = 2.06) compared to the control ($M = 3.2$, SD = 2.0). A
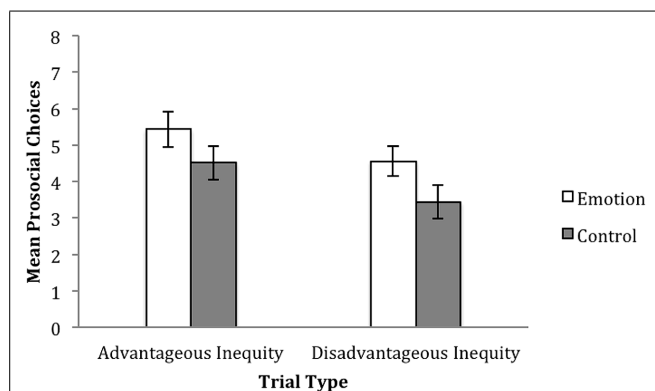

FIGURE 4 | Mean prosocial choices on the resource allocation task with standard error bars, for the emotion induction, and control group, in AI trials in study two (3-year-olds). Scores in cost and no cost trials were pooled into one overall prosocial score, and possible scores ranged from "0" (no prosocial behavior) to "8" (consistent prosocial behavior).
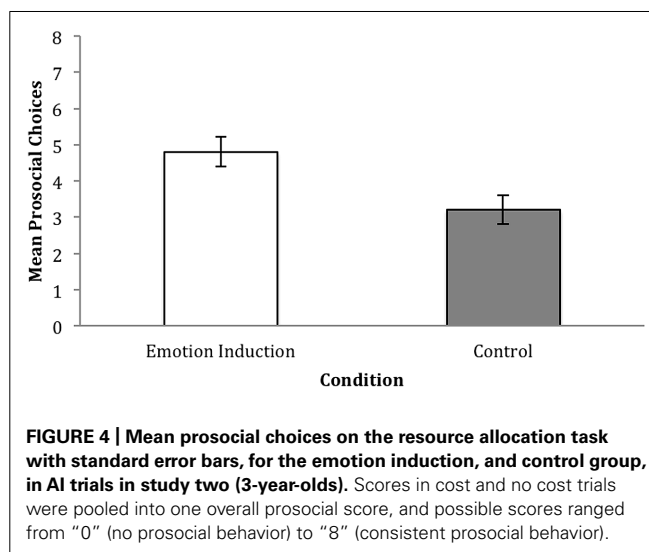
main effect of cost, $F(1,48) = 34.505$, $p < 0.01$, $\eta_p^2 = 0.418$ was also observed, with children making more prosocial allocations in no cost trials ($M = 2.5$, SD $= 1.31$), as opposed to cost trials ($M = 1.5$, SD $= 1.2$). No interaction between cost and condition, $F(1,48) = 0.129$, $p > 0.05$, $\eta_p^2 = 0.003$, was observed.

Finally, correlations between prosocial decisions, and emotion ratings for self, as well as Jenny, were conducted. In contrast to the older children there was no strong relation between overall prosociality and emotion ratings for self, $r = 0.074$, $p = 0.609$, or Jenny, $r = 0.179$, $p = 0.215$. Further, no relationships were observed between self-reported emotion and prosociality when controlling for ratings of Jenny's emotion, $r = 0.048$, $p = 0.742$ or between prosociality and ratings of Jenny's emotional state, $r = 0.170$, $p = 0.244$ when controlling for rating's of one's own emotion.

DISCUSSION

The purpose of study two was to explore whether the positive effects of empathy on prosociality extended to a younger age group, and whether the effects were more closely tied to personal distress or the empathic concern component of empathy. It was hypothesized that empathy would increase prosociality in 3-year-olds, as it did with 5–6 year-olds, but what was of particular interest was whether personal distress would be a stronger influence in younger children, who may be less able to distinguish their own emotions from those of another individual in distress. The method from study one was slightly modified to accommodate the younger children, as the DI trials were found to be difficult for them to understand, and were therefore excluded.

Consistent with study one, an effect of condition was observed with 3-year-olds making more prosocial allocations in comparison to children in the control group. This finding supports the hypothesis that empathy leads to increased prosocial behavior in young, 3-year-old children (at least in AI trials) in addition to older, school aged children.

Explorations of how 3-year-olds rated Jenny's emotion showed that our experimental manipulation produced group differences in empathic concern, as children in the emotion induction condition rated Jenny as feeling sadder than children in the control. However, no differences in self-rated emotion were found between groups. It could be the case that younger children are just not as skilled at recognizing or articulating how they themselves feel in response to witnessing another in a distressing situation, which is perhaps the most likely explanation. These difficulties in using self-report measures with young children have been recognized in the literature (Eisenberg and Fabes, 1990). Difficulty comprehending self-report questions, as well as accurately identifying one's own emotional state, and differentiating between closely related emotional states, have been identified as concerns to be aware of with this population. However, it could simply be the case that our manipulation was not successful in inducing personal distress in younger children.

Finally, correlational analyses showed that prosociality was correlated with neither ratings of Jenny's emotion nor ratings of own emotion. One potential contributor to this discrepancy with findings for the older children could be a lack of power, as 5–6 year olds participated in double the number of trials (both AI and DI,

as opposed to AI alone). Alternatively, if younger children are less able to accurately identify, or verbalize their own, and others' emotions as previously suggested, this inability could also be contributing to the null finding. Including a measure of facial distress would be useful to include in subsequent research with this age group, to more accurately gage personal distress if it is suspected that 3-year-old children are too young to accurately express their own emotions.

GENERAL DISCUSSION

The current studies explored the relationship between empathy and prosocial behavior in children. It was hypothesized that experiencing empathy toward one's partner would both increase prosocial behavior, and decrease non-prosocial behavior. As hypothesized, both 5–6 year-olds, and 3-year-olds showed increased prosocial behavior, and 5–6 year-olds showed decreased non-prosocial behavior toward their partner, if they had first been primed to feel empathy for them. It is important to note that the induced emotion in these experiments was negative, and more specifically, sadness. Empathic experiences of other emotions, or psychological, or physical states in others, such as happiness, fear, pain, etc., may not influence prosociality in the same way, although it is worth exploring how empathic experiences of other negative emotions or states, as well as positive emotions or states, influence prosociality.

As the stimulus videos were created for the purpose of this research, it was important to validate their effectiveness. The fact that children in both studies rated the character as sadder after watching the emotion inducing video than after watching the neutral video provides important validation for the emotion induction manipulation.

Also of interest was whether personal distress or empathic concern could be specifically linked to increases in prosociality. Though the condition effect was consistent across age groups, differences in self-reports of own emotion, and the relationship between prosociality and empathic concern differed between studies one and two. Specifically, in study one, group differences were observed for both personal distress, and empathic concern, and prosociality was correlated with empathic concern (but not personal distress) in 5–6 year-old children. This finding is in line with previous research (e.g., Batson et al., 1981; Eisenberg et al., 1989) suggesting that an outward orientation of empathic concern is related to prosociality, whereas personal distress is not.

In contrast, in experiment two there was no group difference observed in self-rated emotions, and neither personal distress or empathic concern were correlated with prosocial behavior for the 3-year-olds. These differences across age groups could reflect the inability of younger children to accurately reflect on their own emotion, as well as the methodological differences between experiments. As children behaved differently following exposure to the emotion induction vs. control video, and the videos produced group differences in reports of both personal distress and empathic concern – with the exception of personal distress in 3-year-olds – we feel confident that the videos were effective in inducing empathy in both experiments.

Overall, our experiments support the findings of Barraza and Zak (2009) that experiencing empathy for sadness leads to more

prosocial behavior, and extends this finding to children across two distinct age groups. Although similar in concept, it is important to note that our studies differ from Barraza and Zak's (2009) study in a number of ways. First, our videos were closely matched across conditions. Participants both saw a little girl named Jenny playing with her dog, making posters, and hanging them around her neighborhood. They heard her narrate the video, which was matched for factors such as word count, and length. The primary difference between videos was the negative emotion Jenny portrayed in the emotion induction video. Further, the use of the Resource Allocation task allowed for multiple trials, and an exploration of the effects of empathy on both AI and DI trial types so the potential of empathy to reduce non-prosocial behavior could also be examined in 5–6 year-olds. Finally, in this study the partner with whom participants shared was the individual toward whom they were primed to feel empathy, as opposed to an unrelated partner. Whether empathic concern for sadness toward one person would lead children to behave more prosocially with an unrelated partner is unknown at this point and is a question for future research.

It may be noted that our measures of empathy were both self-report and so might be open to concerns about validity. However, similar (verbal) self-report approaches have been commonly used in related research (e.g., Feshbach and Roe, 1968; Eisenberg et al., 1996; Strayer and Roberts, 1997). Importantly, we found that 5–6 year old children's attribution of emotion to a partner in a distressing situation predicted sharing behavior with this individual, thereby providing some validation of the usefulness of this self-report measure.

In both experiments, children were first asked to identify how Jenny felt, and then to express how they themselves felt. As ratings of Jenny's emotion were obtained first, this measure was unaffected by how children may have felt themselves. Recall ratings of Jenny's emotion differed across groups in both experiments, and were correlated with prosociality in experiment 1. Ratings for participants' own emotion were collected subsequently, allowing all children to first reflect on how Jenny felt before communicating their own emotional state. These ratings of own emotion were not correlated with prosociality, and did not differ between groups in experiment two. Although it is unlikely that the order in which the questions were asked influenced the results (especially since it would be the second question influenced by the first which does not seem to be the case), it is worth mentioning that further explorations may benefit from counterbalancing the order of these two questions.

Although the relation between empathy and sympathy and prosocial behavior has been explored in earlier work (e.g., Eisenberg et al., 1988; Zahn-Waxler and Radke-Yarrow, 1990), this is the first experimental demonstration to our knowledge of empathy for sadness, and specifically empathic concern being shown to influence resource allocation in young children. Furthermore, our results suggest empathic concern for sadness can promote sharing, but perhaps the most novel contribution of this work is the finding that it also has a counteracting, or neutralizing effect on the negative consequences of envy.

In sum, these experiments show that empathic concern for sadness does lead to prosocial resource allocation in young children

both by promoting sharing and decreasing envy. Understanding the development of prosocial behavior is important in many regards. Prosocial development is both important in creating and sustaining personal relationships, and on a larger scale, a critical component in maintaining a functioning society. By understanding the mechanisms such as empathy, that influence prosocial behavior, we can better support and encourage the development of prosocial behaviors such as sharing, and learn how to inhibit or neutralize more negative aspects of social behavior such as envy.

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Exploring disadvantageous inequality aversion in children: how cost and discrepancy influence decision-making

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This research examined disadvantageous inequality aversion in 4- and 6-year-old children. Using the resource allocation paradigm, we explored how inequality aversion was influenced by whether a cost was associated with the equitable choice. We also investigated whether preferences for equality differed depending on whether the inequitable choice presented a small or large discrepancy between the payoff of the participant and their partner. The results demonstrated that cost plays a large role in decision-making, as children preferred equality more when there was no cost associated with it compared to when there was a cost. Interestingly, the effect of cost also affected discrepancy, with children more likely to choose equality when the discrepancy was large as opposed to small, in cost trials but not in no cost trials. Finally, the effect of discrepancy also interacted with age, with older children being more sensitive to the discrepancy between themselves and their partner. Together, these results suggest that children's behavior is not indiscriminately guided by a generalized aversion to inequality or established fairness norms. Alternate motives for inequality aversion are discussed.

Keywords: social development, inequality aversion, resource allocation

INTRODUCTION

A concern for fairness is important in motivating human cooperation and prosocial behavior. By understanding how this concern emerges in development, we may be better able to support and encourage the development of important social behaviors. Children appear to be sensitive to fairness from a very young age; for example, children as young as 15 months of age will look longer at an unfair distribution of reward than a fair distribution (Sommerville et al., 2012). Young children also demonstrate a sensitivity to inequality in resource distribution situations in which they are one of the recipients. It is now well documented that children begin to share resources early in the preschool period (e.g., Damon, 1975; Rheingold et al., 1976; Eisenberg and Fabes, 1998). When given the opportunity to share resources with others to establish an equal distribution, children will often do so even when a material cost to themselves is required (Thompson et al., 1997; Fehr et al., 2008; Moore, 2009). By 3-years of age, children will also object when a peer or partner receives more than them (LoBue et al., 2011). However, whether children are motivated by fairness concerns in such situations remains unclear. Alternatively, children may be motivated by prosociality in situations where they can forgo a reward in order to deliver a benefit to a partner or by envy resulting from social comparison in situations where they can act to prevent another receiving more than themselves (Shaw and Olson, 2012). The present study examines possible motivations underlying children's resource allocation, particularly in situations in which they are potentially at a disadvantage compared to a partner. Before elaborating on the particular approach used in the current study, we first briefly describe related work on children's decision-making in such situations.

Situations in which children are asked to react to an inequitable distribution of resources that favors the partner are said to involve "disadvantageous inequality" (DI). In contrast to advantageous inequality (AI) situations in which an inequitable distribution favors the child, DI situations have received less attention in the literature. However DI situations offer an interesting case for comparing differing motivations underlying fairness. When children show preference for an equal distribution of resources rather than allowing a partner to have more, they may be motivated by a desire for fairness but alternatively they may be motivated by envy resulting from social comparison (Shaw and Olson, 2012). While assessing fairness requires a comparison in the sense that one must compare one's own resources to the partner's, in the current study, as in Shaw and Olson's (2012), "social comparison" refers to the desire to not have less than a partner.

In order to study inequality aversion in a way that eliminated social comparison as a potential motive, Shaw and Olson (2012) used a third party design in which 3- to 8-year-old children decided how to allocate resources to two unknown participants. They found that even younger participants would discard an extra resource when asked to split an uneven amount of resources between two recipients. These results revealed a principle of inequality aversion governing children's decisions in third party situations, but cannot inform us about how such concerns may operate when children's own interests are at stake. We know that children as young as 3–4 years of age understand fairness norms, and will report that resources should be split equally, however, it is not until age 7–8 that their sharing behavior aligns with the norms of fairness they endorse (Smith et al., 2013).

Research on DI aversion when children's own interests are at stake has largely been carried out to examine the origin and development of DI aversion in children and much of it has compared children's reactions to DI and AI situations (e.g., Fehr et al., 2008; Blake and McAuliffe, 2011; LoBue et al., 2011). In general, this work shows that aversion to these two forms of inequality develops along distinct developmental trajectories, with children demonstrating a dislike for inequality that disadvantages themselves several years before they exhibit aversion toward inequality that favors themselves. For example, LoBue et al. (2011) found that children as young as 3 years of age would object when an experimenter distributed resources in a way that disadvantaged themselves in comparison to a partner. However, children were less likely to object to unequal distributions that placed them at an advantage in comparison to their partner. This finding suggests that children's motives in DI situations are at least in part motivated by envy resulting from negative social comparison.

In the study by LoBue et al. (2011), children responded to unfair resource distributions imposed by an adult. However, when children have the opportunity to decide themselves how resources are distributed across self and a partner, there is also evidence that children will avoid DI. In perhaps the first experiment on DI situations in children, Fehr et al. (2008) used a forced choice resource allocation task to introduce an "envy" decision in which 3- to 8-year-olds chose between an equal distribution of reward (one candy for both self and partner) and an unequal distribution of reward that disadvantaged themselves (one candy for self and two for the partner). Equitable choices in this DI trial were compared with two AI trials, in which equality came with either a cost or no cost. Though preferences for equality differed across trials, an overall increase in equitable decisions with age was observed, and the authors cast this development in terms of a principle of inequality aversion general to both AI and DI situations. There was, however, no direct evidence that the same concerns were motivating decision-making in the different trials types. The increase in equitable choices observed in the DI choices is particularly ambiguous because the level of preference for the equal choice at the younger age was no different from chance. Because the DI choice did not involve a cost, it is entirely possible that the younger children were only paying attention to their own reward and were unaffected by the disadvantageous comparison between their reward and those of their partner. Without a condition in which avoiding DI comes at a cost, it is not possible to determine whether these younger children really are avoiding inequality, or what, if any, motive they have for doing so.

Subsequent work has shown that a preference for equality sometimes presents itself even when there is a cost associated with removing the comparative disadvantage. Blake and McAuliffe (2011) presented 4- to 8-year-olds with an unequal number of candies for themselves and a partner, and asked them if they would like to accept or reject the offer (in which case neither party received anything). In DI trials children were offered one candy for themselves, and four for their partner, while in AI trials children were offered four candies for self and one for partner. While children did not show inequality aversion to AI until 8 years of age, children across all age groups commonly rejected DI offers. As in the case of LoBue et al. (2011) discussed earlier, the different developmental patterns suggest that avoidance of AI and DI are differentially motivated at least in young children (Blake and McAuliffe, 2011). The results also suggest that when the other stands to get a much larger reward than the self, children are strongly motivated to reject the resource allocation.

The two studies just described remain the only two that have directly examined children's self-involved DI decisions in resource allocation contexts across different age groups. However, comparison across the two studies is difficult because they differed in two key aspects. Fehr et al. (2008) presented DI choices for which there was no cost to making the equitable choice (the children received the same reward either way) and the potential discrepancy between self and partner was relatively small (one vs. two). In contrast, Blake and McAuliffe (2011) presented choices for which there was a cost to avoiding DI (both participants lost everything), and the potential inequality was relatively large (one vs. four). It is conceivable that both of these variables have an impact on children's decisions in DI contexts. Younger children may have a tendency to focus on their own reward exclusively, and therefore a cost choice could lead to a lower level of inequality aversion compared to a no cost choice, for which children may choose essentially randomly. The size of the discrepancy between self and other may also have an effect in that the larger discrepancy, the greater the potential for a negative social comparison and resultant feelings of envy. So, if envy is motivating decisions in DI situations, children may avoid inequality to a greater extent when the discrepancy is large compared to when it is small.

To generate a clearer picture of how young children's decisions in DI situations are motivated, we presented 4- and 6-year-old children with a series of decisions, each involving a choice between an equal distribution of resources and an unequal distribution that favored the partner. We varied both the cost of making an equitable decision and the size of the discrepancy between the reward for self and other in the DI case. First, we compared the type of DI trial introduced by Fehr et al. (2008) in which there was no cost to the participant for either choice, with a costly trial type in which the child would have to give up their own resource to avoid inequality (cf. Blake and McAuliffe, 2011). Although how cost influences DI has not been systematically explored, cost has been shown to influence behavior in other social contexts. In situations of AI, children demonstrate weaker preferences for equality when it comes with a cost (Thompson et al., 1997; Fehr et al., 2008; Moore, 2009). Children also judge others less harshly for not helping someone in need when there are high costs associated with helping, compared to when costs are low (Sierksma et al., 2014). Given these established cost effects across other social domains, it was hypothesized that cost would also influence decision-making in situations of DI. Specifically, it was expected that children would show a stronger preference for equality when there was no cost associated with it, partially because those children who only paid attention to their own payoff would be more likely to choose the equal option. While the absence of a cost effect would provide support for inequality aversion motives, an effect of cost would suggest children's decision making is influenced by what is in their own best interest, as opposed to fairness norms.

Second, we compared children's decisions in DI situations involving two different discrepancies between the participant's and the other recipient's resources in the unequal option. In half the trials the discrepancy was small (one for self; two for partner) and in half the trials the discrepancy was larger (one for self; five for partner). The reasoning here was that if children are primarily concerned with maintaining equality, in accordance with fairness norms, then there should be little or no difference between egalitarian choices in these two trial types. However, if they are responding more to the envy engendered by social comparison between self and other, then the larger the discrepancy, the more they may be inclined to reject it. Therefore, in line with the idea that children's decisions in DI situations may be motivated by social comparison and envy concerns, we predicted more egalitarian choices would be made in large discrepancy trials compared to small discrepancy trials.

To summarize, combining these two variables yielded four types of trials: no cost with a small discrepancy (1,1 vs. 1,2); no cost with a large discrepancy (1,1 vs. 1,5); cost with a small discrepancy (0,0 vs. 1,2); and cost with a large discrepancy (0,0 vs. 1,5). Children of 4 and 6 years of age were tested because evidence of increasing inequality aversion in the envy trial type has been observed in this age range (e.g., Fehr et al., 2008), but previous research has not adequately explored motives underlying decision-making in DI situations in children of these ages. Given that inequality aversion has been observed to increase with age in multiple resource allocation situations (e.g, Fehr et al., 2008; Blake and McAuliffe, 2011; Shaw and Olson, 2012) it was predicated that older children would make more egalitarian decisions compared to younger children. In view of the limited background literature on DI, no specific predictions were made regarding interactions between age, cost and discrepancy.

MATERIALS AND METHODS

PARTICIPANTS

Forty-two typically developing children drawn from a predominately white middle-class neighborhood in a small Canadian city participated in this study, which was approved by the University's research ethics board. Participants were recruited from a database, as well as a variety of community classes and events. Two participants were excluded due to incomplete participation leaving a sample of 40 children. The 4-year-old group (10 males, 10 females) had a mean age of 52 months, 6 days (ranging from 42 months, 17 days to 57 months, 2 days). The 6-year-old group (8 females, 12 males), had a mean age of 75 months, 29 days (ranging from 68 months, 6 days to 82 months, 24 days).

PROCEDURE

All testing took place in the lab, and began once parental consent and participant assent was obtained. Following the approach introduced by Moore (2009), children were asked to think of, and name a friend they enjoyed playing with. Children were then asked to draw themselves and their friend from memory on individual 4″ by 6″ inch blank cards. Before testing started children were asked to identify their drawings, and were corrected if either drawing was misremembered.
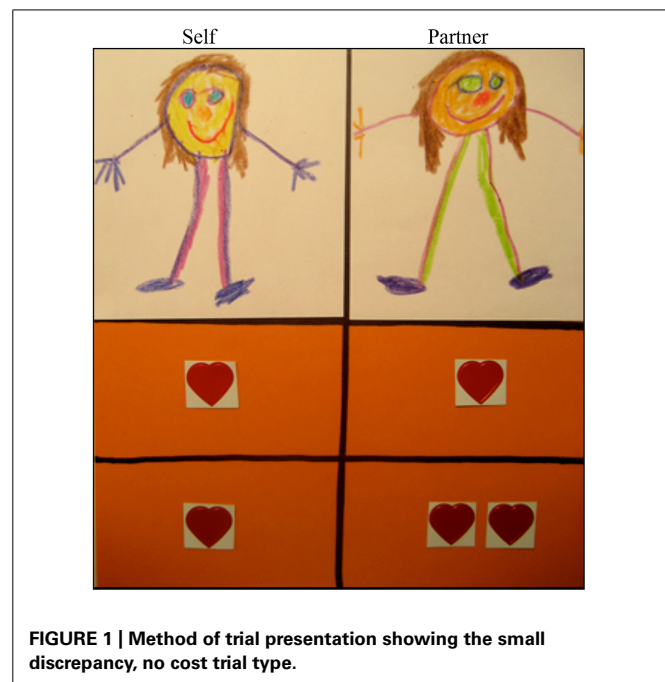
FIGURE 1 | Method of trial presentation showing the small discrepancy, no cost trial type.

The researcher then faced the child and said, "*We're going to play a choosing game. In this game, sometimes you might choose stickers for you and (friend's name) and sometimes you might choose not to take any stickers. The stickers you choose for yourself will go here, and the stickers you choose for (friend's name) will go here.*"

Brightly colored stickers portraying popular television characters that children found attractive, and appealing, were used as the resource. A variety of different stickers was used with each participant to ensure that the stickers remained salient and attractive reward throughout the duration of the task. Children were given a sticker book to place stickers they chose for themselves, and stickers chosen for their friend were placed in a paper bag.

Before the test trials began, each child participated in one practice trial (choosing between one or two stickers for themselves) to familiarize them with the format of the game. Responses were recorded but not analyzed. There were four trial types and children participated in three trials of each, for a total of 12 test trials. Trials were presented in three blocks. Each block contained one of each of the four different trials types. The order of the trial types was varied within block, and the order of the blocks was varied across participants to ensure no order effects contributed to the findings. In each trial the picture of the participant and their partner were placed on a piece of paper, and the two alternative distributions were laid out below each picture, and divided by a line (see **Figure 1**). Children were told, "*Here you are and here is (partner's name).*"

In each trial children were asked "*Would you like to choose (n) sticker(s) for yourself, and (n) for (friend's name), or would you like to choose (n) sticker(s) for yourself and (n) for (friend's name)?*" In cost trials the choices were (0,0 vs. 1,2) in SD trials, and (0,0 vs. 1,5) in LD trials. In no cost trials the choices were (1,1 vs. 1,2)

in SD trials, and (1,1, vs. 1,5) in LD trials. Participation for each child lasted approximately 15 min. Each session for which parental consent to videotape was obtained was recorded for verification and coding purposes.

RESULTS

Children received one point for each egalitarian choice made (0,0 in cost trials and 1,1 in no cost trials), therefore receiving an overall score ranging from "0" to "3" for each trial type. Descriptive statistics can be seen in **Figure 2**.

A $2 \times 2 \times 2$ mixed model repeated measures ANOVA with cost (cost, no cost) and discrepancy (SD, LD) as within subject factors, and age as a between subjects factor was performed with the number of egalitarian choices as the dependent variable. Between subjects, no significant main effect of age was observed, $F(1,38) = 2.410$, $p = 0.129$, $\eta_p^2 = 0.060$. There was a significant main effect of cost, $F(1,38) = 37.272$, $p < 0.001$, $\eta_p^2 = 0.495$, with more egalitarian decisions overall in no cost trials ($M = 3.33$, SD = 1.64) compared to cost trials ($M = 1.6$, SD = 2.01). There was no significant interaction between cost and age, $F(1,38) = 0.196$, $p = 0.661$, $\eta_p^2 = 0.005$.

Although there was no significant main effect of discrepancy, $F(1,38) = 2.018$, $p = 0.164$, $\eta_p^2 = 0.050$, and no significant three-way interaction between cost, discrepancy, and age, $F(1,38) = 0.400$, $p = 0.531$, $\eta_p^2 = 0.010$, two significant interactions involving discrepancy emerged. There were significant interactions between cost and discrepancy, $F(1,38) = 5.778$, $p = 0.021$, $\eta_p^2 = 0.132$, and between discrepancy and age, $F(1,38) = 6.317$, $p = 0.016$, $\eta_p^2 = 0.143$. These interactions were explored using follow-up paired samples t-tests.

To follow up the interaction of cost and discrepancy, paired t-tests showed that for cost trials children were more likely to choose the egalitarian option when the discrepancy was large ($M = 1.0$, SD = 1.13) than when it was small ($M = 0.6$, SD = 0.98), $t(39) = -3.766$, $p = 0.001$, but there was no difference between the large ($M = 1.63$, SD = 1.03) and small ($M = 1.7$, SD = 1.01) discrepancy for no cost trials, $t(39) = 0.386$, $p = 0.701$. In line with the main effect of cost, children preferred equality more in no cost,

FIGURE 2 | Average egalitarian decisions (with standard error bars), made by 4 and 6-year-old children in no cost and cost trials with small and large discrepancies.

compared to cost trials in both small discrepancy, $t(39) = -6.169$, $p < 0.001$, and large discrepancy trials, $t(39) = -3.838$, $p < 0.001$.

To examine the interaction involving age, the discrepancy effect was examined for each age. It was found that the younger (4-year-old) group showed no significant effect of discrepancy, $t(19) = 0.925$, $p = 0.367$, choosing the egalitarian option with equal frequency whether the discrepancy was small ($M = 2.2$, SD = 1.88) or large ($M = 1.95$, SD = 1.99). In contrast, there was a significant effect of discrepancy for the 6-year-olds, $t(19) = -2.438$, $p = 0.025$, who chose the egalitarian option more often when the discrepancy was large ($M = 3.3$, SD = 1.59) compared to when it was small ($M = 2.4$, SD = 1.43).

Independent samples t-tests were run comparing 4-year-olds, and 6-year-olds preferences in small, and large discrepancy trials. While no differences between 4 and 6-year-olds were observed in small discrepancy trials, $t(38) = -0.379$, $p = 0.707$, a significant difference was observed in large discrepancy trials, $t(38) = -2.371$, $p = 0.023$, with 6-year-olds choosing the equitable option more often than 4-year-olds.

DISCUSSION

The goal of the current study was to explore how cost, discrepancy, and age influenced young children's decision-making in DI situations, and to gain insight as to whether inequality aversion or social comparison was motivating their behavior. Four- and 6-year-old children were presented with resource allocation choices in which one option delivered a greater benefit to a friend, and the other option was egalitarian. Across trials, egalitarian choices entailed either a cost to the children's own payoff, or no cost. Trials also differed in terms of the discrepancy between the resources available to self and other in the inequitable option, yielding four distinct trial types; small discrepancy no cost trials (1,1 vs. 1,2), large discrepancy no cost trials (1,1 vs. 1,5), small discrepancy cost trials (0,0 vs. 1,2), and large discrepancy cost trials (0,0 vs. 1,5). We expected that children would prefer equality more when there was no cost associated with it, and that older children would demonstrate a stronger aversion to inequality. It was proposed that if a generalized aversion to inequality or fairness norms motivated decision-making, discrepancy would not influence preferences for equality. However, if social comparison was influencing decision-making, children would show a stronger preference for equality in LD trials compared to SD trials. The findings demonstrated that both cost and discrepancy influenced children's decisions. Therefore there does not appear to be a simple or undifferentiated aversion to inequality operating in these children. Here we discuss the key results in more detail, and offer an account of the development of inequality aversion in DI situations.

The results demonstrated that as hypothesized, children preferred equality more in no cost trials compared to cost trials; more often choosing to prevent their partner from receiving a larger reward when they were not required to sacrifice their own reward to do so. This finding was consistent in both SD and LD trials, and suggests that an important determinant of children's decisions in DI situations is whether a sacrifice is needed to achieve equality. Like Fehr et al. (2008), we found that when there was no cost to the egalitarian choice children chose this option over 50% of the time,
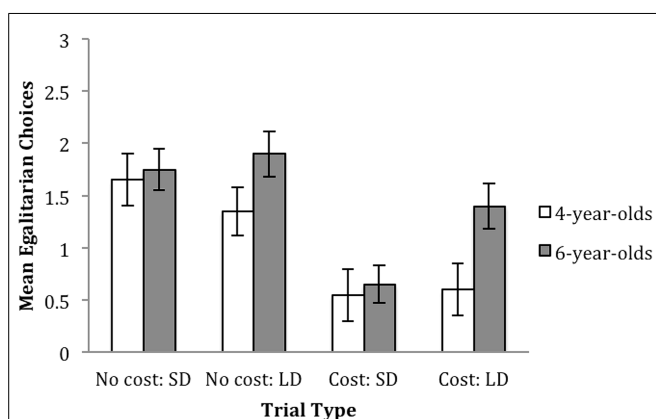
and there was no strong difference between 4- and 6-year-olds to act in this way. However, we found that when there was a cost to the egalitarian choice, and children had to sacrifice their resources, this option was chosen much less frequently. Equality alone is therefore not the issue for these children; if equality comes at a cost it will be largely forgone.

Nevertheless, our results do not suggest that children are completely unwilling to pay a cost to avoid DI. Whereas no overall effect of discrepancy was observed, the effect of cost was influenced by the size of the discrepancy between the resources for the child and their friend. Discrepancy did not influence decision-making in no cost trials, however in costly trials children were more likely to choose the egalitarian option when the discrepancy was large compared to when it was small. This suggests that in cost trials, social comparison was influencing decision-making. Although Blake and McAuliffe (2011) did not explore different discrepancies, our observation in large discrepancy cost trials is consistent with their claim that 4–8 year-olds will sacrifice resources to prevent DI in which the other received four times as many resources. Our results extend theirs in showing that the size of the discrepancy makes a difference to children's tendency to pay the cost of preventing DI – children are more likely to pay to avoid a large discrepancy, compared to a small discrepancy. However, a single motivation based on social comparison cannot explain preferences for equality across all decisions as there was no overall effect of discrepancy and in particular no effect of discrepancy in no cost trials. Interestingly, research suggests that when costs are low children perceive prosociality as morally obligated, while in costly situations they may take other factors into consideration (Sierksma et al., 2014). Therefore, it could be that when there is no cost associated with equality choosing the equitable decision is an easy or even default decision regardless of discrepancy. However, when a cost is associated with equality children may be more sensitive to other considerations such as the comparison between themselves and their partner making a larger discrepancy more likely to motivate a sacrifice. This could explain why a discrepancy effect was observed in cost trials, but no overall effect of discrepancy was observed.

Finally, although no overall age effect was observed, the interaction between age and discrepancy provided evidence of a developmental change in the conditions under which children seek to prevent DI. It was argued that an increase in equitable decisions corresponding with a larger discrepancy would provide support for social comparison motives. An effect of discrepancy was indeed observed but only for the older children. The 4-year-old children's preferences for equality did not differ depending on whether the discrepancy between their own resources and their partner's was small or large. This pattern of behavior is entirely consistent with a simpler account of their decision-making: younger children were only paying attention to their own payoff, and ignoring the payoff for their partner. Thus, in no cost trials where both options resulted in one sticker for the self, 4-year-olds chose each option in about half the trials no matter what the reward conferred to the other was. In cost trials where one option resulted in a smaller reward, they made the more rewarding choice on the large majority of trials, again regardless of the other's payoff. Therefore, it is

likely that social comparison and envy played little or no role for these children.

The 6-year-olds showed a different pattern of choices. They were significantly more likely than younger children to avoid DI in the large discrepancy trials. Clearly they were more reluctant than the younger children to let their friend have many more resources than them, although they showed similar equanimity to the younger children when the discrepancy between self and friend was small. The older children therefore, were displaying an aversion to the large discrepancy between own and other's resources, but because this aversion did not extend similarly to the small discrepancy trials it appeared not to reflect a general inequality aversion or fairness norm. Therefore, it seems that for older children the large discrepancy led to a more negative social comparison, and subsequently increased associated feelings of envy.

Age related changes have previously been documented in DI resource allocation contexts (Fehr et al., 2008; Blake and McAuliffe, 2011; Shaw and Olson, 2012). However, earlier studies have not systematically manipulated different aspects of the DI decisions. If we are correct that different processes are underlying the decisions at different ages in the current experiment, then this would explain why, with different variables manipulated, we did not observe an overall main effect of age. The number of equitable choices made in some trial types may not have differed across age groups, but it is possible that the processes underlying these choices differed from those underlying other trial types. For example, the fact that no overall age effect was observed could be partly due to the robust cost effect that was consistent across both age groups. As evidence of a more generalized aversion to inequality has been observed in older children's decision making (e.g., Blake and McAuliffe, 2011; Shaw and Olson, 2012) it could be the case that social comparison continues to play a role in making fairness evaluations, but children become better able to overcome being influenced by negative feelings with age.

One limitation of the current study is that a variety of different stickers was used for each child and there was no pretest to determine how much each child liked the various stickers. This approach was taken to ensure that the stickers remained novel and attractive over the course of the testing. However, it is possible that the children may have found some stickers more attractive than others, and this variability might have influenced the results, although not in a systematic way. It should also be noted that the inferences from the current study are limited in that the children made their choices with a friend as the recipient, and these results may not generalize to other partners outside of the context of a friendship. It is possible that using friends as partners could have produced more variability in terms of the nature of the relationship between the children and their partners than would have been observed had we used anonymous or unknown partners. As friends have been shown to elicit more generous behavior (e.g., Moore, 2009) it is possible that with a different partner less prosociality would have been observed. Future research would benefit from exploring how preferences for equality in situations of DI differ depending on whether a partner is known or unknown, or a friend or non-friend (cf. Moore, 2009, for AI situations). Future research should also further investigate factors that may influence

preferences for equality in DI situations, and the motivations behind such preferences. Exploring how discrepancy influences decision-making in older age groups, as well as the inclusion of additional measures (for example, asking children to explain the reasoning behind their decisions) could help shed more light on how motivations underlying decision-making change throughout development.

In summary, we found no evidence of generalized inequality aversion in 4- and 6-year-olds' decisions in DI situations. Most obviously, cost and no cost choices elicited different levels of egalitarian choices, with children preferring equality more when there was no cost associated with it. In cost trials discrepancy also played a role, as children were more likely to sacrifice their own resources to prevent their partner from receiving many more stickers than them, as opposed to just one more. Further, the finding that 6-year-olds choose the equitable option more in LD trials compared to the 4-year-olds suggests that children at this age may be particularly sensitive to social comparison, and their desire for equality may be more influenced by social comparison, as opposed to a more generalized aversion to inequality. Taken together, our findings suggest that between 4 and 6 years children become more attuned to the social comparison between self and other when allocating resources in potentially DI situations. Whereas 4-year-olds appear to want to maintain a degree of equality between self and other, they are not willing to pay for it. This pattern can be characterized perhaps as a weak inequality aversion in that equality is preferred when nothing is at stake personally (cf. Shaw and Olson, 2012). By 6 years, children are sensitive to the social comparison such that a desire for equality is increased in accordance with possible size of the negative comparison and even if there is a cost. Interestingly, this age difference is inconsistent with an increasing adherence with age to a social norm of fairness, as the older children showed even less "normative" behavior than the younger children. So, although children do seem to reach a point at about 8 years where their resource allocation decisions are organized in relation to a fairness norm (Fehr et al., 2008; Blake and McAuliffe, 2011; Shaw and Olson, 2012), it appears they first undergo a developmental shift that makes them more prone to social comparison and envy. It is even possible that this shift is a necessary stage in the development of more normative behavior. Social comparison may set up the motivational conditions for fairness, and while DI situations may elicit envy, AI situations may elicit social welfare concerns such as altruism (Shaw and Olson, 2012). The resolution of these incompatible experiences resulting from inequality situations may come, with appropriate cultural support, through an adherence to a more general norm of equality.

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The early origins of human charity: developmental changes in preschoolers' sharing with poor and wealthy individuals

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Recent studies have provided evidence that young children already engage in sharing behavior. The underlying social-cognitive mechanisms, however, are still under debate. In particular, it is unclear whether or not young children's sharing is motivated by an appreciation of others' wealth. Manipulating the material needs of recipients in a sharing task (Experiment 1) and a resource allocation task (Experiment 2), we show that 5- but not 3-year-old children share more with poor than wealthy individuals. The 3-year-old children even showed a tendency to behave less selfishly towards the rich, yet not the poor recipient. This suggests that very early instances of sharing behavior are not motivated by a consideration of others' material needs. Moreover, the results show that 5-year-old children were rather inclined to give more to the poor individual than distributing the resources equally, demonstrating that their wish to support the poor overruled the otherwise very prominent inclination to share resources equally. This indicates that charity has strong developmental roots in preschool children.

Keywords: prosocial behavior, sharing, cognitive development, preschoolers

INTRODUCTION

A fundamental principle of humanity and justice reasoning concerns charity (i.e., sharing with the poor, who are in need, but not entitled to resources). Indeed the principle of charity plays an important role in ethical considerations of many religions (e.g., the idea of *Caritas* in Christianity or the *Zakat* as one of five pillars of Islam) and moral philosophy (e.g., Aristotle, 2011). Notwithstanding the fundamental nature of charity for human life, it is largely unknown whether human charity has roots in early development or is a product of an extended period of socialization and enculturation – although such knowledge would be highly informative for recent debates on the nature of human prosociality in social and comparative psychology (Hertel et al., 2002; Tyler, 2003; Penner et al., 2005; Dovidio et al., 2006; Chudek and Henrich, 2011; Paulus and Moore, 2012; Forgas and Tan, 2013; Tomasello and Vaish, 2013; cf. Paulus, 2014).

Recent findings have provided evidence that already preschool children engage in sharing behavior and that a variety of factors affect their sharing decisions. Amongst others, it has been demonstrated that the type of cues uttered by the helpee (Svetlova et al., 2010), the costs associated with sharing (Moore, 2009; House et al., 2013) a shared collaborative history (Hamann et al., 2011; Warneken et al., 2011), and the social relationship between the helper and recipient (e.g., Birch and Billman, 1986; Moore, 2009) play a role in preschoolers' sharing. For example, Paulus and Moore (2014) gave 3- to 5-year-old children the possibility to share with a friend and with a disliked peer (*Self task*). In a second task (*Other task*), they presented them with another protagonist as well as his friend and a disliked peer (represented by toy bears), and asked to children to predict the protagonist's sharing decisions. The results showed that the 4- and 5-, but not the 3-year-old children shared more with the friend than with the disliked peer; and also expected another agent to share more with a friend than with a disliked peer. This suggests that early sharing behavior becomes more selective in the course of the preschool years (cf. Hay and Cook, 2007). Yet, it remains an open question whether or not early sharing is actually directed at the other's material needs, that is, whether or not preschoolers' take the relative distribution of wealth into account – and share more with poor than with rich recipients. Knowledge about children's considerations of others' needs in their sharing would speak to the mechanisms and motivational basis of early sharing and prosocial behavior, which has remained subject to vivid discussion (e.g., Hay and Cook, 2007; Fehr et al., 2008; Jaeggi et al., 2010; Kärtner and Keller, 2012; Chernyak and Kushnir, 2013; Fawcett and Gredebäck, 2013; Kenward and Gredebäck, 2013).

Classical (Damon, 1977) and recent (Kienbaum and Wilkening, 2009; Shaw and Olson, 2013) interview studies with older children suggested that it is during school-age that children (learn to) take others' needs in resource distribution scenarios into account. For example, Kienbaum and Wilkening (2009) showed that primary school children mainly considered others' needs when allocating resources to different recipients. Yet, distribution scenarios differ from sharing tasks as in these scenarios children never appear as potential recipients themselves. Accordingly, tasks using sharing paradigms and resource distribution scenarios have partly yielded different results (cf. Olson and Spelke, 2008; Paulus and Moore, 2014). Moreover, it is possible that the interview measures might underestimate children's actual behavior. First evidence comes from recent studies. McCrink et al. (2010) asked 4- and 5-year-old children as well as adults to evaluate the kindness of different puppets who

distributed resources. The authors manipulated the relative wealth of the puppets and the proportion of resources given away. The results indicated that the 4-year-old children's judgments were only based on the absolute amount of resources given, whereas the 5-year-old children started to take proportions into account (see also Ng et al., 2011). Moreover, a recent study by Paulus et al. (2013a) provided evidence that 5-, but not 3-year-old children include third parties into dyadic sharing situations to a greater extent when these third party individuals possess the majority of resources compared to a situation in which the child himself was the richest person in the triadic situation. This indicates an appreciation of relative wealth as well as fairness at 5, but not 3 years of age. Yet, this procedure relied on a rather demanding measure – active involvement of a third party – and younger children's failure to do so could be attributed to a number of causes besides a lacking appreciation of wealth and fairness, for example the lacking capacity to simultaneously compare the relative wealth of three individuals. More importantly, as these studies examined reasoning about relative contributions (McCrink et al., 2010) or children's appreciation of their *own* wealth and the related obligation to share or not (Paulus et al., 2013a), they do not answer the question whether preschoolers' sharing is at all affected by the *other's* material needs. Thus, empirical research is needed that directly examines whether preschool children share more with poor than wealthy others.

From a theoretical point of view one could construct two different hypotheses. On the one hand, one could consider findings that preschoolers display sympathy toward others in distress (e.g., Kienbaum et al., 2001; Decety and Svetlova, 2012). This could indicate that from early on children consider others' needs (e.g., Hoffman, 2000). Accordingly, we would expect that from early on young children share more with needy than wealthy others.

Yet, on the other hand, it is possible that these empathic reactions are largely based on automatic and involuntary affect sharing due to perception-action links (e.g., Preston and de Waal, 2002; de Waal, 2008) and thus do not necessarily involve a consideration of others' material needs. Moreover, recent studies have provided evidence for a dissociation between the different varieties of prosocial action (e.g., Dunfield et al., 2011; Dunfield and Kuhlmeier, 2013; Paulus et al., 2013b), indicating that the processes that underlie empathy-motivated comforting might not be related to early sharing at all.

Importantly, recent findings demonstrated that even in sharing situations that bear no cost to the child, 2-year-old children do not understand others' material needs and do not support the other, unless the other explicitly shows his wish (Brownell et al., 2009). Moreover, research by Blake and Rand (2010) has provided strong evidence that in sharing situations even a majority of 3-year-old children do not share with another person, whereas they do so only by the age of 5. Thus, based on this line of reasoning a second hypothesis could assume that early sharing may not be motivated by a consideration of others' material needs and by a wish to support the poor. In contrast, early sharing could be based on motivations that are independent of the others' material wealth – for example, a motivation to interact with another person (i.e., a social, yet not genuinely prosocial

motivation; Paulus, 2014) as sharing with others helps to establish social contacts (e.g., Binmore, 2006); or a motivation to comply with another's request (e.g., Brownell et al., 2009; Dunfield et al., 2011) – and consequently young children would not share more with poor than wealthy others based on a consideration about their needs.

Taken together, it remains an open question whether or not early sharing is motivated by a genuine appreciation of others' material needs and relative wealth; and thus a motivation to allocate more resources to poor than to rich agents. If children's sharing behavior is based on an evaluation of others' relative wealth, then they should share more with poor than wealthy individuals. Thus, when are children's sharing behavior based on an evaluation of the recipients' material needs?

Given the fundamental role of charity for humanity and moral behavior, the present study was designed to examine the early origins of human charity. As our main interest to examine the factors and mechanisms subserving sharing behavior, Experiment 1 employed a sharing task to examine whether preschool children take others' indigence into account when sharing resources with others. Experiment 2 relied on a resource allocation paradigm to investigate children's inclination to distribute resources between poor and rich individuals. As previous work using a variety of different measures has pointed to significant developmental changes in children's sharing behavior in the course of the preschool period (e.g., Blake and Rand, 2010; Paulus et al., 2013a), we choose to examine 3- and 5-year-old children.

EXPERIMENT 1

The current study aimed at clarifying whether young children consider others' material needs in their sharing behavior. As a consequence, Experiment 1 employed a sharing task to assess preschoolers' sharing with poor and wealthy recipients. To keep our results comparable to previous findings, we used a sharing task modeled on previous research (Fehr et al., 2008; Olson and Spelke, 2008; Moore, 2009). It consisted of several situations in which the child could share stickers with one of two different recipients; an agent who had a sticker book full with stickers (rich agent) and an agent who barely had any stickers (poor agent). Two choice types were included. In the even choice type – associated with low costs for the child – the child could choose between two stickers for herself and two for the other (2/2), or three for herself and one for the other (3/1). In the uneven choice type – associated with high costs for the children – the child could choose between three stickers for herself and one for the other (3/1), or one for herself and three for the other (1/3). Previous research has successfully employed similar amounts of resources in 3-year-old children (Olson and Spelke, 2008). We included these two different choice types as they both assessed whether the child would be willing to sacrifice own resources to support another person and as a comparison between the two types would clarify whether the costs associated with sharing would interact with a potential inclination to share more with poor than rich people (e.g., when the cost is quite high as in the uneven trials children would show low sharing and no differentiation, in cases of lower costs as in the even trials differential sharing would become evident).

METHOD

Participants

The sample included 17 3-year-old children ($M = 42$ months, SD = 1.7; seven boys) and 17 5-year-old children ($M = 65$ months, SD = 3.7; six boys). All participants were typically developing children from a larger European city and were of mixed socioeconomic status. Informed consent for participation was given by the children's caregivers. The study followed the ethical principals outlined by the Helsinki's 1964 declaration and the recommendations of the German Psychological Society.

Materials

Materials included colored stickers, which have been successfully used in previous studies (e.g., Prencipe and Zelazo, 2005; Gummerum et al., 2010), an envelope for the child and two sticker books for the two recipients. The sticker book of the poor agent contained ca. three stickers, whereas the sticker book of the wealthy agent contained around 50 stickers. We choose to employ this large difference to prevent the poor agent to become richer than the wealthy agent in the course of the task. Two toy figures (toy bears; appr. 30 cm high) served as possible recipients. Previous studies have successfully employed animal characters or toy figures to investigate children's reasoning about social situations and resource distributions (e.g., Fawcett and Markson, 2010; McCrink et al., 2010; Kenward and Dahl, 2011; Kanngiesser and Warneken, 2012). Moreover, Paulus and Moore (2014) found no difference in children's decisions when toy bears were involved to represent a sharing situation between friends or disliked agents, or when children were asked to share stickers with a friend or a disliked peer.

Procedure

Children were tested individually in a quiet room. Experimental sessions were scored online by the experimenter and videotaped for later reliability coding.

The color of the bears' shirts served as their names during the entire experimental session. The participants were familiarized with the recipients. In particular, they were told that both bears love stickers and that they like to collect them. Subsequently, the experimenter showed the child that one of the bears (rich agent) had already a lot of stickers (the sticker book full of stickers), whereas the other one had barely any stickers (the sticker book containing only three stickers; poor agent). Importantly, the experimenter described both agents and their possessions in the same neutral manner, to not induce sympathy for the poor agent (and thus bias children's decisions) by means of her verbal intonation. After the presentation of the agents, the experimenter introduced the task. She explained that the child could choose items for both herself and another bear. The items chosen for the bears would be handed over to them and kept in a bowl; the items kept by the child would be collected and could be taken home by the children in their envelope.

Children were then presented with three blocks of trials. Each block contained one trial of each of four trial types. The trial types resulted out of the factorial combination of the factor Sharing Partner (Rich agent, Poor agent) and the factor Choice Type (even, uneven). Trial order and the order of the choices offered in each question were counterbalanced among blocks and participants.

The protocol followed the studies by Moore (2009), Paulus and Moore (2014). In every trial, the experimenter put the respective number of items on the table and demonstrated the options by dividing the stickers in the respective manner and by pretending to move the stickers to the respective recipients. This part of the protocol ensured that the options were not only presented verbally, but also concretely experienceable.

After the presentation of the agents and again after they completed the task, participants were asked to identify the agent who has a lot of stickers and the agent who has only few stickers. Data from 27 participants were obtained in this manipulation check (due to experimenter mistake, seven children were forgotten to be asked). All of these correctly identified the respective agents.

Data analysis

Data were coded by the experimenter. For each trial, participants received a score of 1 if they chose the option that afforded relatively more items to the respective recipient than to themselves. That is, they received a score of 1 when they choose the (2/2) option in the even trials and the (1/3) option in the uneven trials. Scores were recorded as proportional measures of equitable choices for each trial type. 12 randomly chosen children (35%) were recoded by a second person blind to the purpose of the study. Both raters agreed to 100%.

Experiment 1 examined whether children were more inclined to share when they were paired with a poor than with a wealthy recipient. In other words, we were interested whether the factor representing recipient's wealth affected children's sharing. Thus, the main test was a 2 (Age Group: 3, 5) $\times$ 2 (Recipient: Rich agent, Poor agent) $\times$ 2 (Trials: even, uneven) mixed-model repeated measures analysis of variance (ANOVA).

RESULTS

Descriptive results are shown in **Figure 1A**. The ANOVA revealed a main effect of Trial, $F(1,32) = 10.915$, $p < 0.01$, $\eta^2 = 0.25$. This shows that the 3- and 5-year-old children chose the option that was more beneficial for the respective recipient more often in the even choice trials than in the uneven choice trials, suggesting that children were more generous when it was less costly for them. Importantly, the analysis revealed also an interaction effect of Recipient and Age, $F(1,32) = 6.071$, $p < 0.05$, $\eta^2 = 0.16$. To follow up on the interaction between Recipient and Age, we conducted *post hoc* t-tests for each age group, comparing whether children afforded more resources to the poor than to the wealthy recipient. These analyses showed that the 5-year-old children shared more with the poor ($M = 0.45$, SE = 0.08) than the wealthy recipient ($M = 0.24$, SE = 0.04), $t(16) = 2.218$, $p < 0.05$. This was not the case for the 3-year-old children, $t(16) = 1.074$, $p = 0.30$, who did not share more with the poor ($M = 0.26$, SE = 0.07) than the wealthy recipient ($M = 0.31$, SE = 0.07).

Next, we compared children's performances in the different trial types against chance by means of t-tests (with behaviors

FIGURE 1 | Panel **(A)** shows the mean proportion of trials on which participants choose the option that afforded relatively more items to the respective recipient in Experiment 1. Panel **(B)** shows the mean proportion of trials (averaged across trial types) per block in Experiment 1. Error bars indicate standard errors of the means.
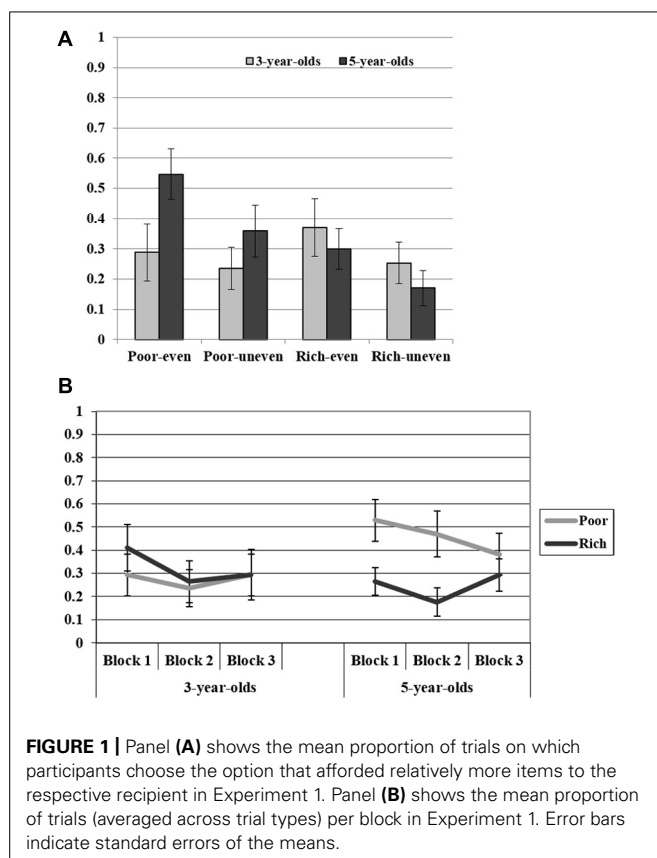
below chance indicating a primarily selfish motive). These analyses showed that for the 3-year-old children performance in all trial types was below chance (all $ps < 0.05$), except for the even-rich trials, $t(16) = 1.351$, $p = 0.20$. In the 5-year-old children, all trial types involving the rich agent were below chance (all $ps < 0.01$), whereas both trial types involving the poor agent were not different from chance, $t(16) = 0.563$, $p = 0.58$ for the even-poor trials, and $t(16) = 1.638$, $p = 0.12$ for the uneven-poor trials, respectively.

As we were interested whether there were general changes in children's performance over time (e.g., indicating that even the 3-year-old children showed some preference for the poor at the beginning of the experiment), we additionally compared performance across blocks (see **Figure 1B**). Given that the previous analysis did not reveal an interaction effect with respect to trial type (i.e., trial type was orthogonal with respect to the age and recipient), we averaged for every child the data for each block and recipient across both trial types. Thus, we calculated for every participant and for each block, how well he/she treated the poor and the wealthy recipient. A 2 (Age Group: 3, 5) × 4 (Blocks: 1, 2, 3) × 2 (Recipient: Recipient: Rich agent, Poor agent) mixed-model repeated measures ANOVA yielded only a significant interaction effect between Recipient and Age-Group, $F(1,32) = 6.069$, $p < 0.05$, $\eta^2 = 0.16$ (all other $ps > 0.13$), replicating the previously reported effect that the 5-year-old, but not the 3-year-old children treated the poor recipient better than the rich recipient.

DISCUSSION

Experiment 1 was designed to examine whether children take others' needs in their sharing behavior into account. The results provide evidence that preschool children as young as 5 years of age share more with poor than wealthy individuals. Furthermore, the results show a strong developmental effect as 3-year-old children's sharing behavior was largely not affected by the others' wealth. Also a follow-up analysis on changes over time (i.e., experimental blocks) did not reveal any effect, excluding the possibility that an initially existing preference for the poor recipient in the 3-year-old children became weaker in the course of the study and did therefore not reach significance. These results suggest that humans' inclination to follow the principle of charity develops in the preschool period.

Note that children of both age-groups showed a tendency to bias their choices toward themselves (i.e., choosing the option that afforded more items to the other below 50%). These results are partly in line with previous findings on young children's sharing behavior (e.g., Blake and Rand, 2010; Smith et al., 2013). This demonstrates that all children understood the task, acted strategically, and supports thus the validity of our method.

Most importantly, for the 5-year-old children this was not the case when being confronted with the poor individual. Here, their selfish motivation was decreased and they showed a higher probability of choosing the option that benefitted the other. Interestingly, this pattern was slightly reversed in the 3-year-old children. They showed a decreased tendency to act selfishly in one trial type involving the rich agent. This might suggest the presence of a tendency to favor advantaged and lucky others over disadvantaged others (cf. Olson et al., 2006) already in 3-year-old children.

Yet, it is possible that even younger children at least understand the idea that more needs to be given to poor than wealthy people, but that this understanding is masked in a task in which they have to share their own resources (cf. Olson and Spelke, 2008). That is, it is possible that issues of self-control could interfere with their understanding that they should more with the poor recipient. Support for this point comes from work demonstrating relations between self-control and strategic social behavior (Steinbeis et al., 2012) as well as between inhibitory control and preschool children's likelihood to share (Aguilar-Pardo et al., 2013). Thus, to investigate the developmental differences in preschooler's considerations of others' material needs in greater detail, we therefore conducted Experiment 2. We employed a resource allocation paradigm (cf. Olson and Spelke, 2008; McCrink et al., 2010; Kenward and Dahl, 2011) in which children had to distribute resources between a rich and a poor individual.

Based on previous findings of developmental differences between 3- and 5-year-olds' inclination to restore fairness in cases of unequal resource distribution (Paulus et al., 2013a) and developmental differences in children's general inclination to share (Blake and Rand, 2010; Smith et al., 2013) as well as the results of Experiment 1, we expected that the 5-, but not the 3-year-old children would allocate more resources to the poor than the wealthy agent.

EXPERIMENT 2

In Experiment 2, children could distribute stickers between the same two recipients as in Experiment 1. Three different choice types were included. In the uneven choice type, the child could choose between three stickers for the poor agent and one sticker for the rich agent (3/1) or one sticker for the poor agent and three stickers for the rich agent (1/3), both choices urging the child to prefer one agent over the other. In the even-poor choice type, the child could choose between two stickers for each recipient (2/2) or three stickers for the poor agent and one sticker for the rich agent (3/1). This choice type investigated in particular whether children preferred to share equally or to follow the principle of charity. In the even-rich choice type, the child could choose between two stickers for each recipient (2/2) or one sticker for the poor agent and three stickers for the rich agent (1/3). This choice type controlled for a preference for the poor agent in the even-poor trials was not merely motivated by a preference for giving someone a large amount of resources.

METHOD

Participants

The sample included another group of 17 3-year-old children ($M = 42$ months, SD = 1.3; eight boys) and another 16 5-year-old children ($M = 67$ months, SD = 1.3; eight boys). Sample characteristics and consent protocol were the same as in Experiment 1.

Materials and procedure

The procedure closely followed Experiment 1 with the following difference. Children were presented with four blocks of trials. Each block contained one trial of each of three trial types (uneven, even-poor, even-rich). Trial order, as well as the order of the choices offered in each question was counterbalanced among blocks and participants. As a prompt, children were asked whether they would like, for example, to choose three stickers for blue bear and one sticker for red bear; or one sticker for blue bear and three stickers for read bear. As in Experiment 1, the option were not only presented verbally, but also physically demonstrated.

Data from 26 participants were obtained in the manipulation check (due to experimenter mistake, seven children were forgotten to be asked). All but one 5-year-old correctly identified the respective agents.

Data analysis

Data were coded by the experimenter. For each trial, participants received a score of 1 if they chose the option that afforded relatively more items to the poor recipient. That is, they received a score of 1 when they chose the (3/1) option in the uneven trials, the (3/1) option in the even-poor trials and the (2/2) option in the even-rich trials. Scores were recorded as proportional measures of equitable choices for each trial type. 12 children (35%) were recoded by a second person. Both raters agreed to 98%.

Experiment 2 examined whether children distributed more items to poor than to wealthy recipients. That is, in contrast to Experiment 1 (where the crucial manipulation was realized between trials) we were interested whether within a trial type

child showed a preference for one over the other recipient. Consequently, the main analyses were t-tests against chance level (50%).

RESULTS

Descriptive results are shown in **Figure 2A**. The t-tests showed that the 3-year-old children did not show any preference in their choice of resource distribution between the rich and the poor agent, $t(16) = 0.194$, $p = 0.85$, $t(16) = 1.496$, $p = 0.15$, and $t(16) = 1.772$, $p = 0.10$, for the uneven, even-poor, and even-rich trials, respectively. In contrast, the 5-year-old children's choices yielded a clear pattern as they differed for all trial types from chance, $t(15) = 4.140$, $p = 0.001$, $t(15) = 2.449$, $p < 0.05$, and $t(15) = 4.000$, $p = 0.001$, for the uneven, even-poor, and even-rich trials, respectively.

To further substantiate these findings, we directly compared children's performance across the trial types. A 2 (Age Group: 3, 5) $\times$ 3 (Trial Types: uneven, even-poor, even-rich) mixed-model repeated measures ANOVA yielded a main effect of Age Group, $F(1,31) = 18.128$, $p < 0.001$, $\eta^2 = 0.37$, showing the 5-year-old children afforded more items to the poor recipient ($M = 0.71$, SE = 0.04) than the 3-year-old children ($M = 0.50$, SE = 0.04). Additionally, the analysis revealed a main effect of Trial Type, $F(2,62) = 3.482$, $p < 0.05$, $\eta^2 = 0.10$. There was no effect of the interaction term, $F < 1$. *Post hoc* comparisons for the Trial Types showed that even-poor and even-rich trials differed from each other, $t(32) = 2.613$, $p < 0.05$ (all other p's > 0.10).

As we were interested whether there were general changes in children's performance over time (e.g., indicating that even the
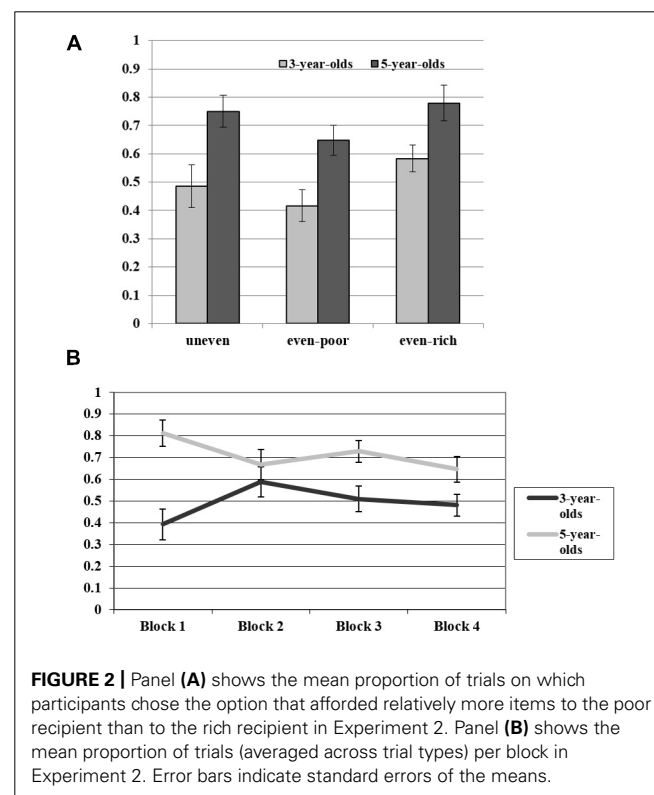

FIGURE 2 | Panel **(A)** shows the mean proportion of trials on which participants chose the option that afforded relatively more items to the poor recipient than to the rich recipient in Experiment 2. Panel **(B)** shows the mean proportion of trials (averaged across trial types) per block in Experiment 2. Error bars indicate standard errors of the means.

3-year-old children showed some preference for the poor at the beginning of the experiment), we additionally compared performance across blocks (see **Figure 2B**). Given that the previous analysis did not reveal an interaction effect of age group and trial type (i.e., trial type was orthogonal with respect to the age), we averaged for every child the data for each block over all trials. Thus, we calculated for every participant an average performance value for each block. A 2 (Age Group: 3, 5) × 4 (Blocks: 1, 2, 3, 4) mixed-model repeated measures ANOVA yielded a main effect of age group, $F(1,31) = 18.498$, $p < 0.001$, $\eta^2 = 0.37$, replicating the finding that the 5-year-old children awarded more items to the poor than the 3-year-old children. Additionally, the analysis showed an interaction effect between the factors Age Group and Block, $F(3,93) = 2.979$, $p < 0.05$, $\eta^2 = 0.09$. *Post hoc* independent samples t-tests were performed to compare age differences for every block. These analyses showed that the performances of the two age groups differed significantly from each other in the first block, $t(31) = 4.462$, $p < 0.001$, the third block, $t(31) = 2.576$, $p < 0.05$, and the fourth block, $t(31) = 2.211$, $p < 0.05$, but not the second block, $t(31) = 0.783$, $p = 0.44$.

DISCUSSION

Experiment 2 examined the developmental origins of children's inclination to allocate more resources to poor than to wealthy individuals in a resource distribution paradigm. The results of Experiment 2 provide clear evidence that the 5-year-old children showed, across three different trial types, a consistent inclination to rather distribute resources to a poor than to a wealthy agent. The 3-year-old children, in contrast, showed no such preference in any of the various trial types. Moreover, an additional analysis revealed no systematic changes over time in this pattern. In sum, corroborating the findings from Experiment 1, the results provide evidence that 5-year-old, but not 3-year-old children take charity considerations into account when deciding of how to allocate resource between different recipients.

A direct comparisons of the trial types with each other showed that children across both age-group choose the option that afforded relatively more items to the poor recipient more often in the even-rich than in the even-poor trial type. What could this mean, particularly given the fact that the 3-year-old children showed no tendency to distribute more stickers to the poor than to the wealthy recipient? Note that in the even-rich trials the option, which was beneficial for the poor, was the equal (2/2) option (instead of distributing 3 to the rich and 1 to the poor). In the even-poor trials, the option, which was beneficial for the poor, was the (1/3) option (i.e., 1 to the rich, 3 to the poor), whereas the equal (2/2) option was less beneficial for the poor. The fact that the 3-year-old children choose the – for the poor recipient more beneficial – (1/3) option in 42% actually shows that they choose the (2/2) option in 58%. In other words, the results indicate a preference for choosing the equal option (2/2) across trial types and across age groups. For the 5-year-old children this tendency interacted with a stronger tendency to support the poor recipient, which is most clearly expressed in the fact that they even in the even-poor rather supported the poor than distributing the resources equally. In contrast, the 3-year-old children had no such tendency to support the poor recipient. Consequently, they

only showed a small preference for the equal option, which presented itself either as a positive or negative deviation from chance level, depending on whether the equal option was beneficial for the poor or the rich. This finding thereby confirms previous findings demonstrating weak preferences for equal distributions in young preschool children. Shaw and Olson (2012) provided evidence that school-aged, but not younger children favor equal distributions. House et al. (2012) reported that younger preschoolers are rather inclined to provide benefits to others than to choose egalitarian outcomes. Finally, Paulus et al. (2013a) demonstrated an impact of own wealth on third party involvement only in 5-, but not 3-year-old children.

More interesting, however, is the finding that the 5-year-old children were rather inclined to support the poor recipient than distributing the resources equally between both recipients. The consequences will be discussed in the next section.

GENERAL DISCUSSION

According to the principle of charity, scarce resources should be distributed considering the relative indigence of the recipients. Such considerations of others' neediness play a vivid role in religions and philosophical theories on prosociality (e.g., Aristotle, 2011) and are substantial for our concept of humanity. This study aimed at investigating the early roots of human charity in two experiments with 3- and 5-year-old children. The experiments provide converging evidence that preschool children of 5 years of age take others' indigence into account when sharing resources with different recipients or when allocating resources between recipients. It extends previous findings on school-aged children's appreciation of others' material needs (e.g., Kienbaum and Wilkening, 2009), by demonstrating that this tendency develops between 3 and 5 years of age – pointing thus to the early roots of human charity.

From a theoretical point of view, knowledge about the principles guiding children's sharing and resource allocation behavior informs us about the psychological mechanisms underlying early prosocial behavior. In other words, it would help us understand why humans in general and young children in particular engage in prosocial behaviors (for discussion see Paulus, 2014). The present results show that by at least 5 years of age sharing is motivated by children's considerations of the others' wealth. That is, already preschool children rely on the principle of charity when sharing or distributing resources with/to others, suggesting that by this age sharing is motivated by considerations to fulfill others' material needs.

Importantly, in Experiment 2 the 5-year-old children did not only prefer to give more to the poor than the wealthy individual in the uneven trials, when they were urged to prefer either of the two recipients. They were also rather inclined to give more to the poor individual than distributing the resources equally between the two recipients in the even-poor trials. This shows that charity considerations have strong developmental roots in the preschool age.

Why are the 5-year-old children inclined to hand over more stickers to the person in need than the wealthy person? It is clear that material need and material wealth are relational concepts, i.e., they are relative to the context. That is, although in our study

the recipient with only two stickers was indubitable more needy than the other recipient, he would have been more wealthy when the other recipient would have had no stickers at all. It is thus unlikely that a particular personal trait or characteristic of the poor recipient triggered the children's behavior. Rather, it seems likely that their decision to prefer the needy recipient was based on fairness considerations, i.e., on a motivation to equalize outcomes. This shows that their wish for equal outcomes trumped the otherwise very prominent inclination to share resources equally between partners as suggested by recent findings (e.g., Blake and McAuliffe, 2011; Hamann et al., 2011). That is, our study demonstrates that – next to a tendency for procedural equality during sharing, i.e., giving everyone the same amount – preschool children show a strong inclination for equal outcomes. This suggests that already preschool children are sensitive to aspects of procedural and distributive justice (for an extended discussion see Müller and Kals, 2007).

In contrast, although even the 3-year-old children showed some sharing behavior, it was largely not affected by the others' material needs. Indeed, if anything, the 3-year-old children showed a tendency to be less selfish toward the rich recipient, suggesting a tendency to favor the lucky (cf. Olson et al., 2006). There are several possible interpretations for the lack of the consideration of others' needs. First, it is possible that a strong motivation for equal sharing dominated their behavior (even though they might consider others' needs). Yet, this interpretation is unlikely given that in Experiment 1 the 3-year-olds did not opt for the equal option in the majority of trials. Additionally, in Experiment 2 they showed no preference for the poor even in trials in which there was no equal option (i.e., they were urged to either give more to the poor or the wealthy agent) or when the equal option was at the same time the option that was most beneficial for the poor. Second, one could argue that the employment of toy bears hampered 3-year-old children's performance. Yet, this interpretation is unlikely given that previous studies have successfully used puppets and toy figures to examine children's social understanding and choices (e.g., Fawcett and Markson, 2010; Meyer et al., 2010; Kenward and Dahl, 2011). Moreover, Paulus and Moore (2014) found the same developmental pattern in sharing tasks employing toy bears or children's actual friends and disliked peers as potential recipients, providing a direct empirical validation for the method used in the current study.

As a consequence, we suggest a third interpretation, i.e., that our results indicate that 3-year-olds just do not consider others' material needs in their sharing behavior, suggesting that these early instances of sharing are not primarily motivated by a consideration of others' needs, but follow simpler heuristics. This interpretation is supported by the fact that even in the resource allocation paradigm (Experiment 2) children did not allocate more resources to the poor individual. This interpretation relates to other studies that even in situations in which sharing would not be costly, toddlers do not allocate resources to another person without being addressed by the other through explicit cues expressing his needs and wishes (Brownell et al., 2009). In line with this, Dunfield et al. (2011) reported that 2-year-old children indeed gave more crackers to a person who had no crackers (experimental condition) compared to a person who also possessed some (control condition). Yet, the person in the experimental condition (but not in the control condition) explicitly requested items from the child by placing her hand out with the palm facing up. Additionally, she made a sad face. Children's preferential giving to this person could thus be based on a reaction to the explicit request for items rather than a genuine appreciation of the other's material need. The current study controlled for these issues, suggesting that the 5-year-olds' preferential sharing with the poor recipient is based on a genuine appreciation on others' material needs, which does not seem to be in place in 3-year-old children. If this interpretation were true, the present results point to a fundamental change in the motivations underlying early prosocial action in the course of the preschool period (cf. Hay and Cook, 2007; Paulus, 2014).

How does development then proceed? Interestingly, a recent study by Svetlova (2013) employing a distribution scenario suggests that even younger children show a slight tendency to allocate more resources to poor than to wealthy agents, when the experimenter emotionally cues the situation of the needy recipient. That is, in this study the experimenter modulated her voice in a neutral manner when presenting a wealthy puppet and in a pitiful manner when presenting the poor puppet. In this situation, even 3-year-old's showed a tendency to support the poor agent. Given that the perception of the experimenter's emotional tone triggers empathic reactions (cf. Hoffman, 2000; Decety and Svetlova, 2012), it is not unlikely that the children's responses in this study were supported by the experimenter's emotional cues, which might have induced sympathy for the poor, but not the rich recipient. This is an important finding as we suggest that such an induction of sympathy could also explain the developmental difference presented in the current study. Whereas 3-year-old children show no spontaneously occurring sympathy with materially needy others (or only after it was externally cued by emotional signals; Svetlova, 2013), 5-year-old children might be better able to put themselves into the shoes of the needy recipient and, as a consequence, showed more sympathy, and thus more prosocial behavior, toward the needy agent; indicating an abstract understanding that poor agents deserve more resources than rich agents. This explanation might be supported by recent findings that early sympathy predicts the development of sharing behavior (Malti et al., 2012) and that mood effects fairness decisions in dictator games (Forgas and Tan, 2013).

The present study is not only informative for current social psychological theories on the nature of prosocial behavior and justice considerations (cf. Tyler, 2003; Penner et al., 2005; Dovidio et al., 2006), it also leads to novel research questions. Our results show that by 5 years of age, children reduce inequality by handing more resources to a poor recipient than a wealthy one. Interestingly, studies with older children provided evidence that under some circumstances people accept inequalities (Almas et al., 2010). It would thus be interesting to examine whether and under which circumstances the 5-year-old children would accept the unequal distribution of resources, without trying to equalize it by providing more resources for the poor recipient. Future research is needed to address this question.

Taken together, the present study shows that a unique characteristic of human moral reasoning, i.e., the principle of charity and

distributive justice, has its developmental origins in the preschool period. That is, considerations of charity develop at an age long before humans engage in theoretical debates on the fairest manner of distributing scarce resources as evident in religious prescriptions and philosophical theories.

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"I pick you": the impact of fairness and race on infants' selection of social partners

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By 15 months of age infants are sensitive to violations of fairness norms as assessed via their enhanced visual attention to unfair versus fair outcomes in violation-of-expectation paradigms. The current study investigated whether 15-month-old infants select social partners on the basis of prior fair versus unfair behavior, and whether infants integrate social selections on the basis of fairness with the race of the distributors and recipients involved in the exchange. Experiment 1 demonstrated that after witnessing one adult distribute toys to two recipients fairly (2:2 distribution), and another adult distribute toys to two recipients unfairly (1:3 distribution), Caucasian infants selected fair over unfair distributors when both distributors were Caucasian; however, this preference was not present when the fair actor was Asian and the unfair actor was Caucasian. In Experiment 2, when fairness, the race of the distributor, and the race of the recipients were fully crossed, Caucasian infants' social selections varied as a function of the race of the recipient advantaged by the unfair distributor. Specifically, infants were more likely to select the fair distributor when the unfair recipient advantaged the Asian (versus the Caucasian) recipient. These findings provide evidence that infants select social partners on the basis of prior fair behavior and that infants also take into account the race of distributors and recipients when making their social selections.

Keywords: fairness, race, social partners, social selections, resource distribution

INTRODUCTION

The ability to actively select social partners on the basis of relevant characteristics critically shapes the acquisition of knowledge; selecting social partners constrains the kinds of people to which an individual is exposed which can, in turn, guide subsequent attitudes and behaviors. A variety of research suggests that adults systematically select social partners on the basis of several dimensions, including an individual's social history and an individual's social category membership. For example, adults prefer individuals who are more generous toward others in economic games (Page et al., 2005), and they tend to affiliate with social partners who are similar to themselves in terms of race, age, and socioeconomic status (McPherson et al., 2001). The roots of the tendency to select social partners on the basis of social history and social category membership can be traced back to childhood: children tend to have friends who are of the same gender (Martin and Fabes, 2001) and of the same race (Katz, 2003). In experimental paradigms, children preferentially select individuals who share characteristics with the self (Shutts et al., 2013) and who previously acted cooperatively over uncooperative individuals (Dunfield et al., 2013).

A critical, unanswered question is whether infants also make systematic social selections on the basis of relevant social dimensions. Emerging evidence suggests that infants may consider social history when selecting between two agents; when given the choice between a prosocial puppet who previously helped another puppet retrieve a toy and an antisocial puppet who previously prevented the puppet from retrieving a toy, 5-month-old infants pick the

prosocial puppet (Hamlin and Wynn, 2011). Moreover, when given the opportunity to select toys associated with native language speakers over those associated with non-native language speakers (i.e., those who speak with an accent) infants prefer toys offered by native language speakers, suggesting that infants may use social category information to guide their social selections (Kinzler et al., 2012).

The goal of the current study is to investigate infants' ability to select social partners on the basis of social history, and to investigate whether and how infants' social selections are altered when social history information conflicts with social category information. In the present study, we operationalized social history in terms of whether an actor had previously distributed toys equally or unequally to recipients. Past work with adults suggests that a "principle of equality" (Deutsch, 1975) guides adults' social judgments and evaluations: that, all other things considered, goods should be divided equally to recipients. In the context of economic games, adults divide resources between oneself and an anonymous social partner equally (Fehr and Fischbacher, 2003; Henrich et al., 2005) and punish individuals who do not do so and seek redistribute goods equally (Dawes et al., 2007; Johnson et al., 2009). Recent studies suggest that infants appear to be sensitive to fairness violations by 15 months of age or earlier: after watching an individual distribute crackers to two recipients in a violation-of-expectancy paradigm, infants show enhanced attention to an unfair outcome (i.e., 1:3 distribution) versus a fair outcome (2:2 distribution) suggesting they expect

goods to be distributed equally (Schmidt and Sommerville, 2011; Sommerville et al., 2013; see also Geraci and Surian, 2011; Sloane et al., 2012).

The novel question addressed in this study was whether infants could use prior information about an individual's fair versus unfair behavior to guide their own selection of social partners. If so, these findings would add to the current literature by demonstrating that infants are not only aware of fairness norms as reflected by their expectations of third-party interactions, but also that infants use their awareness of such norms to guide their social behavior.

In addition to asking whether infants consider an individual's prior history of fair and unfair behavior in making their social selections, we asked whether information about the social category membership of an individual affects infants' social selections. In the current study, we operationalized social category membership in terms of the race of the individuals, as adults systematically use race as an indicator of social category membership (Fiske and Neuberg, 1990; Hewstone et al., 1991; Stangor et al., 1992). Evidence suggests that same-race social preferences are in place by the school-aged years: elementary-aged children reveal a racial bias in their friendships and in peer nominations, preferring same-race peers (Aboud et al., 2003; Bellmore et al., 2007). Work using experimental paradigms also demonstrates that the impact of race on children's social preferences can be traced back to at least the early preschool years. Three- to five-year-old children systematically select same-race unfamiliar peers and adults as potential friends over those of another race (Katz and Kofkin, 1997; Kinzler and Spelke, 2011). Moreover, children prefer others who exclusively affiliate with members of their ingroup: Caucasian preschoolers selectively preferred characters in vignettes who were depicted playing with other Caucasian characters as potential friends, rather than those depicted with Black characters (Castelli et al., 2007). In addition to possessing race-based social preferences children as young as three also show adult-like implicit race biases in an age-appropriate version of the Implicit Association Task (Dunham et al., 2013).

We were motivated to investigate the impact of race on infants' social selections as current research suggests infants show an early sensitivity to race in their attentional patterns. Evidence from visual preference studies suggests that race influences infants' looking preferences for different faces: infants as young as 3 months of age prefer to look at same-race over other-race faces (Kelly et al., 2005). Existing research on social selections based on race in infancy, however, has yielded mixed results. On the one hand, preliminary findings using live, interactive paradigms with 12-month-old infants indicate that Caucasian infants prefer to take toys offered by Caucasian versus Asian individuals when given no other information about the individuals (Shin et al., 2011). On the other hand, Kinzler and Spelke (2011) found that 10-month-old infants selected toys associated with a Caucasian adult at equal rates as toys associated with a Black adult, providing no evidence for race-based social selections in infancy. Thus, the extent to which infants consider race in their social selections is an open question.

In advance of prior work, the current study sought to investigate whether and how infants integrate multiple dimensions – fairness

and race – in making their social selections. In the real world, individuals often select social partners under conditions in which different social dimensions are either in conflict or conflated. Thus, we investigated whether and how infants integrate different dimensions of social information into their social decision-making processes. Experiment 1 investigated whether infants would select individuals on the basis of previously fair behavior when the race of the two individuals was controlled for (i.e., both were Caucasian), and when the fair individual was of a different race than the unfair actor and the infant (i.e., the fair actor was Asian and the unfair actor was Caucasian). These manipulations allowed us to ask whether infants had a baseline preference for fair over unfair individuals, and how and whether this preference was affected by the race of the distributors.

In Experiment 2, we fully crossed fairness with the race of both the distributors and the recipients. Thus, in this study infants had the opportunity to select distributors on the basis of prior fair or unfair behavior, on the basis of race, or on the basis of the consequences of the distributors' actions for their own or other race members. Critically, this experiment allowed us to assess how infants make social selections when faced with competing motivations: concerns about adherence to socio-moral norms, motivations to interact with individuals of the same social category, and considerations of the outcomes of distributive actions for self and same-race members. Past research suggests that each of these factors not only independently affect adult's and children's behavior and social selections, but can also interact in interesting ways to impact social preferences. For example, adults preferred a person who distributed difficult tasks within a group fairly compared to one who distributed such tasks unfairly. However, this preference for the fair distributor was diminished when the unfair distributor divided the tasks in a way that disadvantaged an outgroup member. Under those circumstances, adults endorsed the fair and unfair distributors at equal rates, suggesting adults' evaluations of the distributors were affected by competing considerations, namely, the fairness of the distributor and the impact of his distribution on outgroup members (Platow et al., 1997).

Taken together, the results of Experiment 1 and 2 inform whether infants use prior fair and unfair behavior to guide their social selections and how and whether this information is used to guide social selections in the face of competing motivations.

EXPERIMENT 1

In Experiment 1, we investigated infants' social selections of fair versus unfair distributors, and whether such selections varied as a function of the race of the distributors. In one condition, both distributors were Caucasian and both recipients were Asian. This context provides a particularly stringent test of infants' fairness concerns. First, examining infants' social selections after observing third-party interactions circumvents reward history issues that can arise in the context of first-person interactions. Second, other scholars have argued that the expectation that norms extend across social categories is a hallmark of moral principles (versus social conventions; see Turiel, 1983). Prior work demonstrates that infants of this age show sensitivity to violations to fairness norms in their visual responses, and that such sensitivity relates to infants' prosocial behavior (e.g., Schmidt and Sommerville, 2011;

Sommerville et al., 2013), suggesting that infants may view fair distributions of goods as not only conforming to a social convention but also to a moral rule or principle. Thus, we expected infants to systematically select the fair actor in this condition.

In a second condition, we pitted fairness against race by investigating infants' selections of a fair Asian distributor versus an unfair Caucasian distributor. Past work using similar paradigms provides evidence that Caucasian infants have a baseline preference for Caucasian over Asian individuals in the absence of any other information about these individuals (Shin et al., 2011). In this condition, there are three potential outcomes. First, infants may make social selections strictly on the basis of the distributors' previously fair (versus unfair) behavior and ignore race, systematically selecting the fair actor. Second, infants may make selections strictly on the basis of race, in which case we predicted that infants would select the unfair Caucasian distributor over the fair Asian distributor, given prior work suggesting that Caucasian infants prefer Caucasian to Asian faces (Kelly et al., 2005) and Caucasian to Asian individuals (Shin et al., 2011). Third, these pieces of information may compete with one another, in which case infants may select the Asian fair distributor (versus the Caucasian unfair distributor) at rates roughly equivalent to chance.

Distributors in the current study were Caucasian or Asian. In order to make same- versus other- race comparisons, and because the population from which our sample was drawn was predominantly Caucasian, we limited our sample to Caucasian infants.

METHODS
Participants
Forty 15-month-old Caucasian infants participated in Experiment 1 (22 females; mean age = 15 months, 12 days, range = 14 months, 26 days to 16 months, 2 days). Infants were randomly assigned to the Caucasian Fair/Caucasian Unfair condition (henceforth CF/CUF; $n = 20$, 10 females, mean age = 15 months, 10 days) or the Asian Fair/Caucasian Unfair condition (henceforth AF/CUF; $n = 20$, 12 females, mean age = 15 months, 13 days). All infants were full-term and typically developing. Participants were recruited from a database of parents who had volunteered to participate in experimental studies. Data from 18 additional infants were excluded because of failure to respond at all during the choice trials ($n = 5$ in the CF/CUF condition, $n = 9$ in the AF/CUF),

fussiness ($n = 1$ in the CF/CUF condition, $n = 2$ in the AF/CUF), or due to procedural errors ($n = 1$ in the CF/CUF condition).

Procedure
The infant viewed a distribution phase followed by three choice trials[1].

Distribution. The infant watched a live distribution that involved four actors: two distributors (both Caucasian for the CF/CUF condition; one Caucasian and one Asian for the AF/CUF condition) and two recipients (both Asian)[2]. **Table 1** describes the respective role as of the distributor and recipient as a function of fairness and race for both Experiments 1 and 2.

The infant was seated in the parent's lap roughly 60 cm from the display table. The parent sat in a rolling chair that allowed the parent to change location or orientation when instructed by the experimenter. Before each distribution episode began, the parent was instructed to turn to orient away from the table so that neither the parent nor the infant could see the display. The parent was also instructed to gaze neutrally at the top of the infant's head and to avoid interacting with their infant during the procedure.

During the distribution, the infant watched a total of four distribution episodes: two that resulted in fair outcomes (a 2:2 distribution of toys) and two that resulted in unfair outcomes (a 1:3 distribution of toys). The distribution outcomes alternated, and each distributor consistently allocated toys either fairly (2:2), or unfairly (1:3). The recipient of the lesser distribution for the unfair outcome was consistent across both episodes. The distribution episodes were conducted such that each distributor was unaware of whether she was the fair or unfair distributor to avoid

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[1]These trials were embedded in a larger set of social tasks. Because response rates in other tasks were low (e.g., less than 25% of infants provided responses), we focused our analyses on these three trials.

[2]Past studies have conflated individual identity with category membership by utilizing only one exemplar of the category and drawing inferences about the entire category (e.g., one black person and one white person, Kinzler and Spelke, 2011; one male and one female, Rind and Bordia, 1996). Thus, it may be the case that those findings represent preferences for particular individuals, rather than preferences for particular social groups. To avoid this conflation, and to ensure we were investigating the selection of individuals on the basis of engaging in past behaviors and on the basis of category membership, we used multiple Caucasian and Asian actors to play distributors and recipients across the two studies. Actors were randomly paired with one another, constrained by the race required for a given condition. Roughly half of the time a given actor acted as the fair (versus unfair) distributor. In Experiment 2, when a given actor was the unfair distributor, roughly half of the time she advantaged the Caucasian (versus Asian) recipient.

Table 1 | Race of distributors and recipients as a function of condition and experiment.

Condition (Experiment)	Fair distributor	Unfair distributor	Advantaged recipient	Disadvantaged recipient
CF/CUF (Experiment 1)	Caucasian	Caucasian	Asian	Asian
AF/CUF (Experiment 1)	Asian	Caucasian	Asian	Asian
CF/AUF: CR+ (Experiment 2)	Caucasian	Asian	Caucasian	Asian
CF/AUF: AR+ (Experiment 2)	Caucasian	Asian	Asian	Caucasian
AF/CUF: CR+ (Experiment 2)	Asian	Caucasian	Caucasian	Asian
AF/CUF: AR+ (Experiment 2)	Asian	Caucasian	Asian	Caucasian

experimental bias. This feature of the distribution phase is a critical part of the procedure because if distributors are aware of the outcomes of their actions, this awareness may (inadvertently or unconsciously) influence their behavior on the test trials in subtle ways that can be hard to detect (e.g., the fair actor being slightly more positive toward the infant, etc.), which may artifactually create the experimental effect. Our procedure allows us to bypass this possibility.

To begin the distribution, the experimenter instructed the parent to turn to face the display table. One distributor and two recipients were seated at the table. The distributor knelt behind the table such that the table occluded any actions below her waist. Recipients were seated on either side of the distributor. All actors gazed neutrally down until the procedure began. After a 3-s delay (to ensure the infant was attending to the display table), a distribution episode began.

In the greeting phase, the distributor greeted the infant by saying, "Hello." Next, the distributor greeted the recipient to her left, saying "Hi" and the recipient looked up and said "Hello." The distributor and the recipient to her right repeated this procedure.

In the distribution phase, the distributor lifted up a transparent bin containing four toys and said "Wow" (see **Figure 1A**). Both recipients simultaneously said "Please" and pushed the two containers toward the distributor (**Figure 1B**). The distributor took the containers, simultaneously placed them on the floor behind the table, and appeared to distribute toys into each container; the containers were occluded from the infant's view by the table (**Figure 1C**). The distributor then held up the now-empty transparent bin, said "All gone" (**Figure 1D**) and placed the transparent bin on the table. Next, the distributor lifted identical opaque lids within the infant's view and simultaneously lowered them, pretending to cover the containers. In reality, in order to ensure that distributors were unaware of whether they were acting fairly or unfairly, distributors did not actually distribute the toys; an identical set of containers had been pre-prepared with toy allocations, covered with opaque lids, and hidden behind the table. Then, the distributor lifted the pre-prepared covered containers so they were in view of the infant, gave one container to each recipient saying "here" (**Figure 1E**), and looked down with her eyes closed (so she remained unaware of the outcome).

In the outcome phase, the recipients simultaneously lifted the lids to reveal the number of toys they received and the infant viewed the static allocation outcome for 20 s (**Figure 1F**). Then, the experimenter asked the parent to turn so that the infant was no longer facing the display and the actors reset the display.

The infant watched a total of four distribution episodes. Each distributor distributed a set of green plastic frogs (episodes 1 and 2), and then a set of yellow Lego bricks (episodes 3 and 4). The outcomes (2:2 versus 1:3) alternated each episode. The first outcome (2:2 versus 1:3), and the side of the advantaged recipient (left versus right) were counterbalanced across infants. Throughout the procedure, all actors' actions were timed to a metronome to ensure consistency of timing across episodes and across the different distributors. The total duration of each distribution episode was 85 s.

Choice trials Following the distribution phase, the infant received three trials in which she could choose between the fair and unfair distributors. The side of the fair distributor (left or right) was counterbalanced.

During Trial 1, the infant was seated in the parent's lap facing away from the table, at a marked centered location 60 cm from the display table. The parent was instructed to hold the infant firmly by the waist to keep her in position in the middle of the parent's lap. The fair and unfair distributors sat at the table equidistant from the infant. To begin the trial, the experimenter asked the parent to turn to face the display table. After a 3-s delay (to ensure the infant had adequate time to encode the distributors and their respective locations), the distributors simultaneously smiled and made eye contact with the infant, and then simultaneously extended identical octopus bath toys to the infant at marked locations 80 cm apart at the edge of the table. After a 3-s delay (to allow the infant to encode the toys), the experimenter instructed the parent to move up to the edge of the table with the infant centered between the distributors. During this response period, the distributors maintained eye contact and smiled at the infant in a static position with their arms extended. The trial ended after the infant took a toy or after 30 s elapsed. Once the trial ended, the experimenter asked the parent to move back to their original position facing away from the display table. If the infant had selected a toy, the experimenter retrieved it.

Trial 2 was identical to Trial 1, except before offering the toys to the infant, the distributors simultaneously said, "Wow." Then the distributors placed the toys on the table 80 cm apart, and looked down. The trial ended when the infant took a toy, or after 30 s elapsed.

Before Trial 3 began, the parent and infant faced the table. Distributors moved behind the parent to sit on the floor at marked locations 2.13 m apart on opposite sides of the room and began stacking blocks. Next, the experimenter instructed the parent to turn to face the wall and the infant watched the distributors stack blocks in an identical manner for 20 s. The experimenter then instructed the parent to place the infant on a mark equidistant from the two distributors and release the infant so she was allowed to move freely. The trial ended when the infant approached a distributor and interacted with the blocks, or after 45 s elapsed. The choice was operationalized as the actor toward whom the participant moved nearest, as coded by an observer blind to condition and hypotheses from a video angle perpendicular to the two actors. Infants had to take at least one step toward an actor to be coded as an approach.

Our motivation for including three different test trial types was threefold. First, we wanted to investigate infants' social selections and affiliative patterns generally. We thus sought to feature multiple test trials that measure the same underlying construct but that differ in their surface features to better position us to draw conclusions about infants' social selections more broadly, versus their performance on one particular trial type. Second, based on pilot work we found that by varying the surface features of the test trials we could increase both the number of trials we could administer as well as the number of trials that infants made a choice on, by decreasing boredom, inattentiveness and fussiness. Finally, the use of three unique trials allowed us to strike a balance
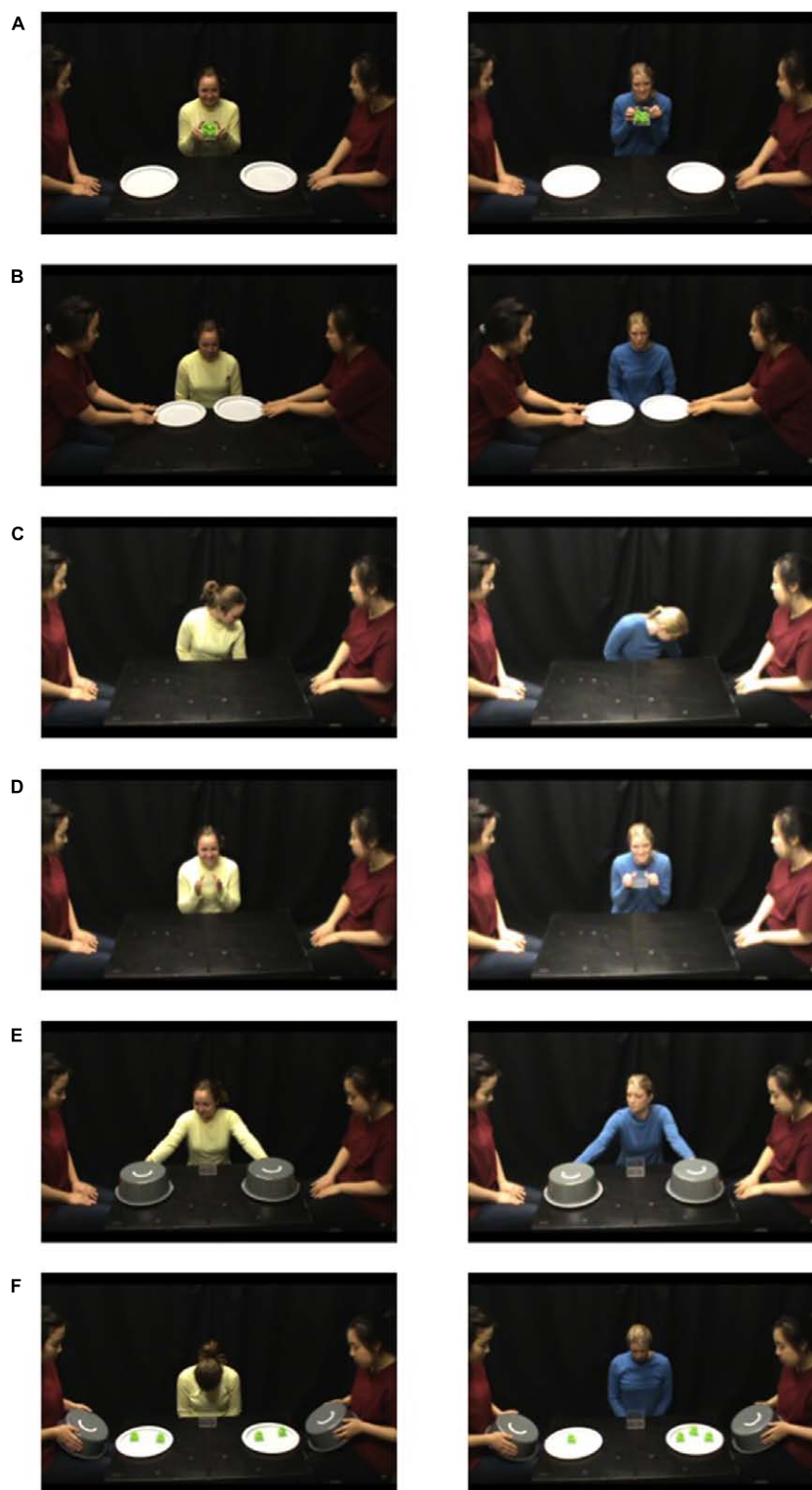
FIGURE 1 | Fair distribution episode (see left column) and unfair distribution episode (see right column). (A) The distributor lifted up a transparent bin containing four toys and said "Wow!" **(B)** Both recipients simultaneously said "Please" and pushed the two containers toward the distributor. **(C)** The distributor pretended to distribute toys into the container on her left side (pictured), and then the container on her right side (not pictured). **(D)** The distributor held up the empty transparent bin and said "All gone!" **(E)** The distributor gave one container to each recipient saying "here." **(F)** The distributor looked down with her eyes closed, and the recipients simultaneously lifted the lids to reveal the number of toys they received.

between (a) the task's resemblance to a true social interaction, (b) the likelihood that the task would induce stranger anxiety, and (c) standardizing actors' interactions with the infant. Trials 1 and 2 require the infant select a toy offered by an actor and were designed to minimize stranger anxiety, while Trial 3 requires that the infant approach an actor and may be a more direct selection of a social partner. Using toys rather than a direct interaction also helped to achieve this balance, allowing tasks that were sufficiently social while reducing stranger anxiety; pilot work revealed that tasks in which infants select toys offered by experimenters reduced indices of stranger anxiety than tasks in which infants interacted with the experimenters directly. Another benefit of using toys is that it eliminated actors' contingent responding to the infants, ensuring the different actors' interactions with the infant were identical within each testing session and across different testing sessions.

Coding and reliability. Infants' distributor selections (fair versus unfair) were coded by a coder unaware of the respective roles of the distributors. For Trials 1 and 2, infants' choices were recorded as the distributor from whom the infant first selected the toy. For Trial 3, infants' choices were recorded as the distributor whom infants approached. On the rare occasion the infants approached both distributors ($n = 3$), infants' choices were recorded as the distributor to whom the infant got closest.

A secondary coder, unaware of the distributors respective roles and also unaware of the primary coder's responses, coded 25% of the sample to establish inter-observer reliability. Coders agreed on infants' choices on 100% of trials.

RESULTS AND DISCUSSION
Infants' selection of the fair distributor

A fair choice score was calculated by dividing the number of fair distributor choices by the total number of choices in the three choice trials. Participants were only included in the overall fair choice score if they made choices on at least two of the three trials; $n = 1$ infants in the CF/CUF condition and $n = 3$ in the AF/CUF condition were dropped for failing to meet this criteria. Given that we had a directional prediction that infants' scores would be significantly *above* chance, one-tailed p-values are reported.

We first investigated whether infants' overall fair choice score differed as a function of condition: there was a marginally significant difference in infants' selection of the fair distributor in the CF/CUF condition (Caucasian Fair / Caucasian Unfair, $M = 0.72$, $SE = 0.05$) versus the AF/CUF condition (Asian Fair / Caucasian Unfair, $M = 0.57$, $SE = 0.09$), $t(34) = 1.50$, $p = 0.07$, $d = 0.51$. A one-sample t-test revealed that infants in the CF/CUF condition selected the fair actor at rates significantly above chance (where chance $= 0.50$): $t(18) = 4.05$, $p = 0.0005$, $d = 1.91$ (**Figure 2**). However, in the AF/CUF condition, infants' fair choice scores did not differ significantly from chance, $t(16) = 0.79$, $p = 0.22$, $d = 0.40$.

To further investigate infants' fair actor selections within each condition we conducted binomial tests on each of the test trials. In the CF/CUF condition, infants selected the fair actor at rates above chance on two of the three trials: 77% of infants selected the fair actor on Trial 1 ($p = 0.045$), 63% of infants selected the fair actor on Trial 2 ($p = 0.18$), and 75% of infants selected the fair actor on

FIGURE 2 | Average fair choice scores in the CF/CUF and AF/CUF conditions. *$p < 0.05$.
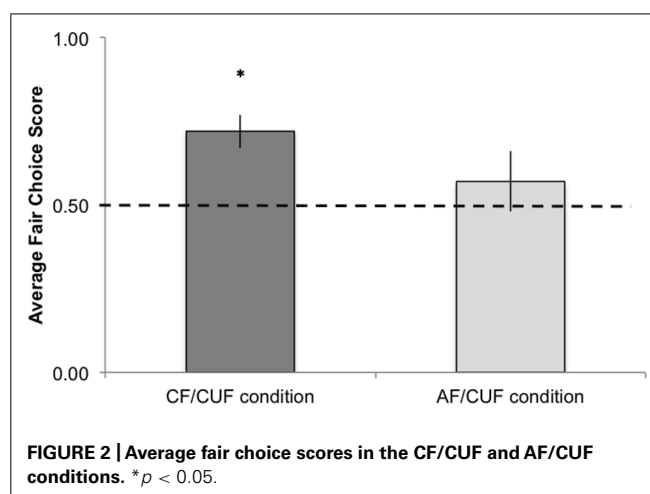
Trial 3 ($p = 0.039$). In contrast, infants in the AF/CUF condition selected the fair actor at rates that did not differ from chance on Trials 1 and 3 (58% selected the fair actor on Trial 1, $p = 0.385$; 50% of infants selected the fair actor on Trial 3, $p = 1.0$) and differed from chance marginally on Trial 2 (68% of infants selected the fair actor on Trial 2, $p = 0.084$)[3].

The results of Experiment 1 suggest that infants select distributors on the basis of prior fair (versus unfair) behavior when the race of the distributors is held constant, suggesting that infants prefer to interact with others who abide by fairness norms, at least under certain circumstances. Thus, our findings suggest that by 15 months of age, infants' fairness concerns guide not only their visual responses but also their social selections. Importantly, infants' preference for the fair actor was present under conditions in which the actors were acting toward recipients of a different race. As some scholars have suggested that moral norms are those that apply universally to members of all social categories, it may be the case that infants are thus treating fairness violations as moral transgressions, rather than social conventional violations (Turiel, 1983). For example, recent work suggests young children implicitly draw this distinction between moral and conventional norms; three-year-old children appear to believe that moral norms apply in interactions with both ingroup and outgroup members, while conventional norms are uniquely restricted to interactions with ingroup members (Schmidt et al., 2012). Our findings that infants appear to recognize fairness norms apply in interactions with outgroup recipients raises the possibility that infants are similarly sensitive to the moral, as opposed to conventional, basis of fairness norms.

Our findings also suggest that when fairness and race are pitted against one another (e.g., fair Asian actor versus unfair Caucasian actor), there is no evidence that infants systematically select the fair actor at rates above chance. These findings suggest that infants

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[3]One potential reason that infants selections on Trial 2 did not differ from chance may be that Trial 1 demonstrates to the infant that, at least in the context of offering toys, both actors are equally likely to offer a toy to the infant and thus the infant chooses randomly on the second trial. An alternative possibility is that because trial 2 is similar to trial 1, infants may feel the actors are encouraging them to make a different choice.

may attempt to integrate both social category information, operationalized here as race, and social history, operationalized here as prior fair and unfair behavior, in making their social selections and that these factors compete with one another in infants' social decision making.

EXPERIMENT 2

The results of Experiment 1 established that infants systematically select fair distributors when race is kept constant. However, when race is pitted against fair behavior infants do not systematically select the fair actor. Experiment 2 asked whether, in addition to considering race and fairness in their social selections, infants also consider the racial identity of the advantaged individual.

Infants were tested in either a Caucasian Fair/Asian Unfair condition, or an Asian Fair/Caucasian Unfair condition. In both conditions the recipients consisted of an Asian individual and a Caucasian individual. For half of the infants in each condition the Asian individual was advantaged by the unfair actor (e.g., received more toys); for the remaining half the Caucasian recipient was advantaged by the unfair actor. Given the results of Experiment 1, suggesting that infants consider both race and fairness in their selections, we thought it was unlikely that infants would select actors solely on the basis of prior fair behavior (e.g., systematically picking the fair actor), or solely on the basis of race (e.g., systematically selecting the Caucasian actor). Instead, we predicted one of two patterns of results.

The first possibility is that infants may select the fair actor over the unfair actor when the fair actor is Caucasian (and the unfair actor is Asian), but not when the fair actor is Asian (and the unfair actor is Caucasian), ignoring the consequences of the fair and unfair actors' behavior for the recipients. An alternative possibility is that infants may consider the consequences of the distributors' actions for the recipients as a function of the recipients' racial identities. For half of the infants in Experiment 2, the unfair actor advantaged the Asian recipient (over the Caucasian recipient), and for half of the infants, unfair actor advantaged the Caucasian recipient (over the Asian recipient). If infants are sensitive to the consequences of the distributor's actions for the recipient as a function of the recipients' racial identities, then infants' social selections may vary as a function of who the *unfair* actor advantages. Specifically, we hypothesized that Caucasian infants would be more likely to select the fair actor when the unfair actor advantaged the recipient that was of a different race than the infant (i.e., the Asian recipient), than when she advantaged a recipient that was of the same race as the infant (i.e., the Caucasian recipient).

METHODS
Participants
Forty 15-month-old Caucasian infants took part in Experiment 2 (19 females; mean age = 15 months, 10 days, range = 14 months, 28 days to 15 months, 27 days). Infants were randomly assigned to the Caucasian Fair/Asian Unfair condition (henceforth CF/AUF; $n = 20$, 10 females, mean age = 15 months, 10 days) or the Asian Fair/Caucasian Unfair condition (henceforth AF/CUF; $n = 20$, 9 females, mean age = 15 months, 11 days). All infants were full-term and typically developing. Participants were recruited

from a database of parents who had volunteered to participate in experimental studies.

Data from 10 additional infants were excluded due to failure to respond at all during the choice trials ($n = 3$ in the CF/AUF condition, $n = 1$ in the AF/CUF), fussiness ($n = 2$ in the CF/AUF condition, $n = 1$ in the AF/CUF) or procedural errors ($n = 2$ in the CF/AUF condition), or due to parental influence ($n = 1$ in the AF/CUF condition).

Procedure
Experiment 2 was identical to Experiment 1 except for the race of the various actors. For both conditions, one distributor was Caucasian and the other distributor was Asian, and one recipient was Caucasian and the other recipient was Asian. For each condition, the race of the recipient who received three toys from the unfair distributor (henceforth, the "advantaged recipient") was counterbalanced; for half of the infants in each condition the advantaged recipient was Caucasian, and for half of the infants in each condition the advantaged recipient was Asian.

Coding and reliability
Infants' choices were coded as in Experiment 1. As in Experiment 1, when infants approached both distributors ($n = 3$), infants' choices were recorded as the distributor to whom the infant got closest. A second coder coded 25% of the sample to establish inter-observer reliability. Coders agreed on the infants' choices on 100% of the trials.

RESULTS AND DISCUSSION
### Infants' selection of the fair distributor
As in Experiment 1, a fair choice score was calculated by dividing the number of fair distributor choices by the total number of choices in the three choice trials. As in Experiment 1, participants were only included if they made choices on at least two of the three trials; $n = 3$ infants in the CF/AUF condition, $n = 3$ in the AF/CUF condition were dropped for failing to meet this criteria. Fair choice scores did not significantly differ between the CF/AUF condition (Caucasian Fair/Asian Unfair, $M = 0.45$, SE = 0.07) and the AF/CUF condition (Asian Fair/Caucasian Unfair, $M = 0.55$, SE = 0.07), $t(32) = 1.06$, $p = 0.15$, $d = 0.37$. Similarly, fair choice scores did not significantly differ from chance in either the CF/AUF condition: $t(16) = 0.75$, $p = 0.23$, $d = 0.38$, or the AF/CUF condition: $t(16) = 0.75$, $p = 0.23$, $d = 0.38$.

Infants' selection of the fair distributor as a function of the race of the recipient advantaged by the unfair distributor
We then investigated whether infants' choices were influenced by the race of the advantaged recipient (i.e., the recipient who receives three toys from the unfair distributor). Overall, there was a significant effect of the recipient who was advantaged (i.e. Asian versus Caucasian) on infants' selections of the fair distributor, $t(32) = 2.00$, $p = 0.03$, $d = 0.71$. Infants were more likely to select the fair actor when the unfair actor advantaged the Asian recipient, $M = 0.59$, SE = 0.06, than when the unfair actor advantaged the Caucasian recipient, $M = 0.42$, SE = 0.07 (**Figure 3**). A one-sample t-test revealed infants' selections of the fair actor was marginally above chance (where chance = 0.50) when the unfair

FIGURE 3 | Average fair choice scores in Experiment 2 as a function of the race of the recipient advantaged by the unfair actor. $*p < 0.05$.
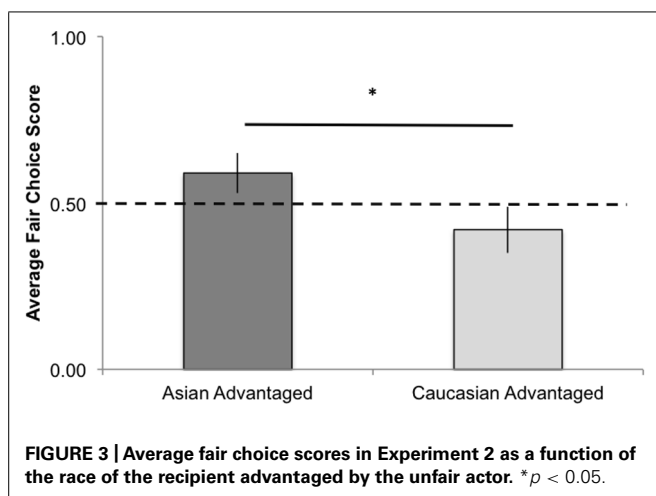
actor advantaged the Asian recipient: $t(15) = 1.65$, $p = 0.06$. Infants' selections of the fair actor were not significantly different from chance when the unfair actor advantaged the Caucasian recipient, $t(17) = 1.26$, $p = 0.13$. Performance on individual test trials was consistent with this pattern of findings (although binomial tests on each trial were not significant, $ps > 0.05$, presumably due to lack of power). When the unfair actor advantaged the Asian recipient, 73% of infants selected the fair actor on Trial 1, 58% of infants selected the fair actor on Trial 2, and 57% of infants selected the fair actor on Trial 3. In contrast, when the unfair actor advantaged the Caucasian recipient, 38% of infants selected the fair actor on Trial 1, 35% of infants selected the fair actor on Trial 2, and 47% of infants selected the fair actor on Trial 3.

The results of the second experiment suggest infants were no more likely to select the fair distributor than the unfair distributor when the recipients belonged to different racial categories. However, infants' selections varied systematically as a function of the race of the advantaged recipient; infants were more likely to select the fair distributor when the unfair distributor advantaged the Asian recipient. These findings suggest that infants may also make social selections based on the consequences that a given individual's behavior may have for individuals that are of the same versus a different race as infants.

GENERAL DISCUSSION

Our findings provide evidence that infants select social partners on the basis of their prior fair versus unfair behavior. Past work suggests infants expect individuals to distribute goods fairly to recipients. Our findings build on this work by showing that infants' fairness concerns also actively guide their social preferences and social selections. Critically, infants chose to interact with the fair actor even when both recipients could be construed as belonging to a different social category than both the recipients and the infants. Thus, infants appear to apply fairness norms when the victim of a fairness violation is of a different social category. Because a moral norm is often defined as one that is universally applied, this may provide initial evidence that infants construe fairness as a moral norm, rather than a social convention (Turiel, 1983).

However, to fully draw this conclusion, future work would need to address whether infants expect outgroup members to abide by fairness norms. Future work similar to the current study with two Asian distributors (e.g., an Asian Fair/Asian Unfair condition) could provide evidence to support this conclusion.

An outstanding question concerns whether infants' social selections reflect the formation of overarching evaluations: forming a positive evaluation of individuals who behave fairly and a negative evaluation of individuals who behave unfairly, and using these evaluations to guide their social selections. Alternatively, infants' choices may merely reflect self-interested concerns about the possible consequences of future interactions between the infant and potential social partners. Future work may disentangle these possibilities.

Another open question is how infants' awareness of such norms differs from that of older children. Our findings suggest that infants have an emerging understanding of fairness norms that operate according to (at least) some of the same moral principles as adults and older children. However, we assume infants' awareness of such norms is primarily implicit. A critical question for future work concerns how children develop an explicit awareness of fairness norms and other socio-moral considerations.

The findings of Experiment 1 also indicated, however, that when distributor race is pitted against prior fair behavior, infants do not systematically select the fair distributor. These findings suggest infants attempt to incorporate information about the individuals' races when making social selections, and may weigh race and fairness as competing dimensions in their social selections. An alternative explanation for the findings of Experiment 1 is that infants may struggle to incorporate multiple social dimensions when making social selections, such that when two or more dimensions are present, infants select social partners at chance. However, this explanation is ruled out by the findings of Experiment 2, in which fairness was crossed with both the race of the distributor *and* the race of the recipient and infants selected social partners systematically based on who (i.e., which race recipient) the unfair distributor advantaged.

Experiment 2 demonstrated that infants were more likely to select the fair actor when the unfair actor advantaged an Asian individual than when she advantaged a Caucasian individual. Given that all of the infants in the sample were Caucasian, these findings may suggest that over and above whether an actor behaves fairly, infants may focus on the consequences of the distribution for members of their own race and its implications for their own future interactions with the distributors, as it may be advantageous to interact with a person who shows preferential treatment to the infant's own race. Infants may prefer the fair distributor in this situation either because the unfair distributor (a) *advantaged* the Asian recipient, or (b) *disadvantaged* the Caucasian recipient. Because the unfair distributor both gave more goods to the Asian recipient than did the fair distributor, and fewer goods to the Caucasian recipient than did the fair distributor, the current study does not address this question. However, previous studies suggest infants' preferences may be based on both of these aspects; 14-month-old infants prefer agents who help a puppet that is similar to the infant (e.g., prefers the same kind of food), but prefer agents who harm a puppet that is dissimilar (e.g., prefers different

foods) (Hamlin et al., 2013). Future studies may cleave apart these two possibilities by introducing one distributor who gives more to the Asian recipient (but gives the same amount to the Caucasian recipient as does the fair distributor), and one who disadvantages the Caucasian recipient (but gives the same amount to the Asian recipient as does the fair distributor).

An additional question concerns whether infants are making their social selections based on shared category membership with the agents involved in the display (e.g., based on the fact that the infant and agents are of the same race) or in terms of considerations for Caucasian recipients *per se*. Because all of the participants in the current study were Caucasian, the current study cannot distinguish between these possibilities. If infants' choices are driven by shared category membership, future studies using the same design as Experiment 2 with Asian participants should yield an opposite pattern of findings (e.g., selections of the fair actor should be higher when the unfair actor advantages the Caucasian recipient). This is likely the case, given that Asian and Caucasian infants have shown opposite looking time patterns in investigations of infants' perception of Asian versus Caucasian faces, i.e., Asian infants look longer at Asian faces and Caucasian infants look longer at Caucasian faces (Kelly et al., 2007).

A related question concerns whether infants' fairness concerns guide their selection of social partners when both the fair and unfair individuals are of another race, e.g., if Caucasian infants were given the option between fair and unfair actors who are both Asian. Our work suggests that Caucasian infants do prefer fair actors over unfair actors when they are both Caucasian, so it is reasonable to expect this would be the case when they are both Asian. An alternative possibility is that Caucasian infants do not have any expectations about how other-race actors should distribute goods. Given, however, that infants in Experiment 2 selectively chose fair actors when the unfair actor advantaged an Asian recipient, it suggests Caucasian infants may hold Asian actors to the same principles as Caucasian actors, and that one would see this same pattern if both fair and unfair actors were Asian.

The extent to which infants focus on the consequences of the distribution for members of their own race parallels similar findings with adults: although adults who had been divided into artificial groups (ostensibly based on perceptual processing styles) condemned ingroup favoritism, they tended to have an *implicit* preference for a person who showed ingroup favoritism over a person who was egalitarian (Castelli et al., 2008). Systematic biases for ingroup members do not appear to emerge until 3 or 4 years of age (Katz and Kofkin, 1997; Dunham et al., 2013); however, our findings may signal the onset of an emerging implicit awareness of social categories and the implications of these categories for people's real-world behavior and consequences of this behavior.

Our findings are consistent with previous studies showing that race affects infants' visual attention, leading to a preference for looking at own- versus other-race individuals (Kelly et al., 2005). However, our findings go beyond looking preferences, which may rely on lower-level processes, and suggest infants actively use this information to coordinate their social selections. The current findings are in contrast to some previous work on infants'

social preferences that finds that infants do not consider race when given the opportunities to select toys associated with White versus Blacks actors (Kinzler and Spelke, 2011). One possibility for this difference is that in our procedure infants observed and interacted with live (as opposed to televised) adults; thus, it is possible infants perceived our task as having realistic consequences for future interactions with these individuals. Another strength of the current study is that we utilized multiple exemplars of Caucasian and Asian individuals, in multiple different pairings, which de-conflates race and personal identity. Thus, our findings could not be accounted for by a preference for one a particular individual over another. Moreover, because infants were recruited from different locales across these studies, it is possible the extent of infants' exposure to same- and other-race adults may have differed. One possibility is that infants in more racially diverse cities may have more exposure to other-race individuals and may be less likely to use race as a marker of social category membership.

In conclusion, the results of the current study suggest that infants can use fairness concerns to guide their social selections. However, infants also take into consideration the race of individuals, and the consequences of the behavior of these individuals for their own- versus other-race individuals. Indeed, the results of Experiment 2 suggest that when given the opportunity to select individuals on the basis of fairness, on the basis of race, or based on the consequences of the distributor's actions for own- versus other-race individuals, infants most strongly consider the consequences for own- versus other-race members. These findings may suggest that when confronted with selecting between individuals on the basis of who abides by a fairness norm versus on the basis of who advantages own-race (versus other-race) individuals, infants may more strongly weight the consequences for individuals of their own race, and, by extension, for the self. Thus, infants may strategically select social partners who previously advantaged members of their own social category, suggesting that they may use group membership to predict the consequences of future interactions for themselves. Thus, our work is consistent with the conclusion that infants and young children may be strategic in their prosocial considerations (Dunfield and Kuhlmeier, 2010; Vaish et al., 2010; Shaw et al., 2012), factoring in not only whether an individual acts fairly, but also the potential consequences of this behavior for their own interactions with others.

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Context-dependent social evaluation in 4.5-month-old human infants: the role of domain-general versus domain-specific processes in the development of social evaluation

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The ability to distinguish friends from foes allows humans to engage in mutually beneficial cooperative acts while avoiding the costs associated with cooperating with the wrong individuals. One way to do so effectively is to observe how unknown individuals behave toward third parties, and to selectively cooperate with those who help others while avoiding those who harm others. Recent research suggests that a preference for prosocial over antisocial individuals emerges by the time that infants are 3 months of age, and by 8 months, but not before, infants evaluate others' actions in context: they prefer those who harm, rather than help, individuals who have previously harmed others. Currently there are at least two reasons for younger infants' failure to show context-dependent social evaluations. First, this failure may reflect fundamental change in infants' social evaluation system over the first year of life, in which infants first prefer helpers in any situation and only later evaluate prosocial and antisocial actors in context. On the other hand, it is possible that this developmental change actually reflects domain-general limitations of younger infants, such as limited memory and processing capacities. To distinguish between these possibilities, 4.5-month-olds in the current studies were habituated, rather than familiarized as in previous work, to one individual helping and another harming a third party, greatly increasing infants' exposure to the characters' actions. Following habituation, 4.5-month-olds displayed context-dependent social preferences, selectively reaching for helpers of prosocial and hinderers of antisocial others. Such results suggest that younger infants' failure to display global social evaluation in previous work reflected domain-general rather than domain-specific limitations.

Keywords: social evaluation, infancy, cooperation, domain-general processes, domain specificity, context-dependence

INTRODUCTION

Human cooperation presents an evolutionary puzzle. Although human beings are easily the most cooperative and altruistic species on earth (Tomasello, 2009; Melis and Semmann, 2010), helping others is personally costly and there is uncertainty that such efforts will be returned. Thus, cooperative systems are constantly in danger of being overtaken by individuals who reap the benefits of others' costly prosocial acts but do not take costs to help others in return. To solve the puzzle of how cooperation could have evolved, theorists argue that human prosocial motivations must emerge *in tandem with* capacities for social evaluation and partner choice. That is, cooperation is possible because humans are selective cooperators: they readily assess others' cooperative potential and choose social partners accordingly, allowing them to pay the costs of cooperating only to those likely to pay them back. Non-cooperators, on the other hand, are shunned or actively punished, making non-cooperation a less beneficial strategy overall (e.g., Trivers, 1971; Axelrod, 1984; Alexander, 1987; Cosmides, 1989; Boyd and Richerson, 1992; Nowak and Sigmund, 1998; Price et al.,

2002; Panchanathan and Boyd, 2003). Although some claim that humans evolved capacities to detect cheaters in social exchanges specifically (e.g., Delton et al., 2012), others treat sociomoral evaluation and partner choice as more general solutions to various problems inherent to group living; promoting bigger and bigger acts of altruism, curbing aggression between group members, allowing for the establishment of a variety of group norms, etc. (e.g., Alexander, 1987; Boyd and Richerson, 1992; Sober and Wilson, 1998; Flack and deWaal, 2000; Katz, 2000; Hammerstein, 2003; Hardy and Van Vugt, 2006; Barclay and Willer, 2007; Nesse, 2007; Boehm, 2012).

Supporting the possibility that humans developed capacities for social evaluation and partner choice along with tendencies toward cooperation and prosociality comes from recent evidence that very young infants engage in third party social evaluations, suggesting they are not solely the result of socialization and learning processes (reviewed in Hamlin, 2013a). Specifically, as early as 3 months of age infants prefer puppet characters who help, versus prevent, third parties in achieving their unfulfilled goals, despite

having no immediate "stake" in the interaction and not knowing anyone involved. Infants' preferences for prosocial versus antisocial puppets are measured by selective attention in 3-month-olds (who cannot yet reach) and by both selective looking and reaching in older infants, and occur in response to helpers and hinderers of several different goal scenarios, including a goal to reach a particular location, to have a dropped object returned, and to obtain an object that is beyond a physical barrier (Hamlin et al., 2007, 2010, 2013b; Hamlin and Wynn, 2011). Critically, infants do not distinguish characters who direct identical physical actions toward an inanimate object or toward an agent who was not clearly demonstrating an unfulfilled goal, suggesting their preferences do not reflect liking or disliking particular lower-level perceptual aspects of the events (Hamlin, in revision; Hamlin et al., 2010; Hamlin and Wynn, 2011; c.f. Scarf et al., 2012a and response by Hamlin et al., 2012a). Finally, by 8–10 months of age infants' evaluations are based on others' *intentions* to help or hinder rather than whatever outcomes happened to occur: infants prefer those who try but fail to help over those who try but fail to hinder, but they do not distinguish those who actually helped and hindered if they did not know they were doing so (e.g., Hamlin, 2013b; Hamlin et al., 2013b).

Of course, adults' social evaluations are not limited to simple heuristics whereby all "locally" intentional prosocial acts are good and all antisocial ones are bad (Heider, 1958). Instead, adults demonstrate more "global" evaluations, readily assessing the very same behaviors differently in different contexts. For example, even though punishment is itself antisocial, adults readily punish those who have behaved antisocially and approve of others who do so (see Bright and Keenan, 1995; Maurer, 1999; Barclay, 2006; Gürerk et al., 2006; Friedland, 2012), and like those who share their social tastes and distastes, even when shared distaste is signaled by an antisocial act (as illustrated by the phrase "the enemy of my enemy is my friend," e.g., Heider, 1958; Aronson and Cope, 1968; Gawronski et al., 2005). In a study exploring one type of context-dependent social evaluation in infancy, Hamlin et al. (2011; see also Hamlin et al., 2013a) compared infants' preferences for Givers versus Takers of a dropped ball when the individual who dropped it had either just helped or just hindered an unknown third party in his goal to open a box. Specifically, we hypothesized that if infants engage in only local evaluations they should prefer Givers to Takers across the board; if infants are capable of global evaluations their preferences should differ based on the past behavior of the targeted individual. Both 8-month-olds infants and 19-month-old toddlers showed markedly different choice patterns depending on the target of giving and taking, selecting givers when targets were prosocial and takers when targets were antisocial. To address whether infants' context-specific preferences reflect mere "valence-matching," or a preference for those whose interactions maintain the same valence over time, additional groups of 8- and 19-month-olds chose between givers and takers when a target had previously *received*, rather than *performed*, an antisocial act. Victims of antisocial behaviors do not deserve further mistreatment, nor do adults wish to befriend their enemies, but they are clearly (however unwilling) participants in a negatively valenced act, and continuously struggle and fail to achieve a goal (see Skerry and Spelke, 2014, for evidence that infants appreciate the emotional

consequences of goal achievement and failure by 8 months of age). If infants simply prefer valence-matchers without analyzing who did what to whom or distinguishing between various forms of negative valence present during hindering, then they should be even *more* likely to choose takers from victims than from hinderers. Critically, both 8- and 19-month-olds preferred givers to victims, ruling out the low-level valence-matching alternative for infants' context-specific choices (but see Scarf et al., 2012b, and response by Hamlin et al., 2012b).

Five-month-olds in Hamlin et al. (2011) were tested on the very same procedures but showed no evidence of context-dependence (nor, notably, of valence-matching): they preferred those who gave to versus took from all targets, whether prosocial or antisocial. This performance difference suggests that the ability to demonstrate global social evaluations develops between 5 and 8 months after birth. That said, the nature of this development remains unclear. On the one hand, development between 5 and 8 months may occur within the domain of social evaluation itself. Infants might first possess relatively simple "helpful = good and/or harmful = bad" heuristics that are impervious to contextual information of any kind, and later develop the ability to evaluate prosocial and antisocial actions in context. Such domain-specific change could be prompted by infants' everyday experiences: as infants age and become increasingly mobile they are presumably confronted with more and more locally antisocial behavior performed by individuals infants are sure they like (their caregivers) toward individuals infants are sure they like (themselves, their peers and/or siblings). These experiences might then drive infants to adjust their rigid social evaluation system in order to incorporate information related to who did what to whom and why. That is, in a process of accommodation (e.g., Piaget, 1928), global social evaluation might emerge as infants encounter, and are motivated to make sense of, apparent inconsistencies in their increasingly complex social world. Notably, 8 months is also the time when mentalistic third party social evaluation has first been observed in infants (Hamlin, 2013b).

A second (non-mutually-exclusive) possibility for younger infants' failure is that 5-month-olds are limited in terms of memory, processing speed/capacity or other domain-general ability relative to 8-month-olds. Indeed, the methodology used in Hamlin et al. (2011) was extremely complex relative to past work on social evaluation in younger infants, and may have placed insurmountable demands on 5-month-olds' processing and memory capacities. To illustrate, infants in Hamlin et al. (2011) saw two different types of prosocial and antisocial interactions within the same study, both the box and the ball scenarios. Although infants readily distinguish prosocial from antisocial others when shown either one of these scenarios, no previous work has demonstrated they can do so when shown both types, much less integrate information across the two. In addition, while in past studies infants have had to keep track of three unique characters who are all onstage together at the start of each event, in the global evaluation procedure infants must keep track of five distinct characters, only three of whom are ever onstage at once. Finally, infants in Hamlin et al. (2011) were not only given more information to process than in past work, they also had less time to process it: past work has utilized a habituation procedure in which infants are shown prosocial

and antisocial events repeatedly until a pre-specified criterion is reached (between three and seven events each; habituation is taken to indicate sufficient event processing, for review see Colombo and Mitchell, 2009), whereas infants in Hamlin et al. (2011) saw just one prosocial and one antisocial event in each of the box and ball scenarios. Therefore, perhaps 5-month-olds selected givers over takers following the ball scenario simply because they initially *failed to process* or subsequently *forgot* what the target in the ball shows had done, and so they evaluated givers and takers as if the target was an unknown third party. If so, then the procedure was not actually a test of 5-month-olds' capacity for context-dependent social evaluation in the first place.

Consistent with this possibility, there are clear improvements in infants' processing and memory capacities with age. Younger infants are slower to process information than are older infants, younger infants forget information faster after equivalent exposure than do older infants, and younger infants show striking difficulty retrieving information over changes in context whereas older infants do better (for reviews see Roveé-Collier, 1997, 1999; Hayne, 2004; Bauer, 2007; Colombo and Mitchell, 2009). Neuroimaging work has linked functional development in learning and memory in infancy to changes in temporal cortical memory networks known to underlie declarative memory in adults, with significant changes happening during the second half-year of life (reviewed in Richmond and Nelson, 2007). Together, this work suggests that given equal exposure time 8-month-olds should be, on average, markedly better than 5-month-olds at encoding, retaining, and retrieving information from one phase of an experiment to the next.

MOTIVATION FOR THE CURRENT STUDIES

The current studies were designed to distinguish between domain-specific and domain-general accounts of the observed difference in 5- and 8-month-olds' social evaluations in Hamlin et al. (2011). Infants from 3.5 to 5.5 months of age were tested, with an average age of 4.5 months. All methodologies were identical to Hamlin et al. (2011), except that memory and processing demands were reduced: rather than being shown one prosocial and one antisocial box event in the first phase of the procedure, infants were habituated to prosocial and antisocial box events, seeing alternating events repeatedly until their attention following each event decreased by half (details below). Dominant theoretical approaches to habituation characterize it as a process of alignment, by which an internal representation of an external stimulus becomes more similar to the stimulus itself (e.g., Sokolov, 1963; see review in Colombo and Mitchell, 2009). Therefore, habituating infants to box events should in some way or another sharpen their internal representations of the would-be Targets of giving and taking, which they might utilize while observing giving and taking. After habituation, 4.5-month-olds were shown just one giving and one taking ball event before choosing between the giving and taking puppets, as in Hamlin et al. (2011).

If 4.5-month-olds in the current study perform as 5-month-olds in Hamlin et al. (2011), consistently choosing givers over takers even after being habituated to prosocial and antisocial box events, this would lend support the possibility that differences in social evaluation at 5 and 8 months reflect some change in

the system of social evaluation itself, whereby infants move from initially rigidly viewing helping as good and hindering as bad to incorporating contextual nuance into their social assessments. On the other hand, if 4.5-month-olds choose Givers to Prosocial Targets but Takers from Antisocial Targets, it would suggest that younger infants' failure to demonstrate global social evaluation in Hamlin et al. (2011) was due to difficult task demands combined with domain-general limitations in memory and processing capacities.

EXPERIMENT 1: PROSOCIAL AND ANTISOCIAL TARGETS
METHOD
Participants

Fifty-five full-term and typically developing infants between 3.5 and 5.5 months of age participated. An additional 22 infants began or completed the procedure but were not included in the final sample due to fussiness (13 infants), procedural error (4), failure to choose either puppet (4), or parental interference (1). Data collection ended somewhat early (the original intention was 32 infants/condition) in time to submit the manuscript for this special issue; in total there were 28 infants in the Prosocial Target condition (14 females; mean age = 4 months; 19 days; range = 3;16–5;16) and 27 infants in the Antisocial Target condition (16 females; mean age = 4 months; 17 days; range = 3;18–5;16). Twenty of 28 infants in the Prosocial Target condition and 19 of 27 in the Antisocial Target condition had were first born and had no siblings at the time of testing.

Procedures

All procedures were approved by the Behavioral Research Ethics Board at the University of British Columbia and conform to relevant regulatory standards.

Stimuli and procedures are identical to Hamlin et al. (2011) unless otherwise noted, and are depicted in **Figure 1**. Infants participated in two Stimuli Phases and a Choice Phase. For each Stimuli Phase, infants sat in their parent's lap before a table (*W*: 122 cm) surrounded on three sides with blue curtains; a curtain with cartoon animal cutouts on it (85 cm from the infants) could be lowered to occlude the puppet stage so stimuli could be reset between events. Parents were instructed to sit quietly with their infants and not attempt to influence them in any way. Before the start of the study parents practiced getting into the appropriate position for the Choice Phase, turning 90° to the right and moving back about 30 cm (placing their feet on a duct tape line on the floor), perching their infants at the front of their knees (not leaning back against their chest), and holding them tightly around the lower abdomen. Parents were told how important it is that infants face straight ahead and have sufficient trunk support to ensure clear reaches at this young age. Infants were *habituated to* up to 14 puppet events in Stimuli Phase 1, and were *familiarized to* exactly two puppet events in Stimuli Phase 2. Additional details of each Phase are described below.

Stimuli Phase 1: box helping and hindering events. Depicted in **Figures 1A,B**. The curtain rose to reveal two pink pigs (one in a blue shirt, one in green) resting at the back corners of the puppet stage; a clear box containing a brightly-colored toy rested at the center of the stage, approximately 20 cm in front of the pigs. To

FIGURE 1 | Stimuli. Depictions of Prosocial/Antisocial puppet shows during Phase 1 and Giving/Taking puppet shows during Phase 2 of Experiment 1 (example of the Antisocial Target condition). Phase 1 **(A)** Prosocial Box Events. The Cow enters the stage and tries but fails to open the box. The Prosocial Pig helps him open it. The Cow lies down on top of the toy inside the box, and the Prosocial Pig runs offstage. Phase 1 **(B)** Antisocial Box Events. The Cow enters the stage and tries but fails to open the box. The Antisocial Pig jumps on top of the box, slamming it shut. The Cow lies down next to the box without the toy, and the Antisocial Pig runs offstage. Phase 2 **(A)** Giving Ball Events. The Antisocial Pig from Phase 1 enters the stage, and picks up a ball resting in the center. The Pig drops and catches the ball several times, and then drops the ball toward the Giver Tiger. The Pig turns to "ask" for the ball back, and the Giver rolls the ball back to him and runs offstage. Phase 2 **(B)**: taking Ball Events. The Antisocial Pig enters and plays with the ball as in Giving Events. He then drops the ball toward the Taker Tiger, and asks for it back as in Giving Events. The Taker Tiger runs offstage, stealing the ball away.

begin each and every event, a Cow puppet wearing a yellow t-shirt entered from the back center of the stage, and ran around one side of the box and "looked" inside twice, as if seeing the toy inside. The Cow then jumped up on top of the nearest corner of the box lid, and lifted the box lid a small amount a total of five times, lowering it in between as though unable to open the box. During *Prosocial Events,* during the fifth struggle the Prosocial Pig (resting in the corner of the opposite side of the stage from where the Cow was struggling) ran forward, grasped the opposite corner of slightly open box lid, and opened the box together with the Cow. The Cow jumped into the open box, lay his body down on top of the toy inside, and paused. The Prosocial Pig then jumped off the box lid and ran offstage to complete the event. During *Antisocial Events,* during the fifth struggle the Antisocial Pig ran forward (the side of the box the Cow struggled with alternated per event so that the Prosocial and Antisocial Pigs could remain in the same corners throughout the procedure) and jumped on top of the slightly-open box lid, slamming it shut. The Cow jumped off the box, lay his body down on the stage, and paused, and the Antisocial Pig jumped off the box and ran offstage.

Once the Prosocial/Antisocial Pig ran offstage at the end of each event, an online coder coded infants' attention toward and away from the puppet stage using a key-press via the program *jHab* (Casstevens, 2007). Coding ended when infants looked away from the stage for 2 consecutive seconds or after 30 total seconds elapsed, as indicated by a "ding" from the

jHab program. After each ding the curtain was lowered and the next event was readied. Infants viewed prosocial and antisocial events in alternation until they reached a pre-set habituation criterion in which their attention over three consecutive events summed to less than half their attention over the first three events that themselves summed to 12 s or more. If infants failed to reach this criterion, they were shown 14 total events in Stimuli Phase 1. In Phase 1, the event order, side of stage, and t-shirt color of the Prosocial Target was counterbalanced.

Once infants completed Phase 1, the online coder and puppeteer from Phase 1 switched places. The new puppeteer (former coder) did not know which puppet had performed which action during Phase 1, and remained blind to condition while puppeteering Phase 2 by reading the shirt color of the Target Pig for Phase 2 from a script only s/he had access to. The new coder, despite having puppeteered during Phase 1 and knowing which Pig was which, could not see the stage during Phase 2 and so did not know which Pig was the Target of Giving and Taking.

Stimuli Phase 2: ball giving and taking events. The curtain rose to reveal two Tiger puppets, wearing a pink and a purple t-shirt, resting at the back corners of the stage. A ball rested at the center of the stage. Depending on condition, either the Prosocial Pig from Phase 1 (in the Prosocial Target condition) or the Antisocial Pig from Phase 1 (in the Antisocial Target condition) entered from

behind the back curtain, and ran forward to grasp the ball. The Target then bounced twice, holding the ball, and then released and grasped the ball, as though playing with it. The Target repeated this jump-release-retrieve sequence twice more; on the fourth release the ball rolled toward one side of the stage or the other. During *Giving Events*, the Giver (closest to the ball) ran forward and grabbed the ball. The Target then turned toward the Giver and opened its arms wide, as though "asking" for the ball back; the Giver turned toward the Target as though acknowledging him, and both puppets turned back to face the infant simultaneously. This sequence repeated once more; the third time the Target turned toward the Giver, the Giver rolled the ball back to the Target (a distance of approximately 30 cm), and then ran offstage. The Target turned back to face the infant, holding the ball, and all action paused. During *Taking Events*, the Taker (closest to the ball because it dropped toward the other side of the stage) ran forward and grabbed the ball. The Target "asked" for its ball back twice as in Giving Events; on the third request the Taker rushed offstage, stealing the ball away. The Taker turned back to face the infant without the ball and all action paused. Infants' attention to each event was recorded as in Phase 1. Unlike in Phase 1, infants in Phase 2 were shown a total of two events, one Giving and one Taking (as in Hamlin et al., 2011). During Stimuli Phase 2, the t-shirt color, event order, and side of the Giver and Taker were counterbalanced in each condition.

After Stimuli Phase 2, parents were instructed to get into position for choice, and were asked to adjust their infants if necessary. Once infants were in the appropriate position, parents were asked to close their eyes.

Choice. The coder from Phase 2, who knew neither which Tiger was the Giver or the Taker nor whether each infant was in the Prosocial or the Antisocial Target condition, presented the choice. The puppeteer from Phase 2 placed puppets in the choice presenters' appropriate hands by reading from a script only s/he had access to, and the choice presenter hid the Tigers behind her back as she appeared from behind the curtain that had been on the infants' right during the puppet shows (now about 45° to infants' left). The choice presenter kneeled directly in front of the infant, said "Hi!" and established eye contact. S/he then brought both puppets into view (but out of reach, approximately 60 cm away) as she said said "Look!". Infants were required to look toward each puppet; if an infant failed look at both spontaneously when they were first introduced, the presenter would shake one or both puppets as necessary to ensure the infant saw each one (with instructions that infants' gaze should land on each puppet for as brief a time a possible). Finally, the choice presenter said "Hi!" again, reestablished eye contact so that an infant did not simply choose whichever puppet s/he had just been looking toward, and moved the Tigers within reach (approximately 15–30 cm away), saying "Who do you like?". Each infant's "choice" was identified online by the choice presenter as the first puppet contacted via a visually guided reach (touching a puppet preceded immediately by looking at it). The side of the Giver/Taker was counterbalanced during choice. An additional 25% of infants' choices in each condition were recoded for reliability purposes; reliability was 100%.

RESULTS

Attention was analyzed using *t*-tests and ANOVAs; statistics reported include 95% Confidence Intervals (CIs). Choices were analyzed using non-parametric tests for categorical data (binomial tests for comparing a given choice distribution to chance (50%); Fisher's Exact Tests and Chi-squares for comparing choice distributions across conditions) and also include 95% CIs. All statistics were generated via SPSS, www.vassarstats.net (for non-parametric analyses) and ESCI (Cumming, 2012).

Attention during Stimuli Phase 1
Rate of habituation. Across conditions, infants habituated in an average of 8.73 events (SEM = 0.37). This number differed marginally by condition (variance assumption violated, independent-samples $t(49) = -1.90$, $p = 0.065$, Cohen's $d = 0.51$, 95% CI of difference $[-2.78, .08]$). Infants in the Prosocial target condition habituated in an average of 9.39 (SEM = 0.58; 95% CI [8.20, 10.58]) events (22/28 infants habituated within 14 events) and infants in the Antisocial Target condition habituating in 8.04 (SEM = 0.42, 95% CI [7.18, 8.90]) events (26/27 infants habituated within 14 events). The difference in the percentage of infants per condition who habituated within 14 events also approaches marginal significance (2X2 Fisher's Exact Test, $p = 0.10$; 95% CI on the difference $[-1, 36]$). As infants in both conditions viewed exactly the same events during Phase 1, and because during Phase 1 both puppeteers and coders were blind to infants' condition, these marginal interactions are considered spurious (in addition, there were no effects of whether infants reached habituation during Phase 1 on infants' puppet choices; see below).

Attention to prosocial versus antisocial events.
Infants attended equally to Prosocial and Antisocial Events across conditions, whether comparing looks to the first instance of each [first Prosocial (SEM) = 11.27 s (1.18); first Antisocial (SEM) = 10.17 s (1.07); paired $-t(54) = 0.90$, $p = 0.37$, $d = 0.13$, 95% CI $[-5.64, 3.44]$ or to the average across the first 3 instances of each [as per the habituation criterion, all infants saw at least three of each event type; average first three Prosocial (SEM) = 8.78 s (0.80); average first three Antisocial (SEM) = 8.18 s (0.72); paired $t_{54} = 0.90$, $p = 0.37$, $d = 0.11$, 95% CI $[-3.68, 2.46]$. As expected given that all infants viewed the exact same events during Phase 1, repeated-measures ANOVAs with condition as a between-subjects factor revealed that infants' relative attention to Prosocial versus Antisocial Events did not differ by condition (first Prosocial/Antisocial: $F_{1,53} = 0.67$, $p = 0.41$, $\eta_p^2 = 0.01$; average first three Prosocial/Antisocial: $F_{1,53} = 0.56$, $p = 0.46$, $\eta_p^2 = 0.01$). This lack of attention difference to Prosocial versus Antisocial acts suggests that 4.5-month-old infants do not hold baseline expectations for whether unknown third parties will help or hinder other unknown third parties.

Attention to giver and taker events during Phase 2
Across conditions, infants attended equally to Giver and the Taker Events [Giver (SEM) = 6.24 (0.78), Taker (SEM) = 7.32 (0.87); paired-$t(54) = -1.26$, $p = 0.22$, $d = 0.17$, 95% CI $[-2.25, 4.39]$; this did not differ by condition (repeated-measures ANOVA, $F_{1,53} = 0.02$, $p = 0.90$, $\eta_p^2 = 0.00$). These results replicate what was reported in Hamlin et al. (2011) and suggest that 4.5-month-olds

do not hold expectations for how independent third parties will treat those they (the infants) know have helped or hindered others (see Meristo and Surian, 2013 for positive evidence with older infants and fair/unfair distributors).

Choice

Preliminary analyses. Choice results are depicted in **Figure 2**. When collapsed across conditions, preliminary binomial tests revealed no effects of side, color, or giving/taking action on infants' choices (p's > 0.41). Both across and within conditions, habituators and non-habituators chose in the direction of the hypothesis at equal rates (Fisher's Exact p_{Across} = 0.59, $p_{WithinProsocial}$ = 1.0, $p_{WithinAntisocial}$ = 1.0). Interestingly, males in the Antisocial Target condition were more likely to choose the Taker than were females (Fisher's Exact p = 0.05); this difference was not observed in the Prosocial Target condition (p = 1.0) nor collapsed across both (p = 0.16) and so is not addressed further. The choice pattern of infants with siblings did not differ from those without (Fisher's Exact p's > 0.54). Finally, a multivariate ANOVA on whether infants chose with or against the hypothesis and whether infants chose the Giver or Taker with age as a covariate revealed no effects of age on infants' choices (F's$_{1,54}$ < 1.05, p's > 0.31, η_p^2's < 0.03).

Choice of givers versus takers. Infants' preference for the Giver versus the Taker puppet differed significantly by condition [Pearson's χ^2 (df = 1) = 25.14, p < 0.0001]. Specifically, infants were 67% more likely to choose the Giver in the Prosocial Target than in the Antisocial Target condition (95% CI on difference does not cross 0 [42, 81]). Infants in the Prosocial Target condition significantly preferred the Giver over the Taker (25 of 28 infants; binomial p = 0.00003; 95% CI on the percentage choosing the Giver is entirely above chance (50%) [73, 96]), whereas infants in the Antisocial Target condition significantly preferred the Taker over the Giver (21 of 27 infants; binomial p = 0.006; 95% CI on percentage choosing the Giver is entirely below chance [10, 41]). Infants' likelihood to choose in the direction of the hypothesis did not differ by condition (Fisher's Exact Test, p = 0.30; 95% CI [−31, 9]): infants were equally likely to choose Givers to Prosocial Targets as they were to choose Takers to Antisocial Targets. Finally, infants' rate of choosing Givers versus Takers differed significantly between the current Antisocial Target condition, in which infants were habituated during Phase 1 (21 of 27 chose Taker), and the Antisocial Target condition of Hamlin et al. (2011), in which infants were only familiarized during Phase 1 [2 of 16 chose Taker; Pearson's χ^2 (df = 1) = 17.21, p < 0.0001], reflecting a 65% [35, 80] difference in rate of choosing the Taker.

DISCUSSION

Results from Experiment 1 suggest that given more time to process the initial prosocial and antisocial acts of the eventual targets of giving and taking, even 4.5-month-olds demonstrate context-dependent social evaluations, preferring those who are nice (over mean) to nice puppets and those who are mean (over nice) to mean puppets. To rule out simple valence-matching effects for infants' choices, a new group of 4.5-month-olds chose between a Giver to and a Taker from a Victim Target as in Hamlin et al. (2011). It was predicted that 4.5-month-olds would prefer the Giver to the Taker

in the Victim Target condition, as had both 8- and 19-month-olds in Hamlin et al. (2011).

EXPERIMENT 2: VICTIM TARGETS
METHODS
Participants

Twenty-seven infants (14 females, mean age = 4 months; 19 days, range = 3;16–5;12) participated. An additional 25 infants began or completed the procedure but were not included in the final sample due to fussiness (7 infants), procedural error (8), failure to choose either puppet (5), parental interference (2), and general inattentiveness or sleepiness, whereby infants did not attend to puppet events at all (3). The relatively high rate of procedure errors in this condition was due to errors in puppeteering; specifically, even very well trained research assistants occasionally inserted a Helper event when there should have been a Beneficiary event, or a Hinderer event when there should have been a Taker Event. Several studies in the laboratory use box events, and so it was fairly difficult to inhibit the practiced motor repertoires of Helping and Hindering to perform Beneficiary and Victim Events. Because these errors disrupted the meaning of the puppet shows entirely, even one required that an infant be excluded from the sample. 19 of 27 infants were first born.

Procedures

Procedures were very similar to those in the Antisocial Target condition in Experiment 1, and counterbalancing was the same. However, instead of the Cow continuously trying and failing to open the box and being alternately helped and hindered by the Pigs, the Pigs took turns trying and failing to open the box and the Cow alternately helped one Pig (the Beneficiary) and hindered the other (the Victim).

Stimuli phase 1: box beneficiary and victim events. All movement details in Experiment 2 were as in Experiment 1, aside from those changes that were necessary to flip the puppets' agent/patient roles. Each event began when the curtain rose to reveal the Pigs resting at each rear corner of the puppet stage and the box containing a colorful toy in the middle. The Cow then entered from underneath the back curtain, but instead of moving forward and attempting to open the box himself he simply paused just in front of the curtain while one of the Pigs made a failed attempt to open the box. Specifically, during *Beneficiary Events*, the Beneficiary Pig ran forward and looked into the box, and then tried but failed to open it. On the Beneficiary's fifth failed attempt, the Cow intervened by running around from behind the box to the side of the stage opposite the Beneficiary Pig, and grasped the lid and opened it together with the Beneficiary. The Beneficiary then jumped into the box and lay down on the toy inside, achieving its goal, and the Cow jumped off the box and ran offstage. During *Victim Events*, the Victim Pig ran forward and tried but failed to open the box; on the Victim's fifth attempt the Cow ran to the side of the box opposite the Victim Pig and jumped sideways onto the box lid, slamming it shut. The Victim jumped off the box and lay his head on the table, failing to achieve his goal, and the Cow jumped off the box and ran offstage. Infants' attention following each event was coded as in Experiment 1. Once infants' reached the habituation criterion or watched 14 total Beneficiary and Victim events, the
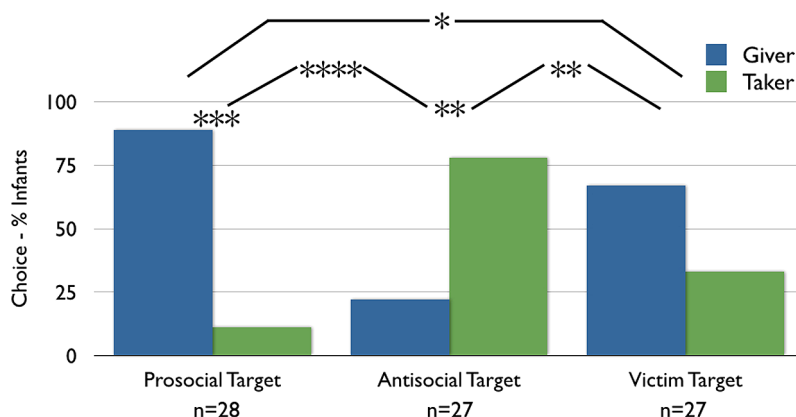
FIGURE 2 | Results. Infants' choices for the giver versus the taker (in %) across conditions. $*p < 0.05$, $**p < 0.01$, $***p < 0.00005$, $****p < 0.0000005$.

Victim was made the Target of giving and taking during Stimuli Phase 2.

Stimuli Phase 2: giving and taking events. As in Experiment 1, Giving and Taking in Stage 2 was puppeteered by the coder from Stage 1. Giving and Taking Events in Phase 2 of Experiment 2 were absolutely identical to Giving and Taking Events in Phase 2 of Experiment 1. Rather than the Target of Giving and Taking being either the Prosocial or the Antisocial Pig, it was always the Victim Pig.

Choice phase. As in Experiment 1, the choice was presented by the coder from Phase 2 who had puppeteered the Beneficiary/Victim Events during Phase 1. Although Experiment 2 was not "double blind" in the same way as Experiment 1 (because only the Victim condition was run), the choice presenter was entirely unaware of which puppet had been the Giver and the Taker during Phase 2 and so s/he could not unduly influence infants' choices. An additional 25% of infants' choices in each condition were recoded for reliability purposes; reliability was 100%.

RESULTS

Results in the Victim Target are first presented alone, and then compared to infants in Experiment 1.

Attention during Stimuli Phase 1

Rate of habituation. Infants in the Victim Target condition habituated in 9.26 (SEM = 0.56; 95% CI [8.11, 9.41]) trials, with 23/27 habituating within 14 trials. The number of habituation events viewed by infants in each condition did not differ [univariate ANOVA on how many events infants viewed during habituation with condition (Prosocial Target, Antisocial Target, Victim Target) as a between-subjects factor: $F_{2,79} = 2.01$, $p = 0.14$; $\eta_p^2 = 0.05$].

Attention to beneficiary versus victim events. Infants looked equally to the first Beneficiary event and the first Victim event they saw [Beneficiary (SEM) = 8.74 s (1.55); Victim (SEM) = 7.69 s (1.13); paired-$t_{26} = 0.82$, $p = 0.42$, $d = 0.15$; 95% CI [−3.67, 1.57]], and equally to first three Beneficiary and first three Victim events [average three Beneficiary (SEM) = 8.37 s (1.12); average

three Victim (SEM) = 8.40 s (1.01); paired $t_{26} = -0.04$, $p = 0.97$, $d = 0.01$; 95% CI [−1.55, 1.63]]. Neither measure of attention to habituation events differed with that of infants in Experiment 1 who viewed Prosocial and Antisocial events (repeated-measures ANOVAs on attention with condition (Prosocial Target, Antisocial Target, Victim Target) as a between-subjects factor revealed neither main effects nor interactions with condition; $F_{2,79}$'s < 1.35, p's > 0.24, η_p^2's < 0.02). This is not surprising, given all infants viewed the essentially the same alternating Prosocial and Antisocial acts in all three conditions: box shows during Phase 1 only differed based on whether there were two actors and one recipient (in Experiment 1) or one actor and two recipients (in Experiment 2).

Attention to giving versus taking events during phase 2. Infants looked for an average of 6.90 s (SEM = 0.96) to the Giving event and an average of 8.06 s (1.45) to the Taking event during Phase 2; attention did not differ by event type (paired $t_{26} = -0.86$, $p = 0.40$, $d = 0.18$, 95% CI [−1.63, 3.95]). Attention to Giving and Taking events did not differ with either condition in Experiment 1 (repeated-measures ANOVA with condition as a between-subjects factor, $F_{2,79} = 0.01$, $p = 0.99$, $\eta_p^2 = 0.00$).

Choice

Preliminary analyses. Preliminary binomial tests revealed no effects of side or color of the Giving Tiger on infants' choices for Givers over Takers (p's > 0.21), habituators' choice patterns did not differ from non-habituators' (Fisher's Exact $p = 0.58$), boys and girls preferred Givers and Takers at equal rates (Fisher's Exact $p = 1.0$) and the choice pattern of infants with siblings did not differ from those without (Fisher's Exact $p = 1.0$). An ANOVA on infants' choice of the Giver versus the Taker with age as a covariate revealed no effect of age on infants' choices ($F_{1,26} = 2.35$; $p = 0.14$; $\eta_p^2 = 0.09$). An additional 25% of infants' choices were recoded for reliability purposes; reliability was 100%.

Choice of givers versus takers. More infants in the Victim Target condition chose the Giver than chose the Taker (18 of 27 infants; binomial $p = 0.12$; 95% CI contains 50 [48, 81]). Critically, although the rate of choosing the Giver over the Taker did

not reach significance in this sample, the rate of choosing the Taker was significantly different in the Antisocial Target and Victim Target conditions [Pearson's χ^2 (df = 1) = 10.8, p = 0.001]; infants were 44% more likely to choose the Taker in the Antisocial Target condition than in the Victim Target condition (95% CI does not contain 0 [18, 63]). This result suggests that infants in the Antisocial Target condition in Experiment 1 did not choose the Taker based on valence-matching alone. That said, the rate of choosing the Taker was *also* significantly different between the Prosocial Target and Victim Target conditions [Pearson's χ^2 (df = 1) = 4.12, p = 0.04]; infants were 23% less likely to choose the Taker in the Prosocial Target condition the Victim Target condition (95% CI contains 0 [0, 43]). Implications for this result will be addressed in the discussion.

GENERAL DISCUSSION

Results from the current studies suggest that given sufficient time to process prosocial and antisocial events, 4.5-month-olds are capable of evaluating others' actions in context. In contrast to past work in which younger infants preferred prosocial Givers over antisocial Takers regardless of the past actions of the Target of those behaviors, when 4.5-month-olds were habituated to the past prosocial or antisocial actions of a Target they preferred Givers to Prosocial Targets and Takers from Antisocial Targets. That younger infants require more time to process and/or remember events than do older ones has been consistently demonstrated in developmental psychology research (see Roveé-Collier, 1997, 1999; Hayne, 2004; Colombo and Mitchell, 2009), the current studies demonstrate that similar information processing and memory limitations may underlie early failures to demonstrate context-dependent social evaluation. Notably, infants in the current studies were only habituated to prosocial and antisocial box events (not to giving and taking ball events): they were shown only one giving and one taking act before asked to choose between the Giver and the Taker. This indicates that 4.5-month-olds can evaluate others' actions in context on their *very first* observations of valenced actions directed toward a valenced target, so long as their representation of that target is sufficiently strong.

The current studies used preferential reaching as a measure of infants' social evaluations. Experimental methodologies are necessarily limited to those behaviors infants are physically capable of performing; indeed, the current studies lowered the age at which we achieved successful reaches from infants under 4.5 months of age. Though there are presumably countless reasons why infants would touch one puppet versus another; including social evaluation but also including perceptual interest, confusion or curiosity, absence of fear, etc., other work using the very same box events as in the current Stimuli Phase 1 has revealed that 16-month-olds selectively match the food preferences of prosocial puppets but not antisocial ones, and 21-month-olds selectively give resources to prosocial puppets and take them from antisocial ones (Hamlin et al., 2011; Hamlin and Wynn, 2012). Thus, although it is critical to continue assessing at what level young infants' reaching behaviors reflect true "evaluation," this developmental continuity suggests it is appropriate to (cautiously) do so.

Infants' context-dependent evaluation did not stem entirely from simple valence-matching mechanisms: when infants viewed a Giver and a Taker act on a Victim Target, more preferred the Giver, a significantly different pattern of choice than infants in the Antisocial Target condition. Intriguingly, infants were *also* significantly more likely to choose the Giver in the Prosocial Target than in the Victim Target condition: 89% of infants chose a Giver to a Prosocial Target, whereas 67% of infants chose a Giver to a Victim Target. This pattern was not observed in the corresponding conditions Hamlin et al. (2011), wherein 8- and 19-month-olds preferred Givers to Prosocial Targets and Victim Targets at the same rate; furthermore, here fully 2/3 of infants preferred Givers to Victims. Despite this, if the difference in rate of choosing Givers to Prosocial versus Victim Targets were to replicate it would be consistent with several potential explanations. First, perhaps valence-matching mechanisms play a role in early social evaluations but are not entirely responsible for them. For instance, perhaps 4.5-month-olds *do* like those whose interactions serve to maintain action valence through time, as some form of valence-based familiarity preference, thereby weakening their preference for Givers to Victims. That the same asymmetry was not observed in 8- or 19-month-olds in Hamlin et al. (2011) suggests either that the asymmetry reflects early confusion about the roles of agent versus patient in social interactions that is overcome by 8 months of age, or that associative effects are relatively weak and emerge only after someone has been victimized repeatedly, as in the current habituation methodology. Alternatively, the asymmetry in preference for Givers to Prosocial versus Victim Targets could reflect some tendency to "blame the victim," as has been demonstrated in adults and young children (Piaget, 1932/1965; Lerner, 1980; Jost and Hunyady, 2002; Olson et al., 2006; Olson et al., 2008). Indeed, children show preferences for lucky and against unlucky individuals even when the lucky and unlucky events were clearly random (finding 5$, getting caught in the rain); in the current studies, given that the Cow engages in *both* prosocial and antisocial acts and directs antisocial acts toward the Victim specifically, infants may have had reason to suspect that the Victim's lot was non-random. Future work might examine whether infants show a tendency to "blame the victim" (defined by smaller preferences for Givers to Victims than for Givers to Prosocial others) in a condition in which Beneficiaries are helped and Victims are hindered by two distinct individuals, as this might provide less reason to view Beneficiaries and Victims as deserving their treatment.

Herein, the general terms "context-dependent" and "global" social evaluation have referred to a very specific form of context-based evaluation, asking whether infants prefer those who intentionally harm those who have intentionally harmed others. Above and beyond the very simple valence-matching mechanisms that do not account (entirely) for infants' preferences, there remain several possibilities for the exact nature of infants' global evaluations, not disentangled by the present work. For instance, past work suggests that infants utilize and privilege intention in their assessment of others for their third-party prosocial and antisocial acts by 8–10 months of age (Hamlin, 2013b; Hamlin et al., 2013b). Do mental states influence context-dependent evaluations? If so, whose mental states matter? For instance, would infants prefer those who try but fail to harm intentional hinderers to those who try but fail to help them? Would they prefer those who intentionally harm someone who only accidentally harmed someone else?

In a different form of context-specific evaluation, it is as of yet unclear to what extent the *relationship* between an agent and a patient influences infants' evaluations of intentional helping and hindering acts. For instance, if infants could identify a hindering agent as a "caregiver" of another agent, would they evaluate the hinderer differently? Adults regularly excuse (or applaud) caregivers' hindering acts, based on the assumption that the target needs protection rather than deserves mistreatment; it is an open question whether infants do the same.

Although the current results suggest that some form of domain-general development is responsible for previously observed developmental differences in context-dependent social evaluation, it remains unclear exactly what domain-general process is responsible, or whether it is a combination of several interrelated processes. Did 5-month-olds in Hamlin et al. (2011) fail to *encode* the prosocial and antisocial acts in Stimuli Phase 1? Or was it that they failed to *remember* who did what over the (very) brief delay during which the second puppet show was set up? Or was it the context-change from box to ball events that disrupted infants' *retrieval* of the puppets' past actions? Although young infants have some difficulty with each of these processes (Hayne, 2004), an encoding failure seems the least likely: infants succeeded at distinguishing Givers and Takers after observing only one of each behavior in Stimuli Phase 2, both here and in past work. Thus, it does not appear that 8-month-olds are simply more efficient processors of prosocial and antisocial actions in general. However, simple time-decayed forgetting versus context-disrupted retrieval are currently difficult to tease apart. Although there is a delay after Stimuli Phase 2 during setup for the Choice during which infants do not forget who did what in Stimuli Phase 2 (if they did they should not be able to distinguish Givers and Takers at all), the delay after Stimuli Phase 1 is longer, as it requires trading experimenters, exchanging stimuli, reading scripts to identify which puppets are involved, etc. If infants' memory for who did what is already weakened at the start of Phase 2, then the change in context with the introduction of a new puppet show might wash it away entirely. Future study might examine whether utilizing more-similar contexts across Phases would improve younger infants' performance.

Furthermore, these results raise the question of exactly what it is that infants in the current studies *habituate to*: upon habituation, what is contained in infants' internal representations of prosocial and antisocial box events? A representation of the acts themselves and their valence? A representation of the relationship between the helper and hinderer and the target of their actions? Or perhaps a representation of the evaluation of the helper's and hinderer's traits? Work with adults would suggest the latter (e.g., Todorov and Uleman, 2003); but young children do not readily predict future from past behaviors, presumably due to a failure to attribute traits (e.g. Boseovski and Lee, 2006). Future studies might explore these questions by examining infants' expectations for the future behaviors of helpers and hinderers. For instance, do infants see former helpers and hinderers as more likely to perform the same action again toward a new individual, to perform a similar action in such a way that it is no longer valenced, or to perform a different kind of action that is of the same valence?

Finally, demonstrating that 4.5-month-olds *can* evaluate others in context given sufficiently supportive methodological design should not be taken as evidence that they routinely do so in their daily lives. First, given their first-born status and very young age, it is relatively unlikely that our infants regularly (if ever) observe overtly antisocial behaviors directed at individuals whom they have also observed behaving antisocially; at least of the kind demonstrated here that involve neither valenced facial expressions nor linguistic cues. Even if such behaviors were to occur in infants' environments, everyday social observations presumably do not provide sufficient information to *habituate* infants to others' prosocial and antisocial acts, and the current studies demonstrate that habituation is required for young infants to demonstrate context-dependent social evaluation. Although this could be viewed as a limitation of this work, the present findings nonetheless suggest that given sufficient support, young infants' social evaluations share important commonalities with older infants' and children's, informing our understanding of the nature and developmental progression of social evaluation in infancy.

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The emergence of human prosociality: aligning with others through feelings, concerns, and norms

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The fact that humans cooperate with nonkin is something we take for granted, but this is an anomaly in the animal kingdom. Our species' ability to behave prosocially may be based on human-unique psychological mechanisms. We argue here that these mechanisms include the ability to care about the welfare of others (other-regarding concerns), to "feel into" others (empathy), and to understand, adhere to, and enforce social norms (normativity). We consider how these motivational, emotional, and normative substrates of prosociality develop in childhood and emerged in our evolutionary history. Moreover, we suggest that these three mechanisms all serve the critical function of aligning individuals with others: Empathy and other-regarding concerns align individuals with one another, and norms align individuals with their group. Such alignment allows us to engage in the kind of large-scale cooperation seen uniquely in humans.

Keywords: other-regarding concerns, empathy, normativity, altruism, evolution of prosociality, children, great apes

INTRODUCTION

The fact that people are kind to each other is something that most of us take for granted. We see numerous examples of it daily: motorists stopping to let pedestrians cross the street, people holding doors open for others, travelers carrying babies in buggies up staircases, passersby donating a few coins to charities or homeless people, colleagues regularly donating blood. More outstanding examples of prosocial behavior feature regularly in the news, particularly when the helper risks fatal injury to save someone else. Yet, despite their banality, these behaviors are spectacularly unusual when compared to other animals. Outsiders in a society of chimpanzees, for instance, would not expect to receive offers of food or solicitude; rather, they would be fiercely attacked. Even when well-integrated within a group, simple acts such as food sharing come only with begging and harassment (Stevens, 2004; Gilby, 2006). That is not to say that chimpanzees and other species do not engage in mutualistic, and sometimes coordinated, actions with one another. Social life is, for the most part, peaceful. But the fact that humans can interact in a peaceful, coordinated way, with a clear division of labor with unrelated individuals has earned our species the label (granted, a self-made label) of being ultrasocial (Szathmáry and Maynard Smith, 1995; Richerson and Boyd, 1998; Hill et al., 2009).

We see the hallmarks of ultrasociality in our children. They readily incorporate other children into their activities, they share with others (though sometimes under duress), they coordinate their actions with each other, they negotiate meanings, such as rules of games, and they help unfamiliar individuals achieve their goals. How does our ability to cooperate with each other emerge in development and how did it evolve?

In this paper, we address these questions by looking at three key psychological mechanisms. These are the abilities (a) to care about their welfare, (b) to feel with others and to understand how they feel (empathy), and (c) to learn, understand, and enforce

norms. We will address the ontogenetic question by reviewing the literature on prosocial behavior in children, and the phylogenetic question by examining findings in our closest living relatives, notably the great apes. The two questions are related: understanding the phylogenetic history of a trait can inform our understanding of its development (Hinde, 1966). The role of empathy in altruism has been discussed before (e.g., Batson, 1991; Hoffman, 2000; de Waal, 2009), but we expand on this by suggesting that empathy is not enough. The ability to empathize can equally lead to antisocial behaviors. Something else is needed to get prosocial behaviors to emerge from empathy. We suggest that this "something else" is an emotional, possibly innate, sensitivity to the needs of others coupled with a motivation toward their welfare. Furthermore, we will argue that norms add enormous complexity and richness to human prosocial behavior, making human prosociality and morality unique in the animal kingdom. We refer to our capacity to respond to the needs of others and to do so normatively as *alignment*, both to other individuals (other-regarding concerns and empathy) and to one's group (norms). Studying how alignment emerges through development will better enable us to see how the traits constituting it function; looking at our closest living relatives will inform our understanding of its evolution.

To explore the nature of alignment, we will first discuss prosocial behavior and show why preferences for outcomes that benefit others (positive other-regarding preferences) are a necessary feature. The limits of other-regarding concerns in explaining prosociality will also be considered. We will suggest that positive other-regarding concerns motivate behavior that is intended for the improvement of the welfare of others, and discuss the importance of empathy in aligning emotional states. We will then discuss the emergence of norms and their importance in shaping other-regarding concerns. Throughout, we will review the pertinent developmental literature, as well as the comparative

literature, to highlight how other-regarding concerns, empathy and a norm psychology could have evolved, as well as how they emerge ontogenetically. Finally, we will briefly speculate on the possible role of alignment that allows humans to be as social as we are.

PROSOCIAL BEHAVIOR

Prosocial behavior – that is, voluntary behavior that benefits others – seems to emerge very early in ontogeny, with some researchers arguing that it is a biological predisposition (Warneken and Tomasello, 2009a,b). Certainly by 14 months of age, infants help others in simple instrumental ways, such as by handing them out-of-reach objects (Warneken and Tomasello, 2007). During the second year, as children's cognitive capacities to understand others' goals and intentions increase, children are able to help others in a wider variety of tasks and in response to a wider array of cues (Rheingold and Hay, 1978; Warneken and Tomasello, 2006; Svetlova et al., 2010). Importantly, early prosocial behavior is not limited to completing others' action goals. Thus, when 12-month-old infants see an adult searching for an object that they know the location of, they point to direct the adult's attention to it (Liszkowski et al., 2006, 2008). Given that infants themselves do not gain anything by providing this information, their informative pointing may be considered a prosocial act.

Infants also begin to share objects by the end of the first year and their sharing behavior becomes more sophisticated during the second year of life (Rheingold et al., 1976; Hay, 1979; Brownell et al., 2009; Schmidt and Sommerville, 2011). Children as young as 3 years of age will share rewards and will do so with other children as well as adults (Thompson et al., 1997; Fehr et al., 2008; Moore, 2009; Rochat et al., 2009). Children at about 2 years of age require explicit communication from the recipient to elicit sharing, and even this is not sufficient to prompt much sharing in 18-month-olds (Brownell et al., 2009). Moreover, there are individual differences in how willing 15-month-old infants are to share at a cost to themselves (Schmidt and Sommerville, 2011). Nonetheless, the important finding is that young children share at all, since this is not the rational, self-interested thing to do[1]. Sharing is a particularly interesting form of prosociality because it is costly and because it is important for the evolution of human societies (e.g., Gurven, 2004). It is thus valuable to see how this behavior emerges throughout childhood.

Given the importance of prosocial behavior in humans, the question arises, how did it evolve? The extant species most closely related to humans (i.e., chimpanzees and other non-human primates) do engage in prosocial behaviors. In the wild, they come to the aid of their allies in fights (Harcourt and de Waal, 1992), they console the combatants afterward (de Waal and van Roosmalen, 1979) and they have been observed adopting orphans (Boesch et al., 2010). In experimental settings, they help humans

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[1]The suggestion from experimental economics is that people should be rational maximizers, namely that they should be interested only in outcomes that affect themselves. Sensitivity to outcomes for others is referred to as an other-regarding preference. For example, giving up money in a dictator game is a departure from rational self-interested maximization (Camerer and Thaler, 1995).

and conspecifics by retrieving out-of-reach objects on request (Warneken and Tomasello, 2006; Yamamoto et al., 2012), opening doors for conspecifics trying to access food (Warneken et al., 2007) and releasing food and non-food items when the recipient acts on the chain holding the reward or signals to the helper (Melis et al., 2010).

However, there is not very strong evidence from the field for food sharing in our closest living relatives. In most cases, in chimpanzees at least, food is shared only under harassment (Stevens, 2004; Gilby, 2006); even mothers will not voluntarily offer novel foods to their own infants unless the infants beg for them (Ueno and Matsuzawa, 2004). In the lab, chimpanzees do not show a preference for outcomes that benefit their groupmates (Silk et al., 2005; Jensen et al., 2006; Vonk et al., 2008). In these studies, chimpanzees were no more likely to choose an option that benefited another chimpanzee and themselves as well (mutualism) than an option that only benefited themselves (selfishness). Remarkably, there was never even a tangible cost, such as giving up some food. Chimpanzees thus seem to be more focused on their own outcomes, and in this sense, behave more like the theoretical *Homo economicus* (Frank, 1987) than do humans. Even in tasks where two subjects working together can both get food, mutualistic cooperation breaks down if the food is not easily divisible (Melis et al., 2006) in contrast to human children who will actively divide rewards after a collaborative task (Warneken et al., 2011). Whether this indifference to outcomes for others holds across different experimental paradigms (Horner et al., 2011) or different species (e.g., common marmosets; Burkart et al., 2007) is a matter of current debate.

Evidence for prosociality in other species raises questions of its own, namely: Are these behaviors similar to and underlain by the same psychological mechanisms as in humans (homologous, that is shared by descent), or do they only superficially resemble human prosocial behavior but are driven by different mechanisms (analogous – similar by selection pressures)? For example, consolation may be more effective at reducing the stress of the consoler rather than the consoled individual and can serve to reduce the likelihood of future attacks (Koski and Sterck, 2007; Koski et al., 2007). Chimpanzees in captivity might hand objects back to experimenters due to prior training and they might remove bolts to open doors and cause food to drop because doing so is an interesting distractor or because the begging and signaling from a conspecific is annoying. Even insects and fish will engage in prosocial behavior – both mutualistic and altruistic (Bshary et al., 2006; Ratnieks and Wenseleers, 2008), and very simple computer programs can appear prosocial (e.g., "generous" tit-for-tit; Wedekind and Milinski, 1996). It is therefore important to not assume that similar looking behaviors are indeed one and the same. Different underlying causes can lead to similar outcomes (for reviews, see Jensen, 2012; Jensen and Silk, 2014).

OTHER-REGARDING CONCERNS

It is difficult to infer what psychological processes lay behind a behavior such as helping, particularly with naturalistic observations. A single action can have multiple causes. A person seen carrying a suitcase off a train might be doing so to help the traveler reach his or her destination, but the goal might be

to run off with the suitcase once on the platform, to impress the traveler with the goal of arranging a date, or even out of spite after the traveler had just struggled to get the suitcase onto the train. An implicit assumption of other-regarding preferences and other prosocial acts is that they are motivated for their effect on other individuals (e.g., Warneken and Tomasello, 2008). However, this need not be the case. People can have ulterior motives. Acting out of self-interest can lead to unintended benefits for others (Adam Smith referred to this as the "invisible hand" guiding markets; Smith, 1776/2005). Selfish motives are particularly relevant in mutualistic interactions – both individuals benefit by working together, but consequences for the partner can be incidental to the actor's achieving his or her personal goals. Altruistic acts (functionally altruistic in terms of immediate costs and benefits to actor and recipient, not in the biological use of the term which is measured in fitness; West et al., 2007; Clavien and Chapuisat, 2013) are typically clearer demonstrations of actions performed for their effect on another individual, but even these need not be performed for the benefit of the recipient. The other individual can be used as a means to an end. If the end is one's own happiness ("warm glow" altruism; Andreoni, 1990), then any benefits to others can be unintended side-effects. This is hardly a starting point for truly prosocial behavior.

POSITIVE OTHER-REGARDING CONCERNS

As stated above, prosocial behavior can arise from a variety of mechanisms and be driven by a range of motivations, but for an act to be truly prosocial (other-regarding) in the sense that the intended goal is the benefit to the recipient, then the actor's motivation will have to be for the recipient's welfare (e.g., Batson, 1991). The stance toward the environment that impacts on an individual's well-being is a *concern* (Prinz, 2007). When the stance is toward the welfare of others, this is an *other-regarding concern*, and it is the motivational basis for truly prosocial behavior. There can be a cognitive component to prosocial behavior, such as recognizing the goals and desires of others, but there must also be a concern that has an emotional consequence – a felt response – for the actor (Nichols, 2004b; Prinz, 2007). Otherwise, there will be no impetus to act on the other's behalf. Recognizing that someone is in need is not sufficient to lead to helping. For example, seeing a homeless person on the street and recognizing that he needs money does not guarantee that one will give him any loose change, let alone invite him to move into one's home; some additional motivational force is needed to make one act in a truly prosocial manner. The felt response can be sensitive to the emotions of others, and these are called fortunes-of-others emotions (Ortony et al., 1988). If the emotions are the same as another person's – e.g., sad for sadness (empathic distress) and happy for happiness (symhedonia) – then they are aligned. Aligned (or congruent) fortunes-of-others emotions will motivate action if seeing someone in distress is distressing and will lead to satisfaction at seeing the welfare of the other improve. The child will seek to remove the source of distress – ideally by helping the distressed other – and will be reinforced by the satisfaction of others. The role of these emotional processes, notably affective resonance and empathy, in social and prosocial behavior will be discussed further in the next section.

While children do help others and share with them, they might not do so out of a concern for their welfare. For instance, they may do so simply because this is what they have been taught to do, along with shaking hands with the right hand and eating with a fork (a point that will be raised in the section on norms). Recent work has begun to address these alternative possibilities, at least with regard to instrumental helping. One line of work shows that young children's helping behavior is not influenced by parental presence or encouragement, and indeed, is undermined by external material reward, hinting that helping behavior may be intrinsically rather than extrinsically motivated (Warneken and Tomasello, 2008, 2013). Of particular importance to the role of emotions in prosociality, a recent study used physiological measures (pupil dilation) and found that 2-year-old children are not motivated primarily by a desire to help a person themselves (and thus to benefit themselves via reciprocity, an improved reputation or just an interest in engaging with the task), but rather by a desire just to see the person be helped, indicating that toddlers' prosocial behavior stems from a genuine concern for the other's welfare (Hepach et al., 2012a).

NEGATIVE OTHER-REGARDING CONCERNS

Other-regarding concerns are not always aligned. One can feel unhappy at the happiness or fortunate circumstances of others (jealousy and envy), and happy at their unhappiness or misfortunes (schadenfreude; Ortony et al., 1988). Misaligned fortunes-of-others emotions would hardly seem to be ingredients for prosociality. They can form the basis of negative other-regarding concerns, in which the actor is motivated to diminish the welfare of others. Negative other-regarding concerns can also lead to harming behavior, as in the case of sadists being able to grasp how their victims feel but deriving pleasure from their suffering.

Negative other-regarding concerns should not be dismissed simply as the evil twin of positive other-regarding concerns, however. They might also have a place in prosociality. They can motivate punishment, or negative reciprocity, in which harm is returned by harm; this is a powerful disincentive to free-riders who would otherwise exploit prosocial individuals (Boyd and Richerson, 1992; Clutton-Brock and Parker, 1995; Jensen, 2010). In economic experiments such as the public goods game, cooperation – in terms of contributions to a public good – declines quickly with repeated rounds, but with the addition of a punishment option – which is costly for the punisher but provides a benefit for everyone – cooperation can be sustained at a high level (Fehr and Gächter, 2000, 2002; Gürerk et al., 2006). Punishers often feel angry at being cheated (e.g., Pillutla and Murnighan, 1996; Ben-Shakhar et al., 2007) and people (men, at least) will show neurological signatures of pleasure when seeing someone who cheated them apparently receive a painful stimulus (Singer et al., 2006). Negative other-regard, then, can have hedonic value for the punisher, and in the right circumstances, such as when encountering cheaters and free-riders, motivate punishment that is costly at the time it is performed, but can ultimately lead to more prosociality. More generally, punishment is an important means to enforce norms and cooperation, a topic that will be addressed in the section on norms.

It may be the case that other-regarding concerns – both positive and negative – motivate social behavior. Negative other-regarding concerns can be thought of as the spice that accompanies the sugar in everything nice. Our attention will now turn to the emotional substrate for positive other-regarding concerns, both because this has been much more studied in children and because it is of clear and direct value to prosociality.

EMPATHY

One of the most fundamental sources of prosocial motivation is thought to be empathy, which is an affective response that stems from the apprehension or comprehension of another's emotional state and is similar to what the other is feeling, and the related process of empathic concern (or sympathy), which is the feeling of concern or compassion for the other (Hoffman, 1981; Eisenberg, 1986; Batson, 1991; Eisenberg et al., 1991). From early in ontogeny, empathy, and especially empathic concern, have been extensively shown to lead to prosocial behaviors and away from antisocial behaviors (Eisenberg and Miller, 1987; Miller and Eisenberg, 1988; Hoffman, 2000). To understand the nature and origins of truly prosocial behavior, therefore, it is imperative to understand the nature and origins of empathy-related processes. This is the aim of the next section, in which we will describe the fundamental components of empathy and empathic concern, and assess the developmental and comparative evidence for those components.

AFFECTIVE RESONANCE

From the very beginning of life, humans are deeply tuned to the affective states of others. Newborn infants mimic others' facial expressions and gestures (Meltzoff and Moore, 1977; Haviland and Lelwica, 1987). They also respond by crying when they hear another infant in distress but not when they hear other equally loud sounds or recordings of their own cries (Simner, 1971; Sagi and Hoffman, 1976; Dondi et al., 1999). Such automatic and involuntary emotional contagion persists through the first year (Geangu et al., 2010). From the very start of life, then, humans are deeply connected to others' internal states, suggesting that this capacity is hard-wired and may be evolutionarily preserved (de Waal, 2008; Decety, 2011). Indeed, mimicry of facial expressions as well as emotional contagion are seen not only in human infants but also in great apes and several other social species (Parr, 2001; Bard, 2007).

Such affective resonance – which is thought to be based on automatic perception-action processes and the mirror neuron system – aligns individuals' internal states with those of others and, as such, is foundational to countless aspects of social life, ranging from mother-infant bonding, regulating social interactions, and coordinating activities (McDougall, 1908/2003; Blakemore and Decety, 2001; Preston and de Waal, 2002; de Waal, 2008). To take just one example, if one monkey in a group sees something dangerous, such as a snake, he is aroused and produces an alarm call, which produces arousal in his group members and leads the group to move away from the source of danger en masse (Cheney and Seyfarth, 1985). Crucially, though, this phenomenon does not constitute empathy or empathic concern and is not sufficient to motivate prosocial behavior, as discussed next.

DISTINGUISHING SELF FROM OTHER

When an observer shares the affective state of a target, she experiences a greater or lesser degree of the same or a similar affective state as the other. When this happens and no other mechanisms are at work, the observer will not experience the affect as vicariously induced but rather as being her own and rooted in her own situation, and will thus be motivated to regulate and respond to her own affective state (e.g., by escaping the situation that is causing her distress; Batson, 1991; Eisenberg et al., 2006). In such scenarios, it is unclear what the observer's motivation would be to respond to the target's affective state (unless doing so is the only way she could reduce her own arousal). For the observer to identify her affective state as being rooted in the target's rather than her own situation, the observer must distinguish herself from the other and her own internal states from those of the other. This sense of self as distinct from others is considered essential for affective resonance to become empathic responding (Hoffman, 1976, 2000).

Such self-other distinction is typically tested by mirror self-recognition (MSR), wherein a small mark is surreptitiously placed on an individual's face and the individual's behavior in front of a mirror is assessed (Gallup, 1970; Amsterdam, 1972). If the individual shows self-directed behavior (e.g., touching the face), she is thought to have a concept of self as distinct from and in relation to others (see Moore, 2007, for a discussion). Note, however, that other authors have questioned this rich interpretation, arguing, for instance, that MSR indicates an awareness of one's physical appearance but not a more conceptual awareness of the self (e.g., Suddendorf and Butler, 2013).

In humans, MSR starts by around 18 months of age (Amsterdam, 1972) and has been shown to coincide with the beginning of other-directed and appropriate prosocial behavior (Bischof-Köhler, 1991; Zahn-Waxler et al., 1992a). However, some authors have recently questioned whether the ability to experience empathy requires the kind of explicit, reflective self-knowledge tested by MSR (Davidov et al., 2013). These authors propose that a simpler, more implicit form of self-recognition may be sufficient for empathy, and that this form of self-recognition (based on the infant's subjective experience of her own sensory perception and self-generated actions) is present from birth (see also Lewis and Brooks-Gunn, 1979; Rochat, 2003). The suggestion is that from the very beginning of life, humans are not only affectively tuned to others' states but, with the aid of simple and implicit social-cognitive tools, are able to empathize with them. This fundamental capacity stays with us through development and indeed throughout our lives. What changes and improves with development is the ability to mentalize, as well as the child's knowledge about the world, both of which facilitate the child's ability to help those in need and respond in more complex situations such as when a victim is absent or when a victim's immediate cues are inconsistent with the general state of the victim (Davidov et al., 2013).

Support for this proposal comes from recent findings showing that infants as young as 8–10 months do show concern for victims displaying distress, as measured in the infants' facial expressions, vocalizations, and gestures (Roth-Hanania et al., 2011). Moreover, while the level of empathic concern does not increase between 8

and 16 months of age, infants' "cognitive empathy" (or attempts to explore and comprehend the others' distress, akin to a basic theory of mind) does seem to increase gradually over this time period (Roth-Hanania et al., 2011). Other work has also shown that when self-understanding is defined more broadly than MSR (e.g., self-description as seen in the use of own name, use of words such as "me" and "mine"), it relates positively with the degree of empathic concern that children as young as 12 months show for a distressed peer (Nichols et al., 2009).

There is thus some reason to think that empathy could exist even in the earliest stages of infancy. If correct, this proposal may have wide-reaching implications. It implies, for instance, that empathy is a fundamental part of the human make-up. As such, it also suggests that not only affective resonance but also empathy may have deeper evolutionary roots than previously believed. For instance, thus far, the only primate species to reliably show MSR have been the great apes; lesser apes (gibbons) and monkeys seem to differentiate between their own and another monkey's image in the mirror but fail the formal mark test (de Waal et al., 2005; Suddendorf and Collier-Baker, 2009); this suggests that the capacity for visual self-recognition evolved in a common ancestor of all great apes after the split from the line that led to modern lesser apes (Suddendorf and Collier-Baker, 2009; Suddendorf and Butler, 2013). The conclusion from such findings has been that this prerequisite for empathy is limited to the great apes and humans and is thus relatively recent in our evolutionary history. However, if a more implicit sense of self exists and can fulfill some of the same functions as a more reflective sense of self, then it is possible that many more social species than previously believed have at least one of the prerequisites for empathy (cf. de Waal, 2008), though this certainly need not imply that they necessarily have empathy or empathic concern.

EMPATHY AND EMPATHIC CONCERN

The abilities to experience affective resonance and to discriminate between self and other are the essential ingredients for empathy, which is the affective response that stems from an apprehension or comprehension of another's emotional state and is similar to what the other is feeling. However, knowing how another feels via a mechanism such as empathy may be necessary, but is not sufficient, for prosocial behavior motivated out of concern for the welfare of others. This is because *knowing* how the other feels is not the same as *caring* how the other feels. This requires positive other-regard (as discussed above), which has the powerful capacity to bring about empathic concern wherein the observer not only feels as the other feels and identifies the other as the source of the feeling but also *cares* what happens to the other and is therefore *motivated* to enhance the welfare of the other. Notably, this means an alignment not only of the observer's and target's affective states but also of their goals and motivations: Both the observer and the target are invested in and affected by the target's welfare and both are thus motivated to improve it (Hepach et al., 2013; Vaish and Tomasello, 2014). We now have the ingredients in place for empathic concern (or sympathy), which provides a fundamental motivational force for prosocial behavior.

Decades of research show that toddlers and young children respond with empathic concern toward others and that this empathic concern motivates prosocial behavior. Typically, infants see a person (parent or stranger) experience a negative situation (bumping her knee against a table, for instance) and overtly showing pain, distress, or sadness. In such situations, infants as young as 14 months of age show concern in their facial and vocal expressions and often attempt to alleviate the victim's distress by comforting, helping, or sharing with her (Eisenberg et al., 1989; Zahn-Waxler et al., 1992a,b; Svetlova et al., 2010). Moreover, the empathic concern that infants and toddlers show in these situations correlates positively with their prosocial behavior toward the victim (Hoffman, 1982; Eisenberg and Miller, 1987), indicating that empathic concern serves prosocial motives from early in ontogeny. This work provides evidence for an early capacity to experience empathic concern stemming from affective resonance whereby children automatically share the victim's affect, distinguish between self and other, and, in conjunction with positive other-regard, experience empathic concern for her.

Whether empathic concern is present even during the first year (with the aid of implicit self-recognition capacities) is an open question. As noted earlier, some recent work suggests that infants as young as 8–10 months show concern for others displaying distress (Roth-Hanania et al., 2011; see also Nichols et al., 2009). Certainly by the second year, human children experience other-directed empathic concern and this concern motivates their prosocial behavior toward those in need.

The story is far less clear when it comes to empathic concern in the great apes. As discussed above, a sense of self is present in the great apes, but other-regard may or may not be, making it difficult to formulate a clear hypothesis about whether empathic concern could or could not exist in these species. A recent experimental study aimed to directly test whether empathic concern motivates prosocial behavior in the great apes (Liebal et al., 2014; based on a similar study with children by Vaish et al., 2009). In this study, subjects saw a conspecific being either harmed (a human experimenter stole the conspecific's food) or not being harmed (no food was stolen from the conspecific). Subsequently, subjects had the opportunity to provide help to the conspecific in a new task. The logic was that if subjects experience empathic concern for a conspecific who is harmed (versus one who is not harmed), then this concern should motivate their subsequent prosocial behavior toward the conspecific. The results did not support this hypothesis, as apes helped their conspecific equally if he had previously been harmed than if he had previously not been harmed, suggesting that their prosocial behavior was not motivated by empathic concern. However, much more work is needed to rule out alternative explanations. For instance, perhaps the harm situation was simply not serious enough to elicit concern in the subjects. Equally, perhaps apes do experience concern for others but this concern does not necessarily translate into helping behavior of the kind measured in the study; instead, perhaps apes would be more likely to groom or console a conspecific for whom they felt empathic concern (Liebal et al., 2014).

Empathy has been attributed to numerous other species as well. For instance, recent studies, in line with decades-old research

(Church, 1959; Rice and Gainer, 1962), conclude that mice and rats are empathic because they exhibit heightened pain responses after seeing conspecifics in pain (Langford et al., 2006) and altruistically open doors to release conspecifics trapped in tubes (Bartal et al., 2011). However, we must be cautious in our interpretations here because there is no reason to believe that empathic concern, or even more "primitive" emotional contagion, are involved. Like rats, ants show releasing behaviors, and there is nothing to suggest that an emotional mechanism tuned to the welfare of others is involved there (Nowbahari et al., 2009; Vasconcelos et al., 2012). Furthermore, even if the rats did experience emotional contagion, the "helping" rat did not have an alternative, such as escaping to avoid the distressing stimulus of a stuck rat, a key element of empathy–altruism studies on adults (e.g., Batson et al., 1981). Moreover, the helper might simply be curious, especially given that after the rats have opened the tube door, they often go inside and explore it, or they might have been seeking social contact (Silberberg et al., 2014). These issues must be given special consideration when studying animals most akin or familiar to us due to our tendency to anthropomorphically project human characteristics onto other species (Wynne, 2004; Barrett, 2011).

Overall, then, humans demonstrate empathic concern from as early as the second year of life and such empathic concern motivates their prosocial behavior toward victims. However, the jury is still out as to whether empathic concern may occur even earlier in human ontogeny as well as about whether it occurs at all in other species, including our closest living relatives.

BEYOND AFFECTIVE RESONANCE

Our discussion of empathic concern has thus far focused on empathic concern grounded in the fundamental capacity for affective resonance. That is, when an observer attends to a target in pain or distress, he experiences resonant affect that, with the aid of self-other discrimination and other-regard, can become empathic concern. But humans (at least) have higher cognitive capacities that allow us to experience empathic concern even without affective resonance. Perhaps most prominently, even when we have no perceptual access to a target's emotional state, our ability to take others' perspectives allows us to imagine how the target might be feeling and perhaps experience empathy as a result. As noted earlier, knowing how another feels (either through affective resonance or perspective taking) is not sufficient to elicit concern or prosocial behavior. However, in conjunction with positive other-regard, imagining or understanding how another feels can enable us to experience empathic concern for the other (Feshbach, 1978; Hoffman, 1984; Eisenberg et al., 1991; Batson et al., 1997; Ruby and Decety, 2004).

Interestingly, even when we do experience affective resonance in response to overt perceptual cues, we are able to use our contextual appraisal abilities to modulate our empathic concern as appropriate (e.g., Lamm et al., 2007a,b). For instance, if adult participants are made to believe that the hands they see in painful situations have been anesthetized, their empathic concern is significantly dampened compared to when participants do not believe the hands are anesthetized (Lamm et al., 2007b)[2]. Such processes act as *top-down* generators and modulators of empathic concern, adding tremendous scope and flexibility to our empathic system by ensuring that we are able to respond empathically – and thus prosocially – in diverse situations and toward diverse victims (Hoffman, 2000; Decety and Lamm, 2006; Singer and Lamm, 2009; Decety, 2010; Vaish and Warneken, 2012).

Recent work provides evidence for this extended scope and flexibility even in young children's empathic concern. One line of work has explored whether children can experience concern even in the absence of any perceptual access to a victim's distress. In one study, 6-year-old children who observed an adult being harmed (another adult destroyed her artwork) showed expressions of concern for her even though she did not display any distress (Hobson et al., 2009). A further study found that even 18- and 25-month-old children showed greater facial concern for an adult who was harmed but displayed no distress than for an adult who was not harmed. Moreover, when the adult subsequently needed help, children were more prosocial toward her if they had previously seen her being harmed than not being harmed, and individual children's concern while seeing the adult being harmed correlated positively with their subsequent prosocial behavior (Vaish et al., 2009; see also Vaish et al., 2010b). These studies show that human empathic concern is multi-determined (evoked in response to several types of cues – both emotional and situational) from early in development.

In a second line of work, researchers have begun examining whether contextual appraisal plays a role in children's empathic concern. In one study, 3-year-old children showed reduced concern and subsequent prosocial behavior toward a "crybaby," i.e., a person who was considerably distressed after being very mildly inconvenienced, than toward a person who was similarly distressed after being more seriously harmed (Hepach et al., 2012b; see also Leslie et al., 2006; Chiarella and Poulin-Dubois, 2013). Thus, young children's empathic concern is impacted by not only the presence or absence of distress cues from a person but also the contextual cues surrounding the distress.

To sum up, top-down processes such as perspective-taking and contextual appraisal add scope and flexibility to humans' empathic concern from an early age (certainly by the middle of the second year). This allows even young children to, on the one hand, align their affective states with those of others in a broad array of situations and in response to various types of cues, and yet, on the other hand, have the flexibility to modulate their empathic concern so that they can direct their concern and prosocial behavior toward those who truly need it. This sophistication in early empathic concern speaks to the complexity of human social interactions and the vital role played by empathic concern in allowing for and regulating such interactions.

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[2]Note that such modulation of empathic concern – and indeed all empathic concern – additionally requires the ability to regulate one's emotions, which allows one to modulate and regulate one's emotional response as appropriate. We will not deal with this vast topic here but the interested reader is referred to the theoretical and empirical work of Eisenberg and colleagues (Eisenberg and Fabes, 1990, 1992; Eisenberg, 2000; Eisenberg et al., 2006; Eisenberg and Eggum, 2009; see also Koski and Sterck, 2009, for a discussion of the emotion regulation capacities of chimpanzees).

Whether empathic concern with such scope and flexibility may be available to any other species is as yet unknown. Before tackling this question, however, it would seem much more fruitful for future work to examine whether or not empathic concern through affective resonance exists in other species. This is because if any form of empathic concern is likely to exist in other species, we think it is most likely to be empathic concern that arises out of affective resonance – given that the foundations for such empathic concern lie in the automatic, perception–action mechanisms that all social species share (Preston and de Waal, 2002). As mentioned above, the first experimental test of empathic concern in the great apes failed to find evidence for such empathic concern (Liebal et al., 2014), but much more work is needed to draw firm conclusions. More multi-determined and flexible forms of empathic responding require higher cognitive (and emotional regulation) skills that the great apes may or may not possess (see Call and Tomasello, 2008; Koski and Sterck, 2009). Our prediction here is that if any empathic concern exists in species other than humans, it will be the most fundamental kind – evoked by overt emotional signals and via affective resonance – and that much more complex and sophisticated forms of empathic concern may well be unique to humans.

So far, we have been concerned with alignment on the interpersonal level, that is, alignment with others through empathy and empathic concern. Humans also interact on the impersonal level (e.g., in third-party interactions), that is, they align with their group through social norms; this is the topic of the next section.

NORMS

Human infants are born in a world replete with normativity. Thus from early on, the young learner needs to make sense of human social interactions in a given cultural context and discern which actions (e.g., hitting someone else) are generally prohibited or prescribed (and thus come with binding force or "oughtness") and which actions (e.g., petting a dog) are merely idiosyncratic and thus not subject to norms. But when and how can the young learner make and understand this distinction? And how do empathy and other-regard interrelate with children's developing norm psychology? In what follows we will first describe some important theoretical and conceptual aspects of social norms and then look at evidence suggesting that even young children have a robust understanding of social norms.

There are many different ways to describe social norms, but perhaps the most crucial features are their *binding force* – that is, people "should" or "ought to" perform certain actions in certain contexts, thus have reason to act in certain ways (Searle, 2001) – and their *generality* – that is, norms apply to all participants of a social practice alike (Nagel, 1970). Thus, we have *normative expectations* about how people ought to act in certain situations in our cultural group (Chudek and Henrich, 2011). An important consequence is that social norms help and even urge us to align with our group members, and so they are essential to social order – at least by making others' behavior more predictable, albeit not necessarily more cooperative or moral (Elster, 1989). For example, codes of honor or dress norms (e.g., wearing ties at office) need not make people more cooperative, but one can predict what is likely to happen in a certain situation. Moreover, there are many

conflicting norms, for example, about how to allocate resources in a society (e.g., in egalitarian vs. utilitarian ways), and these conflicting norms are frequently obstacles to compromise at different levels within a society. Here, we suggest, is the important role of human other-regard and empathetic competencies in both the ontogeny and phylogeny of human norm psychology and morality. But before examining the interrelations between other-regard, empathy, and normativity, we first need to know what young children actually understand about social norms as entities that come with binding force and generality – not least because morality is essentially based on norms (Piaget, 1932).

NORMATIVE FORCE AND GENERALITY

There is a rich literature on children's moral knowledge – starting with Piaget's (1932) pioneering work – that is, their judgment of norm transgressions in hypothetical scenarios, suggesting that by 3–4 years of age, children make robust distinctions between existing conventional norms (e.g., proper classroom behavior) and existing moral norms (e.g., the prohibition to hit someone else). In particular children have been repeatedly shown to categorize moral transgressions as more severe, less dependent on context, less contingent on authority, and more deserving of punishment than conventional violations (Smetana, 1981; Turiel, 1983; Killen and Smetana, 2006; Killen and Rutland, 2011).

The focus here, however, is on children's normative judgment in action, that is, on their understanding of the force and the generality of norms in social interactions. The reason for this is twofold. First, normativity is fundamentally about human actions and therefore about practical norms that give people (normative) reasons to act in certain ways (distinct from reasons to think in certain ways; Wallace, 2011); thus, the question of whether children understand the force and generality of norms can be answered best by assessing whether they, as unaffected observers, demand from third parties to act in certain (prescribed) ways[3]. Second, looking through an evolutionary lens, it is primarily "adaptive" social actions that are relevant for natural selection (Vaish and Tomasello, 2014) such that some kind of coordinative, cooperative, and moral behaviors made some hominin ancestors, or groups, more successful than others (Alexander, 1987; Krebs, 2008; Tomasello et al., 2012). In what follows, we will look at children's enforcement of conventional and moral norms and the importance of these types of norms for processes of alignment.

CONVENTIONAL NORMS

We live in a world of traditions, customs, and existing social practices, so it can be easy to forget that norms are essentially socially constructed facts that could have been different (i.e., they are arbitrary). We typically follow conventional norms and this leads to alignment with one's group. For instance, we drive on a particular side of the street, dress in certain ways in certain contexts, or greet each other in certain ways. However, mere norm adherence does not tell us whether individuals are committed to the norms or just intend to avoid sanctions. Enforcing (often arbitrary) conventional norms as an unaffected observer, however, not only fosters

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[3]This is not to say that there is not a close link between moral knowledge and moral action or using one's moral knowledge (but see Blasi, 1983, for the intricacy of this relation).

group-wide alignment, but also entails some "impersonal prosociality" on the part of the enforcing group member as it indicates that the individual cares about the group's values and ways of doing things *per se*, not just about whether they serve the self (Rossano, 2012; Schmidt and Tomasello, 2012). Hence, our understanding of the development of prosocial behavior can be greatly enriched by our understanding of the emergence of conventional norm enforcement.

A recent line of research has used an action-based approach to assess children's normative understanding. Investigators put children into social situations in which different types of third-party norm transgressions occurred (typically committed by puppets). Thus, it was possible to examine children's understanding of the force and the generality of norms by dint of their spontaneous (verbal and behavioral) interventions against norm transgressors.

This line of research has found that by 2–3 years of age, children criticize and protest conventional norm violations, for instance, when third parties break the rules of a simple game; in particular, 3-year-olds often use normative language (e.g., "This is how it is done!") when reprimanding others (Rakoczy et al., 2008). Moreover, children preferentially enforce novel conventional norms they learn from adults rather than from peers, and from reliable versus unreliable models (Rakoczy et al., 2009, 2010). Interestingly, young children do not need explicit teaching, ostensive cues (Gergely and Csibra, 2006; Csibra and Gergely, 2009, 2011), or normative language by the model to infer that an act is normative and culturally relevant: Schmidt et al. (2011) found that 3-year-old children learn novel conventional norms by mere incidental observation of a confident adult that does not perform a game-like action for the child's benefit. Hence, young children are not only adept at following conventional norms, they even enforce them when third parties transgress, thus providing evidence for an early impersonal prosociality.

MORAL NORMS

Alignment with group members occurs not only by means of conventional norms but also moral norms (e.g., against harming one another), many of which help sustain human cooperation and suppress individuals' self-interest (Joyce, 2006; Krebs, 2008). As with conventions, group members not only follow these norms, but they also enforce them against third-party transgressors. On a functional level, enforcement of such norms is considered prosocial or costly because the enforcer provides the group with a benefit but risks retaliation (Fehr and Fischbacher, 2004; Kurzban et al., 2007). Some norms (often considered moral) carry more normative weight than others – that is, some violations cause particularly strong emotional reactions in unaffected observers (Nichols, 2004a; Rossano, 2012). And the normative weight of a given norm is adjusted by other-regard and empathy (observers need to be moved at all by some action), and by the collectivistic and normative understanding (e.g., "One should not harm others") that feeds back into the process and reinforces other-regard and emotional reactions to norm violations in a cultural context.

Recent work has found that by 3 years of age, children protest violations of moral norms, such as those against destroying or throwing away others' property (Vaish et al., 2010b; Rossano et al., 2011). Preschool-aged children also direct less helping toward

harmful individuals and prefer (verbal) punishment to be directed at immoral individuals rather than at victims (Vaish et al., 2010a; Kenward and Dahl, 2011; Kenward and Östh, 2012). Another recent study shows that 3- and 5-year-old children will punish puppets that violate a moral norm (theft) by making the stolen object inaccessible to all individuals, or restoring them to the original owner when that option exists (Riedl et al., in preparation).

Typically, moral norms are considered wide in scope and thus applicable to virtually all people (Turiel, 1983; Korsgaard, 1996; Scanlon, 1998), whereas conventional norms are narrow in scope and thus applicable only to those who (implicitly or explicitly) agreed on them (Searle, 1995; Diesendruck and Markson, 2011). The nature of this distinction is highly debated, with some arguing for a categorical divide and conceptually distinct domains (Turiel, 1983) and others suggesting a distinction between norms accompanied by strong feelings (e.g., norms prohibiting harm, but also disgusting actions) and norms without or with less emotional involvement (Haidt et al., 1993; Nichols, 2002, 2004b; Kelly et al., 2007). What is clear, however, is that moral and conventional norms are distinct along at least some dimensions.

Indeed, a wealth of interview studies have shown that children and adults show systematically different response signatures when confronted with hypothetical vignettes about paradigmatic moral versus paradigmatic conventional norm violations (Smetana, 1981; Turiel, 1983; Tisak and Jankowski, 1996; Turiel, 2002, 2006). Most importantly, moral transgressions are categorized as more severe, more deserving of punishment, and less contingent on authority or context. But how do young children understand the scope of moral versus conventional norms? Who *ought* to follow these norms – any third party or ingroup members only? A recent study investigated this question and found that 3-year-olds show systematically different patterns of norm enforcement in response to violations of paradigmatic conventional and moral norms: Children protested violations of moral norms (against destroying another's property without any obvious reason) equally for ingroup and outgroup individuals, but they enforced conventional norms (about simple game rules) for ingroup members only (Schmidt et al., 2012). Thus, children recognized that conventional norms are group-specific in nature and therefore apply only to ingroup members who can be expected to respect them.

The space of morality, however, is not confined to people having obligations to perform or refrain from certain acts. People also have rights that are mutually recognized (Turiel, 1983; Helwig, 1997; Killen and Smetana, 2006). And the key feature of a right or entitlement is that they are inherently linked to obligations by others and hence create normative constraints on others' conduct (Rainbolt, 2006; Searle, 2010): When some right-holder R is entitled to do something (e.g., to use someone's property), then others are obligated not to interfere with R's entitlement. A recent study examined young children's understanding of rights in different contexts and found that 3-year-olds, as unaffected observers, enforce and defend a right-holder's legitimate entitlements (e.g., being granted permission to use an object by the owner of that object) against someone who threatened the right-holder's entitlements, for instance, by taking away an object (Schmidt et al., 2013).

Fairness – for instance the principle of equality – is particularly important in discussions of conventional and moral norms (Rawls, 2001) and has long been a topic of interest in the study of moral development focusing on distributive justice (Piaget, 1932; Hook and Cook, 1979). Expectations about fairness appear early in development and may be linked to prosociality. For instance, Schmidt and Sommerville (2011) found that 15-month-old infants expect resources to be distributed equally, and importantly, that these third-party expectations are closely linked to infants' own other-regarding sharing behavior: Infants who share altruistically (part with a toy they prefer) are more concerned about fairness than infants who share selfishly (part with a toy they do not prefer). This interrelation between fairness and other-regard was found for costly sharing behaviors in 12- and 15-month-old infants, but not for *prima facie* less costly instrumental and informational helping behaviors (Sommerville et al., 2013).

The ultimatum game is the most widely used tool for probing fairness preferences in adults (Güth et al., 1982). In this game, one "player," the proposer, has an endowment that can be shared with the second player, the responder. If the responder accepts the offer, both get the proposed division, but if he or she rejects it – out of a sense of perceived unfairness – both get nothing. Four-year-olds make fair offers in response to the threat of rejection (Takagishi et al., 2010) and this strategic decision-making continues to improve between 6 and 14 years (Steinbeis et al., 2012). Of particular importance is the rejection of unfair offers due to disadvantageous inequity aversion (e.g., Fehr and Schmidt, 1999; Falk and Fischbacher, 2006). Five-year-old children do reject unfair offers in a reduced form "mini" ultimatum game in which there are paired choices (e.g., 50/50 vs. 80/20). Unlike adults (Falk et al., 2003), however, the children do not show sensitivity to outcomes, nor even to the intentions of the proposer, but rather attend to a particular sharing norm, namely that parity constitutes fairness (Wittig et al., 2013). The details of what constitutes a fair offer is not universal – offers of 50% are not found in all cultures, and people in different cultures do not always punish offers that depart from this (e.g., Henrich et al., 2006). However, in ultimatum game studies, children will punish personally unfair offers (disadvantageous inequity aversion), even though it is costly to do so (for other examples, see also Murnighan and Saxon, 1998; Bereby-Meyer and Fiks, 2012). Surprisingly little is known about how children in different societies understand fairness (e.g., Rochat et al., 2009; Zebian and Rochat, 2012; House et al., 2013)[4].

In sum, the research reviewed here suggests that young children are highly motivated to seek out social norms, to acquire them, and perhaps most importantly, to enforce them as unaffected observers. They apply both the normative force and the generality of norms. Still, they make important distinctions and apply norms selectively depending on context and scope. And so they also appreciate the conventionality of many norms (e.g., the group-specificity of conventional norms). Young children's normative learning is guided by rational principles as they take

into account social-pragmatic and contextual cues (e.g., they preferentially learn from competent models). Hence, these findings from diverse domains of normativity suggest that young children already have a basic understanding of important properties of our normative reality.

LEARNING NORMS

In children, normative learning most likely capitalizes on early infant–caregiver interactions, including ritualized behaviors, sharing affective states in joint activities, and reciprocal imitation (Tomasello et al., 2005; Rochat, 2007; Rossano, 2012). Importantly, infants and young children can also use second- and third-party emotional appraisal (i.e., external sanctions and reward) as a compass for what others (their culture) understand as normative. For instance, a caregiver might show a strong emotional response when one child hits another (Smetana, 2006). However, the young learner actively makes sense of these situations with capacities for other-regard, empathy, and normativity, so this is not a unidirectional process of cultural–emotional conditioning (Prinz, 2007), but an interaction of the child's predispositions (i.e., empathic concern and norm psychology) and the respective normative-cultural context (Turiel, 1998; Smetana, 2006).

Once children have aligned with their group and internalized the group's norms, they may also apply personal emotional appraisal (i.e., internal sanctions or reward) such that they may even judge their own transgressions negatively and punish themselves through guilt and shame, and may reward themselves for having lived up to a social norm via pride (e.g., Zahn-Waxler and Kochanska, 1990; Barrett et al., 1993; Tangney et al., 2007). Such emotions are important for self-regulation, serve as motivations to act normatively in the future (Kochanska and Aksan, 2006), and help children follow the norms of the group more generally. (It remains to be seen whether other animals, great apes in particular, experience self-conscious emotions; dogs will show an anticipation of punishment that can be confused with – but is not – guilt; Horowitz, 2009.) Beyond experiencing self-conscious emotions such as guilt, young children also show a preference for and distribute more resources to transgressors who display guilt than those who display no guilt, suggesting they understand the important appeasement functions that guilt serves after norm violations (Keltner and Anderson, 2000; Vaish et al., 2011). It is important to note here that although third-party and personal emotional appraisals are a vital aspect of normativity, they can only explain children's adherence to norms, not their motivation for enforcing norms, since these require the alignment mechanisms based on other-regard and empathy discussed above.

THE EVOLUTION OF NORMS

The important evolutionary question is when in human history did the key mechanisms for normativity – namely their binding force and generality – evolve. At present, there is no evidence that primates have anything resembling norms. They do follow sanction-based "rules" in their groups, such as "subordinate individuals do not take food away from dominants," but there is nothing binding or general about these. Individual learning and fear of retaliation is sufficient. Primates have been said to have a "respect for possession" in which dominant individuals will not

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[4]Chimpanzees and bonobos do not reject unfair offers when tested with the ultimatum game (Jensen et al., 2007a; Kaiser et al., 2012; Proctor et al., 2013), though some non-human primates sometimes reject food when a partner receives better (Brosnan and de Waal, 2003; though see, for example, Bräuer et al., 2009).

take food from subordinates (Kummer and Cords, 1991), but this is, of course, not a normative notion, and a rather crude analogy to the normative institution of ownership in humans. In chimpanzees, for instance, subordinates will vocalize loudly in response to food theft, calling the attention of the group, which might chase or threaten the food "thief."

There has been some suggestion that some individuals (dominants) in non-human primates will "police" their social groups by intervening in fights (Flack et al., 2006; von Rohr et al., 2012). However, in the only experimental test of third-party punishment, dominant chimpanzees did not punish a third-party "violation" – namely one individual taking food – even when the "victim" was genetically related to the impartial observer and the observer was dominant to the "thief" (Riedl et al., 2012)—even though they did "punish" by collapsing a food table when their own food was taken (Jensen et al., 2007b). Any policing or punishment in non-human primates and other animals does not need to appeal to normativity or impersonal group concerns. Yet, despite this, groups of animals, including chimpanzees, can exhibit regional differences in behavior – traditions – that some authors refer to as cultures (e.g., Whiten et al., 1999). They do learn socially from their groupmates in a way that might support the emergence of culture, or something akin to culture (e.g., Horner et al., 2006; Hopper et al., 2011; van de Waal et al., 2013), but there is considerable debate as to whether social learning is even necessary (e.g., Tennie et al., 2009; Langergraber et al., 2010). Chimpanzees and other non-human primates, then, might not have the evolutionarily more recent elements for normativity, but they have some capacity for social learning that is certainly essential. When and how the key elements of normativity evolved remains an open question (for one possibility, see Tomasello et al., 2012).

DISCUSSION

We have argued that two forms of social alignment – alignment with other individuals (interpersonally) and with the group (impersonally) – form the bases for human morality and prosociality. We align ourselves with other individuals by way of empathy and other-regarding concerns, especially empathic concern, which allow us to feel with and for others. And we align ourselves with the group by way of normativity. These two forms of alignment are intricately linked, and they together give rise to uniquely human forms of prosociality and cooperation, both at a small scale, namely families and tribes, and at a large scale in groups of unrelated strangers. Empathy, other-regarding concerns, and norms lead to alignment, and group-wide alignment on interpersonal and impersonal levels is not merely an outcome, but also feeds onto individual human psychology. This, in turn, changes the social dynamics of human group life (in stark contrast to, say, chimpanzee group life). Though some other species – in particular the great apes – might align themselves interpersonally with other individuals via affective resonance, they might not be able to do so via empathic and other other-regarding concerns, and there is no evidence to suggest that they align themselves impersonally with the group via normativity. Human ultrasociality evolved, but it is not yet clear when in our history we displayed the first signs of our "better nature."

To further our understanding of the development and evolution of ultrasociality, future work will need to examine these alignment processes in more depth. The work on the origins of other-regard, for instance, is rather limited. Among children, studies are only now emerging that show that young children genuinely care about the welfare of others (Hepach et al., 2012a, 2013), and this work has only explored simple instrumental helping situations. Whether such other-regard is present across diverse prosocial contexts and when it emerges in development are vital questions to answer if we are to understand the nature of this fundamental alignment process. Equally, it is important to explore this process in the other great apes using a similar method as with children, which will help establish whether the uniqueness of human ultrasociality stems from this most basic alignment mechanism. Much more work is also needed to establish the role (or lack thereof) of empathy and empathic concern in the prosocial behavior of the great apes. Although we know a great deal about empathic processes in infants and young children, systematic investigations with the great apes are severely lacking, and the little work that exists, though suggestive, is open to alternative interpretations (e.g., Liebal et al., 2014). As more evidence emerges, the picture of the interpersonal alignment processes in humans and other species will become clearer and will help shape further hypotheses about the shared versus unique aspects of human prosociality.

How empathic, other-regarding, and normative capacities evolved – whether together or independently – is also an open question. We suggest that they are mutually dependent both in ontogeny and in phylogeny. Young children care a lot about others in interpersonal and impersonal (i.e., third-party normative) interactions, and they care about norms for the norms' sake – most clearly evidenced by their enforcement of totally arbitrary conventional norms, such as game rules (Schmidt and Tomasello, 2012). Most generally, other-regarding concerns and empathy help humans cooperate in such a way as to create, learn, understand, and maintain norms. In turn, norms help to structure and determine contexts in which other-regarding behavior and empathic concern occur.

The capacities for empathy and other-regard make it more likely for some norms to emerge and to persist. These are, for example, norms that have to do with cooperation, such as norms of reciprocity, norms against harm, norms regarding justice (e.g., in resource distribution) and the like. For these norms, suppression of self-interest and some concern for other conspecifics' welfare is crucial. Thus, children's early other-regard and empathy are morally relevant in the sense that they help them learn and understand cooperative norms, and to be motivated to follow and enforce these norms. The direction of this process is from interpersonal (other-regard, empathy) to impersonal (normativity). One consequence of this process would be that human infants acquire norms of distributive justice (in particular fairness as equality) early because of their concern for others' well-being and their early first-party and third-party experience with fairness situations (e.g., desiring resources oneself and observing others desiring resources; see Geraci and Surian, 2011; Schmidt and Sommerville, 2011).

Other-regard and empathy also have an impersonal dimension. They help the young child to identify with the group and to be emotionally committed to the group's values and norms

(Tomasello, 2009; Rossano, 2012; Schmidt and Tomasello, 2012). This then strengthens motivations to care about the group's norms and thus not only to follow them, but also to defend and enforce them in interpersonal and impersonal interactions. Importantly, this impersonal dimension not only leads to punitive behaviors for norm violations, but also constructively fosters conformity, for instance, by teaching others the group norms. One key point here is that the norms apply to the group. What constitutes a group can be arbitrary. For instance, in the classical "minimal group paradigm," group assignation such as preference for certain artists, can lead to in-group favoritism (Tajfel et al., 1971). In addition to increased cooperation within an arbitrarily created group, it can also lead to increased punishment of norm violations within the group, but not across groups (Shinada et al., 2004; Bernhard et al., 2006; Goette et al., 2006). Parochialism has also been demonstrated in children on the basis of which school class they belong to (Fehr et al., 2008). It would seem that the general direction of this process is from the impersonal to the interpersonal, and children's propensity to enforce different types of norms in different contexts is paradigmatic of this process.

Norms go far in shaping which behaviors are appropriate in which contexts, and moral norms (in particular those related to harm) have special normative weight. Even so, there can be norms for everything, and conduct rules for helping others and preventing harm are not universal. The foundations for uniquely human ultrasociality thus comes from the combination of an emotional, possibly innate, sensitivity to the needs of others, coupled with a motivation toward their welfare. Norms systematize, standardize, and contextualize for the group which prosocial (or antisocial) behaviors are expected, when, and toward whom.

To explore the role alignment plays in interpersonal and normative behavior, future studies can pit these alignment processes – alignment with an individual versus a group – against each other to see how children resolve them. For instance, there may be situations in which empathic concern is likely to motivate one course of action whereas social norms might prescribe another. As another example, norms for how one ought to behave toward ingroup members as opposed to members of other groups can come into conflict (see also Killen and Rutland, 2011), especially when what constitutes a group is fluid (an ingroup member can be anyone from a child's class, but can also be anyone of the same gender regardless of which class he or she is in). Importantly, these research questions would need to be applied across various cultures to explore the importance of norms for interpersonal alignment. While it would not be possible to test norms in non-human animals in the same way as in children, it would be worth investigating whether other species are sensitive to individuals who align with others or the group and those who do not, such as by pursuing self-interests ahead of those of others. This work could be done on our closest living relatives, as well as by comparing species that have complex social interactions versus those that do not (e.g., wolves vs. foxes) or cooperative breeders and non-cooperative breeders (e.g., meerkats vs. banded mongooses). Future work could also explore how sensitive individuals are to cues of alignment from others. For example, if another child shows a concerned look for a child (or a third party), or signs of shared joy, a child who is sensitive to interpersonal alignment should be

more likely to engage in mutualistic or prosocial acts toward that person than toward someone who shows no emotional cues of alignment, or shows signs of misalignment. Whether other species even have the appropriate signals is an open question. Certainly dog owners will recognize concerned looks in their dogs; it is not clear whether dogs would also recognize and use these looks to cue alignment.

It is possible that mutualistic, coordinated interactions – among interdependent individuals – explain the first step toward ultrasociality, followed then by inter-group competition, which led to the formation of norms (Tomasello et al., 2012). We suspect that the core elements for ultrasociality arose first in small-scale, interdependent interactions, such as dyads (face-to-face and two individuals in a collaborative activity) and in small groups (e.g., observing two people interacting). These small-scale interactions were greatly facilitated by, and thus gave rise to, the ability for individuals to align their emotions (empathy), as well as their goals (joint intentionality; e.g., Tomasello et al., 2005), and precursors of generic codes of behavior (more local norms) could arise from these. Once the capacities allowing individuals to align with each other have evolved (and developed), group-level alignment (e.g., parochialism, common values and ways of doing things) can evolve, potentially as a result of pressures such as inter-group competition and cultural group-selection (Boyd and Richerson, 2002; Henrich, 2004). This account of alignment with others via empathy and other-regarding concerns, as well as an alignment with the group via normativity, can provide a fresh perspective on and thus contribute importantly to our understanding of humans' ultrasociality.

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A construct divided: prosocial behavior as helping, sharing, and comforting subtypes

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The development and maintenance of prosocial, other-oriented behaviors has been of considerable recent interest. Though it is clear that prosocial behaviors emerge early and play a uniquely important role in the social lives of humans, there is less consensus regarding the mechanisms that underlie and maintain these fundamental acts. The goal of this paper is to clarify inconsistencies in our understanding of the early emergence and development of prosocial behavior by proposing a taxonomy of prosocial behavior anchored in the social-cognitive constraints that underlie the ability to act on behalf of others. I will argue that within the general domain of prosocial behavior, other-oriented actions can be categorized into three distinct types (helping, sharing, and comforting) that reflect responses to three distinct negative states (instrumental need, unmet material desire, and emotional distress). In support of this proposal, I will demonstrate that the three varieties of prosocial behavior show unique ages of onset, uncorrelated patterns of production, and distinct patterns of individual differences. Importantly, by differentiating specific varieties of prosocial behavior within the general category, we can begin to explain inconsistencies in the past literature and provide a framework for directing future research into the ontogenetic origins of these essential social behaviors.

Keywords: prosocial behavior, social-cognitive development, emotional development

Humans have a number of exceptional abilities, one of which is our pervasive, obligatory sociality (Brewer and Caporael, 2006). Not only do humans regularly act *with* others, we also often act on *behalf* of others (e.g., Tomasello, 2009). Importantly, this other-oriented tendency has long been recognized as an intriguing explanatory puzzle. Specifically, from a strict Darwinian "survival of the fittest" perspective, behaviors that benefit another at a cost to one's self should not exist, largely because the temptation to, and benefits of, cheating are simply too high (e.g., Darwin, 1859; Dawkins, 1989). Yet, despite the explanatory challenges, other-oriented acts do exist and appear to be an essential (Tomasello, 2009), automatic (Zaki and Mitchell, 2013), universal (e.g., Henrich et al., 2005; Callaghan et al., 2011), and relatively unique (e.g., Warneken and Tomasello, 2009; Silk and House, 2011) part of human social life.

The ability and willingness to engage in prosocial behavior appears to have important implications for well-being at the individual (e.g., Crick, 1996; Sallquist et al., 2012), group (Anderson and Kilduff, 2009), and societal (Zak, 2008; Tomasello, 2009; Pinker, 2011) level of analysis. Due in part to their intriguing theoretical constraints (Hamilton, 1964; Trivers, 1971), and in part to their widespread social implications (Tomasello, 2009; Pinker, 2011), other-oriented behaviors have captured the curiosity of scholars from a variety of disciplines (e.g., Bowles and Gintis, 2011; Wilson, 2012; Bloom, 2013; Greene, 2013). This diverse interest has resulted in a large body of literature examining the factors that support the emergence and maintenance of these essential social acts across both phylogeny (Warneken and Melis, 2012)

and ontogeny (Eisenberg et al., in press). Yet, instead of providing clarity and insight, these diverse research programs have brought to light a number of challenges and controversies in our current understanding of prosocial development. For example, different measures of prosocial behavior are often uncorrelated (e.g., Hay and Cook, 2007; Dunfield and Kuhlmeier, 2013), early prosociality often correlates with aggressive tendencies (e.g., Hay, 2006), and children regularly ignore or exacerbate the distress of others (Dunn, 1988).

The goal of this paper is to shed light on some of these explanatory challenges by considering prosocial behavior from the perspective of social-cognitive development. Specifically, I will propose that within the general domain of prosocial behavior there are three distinct varieties of responses that can be differentiated based on their unique underlying social-cognitive constraints. Then, I will provide evidence for the utility of this distinction by demonstrating that these behaviors show dissociable developmental trajectories and distinct associations with individual difference factors early in life. As this paper is intended to organize and direct research into the emergence and early development of prosocial behavior, the focus will be on the rapidly growing body of literature examining prosociality from infancy through early childhood.

DEFINING PROSOCIAL BEHAVIOR

There are many ways to act on behalf of others. Typically we apply the term "prosocial" to any behavior that is intended to benefit another (e.g., Eisenberg, 1986). Utilizing this broad definition, numerous studies have demonstrated

that humans appear exceptional in their ability to respond to a diversity of needs (Svetlova et al., 2010; Dunfield et al., 2011; Dunfield and Kuhlmeier, 2013), very early in development (Zahn-Waxler et al., 1992; Warneken and Tomasello, 2006). Though we have made great strides in documenting the myriad of prosocial behaviors that children can produce, we still have much to learn about the mechanisms that underlie and support these fundamental acts (see Radke-Yarrow et al., 1983 for a historical, yet relevant, perspective on similar issues).

While many have *hypothesized* supporting mechanisms such as socialization (Hastings et al., 2007), cognitive development (e.g., perspective taking, Hoffman, 1982; Underwood and Moore, 1982), or underlying individual differences (e.g., prosocial personality, Eisenberg et al., 1999; genetic underpinnings, Knafo and Israel, 2009), these claims have been difficult to evaluate. A historical tendency to employ a broad definition of prosocial behavior and naturalistic or observational designs (Schroeder et al., 1995; Eisenberg et al., 2006) has resulted in limited consistency charting the age of emergence (e.g., Zahn-Waxler et al., 1992), developmental trajectories (e.g., Radke-Yarrow et al., 1983), behavioral correlates (e.g., Eisen-berg and Hand, 1979), and individual differences associated with production of other-oriented acts. Indeed, treating all prosocial behaviors as similar "kinds" has resulted in much difficulty developing coherent theories regarding developmental mechanisms (see Radke-Yarrow et al., 1976; Eisen-berg and Hand, 1979; Zahn-Waxler et al., 1992 for notable exceptions).

Part of the explanatory difficulty may result from a tendency to consider prosocial development from either an individual difference *or* developmental universal perspective (e.g., Nichols et al., 2009). Individual difference (dispositional) accounts attempt to explain variability in the propensity to act prosocially by examining stable individual difference factors such as emotion regulation, contentiousness, or inhibitory control. Though there is support for this perspective (e.g., Eisenberg et al., 1999), the pattern of relations is not always consistent. For example, though spontaneous prosocial behavior in preschool predicts other- and self-reported prosocial behavior in early adulthood, compliant and low-cost helping did not. Importantly, the mechanism underlying these variable relations is not always clear. One possibility is that that methodological limitations associated with assessing motivation in infancy and early childhood are limiting our ability to identify the relevant relations (Thompson and Newton, 2013). Alternatively, it's possible that the variability reflects the fact that prosocial motivation is diverse (e.g., Eisenberg et al., 1991; Paulus, 2014).

Developmental accounts, on the other hand, typically examine how the acquisition of various universal cognitive skills, such as mental state understanding, affects the production of prosocial behavior. These accounts seek to explain similarities across individuals in the development of prosocial behaviors by first identifying universal milestones in the development of prosocial behavior, then identifying the underlying social cognitive correlates. These two varieties of accounts are *not* mutually exclusive, and there is reason to think that both dispositional and developmental factors work in concert to support the production of prosocial behavior (e.g., Nichols et al., 2009). Specifically, it has been suggested that prosocial behavior can be considered both

a general, superordinate category that contains a variety of distinct responses (i.e., a prosocial disposition), but also a construct that gains breath and complexity with development (i.e., a developmental universal; Thompson and Newton, 2013). By taking a developmental universal perspective, the current paper seeks to clarify the variety of ways humans act prosocially with the hope that by clarifying the various manifestations of prosocial behavior and their unique constraints, we can gain better insight into the interplay between developmental universals and individual differences in the production of prosocial behavior.

A DEVELOPMENTAL UNIVERSAL PERSPECTIVE

One way that we may address and overcome some of the current explanatory limitations is by clarifying the variety of ways that humans act prosocially. The current proposal builds off of existing categorizations that acknowledge heterogeneity in the various manifestations of prosocial behavior and recognize an important role for social cognitive development in the production of early prosocial acts (e.g., Hay and Cook, 2007; Warneken and Tomasello, 2009; Brownell et al., 2013b). However, the current proposal differs from previous categorizations in the emphasis placed on the primary mental state evaluation that the individual is required to make when determining whether and how to aid another.

Regardless of what the prosocial actor does or why, the central characteristic underlying the dissociation of the various prosocial responses is the primary negative state that the actor is recognizing and responding to. For example, effectively alleviating distress in a crying individual whose stomach is rumbling would depend on whether the affective response is a cause or consequence of the hunger. An individual who is so hungry they become upset requires a very different intervention than an individual who is so upset they lose their appetite. In the first case, reducing hunger by offering food will alleviate the emotional distress; in the second case, reducing emotional distress by offering social support will (eventually) alleviate the hunger (by allowing an anxious appetite to return). This fit between the initial eliciting event and the appropriate/effective intervention is a *fundamental* but commonly overlooked part of engaging in prosocial behavior.

There is growing consensus that understanding prosocial behavior will require a multidimensional approach that considers the variety of distinct mechanisms that may lead to different prosocial responses (e.g., Hay and Cook, 2007; Dunfield and Kuhlmeier, 2013; Thompson and Newton, 2013; Paulus, 2014). Categorizing varieties of prosocial behavior based on the negative state they respond to seems to be a fruitful conceptualization because considerable past research has demonstrated that from very early in development humans automatically identify others' mental states (including goals, beliefs, and desires) and then use these evaluations to understand and predict others' behavior (e.g., Frith, 2012). This tendency to automatically attribute and share mental states is thought to play an integral role in human social interactions, so much so that it has been argued that a primary function of explicit metacognition is to enhance social relations and support fruitful group interactions (e.g., Tomasello et al., 2005; Tomasello, 2009; Frith, 2012).

Consistent with this claim, previous studies have found that as children's social-cognitive capacities mature so does their ability to work with (Brownell and Carriger, 1990; Brownell et al., 2006) and on behalf of others (Wu and Su, 2014). Moreover, framing social cognitive tasks as prosocial problems appears to facilitate performance (Matsui and Miura, 2008; Buttelmann et al., 2009), suggesting that prosocial behaviors are integrally entwined with the development of human social-cognition (see also Brownell et al., 2013b for a review). Given the automatic and pervasive role that mental state understanding plays in a wide variety of human interactions, and the central role prosocial behaviors play in human social success, it is plausible that the ability to represent others' mental states accurately is a necessary prerequisite for early prosocial behavior.

One of the easiest, and most assured, ways of benefitting another involves intervening when they are faced with a negative experience. With this in mind, prosocial behaviors can be thought to require three components: (1) the ability to take the perspective of another person and recognize that they are having a problem; (2) the ability to determine the cause of that problem; and (3) the motivation to help them overcome the problem. Indeed, simply recognizing that someone is distressed is of little value if one is not willing to actually do something about it, nor is motivation helpful if you don't know how to intervene. Together, the ability to successfully navigate each of these steps is necessary – but not alone sufficient – for the production of effective prosocial behavior; if an individual is unable to overcome any of these three challenges then a successful intervention is unlikely.

To be clear, the claim is not that *all* prosocial behaviors are *always* motivated by the direct perception of another's negative state. Instead, the proposal is that the earliest instances of prosocial behaviors likely are, and that by considering the social cognitive constraints related to recognizing a negative state and identifying an appropriate intervention, we may gain better insight into how prosocial behaviors develop and change over early life. Adults are clearly motivated by imagined or implied distress and engage in prosocial behavior even in the absence of direct perception of a problem. At some point in development (potentially as early as the start of the second year, e.g., Vaish et al., 2009; Knudsen and Liszkowski, 2013; Warneken, 2013), humans can use imagined or inferred negative states as prosocial impetus. Without belittling the impressive developmental challenges that underlie the internalization of prosocial motivation, there is an important explanatory role for understanding how very young children come to recognize, interpret, and overcome the negative states that they directly perceive in others.

CATEGORIZING PROSOCIAL BEHAVIOR

To reiterate, early prosocial behaviors rest on the ability to recognize that another is having a negative experience, the ability to determine what an appropriate response would entail, and finally, the motivation to intervene. With these constraints in mind, it is helpful to consider the types of negative states that individuals may need to recognize and respond to when engaging with others. Broadly considered, humans appear to experience three varieties

of negatives states: *instrumental need*, where an individual has difficulty completing goal directed behavior; *unmet material desire,* in which the individual does not have access to a particular resource; and *emotional distress,* when an individual experiences a negatively arousing emotional state. Further, each of these negative states can be alleviated by a different variety of prosocial behavior namely, *helping* (e.g., retrieving an out of reach object; Warneken and Tomasello, 2006), *sharing* (e.g., giving up a limited resource, Hay, 1979; Brownell et al., 2009), and *comforting* (e.g., offering verbal or physical support; Vaish et al., 2009; Svetlova et al., 2010), respectively.

Because these three varieties of prosocial behavior are thought to rely on different initial social-cognitive assessments (i.e., goals, desires, and emotions), and the ability to represent these various mental states show unique patterns of development (e.g., Wellman and Woolley, 1990; Repacholi and Gopnik, 1997; Woodward, 1998; Wellman and Liu, 2004; Wellman et al., 2011), we should not necessarily predict consistency in the age of emergence, developmental trajectories, or supporting mechanisms for each variety of prosocial behavior. Looking to the existing literature on children's social cognitive development, we find support for this position.

INSTRUMENTAL NEED
Representing the problem
Helping requires the ability to accurately represent an instrumental need. Representing an instrumental need requires the ability to attribute an intended goal despite incomplete observations. Previous research suggests that within the first year of life infants can represent simple goal directed action (Woodward, 1998; Csibra et al., 1999), and shortly thereafter they can differentiate intentional from unintentional acts and recreate intended acts despite incomplete observations (Carpenter et al., 1998; Behne et al., 2005). For example, between 5 and 9 months, infants begin to construe others' actions in terms of goals, not motions, showing greater interest in actors that change the target, as opposed to direction, of their reach (Woodward, 1998). By 8 months, infants identify and preferentially imitate intended behaviors, even when they are paired with accidental behaviors (Carpenter et al., 1998). Finally, by 9 months, infants prefer, and show more patience towards, individuals who fail to share because they are unable (and kept dropping the toy out of reach) as opposed to unwilling (and kept pulling the toy out of reach; Behne et al., 2005). Together, these studies demonstrate that between the end of the first year and start of the second year, infants are able to represent other's behaviors in terms of their underlying goal structure and, despite observing incomplete actions, differentiate intended from unintended outcomes.

Representing the solution
In addition to being able to represent the goal structure underlying and organizing behavior, effective helping requires the ability to recognize effective interventions that support goal completion. An understanding of goals, and a preference for individuals associated with goal completion, appears to develop within the first year of life. For example, 8-month-olds expect individuals to display positive emotions following goal completion (Skerry and Spelke,

2014). By 2 years, infants display sympathetic nervous system arousal in response to incomplete goals, which is reduced after they witness the individual receive help, regardless of whether the help is self or other initiated (Hepach et al., 2012). Finally, when infants witness a character trying but failing to complete a goal, they prefer the character that was helpful (Hamlin et al., 2007) and expect others to share this preference (Kuhlmeier et al., 2003). And although these studies were not specifically intended to assess infants' understanding of effective goal interventions, the only way infants could have made sense of the various interactions is by representing an initial goal (e.g., getting up the hill), representing the appropriate intervention (e.g., pushing to the top), and understanding that individuals are positively inclined towards completed goals.

Finally, utilizing a behavioral reenactment paradigm, Meltzoff (1995) provides the clearest evidence that by 18 months infants not only represent other's actions as goal directed and prefer individuals and situations associated with completed goals, but also that they can represent and reproduce goals that they have not witnessed completed. Children watched as an experimenter tried but failed to complete a number of actions such as pulling apart a dumb bell or hanging a hoop on a post. The children were then given the opportunity to produce the actions themselves. Consistent with an ability to represent human action through the organizing lens of goals, the infants preferentially produced the actor's intended outcome (e.g., pulled the barbells apart and hung the hoop) despite the fact they had never seen these goals completed, simply implied.

Together, it is clear from the extant literature that before the second birthday, children represent others' actions in terms of underlying goals, recognize when and why goals may fail to be completed, and are highly motivated to see goals achieved. This suggests that within the first two years of life, children have developed the social cognitive skills required to support the recognition of instrumental need and produce helping behaviors.

UNMET MATERIAL DESIRE
Representing the problem
Sharing, on the other hand, requires the ability and willingness to represent another's unmet material desire. Typically, this involves recognizing and rectifying an unequal distribution of resources. In adults, allotments tend to be governed by the norm of fair distribution and associated with the "principle of equality," which proposes that *ceteris paribus* goods should be divided equally among potential recipients, particularly when the primary goal of the interaction involves fostering and maintaining "enjoyable social relations" (Deutsch, 1975, p. 143). This tendency is well established in adults (e.g., Henrich et al., 2005; Baumard et al., 2013) and appears to emerge relatively early in development (e.g., Fehr et al., 2008; Sloane et al., 2012). Yet, unlike goal understanding, which has been extensively studied outside of the domain of prosocial behavior, the majority of the work that speaks to children's understanding of resource inequality has been examined in relation to sharing behaviors.

Despite a long history of debate regarding whether children under the age of 5 are sensitive to unequal distributions of resources (e.g., Lane and Coon, 1972; Damon, 1975; Fehr et al., 2008), recent research utilizing a variety of converging implicit measures suggests that infants begin to recognize unequal distributions, and prefer equal distributions, early in their second year of life. Specifically, infants show greater attention to unfair (i.e., unequal) as opposed to fair (i.e., equal) distributions, suggesting that they expect resources to be divided fairly (e.g., Sloane et al., 2012). Indeed, multiple studies, conducted across a variety of labs, confirm this tendency (Geraci and Surian, 2011; Schmidt and Sommerville, 2011; Sommerville et al., 2013).

Critically, this preference for equal outcomes appears specific to social interactions. Infants do not show a similar pattern of looking when the recipient is inanimate, ruling out a low-level perceptual preference for equal amounts (Sloane et al., 2012). Moreover, consistent with the recognition that, in general, it is preferable to share items equally between recipients, infants prefer (based on reaching behavior) and expect others to prefer (based on looking time preferences) equal distributors (Geraci and Surian, 2011). Finally, consistent with the claim that representing an unmet material desire is uniquely important to the development of sharing behavior, infants' sensitivity to unfair outcomes correlates with concurrent sharing (Schmidt and Sommerville, 2011) but not helping (Sommerville et al., 2013).

Although children under the age of 5 show mixed results articulating norms and expectations of fairness, when response demands are reduced and implicit measures (such as affective behavior) are used, children as young as 3 years of age recognize and respond negatively to unfair distributions of resources (LoBue et al., 2011). Specifically, children display clear negative emotions in response to unequal distributions and when prompted, identify such outcomes as "unfair" (especially when the participant is in the disadvantaged position). Together, this research suggests that the ability to represent, and negatively evaluate, unequal access to resources emerges over the course of the second year of development.

Representing the solution
Effectively alleviating material desire requires the ability to recognize an unequal distribution of resources, the motivation to see equality restored, and the ability to overcome an egocentric desire to monopolize resources. Although children can recognize unequal distributions of resources at least by 15 months, it is not clear that recognizing inequality is, in and of itself, sufficient to account for sharing behavior. Indeed, a compelling point raised by comparative researchers is that even when chimpanzees (and other non-human primates) can recognize an unfair offer, they are not necessarily motivated to act in order the change the situation (e.g., Brosnan, 2013). Moreover, even when children *do* act to change situations, it is not always clear whether their behaviors are directed at the alleviation of material desire *per se*, or are a manifestation of an impulse to engage socially (Tomasello et al., 2005).

When children are given the opportunity to divide resources between themselves and others, or select between predetermined divisions, there is a general trend towards fairer behavior with age. For example, when children are given the opportunity to divide resources on behalf of another, children as young as 3 work to ensure equal distributions (Olson and Spelke, 2008; Shaw and

Olson, 2012). However, when children are making decisions that affect the self, an aversion to disadvantageous equality (i.e., rejecting offers that favor the other, e.g., 1 – self, 4 – other) emerges around 4 years of age, while opposition to advantageous inequality (i.e., rejecting offers that favor the self, e.g., 4 – self, 1 – other) emerges much later, between the ages of 6 and 8 years (Blake and McAuliffe, 2011).

Interestingly, despite having the ability to articulate the norm of fairness as young as 3, children do not always follow it. For example, Smith et al. (2013) found that children could report that they should distribute resources fairly and expected others to do so, yet when given the chance to divide resources, they showed a preference for self. Most amusingly, children seem well aware of their limits; though they knew they should share fairly, and expected others to do so, when asked what they would do when given the opportunity to share, participants correctly predicted that they would behave selfishly.

Finally, a recent study that employed both experimental control and a naturalistic social context demonstrated an increase in the frequency and spontaneity of early sharing behavior between 18 and 24 months (Brownell et al., 2013a). Specifically, participants were given access to food and toys in the presence of an adult experimenter who had none. Unlike many of the studies examining resource distribution, the participants were not explicitly instructed to divide the resources. Instead, the adult playmate expressed her desire using a series of progressively more explicit cues. Eighteen-month-olds were willing to share but often only after the experimenter made her desire explicit. In contrast, by 24 months, participants shared spontaneously, often immediately, and typically more generously than at 18 months. Moreover, consistent with an important role for understanding another's desire in the emergence of sharing behavior, sharing was positively associated with understanding of self and ownership, and negatively associated with self-focused behaviors (e.g., ignoring the experimenter) and hypothesis testing (e.g., staring at the experimenter).

In sum, children recognize the importance of equal outcomes within the first two years of life; however, the tendency to spontaneously act to resolve these issues shows protracted development. Moreover, there are a number of situational factors that influence whether children will apply their recognition of unequal outcomes to remedy an unfair situation. For example, sharing in children under the age of 3 can be increased when others make their desire explicit (e.g., Brownell et al., 2009, 2013a; Dunfield et al., 2011), the cost of sharing is low (e.g., Thompson et al., 1997; Moore, 2009), or the recipient is familiar (Rheingold et al., 1976; Hay, 1979; Hay and Murray, 1982). Together these findings providing further support for the proposal that recognizing unmet material desire (i.e., an unequal outcome) alone is not sufficient for effective sharing, particularly when the solution is unclear, or motivation is weak.

EMOTIONAL DISTRESS
Representing the problem
Comforting requires the ability to represent another's negative emotional state. Effectively representing another's emotional distress requires the ability to differentiate and identify the various

emotional experiences of others. From the earliest days of life, infants respond to other's distress with distress of their own (e.g., Sagi and Hoffman, 1976). Yet, despite the integral role that emotional contagion is thought to play in the development of sympathy and comforting behavior (see Hoffman, 1982; Preston and De Waal, 2002; Decety and Meyer, 2008 for reviews), it is not sufficient to support effective other-oriented responses to distress. Instead, it is the ability to identify both another's negative emotional state, and the cause, that likely supports effective comforting behavior.

Researchers have demonstrated the foundations of the ability to identify negative emotional states in early infancy. As early as 3 months of age, infants can differentiate the facial expressions of happiness from surprise and anger, and by 7 months, infants can additionally represent fear, sadness, and interest (Grossmann, 2010). Developing in concert with the ability to discriminate between various emotional expressions is the ability to represent the equivalency of various emotional cues. For example, around 7 months of age, infants begin to recognize conflicting emotional expressions (e.g., when a sad face is paired with a happy voice) and preferentially attend to pairings that are emotionally consistent (e.g., a happy face paired with a happy voice; Walker-Andrews and Dickson, 1997). Together, these results suggest that within the first year of life infants differentiate positive and negative emotions, with differentiation between varieties of negative affect developing shortly thereafter.

Consistent with many developmental accomplishments, children's emotion recognition appears to vary depending on the task demands. Although infants can differentiate varieties of emotional expressions and recognize cross-modal congruence in implicit tasks within the first year of life, it is not until almost 3 years of age that they show a limited ability to discuss a restricted range of emotions (Denham and Couchoud, 1990). The development of children's ability to explicitly label others' emotions mirrors the developmental progression observed with implicit measures. Specifically, while children as young as 2 years can label happiness, it takes an additional year or two before they can reliably identify negative emotions such as anger, fear, and sadness (Denham and Couchoud, 1990; Widen and Russell, 2003). As a whole, these studies suggest that while some of the necessary emotional understanding is in place in the first year of life (i.e., emotional discrimination and expectations of consistency), many of the requisite skills (i.e., explicitly identifying the particular type of distress) do not emerge until later toddlerhood.

Representing the solution
Simply recognizing another's negative emotions is not sufficient to support mature comforting behavior. Being able to identify the cause of another's emotional state is critically important for understanding and intervening on their behalf (e.g., Saarni et al., 2006). Indeed, the social, emotional, and cognitive developments that children experience over the first year of life – which allow them to progress from mirroring another's negative emotion to representing the negative state and understanding a cause and solution – have long been thought to be an integral part of prosocial development (Hoffman, 1982, 2000).

Children's understanding of the idiosyncratic nature of emotions emerges in the second year of life. For example, though 14-month-olds overgeneralize their personal preferences, 18-month-olds recognized that individuals might differ in their emotional experiences (Repacholi and Gopnik, 1997). Relatedly, children as young as 2, understand that situational factors influence both emotions and behaviors (Wellman and Woolley, 1990). Then, by three children can make accurate predictions regarding the types of situations that lead to happiness and between 4 and 5 start making accurate predictions about situations that lead to anger, fear, or surprise (Denham and Couchoud, 1990; Widen and Russell, 2003).

Finally, children not only recognize situations that lead to various emotions, but also the contextual appropriateness of emotional expressions. As early as 18 months infants have expectations regarding likely emotional reactions, engaging in more checking behavior and less concerned attention when witnessing unjustified as opposed to justified distress (i.e., distress following positive versus negative outcomes respectively; Chiarella and Poulin-DuBois, 2013). Further, by 3 years of age, children will show concern, offer assistance, and even check on an individual who has displayed justifiable distress, while largely ignoring an individual whose distress is unjustified (Hepach et al., 2013). It appears as though the appropriateness of the emotion plays an important role in early distress intervention.

Thus, although infants can recognize consistency in emotional expressions within the first year of life, the ability to represent, track, and respond appropriately to the person-specific idiosyncratic nature of emotions takes much longer to develop. Indeed, consistent with Hoffman's early theoretical account, the ability to represent another's emotional distress alone is not sufficient for effective comforting interactions. Instead, it is likely that effective other-oriented comforting should emerge over the course of the second to fourth years and capitalize on a growing understanding of the unique, diverse, and situationally constrained nature of others' emotional experiences.

PROSOCIAL BEHAVIOR AS HELPING, SHARING, AND COMFORTING SUBTYPES

To summarize, this categorization (**Figure 1**) proposes that within the general domain of prosocial behavior there are three more specific varieties of behavior that individuals engage in, namely helping, sharing, and comforting. Moreover, each of these three varieties of behavior is elicited by a unique negative state: instrumental need, material desire, and emotional distress, respectively. Because the successful production of an effective prosocial intervention relies largely on the ability to recognize the presence of a negative state and determine the cause of the negative state,
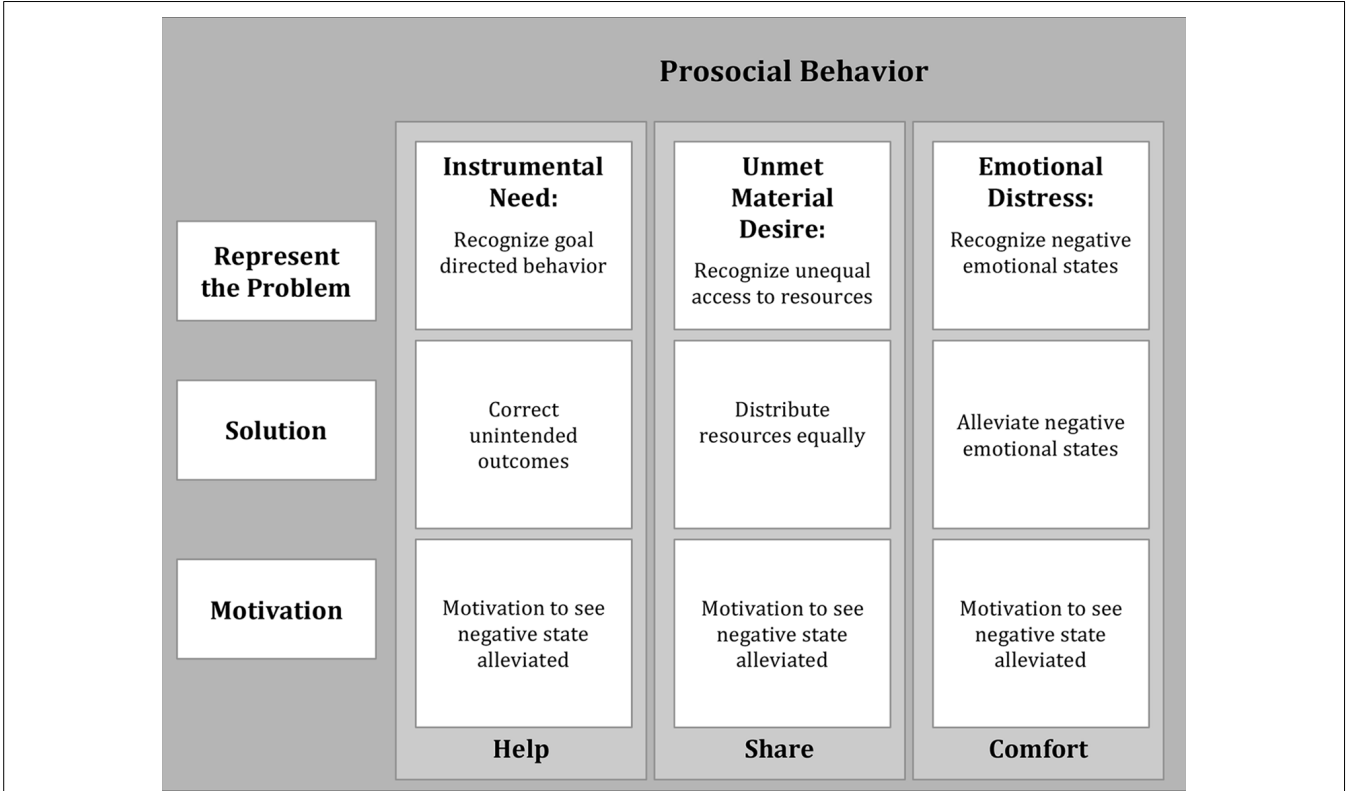

FIGURE 1 | Categorization of prosocial behavior based on the varieties of negative state the child must identify and overcome. An effective intervention will only occur when all three components can be successfully resolved. Different varieties of prosocial behavior show independent developmental trajectories because of the unique social cognitive demands.

this categorization allows us to make a number of predictions: (1) Prosocial behavior should be more likely to occur when a negative state is present than when it is absent. (2) Different varieties of prosocial behavior should emerge at different ages and develop along different trajectories based on the underlying social-cognitive constraints. (3) Finally, individual difference factors should affect the various form of prosocial behavior differently depending on how they influence the underlying constraints. In the following sections, I will briefly present a selection of relevant research that speak to these predictions and support the utility of this categorization.

RESPONDING TO NEGATIVE STATES

One of the major contributions of this categorization is that it predicts that other-oriented acts, especially ones produced early in life, are more likely to occur when the child is able to represent another's negative state. Recent research provides strong support for this proposal. Warneken and Tomasello (2006) developed a novel experimental paradigm that clearly demonstrates that by 18 months, children will intervene helpfully when they observe an unknown adult in need of help. Unlike much previous research, this study included an elegant control condition that allowed for a systematic investigation of the role of need in the production of prosocial behavior. In experimental trials, the children saw the experimenter genuinely trying and failing to complete a goal, whereas in control trials the children observed the same behaviors manipulated to obscure the experimenter's need. Across a variety of tasks, 18-month-olds showed a sensitivity to need, helping only in situations where the experimenter was actually having difficulty completing an intended goal.

Capitalizing on this powerful experimental design, more recent studies have examined infants' ability to respond to all three of the proposed negative states (Dunfield et al., 2011). Specifically, infants were presented with both an experimental and control trial for instrumental need, unmet material desire, and emotional distress. In experimental trials the negative state was clearly present. In control trials however, the participants observed identical surface behavior with the negative state obscured. Consistent with the proposal that prosocial behavior relies on the ability to represent the negative states of another, both 18- and 24-month-olds were found to help and share when instrumental need and material desire were present (experimental trials), but not in highly similar situations where the negative states were absent (control condition). Even in the case of emotional distress, in which children failed to differentiate between the experimental and control conditions, it was not because they inappropriately offered comfort in the absence of a distress cue; instead, they simply failed to demonstrate any prosocial behavior.

Consistent with an important role for representing negative states in the production of prosocial behavior, young children are more likely to act prosocially when the appropriate intervention is made obvious, or the specific negative state and appropriate intervention is made explicit (e.g., Brownell et al., 2009, 2013a; Svetlova et al., 2010; Dunfield and Kuhlmeier, 2013). For example, Svetlova et al. (2010) gave 18- and 30-month-olds the opportunity to respond to multiple prosocial "requests" in which the children could alleviate the experimenter's distress by offering her various objects; over the course of each trial the experimenter exhibited up to eight increasingly specific cues that eventually highlighted the particular need and the appropriate intervention. Two patterns of results were particularly compelling: (1) 30-month-olds required less explicit cuing than 18-month-olds, and (2) children were more likely to assist when the experimenter's difficulty was instrumental as opposed to emotional. Together these results support the proposal that early in development the ability to represent another's negative state limits when and how children produce prosocial behavior.

Moreover, consistent with an important role for negative state understanding in the production of effective prosocial behavior, 3-year-olds will override an experimenter's specific request (e.g., for a cup that the child knows is broken) in order to provide more effective solutions (e.g., for another cup that was not requested but functional; Martin and Olson, 2013). Taken together, there is mounting support for the proposal that differences in the age and conditions under which children's early prosocial behaviors develop may be accounted for, at least in part, by the developing ability to represent accurately the negative mental states of others.

Finally, though early prosocial behaviors are often observed in response to negative states, it is not the case that all prosocial behaviors are always motivated by the direct perception of difficulty. For example, while 14- and 18-month olds are more likely to help an experimenter who notices, and reaches for a dropped object (Warneken and Tomasello, 2006, 2007), by 30-months children helpfully retrieve dropped objects that were unnoticed by the experimenter (Warneken, 2013), suggesting that children quickly internalize situations that lead to instrumental need.

Moreover, as predicted by the categorization, some negative states are unrelated to the production of a prosocial intervention. Specifically, consistent with the claim that helping is a specific response to an instrumental need, the addition of negative affect does not increase helping behavior (Newton et al., 2014). Yet, the ability to take another's affective perspective, even in the absence of displayed negative affect, influences children's motivation to share following the observation of a clearly unmet material desire (Vaish et al., 2009). Further, in cases where a goal has been demonstrated and an impediment to goal completion is made clear, children as young as 18 months can communicate helpfully to aid an experimenter in avoiding a negative outcome (i.e., *before* the problem occurs, Knudsen and Liszkowski, 2013).

Together, these studies support the important fit between the representation of a particular negative state and the ability to produce an appropriate prosocial intervention. Yet they also highlight an important role for future research in better understanding when and how these evaluations get internalized. Moreover, they suggest more research is required to understand how individuals come to triage between negative states to determine the core issue that needs to be addressed in order to appropriately and effectively aid another.

AGE OF EMERGENCE AND DEVELOPMENTAL TRAJECTORIES

Another prediction of this categorization is that varieties of prosocial behavior should emerge at different ages and develop along

distinct developmental trajectories due to the fact they rely on different mental state attributions, which develop along different trajectories. Though previous research has suggested that prosocial behavior emerges between the first and second birthday and increases in frequency and complexity as the child ages (e.g., Hoffman, 1982; Zahn-Waxler et al., 1992; Hay, 1994; Eisenberg et al., 2006), it is not clear that this claim applies equally to all varieties of prosocial responses.

Looking to the existing literature reviewed above, children should be able to respond to instrumental need prior to unmet material desire and emotional distress, both of which will show more variability and context dependence due to the later emerging social cognitive supports. Consistent with this prediction, helping appears to be one of the earliest emerging forms of prosocial behavior, beginning shortly after the child's first birthday (Warneken and Tomasello, 2007) and showing rapid development over the first half of the second year (Warneken and Tomasello, 2006). Sharing appears to emerge later in the second year increasing in frequency and spontaneity between 18 and 24 months (Brownell et al., 2013a), supported by a clear articulation of desire (Brownell et al., 2009, 2013a), and a reduction of inhibitory demands (e.g., Olson and Spelke, 2008; Smith et al., 2013). Finally, as expected, children's ability to alleviate another's emotional distress with other-oriented comforting behavior emerges last (Dunfield and Kuhlmeier, 2013) and is preceded by concerned attention (Spinrad and Stifter, 2006), and facilitated by clarifying the appropriate intervention (Svetlova et al., 2010).

We see the same pattern of production when the three negative states are presented within-subject, suggesting this is not a methodological artifact but instead a characteristic of early other-oriented behaviors (Dunfield et al., 2011; Dunfield and Kuhlmeier, 2013). Further, tasks that use subsets of prosocial behavior converge, showing that relative to helping, comforting emerges later (Radke-Yarrow et al., 1976) and sharing appear less frequent (Radke-Yarrow et al., 1976; Grusec, 1991; Eisenberg, 2005).

Together, the existing literature supports the claim that early prosocial behaviors show unique patterns of emergence as a function of the specific negative state they address. Further, these studies are consistent with the position that the ability to understand others' negative mental states influences the age at which children can intervene prosocially on behalf of others. Indeed, children are more likely to assist others when the negative state is made clear and the appropriate intervention is simple, suggesting an important facilitatory role for mental-state understanding in the development of children's prosocial responses.

A closely related prediction is that the production of various forms of other-oriented behavior should not necessarily correlate. Dunfield and Kuhlmeier (2013) gave 2-, 3-, and 4-year-olds the opportunity to respond to four instances of instrumental need, unmet material desire, and emotional distress. Because the children were given the opportunity to respond to multiple instances of multiple varieties of each of the three negative states, it was possible to examine correlations both within and across tasks. Consistent with the proposed utility of the present categorization, participants reliably responded to a particular negative state, while responses *across* negative states remained uncorrelated. Thompson and Newton (2013),

find consistent behavioral results and similarly suggest that differences in the production of varieties of prosocial behavior may relate to the unique underlying social-cognitive constraints. Finally, in support of these interpretations, it appears that helping and comforting are associated with distinct, dissociable neural correlates (sharing was not examined; Paulus et al., 2013).

Taken together, there is mounting support for the proposal that helping, sharing, and comforting reflect unique varieties of prosocial behaviors with distinct ages of onset (Dunfield et al., 2011), unique uncorrelated developmental trajectories (Dunfield and Kuhlmeier, 2013; however, see Thompson and Newton, 2013 for an alternative explanation), and distinct underlying neurophysiological supports (Paulus et al., 2013). Each of these findings are consistent with the utility in dividing the general domain of prosocial behavior into three more specific varieties based on the unique mental state they respond to.

VARIABILITY IN DEVELOPMENT

The third prediction is that individual differences will not necessarily influence each variety of prosocial behavior equally. A number of individual difference factors have been found to affect the production of prosocial behavior as a whole (for comprehensive reviews see Eisenberg et al., 2006, in press). However, because these studies were not intended to examine whether different prosocial behavior are differentially affected by individual difference factors, it is not possible to determine whether these factors have a similar influence on all proposed varieties of prosocial behaviors or instead exert their influences selectively. If the proposed categorization based on negative state attribution is going to be useful in organizing the examination of prosocial behavior, then it should help predict and explain differences in the production of prosocial behavior across individuals. Specifically, an individual difference factor should only affect the production of a particular prosocial behavior if it influences the ability to represent, or the motivation to resolve, a particular negative state. In this section I will demonstrate how variations in social cognition, emotion processing, socialization, and culture assert different influences on the three proposed varieties of prosocial behavior.

Autism

One factor that that may affect the ability to represent, and motivation to assist in overcoming, another's negative state is a diagnosis of autism spectrum disorder (ASD). Children with ASD develop social cognitive abilities along an atypical trajectory (e.g., Charman et al., 1998; Dyck et al., 2001) and receive less reinforcement from shared social interactions (Dawson et al., 2004). This suggest that children with autism may have a harder time recognizing and interpreting each of the three negative states and possess less motivation to see another's negative state overcome.

The few studies that do exist examining prosocial behaviors in children with autism found that while children with ASD engage in simple helping and sharing (Liebal et al., 2008), they are unlikely to respond to observations of distress (e.g., Sigman et al., 1992; Travis et al., 2001; Hobson et al., 2009). When given the opportunity to respond to all three varieties of prosocial behavior in a

controlled experimental paradigm (see Section "Methods" in Dunfield et al., 2011), children with ASD responded to material desire and emotional distress, but surprisingly, not instrumental need (Dunfield et al., 2012). Although these children were much older (the mean age was 46 months) than Dunfield et al.'s (2011) sample, the overall pattern of results was opposite, with comforting and sharing preceding helping, suggesting that the unique suite of social-cognitive abilities and deficits that characterize ASD do indeed differentially affect the three varieties of prosocial behavior. However, it is not currently possible to determine if these effects are a function of difficulty representing the displayed negative state, or limited motivation to interact, future research will be required to determine at which stage in the prosocial process children with autism are experiencing difficulty.

Attachment security

A second individual difference factor that has been observed to differentially affect the ability to represent the various negatives states is attachment security. Attachment security refers to the extent to which individuals believe that they can depend on others to have their needs met, and their expectations regarding others' tendencies to seek and accept comfort (e.g., Bowlby, 1982). Securely attached individuals generally see other people as reliable sources of support, whereas insecurely attached individuals see others as unreliable sources of potential pain (e.g., Dykas and Cassidy, 2011). And although attachment security has been generally associated with the production of empathic behaviors across the lifespan (Mikulincer et al., 2001; Mikulincer and Shaver, 2005; Mikulincer et al., 2005; Diamond et al., 2012), it is possible that it does not affect the ability to represent all three varieties of negative states equally (Johnson et al., 2013).

Specifically, though infants appear to have universal expectations regarding instrumental interventions (e.g., Kuhlmeier et al., 2003; Hamlin et al., 2007), their expectations regarding emotionally distressing situations appears to differ based on attachment security (e.g., Johnson et al., 2007, 2010). When university undergraduates are given the opportunity to describe social interactions where the specific negative state is ambiguous, securely attached individuals identify both instrumental need and social-emotional distress with equal ease, while insecurely attached individuals preferentially avoid discussing social-emotional distress (Dunfield, 2012; Johnson et al., 2013). Attachment security appears to represent a second domain of individual difference that exerts a differential effect on the ability to represent the various negative states. Future research will need to examine whether and how these different representations affect the production of the three varieties of prosocial behavior.

Socialization

While the focus of this paper has largely been the importance of considering underlying, species universal, social cognitive mechanisms that differentiate varieties of prosocial behaviors, socialization plays an integral role in the emergence and production of prosocial behavior (e.g., Rheingold, 1982; Hay, 1994). Styles of caregiving, play, and discipline have all been found to influence children's tendency to respond sensitively and appropriately to the

observation of another's distress (for a complete review of the socialization of prosocial behavior, see Hastings et al., 2007; Eisenberg et al., in press). Particularly relevant to the current proposal is the idea that there are at least three pathways through which socialization can influence the production of prosocial behavior (e.g., Brownell et al., 2013c). Specifically, socialization could affect the production of prosocial behavior by increasing motivation (e.g., Dunn, 2008), supporting self-regulatory skills (e.g., Eisenberg, 2000; Spinrad and Stifter, 2006), or supporting the development of underlying social cognitive abilities (e.g., Denham et al., 1994; Ensor et al., 2011).

While it is clear that socialization is fundamentally important to supporting the production of prosocial behavior, it is not clear that all types of socialization are equally effective in encouraging all varieties of prosocial behavior. For example, a recent study (Pettygrove et al., 2013) investigated the relation between parental socialization and prosocial behavior by giving 18- and 30-month olds the opportunity to help, share, and comfort in response to increasingly explicit cues to the experimenter's negative state. Additionally, parental socialization techniques were coded while the parent and child interacted in a different but related task. The researchers replicated previous findings regarding the unique, uncorrelated production of prosocial behavior in early development. Moreover, they demonstrate that varieties of prosocial behaviors were differentially affected by varieties of socialization techniques, finding that the most effective socialization techniques were ones that targeted the child's particular developmental need.

However, socialization influences do not always show distinct relations with varieties of prosocial behaviors. For example, parents who frequently elicited emotion talk from their children tended to have children who helped *and* shared more quickly and frequently than children who engaged in less emotion discussion (Brownell et al., 2013c). Looking to the three components that are proposed to support effective prosocial behavior, it is possible that factors that influence the ability to represent the underlying negative state and solution may require different socializing influences (e.g., Pettygrove et al., 2013) than factors affecting motivation to act on behalf of others (e.g., Brownell et al., 2013c). Specifically, though socialization undoubtedly plays an important role in supporting when and how children act on behalf of others, considering the unique constraints that underlie the varieties of prosocial behavior may lead to more nuanced understanding of the variety of ways that socialization exerts its influence. This categorization of prosocial behavior, based on the unique and dissociable social-cognitive constraints that underlie other-oriented acts, could aid in better understanding when, how, and why, varieties of prosocial are differentially influenced by socialization.

Culture

Although it is well established that humans universally engage in prosocial behaviors (e.g., Henrich et al., 2005), there appears to be culture-specific variability in the developmental trajectories (Rochat et al., 2009; Callaghan et al., 2011), frequency (Graves and Graves, 1983; Williams, 1991), and social cognitive influences (Kärtner et al., 2010) underlying varieties of prosocial behavior (for more comprehensive reviews see Drummond et al., in press;

Hammond et al., in press). Specifically, cultures seem to vary in the types of prosocial behaviors they value, beliefs about who is deserving of prosocial behavior, and the manner in which social-cognitive abilities support the production of prosocial behavior (e.g., de Guzman et al., 2008; Knafo et al., 2009).

There is relatively little systematic cross-cultural research examining the production of multiple varieties of prosocial behavior, particularly in early childhood, but the studies that do exist suggest that some components of prosocial development are shared across cultures, while others vary. For example, though mothers from Peru, India, and China all report that their infants begin helping between 14 and 17 months, they identified different types of helping behavior (Callaghan et al., 2011). Specifically, Peruvian and Indian children tended to only help with household tasks, while Canadian children also engaged in self-helping behaviors such as dressing and putting away toys. Mothers also reported different motivations underlying helping; Peruvian mothers saw helping as a natural behavior, Indian mothers saw it as reflection of their child's understanding of need, whereas Canadian mothers saw it as a function of social learning. Yet, despite these differential self-reports, by 18 months children from all three cultures identified instrumental need and preferentially helped when need was present.

When sharing behavior is examined across a number of diverse cultural contexts (i.e., rich and poor urban environments, small-scale traditional and rural communities; Rochat et al., 2009), the general trend of 3-year-olds engaging in relatively self-interested behavior that becomes increasingly other-oriented by 5 is replicated. Moreover, the results hinted at a universal association between the development of social cognition and increasingly generous behavior. However, despite considerable similarity, there are important differences in the level of self-interest the youngest children started with and magnitude of the developmental differences across the various cultures tested.

Finally, when given an opportunity to respond to an experimenter's emotional distress, 19-month-olds in Berlin and Delhi were equally likely to recognize and respond to an experimenter's negative emotional state (Kärtner et al., 2010). Yet, despite responding similarly to distress cues, the two cultures differed in the socialization goals they emphasized and the role of social cognitive development in the production of pseudo-comforting behavior. Specifically, mothers from Delhi tended to emphasize more relational socialization goals than mothers from Berlin whereas, mirror self-recognition predicted distress and comforting behavior in Berlin but not Delhi. Together these results suggest that there may be a number of distinct developmental routes that lead to similar behavioral outcomes.

Though the tendency to produce prosocial behaviors is a human universal, there is considerable cultural variability in the form and development of other-oriented acts. Culture may exert its influence on the development of prosocial behavior by selectively emphasizing particular values and then affording differential socialization opportunities (e.g., Keller, 2007). Moreover, depending on the cultural context of development, it is possible that the same developmental outcome (i.e., effective other-oriented behavior) may emerge along different pathways. To that end, research

that specifically examines varieties of prosocial behavior and their associated social-cognitive supports will be in a better position to understand the nuanced development of these fundamental social behaviors.

Taken together, the reviewed lines of research suggest that individual difference factors do not necessarily exert the same influence on all varieties of prosocial behavior. Specifically, it is important to consider the fit between the social-cognitive or motivational effects of a particular individual difference variable and the demands of a particular variety of prosocial behavior when predicting how the two will interact. While exciting and suggestive, this line of inquiry is still in its infancy. An important direction for future research will involve a more systematic examination of how various individual differences affect the representations and motivations underlying the three varieties of negative states and the extent to which these differences affect the types and frequencies of prosocial behaviors that children produce.

SUMMARY

The goal of this paper was to address some of the inconsistencies in our understanding of the early emergence and development of prosocial behavior by considering the social-cognitive constraints that underlie the ability to act on behalf of others. This social-cognitive categorization of prosocial behavior proposes that within the general domain of prosocial behavior, other-oriented actions can be categorized into three distinct types namely: helping, sharing, and comforting. Each of these varieties of prosocial behavior relies on the recognition of, and response to, a distinct negative state namely: instrumental need, unmet material desire, and emotional distress, respectively. By distinguishing between these three negative states we are in a better position to identify the *distinct* social cognitive abilities that support each type of prosocial behavior. Importantly, by doing so we can begin to better understand the unique ages of onset, uncorrelated patterns of production, and distinct patterns of individual differences that are currently challenging our understanding of the earliest instances of these fundamental human behaviors.

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Selectivity in early prosocial behavior

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Prosocial behavior requires expenditure of personal resources for the benefit of others, a fact that creates a "problem" when considering the evolution of prosociality. Models that address this problem have been developed, with emphasis typically placed on reciprocity. One model considers the advantages of being selective in terms of one's allocation of prosocial behavior so as to improve the chance that one will be benefitted in return. In this review paper, we first summarize this "partner choice" model and then focus on prosocial development in the preschool years, where we make the case for selective partner choice in early instances of human prosocial behavior.

Keywords: prosocial behavior, reciprocity, partner choice, social evaluation, cooperation

INTRODUCTION

Human social behavior is frequently marked by actions that are generated on behalf of others. As adults, we show great flexibility in our production of prosocial acts and readily identify these behaviors in others. Yet, the fields of anthropology, biology, economics, philosophy, and psychology have long noted that widespread engagement in prosociality is somewhat surprising, as it requires expenditure of personal resources for the benefit of others, including others with whom we share no appreciable genetic relatedness (e.g., Axelrod, 1984).

Seminal models that address this "problem" of prosociality have been developed, with emphasis typically placed on reciprocity. One model, described more fully below, considers the advantages of being selective in terms of one's allocation of prosocial behavior so as to improve the chance that one will be benefitted in return. In this review paper, we first present the fundamental aspects of this "partner choice" model (for a more detailed discussion, see Roberts, 1998; Bshary and Noë, 2003; Baumard et al., 2013). Then, emphasis is placed on prosocial development in infancy and the preschool years, and we make the case for selective partner choice in early instances of human prosocial behavior.

This review article primarily focuses on the first 5 years of life, an age range that has received much attention in recent studies of prosocial development (for review, see Eisenberg et al., in press). We define prosocial behavior as the intervening, beneficial actions that are preceded by the direct observation or inference of another's negative state (e.g., Dunfield and Kuhlmeier, 2013; Warneken, 2013a; Dunfield, 2014). These negative states can include instrumental need (i.e., an individual is having difficulty completing a goal-directed behavior such as retrieving an out of reach object, and a person can intervene by *helping*), material desire (i.e., an individual does not have a desired resource, and a person can intervene by *sharing*), and emotional distress (i.e., an individual is experiencing a negative emotional state, and a person can intervene by *comforting*). Each type of prosocial behavior has been examined and documented in early childhood (e.g., Zahn-Waxler et al., 1992; Hay et al., 1999; Warneken and Tomasello,

2006; Brownell et al., 2009; Dunfield et al., 2011; Dunfield and Kuhlmeier, 2013; Paulus et al., 2013; Paulus, 2014). Selective helping and sharing have been the focus of most of the research work to date on selective prosocial behavior and thus will be emphasized here; however, "sharing" in some of these instances is considered broadly to include the adult-encouraged distribution of resources to those who have none, not just the spontaneous response to others' lack of resources.

RECIPROCITY AND PARTNER CHOICE

Reciprocity solves the "problem" of prosociality because an individual's investment can be repaid. It is a mutually beneficial, universal feature of human social organization (e.g., Brown, 1991), appearing as both direct reciprocity (e.g., B helps A in return for A having helped B; Trivers, 1971) and indirect reciprocity (e.g., B helps A in return for A having helped C; Alexander, 1987). Importantly, reciprocity requires reliable compensation, and yet it is possible for investments to be directed to ineffective members of the group who do not provide a good return on the investment (e.g., Krupp et al., 2011). The maintenance of reciprocal systems in the face of this risk has been conceptualized in various sets of models.

One of these sets can be termed "partner control" or "partner fidelity" models (e.g., Bull and Rice, 1991; Baumard et al., 2013), exemplified by situations in which two individuals are forced into interaction, often over repeated rounds. Because the social partner is predetermined and individuals can neither withdraw nor switch partners, the only recourse an individual has involves the punishment of undesirable behaviors. Here, the paradigmatic case is the iterated Prisoner's Dilemma game, in which participants who do not cooperate with their partners can be penalized in later trials, while prosociality is matched with reciprocated prosociality (e.g., a "tit-for-tat" strategy; Axelrod and Hamilton, 1981). In this way, preventing the partner from cheating can maintain the cooperative system.

In contrast, "partner choice" models are based on the idea that individuals can be selective in their social interactions. Emphasis is

placed on choosing cooperative partners and being chosen as one (e.g., Bull and Rice, 1991; Roberts, 1998). An illustrative example comes from the behavior of cleaner fish and their clients. Cleaner wrasse (*Labroides dimidiatus*) eat the ectoparasites found on the surfaces of other fish (various Australian reef fish: the "clients,") who, in turn, benefit from the parasite removal (for review, see Bshary and Noë, 2003). Cleaner wrasse are often tolerated as they eat the ectoparasites, yet cleaners sometimes cheat by eating the client's mucus, which is preferred over the parasites. The clients, however, find this aversive and may react in one of two ways. Sometimes clients "punish" by going on the attack, chasing, and driving the cleaners away (described as partner control), but clients may also engage in behavior that exhibits partner choice, such as swimming away and finding other cleaners. Indeed, partner choice is also evidenced by observations of clients preferably approaching cleaners who were previously observed cleaning other fish without conflict. Thus, in partner choice models, the general preference for good partners maintains reciprocity and selects for prosocial behavior within a species in the form of "social selection" (e.g., Baumard et al., 2013) and "competitive altruism" (Roberts, 1998; Barclay, 2004; Barclay and Willer, 2007).

The remainder of this paper will consider the evidence for behavior in early instances of human prosociality that is consistent with partner choice models. This is not to say that partner control models cannot describe some instances of early prosocial behavior, and there is recent informative work that may better fit that model than a partner choice model (e.g., Ingram and Bering, 2010; Vaish et al., 2011; Warneken and Tomasello, 2013). Further, for the purposes of this brief review, we do not focus on instances in which young children's prosocial behavior may be best interpreted as the outcome of "social selection," even though this is an important aspect of partner choice models (e.g., sharing after collaborative effort: Hamann et al., 2011; see also Warneken et al., 2011; Baumard et al., 2012; Melis et al., 2013). Instead, we will present a review of recent studies that together support the claim that early prosocial behavior is often selective in terms of recipient.

EVIDENCE FOR PARTNER CHOICE IN EARLY PROSOCIAL DEVELOPMENT

An important prerequisite for partner choice behavior in humans would be an evaluative system that distinguishes positive interactions from negative interactions and encourages approach or other affiliative behaviors directed toward those involved in positive interactions. In this section, evidence for this evaluative system in infancy will be presented, followed by discussion of instances in which the evaluations that young children make are followed by selective engagement of prosocial behavior. Then, we will consider why, at a more proximate level, children are being selective. It is important to acknowledge, though, that selectivity in prosocial behavior – and the motivations to be selective – will become more sophisticated with age as new means of evaluation develop (e.g., Hay et al., 1991; Warneken and Tomasello, 2009, 2013; Dahl et al., 2013; see also Wynn, 2009).

FOUNDATIONS IN INFANCY: EVALUATION OF OTHERS' BEHAVIOR

Partner choice models present an adaptive strategy for the maintenance of reciprocity, though the existence of behaviors that

support partner choice during infancy may not seem immediately adaptive. Infants cannot easily "choose" their social partners and their prosocial behavior is limited at best. Yet, arguably, the infant's evaluation of social interaction may serve as adaptive preparation for later childhood and adulthood partner choice behavior, or even have some adaptive value during infancy, possibly as part of an attachment mechanism (i.e., serve as an "ontogenetic adaptation," Bjorklund and Pellegrini, 2000).

In one of the first studies to examine infants' evaluation of simple interactions among agents, Premack and Premack (1997) reported that 12-month-old infants recognize the underlying valence of helping and hindering behavior as positive and negative, respectively. Infants visually habituated to one of four interactions conveyed by animated circles: helping (one circle lifted and pushed the second, enabling it to exit a door), hindering (one circle prevented the other from exiting the door), caressing, and hitting. To the adult observer, these events can be categorized at different levels. At one level, the helping and hindering events show intention to exit a door (and, for that matter, the presence of a door), and the hitting and caressing events both depict the approach of one agent toward another in an otherwise empty scene. At another level, the events could also be categorized by valence, such that helping and caressing share a sense of positivity, and hindering and hitting share negativity. The authors proposed that infants categorized the events by valence because the infants showed dishabituation to the hitting event if habituated to either helping or caressing, but not if habituated to hindering or hitting.

The evaluation of interactions also appears to influence infants' approach (e.g., reaching) behavior. After witnessing a wooden square enable a circle to reach the top of a hill and a triangle hinder the circle's climb, infants as young as 10 months reach for the square more often than the triangle (Hamlin et al., 2007). Similar results are found with younger infants and when different types of helping and hindering events are depicted (Hamlin and Wynn, 2011). Further, infants appear to have similar considerations regarding others' behavior: after being habituated to helping and hindering events involving computer-animated agents, 9- and 12-month-old infants look longer when hindered agents approach those who have hindered them in the past (Kuhlmeier et al., 2004; Hamlin et al., 2007; also see Kuhlmeier et al., 2003, for results with simple, faceless stimuli). Comparable results have been found in other laboratories and with other actions, such as harming (i.e., reaching for victims over harmful agents, Kanakogi et al., 2013) and sharing. For the latter, infants appear to be sensitive to the equal or unequal distribution of goods (Schmidt and Sommerville, 2011; Sommerville et al., 2013), and by at least 10 months, this evaluation is utilized when they subsequently consider the likelihood of another agent approaching the distributor (e.g., Geraci and Surian, 2011; Meristo and Surian, 2013). Together, these studies suggest that evaluative processes that support later selective prosociality are present within the first year of life.

SELECTIVE PROSOCIAL BEHAVIOR BASED ON OTHERS' HELPING, HINDERING, AND HARMING BEHAVIOR

During the second year of life and beyond, the evaluation of interactions appears to influence the selective engagement in prosocial behavior. Recent experimental paradigms have manipulated the

interactions that young children witness by varying the behavioral and physical characteristics of the actors. Children's subsequent engagement in prosocial behavior toward these individuals is then measured. The manipulated characteristics of the actors have included engagement in helping, hindering, and harming behavior, discussed here, as well as other behaviors and physical characteristics that will be discussed in later sections. Additionally, some experimental paradigms have included the child as a third-party witness of the actor's behavior toward another actor (i.e., similar to indirect reciprocity), while others are designed with the child as a member of the interaction (i.e., similar to direct reciprocity).

Young children appear to selectively share resources with individuals who have a history of helping over individuals who have hindered. In one study (Kenward and Dahl, 2011), preschool children observed events inspired by Kuhlmeier et al. (2003) in which a puppet was trying to climb a ladder or trying to dig a hole and was helped by one character and hindered by another. Subsequently, 4.5-year-old, but not 3-year-old, children distributed resources ("biscuits") in favor of the helper. These children also tended to justify this distribution in relation to the helper and hinderer's previous actions. Of note, however, was that when biscuits were plentiful (e.g., eight or nine biscuits), children opted to give equal numbers to each actor, even if that meant not distributing all of the resources. Thus, factors such as an "equality bias" may eclipse selective sharing when resources are plentiful, while selectivity based on recipients' previous behavior is observed when resources are scarce.

The selective sharing of a desired resource is also suggested in a study that presented 18- and 25-month-old children with events in which a person was either the victim of another's harmful behavior or not a victim (Vaish et al., 2009). Children gave a balloon more often to the victim, though since this victim was not paired with the harming actor, it is unclear from this study whether children would also avoid individuals who harm others. Also, as the authors conclude, the sharing behavior may be best interpreted as the outcome of sympathy, which, while likely integral to the broader consideration of human morality, is not currently a key feature in partner choice models. A perhaps clearer example of partner choice comes from a second study by Vaish et al. (2010) which found that 3-year-old children in a forced-choice task selectively helped an actor who previously did *not* intend to harm another actor over one who did show the intention (Vaish et al., 2010). When an overtly helpful actor was paired with a neutral actor in second experimental condition, though, children were not selective in their helping behavior. Yet, notably, the "neutral" actor had previously interacted in a friendly manner with participants in a warm-up period, and thus selectivity may not have been observed simply because both actors had a history of only positive interactions.

SELECTIVE PROSOCIAL BEHAVIOR BASED ON OTHERS' PROVISION OF RESOURCES

Young children also appear to selectively help individuals who have shown the intention to provide resources to them. Dunfield and Kuhlmeier (2010) demonstrated that 21-month-old children selectively picked up an out-of-reach object for an individual who,

in a previous interaction, intended to provide them with a desired toy over one who did not. Children selected the recipient of their helping behavior based on an actor's positive intention even if the actor had tried but failed to deliver the toy. A subsequent experiment indicated that the children were selective even when both actors' actions resulted in providing the toy, yet only one of the actor's showed the overt intention to provide (i.e., the other actor's actions were accidental).

Further evidence for selective prosocial behavior based on others' provision of resources comes from studies in which children observe interactions between other individuals and then are given the opportunity to act. For example, Dahl et al. (2013) found that 27-month-olds were more likely to help an actor who had previously returned a desired object to another actor than one who had not returned the object. Additional analyses indicated that although 16-month-olds did not demonstrate selective helping, they also did not show the same looking time patterns as the slightly older children who did selectively help (i.e., looking longer at non-sharing interactions). It is possible that the younger participants did not understand and evaluate the interactions they observed and thus had no basis for selectivity (though see Section 3 below).

In a study with slightly older children, 3-year-olds directed a doll to give more resources to a doll that had previously given to others (Olson and Spelke, 2008). In another condition, children directed the doll to give more to someone who gave to directly to the doll than someone who gave to others, suggesting that early selective sharing behavior is constrained by a nuanced evaluation of the previously witnessed interaction and the individuals involved. Similarly, as reported in this Special Topic Volume, 15-month-old toddlers will selectively provide a resource to someone who has made equal (fair) distributions to two other people over someone who has not, but the children's selectivity appears to be affected by the race of the distributor and recipient in relation to the participant (Burns and Sommerville, 2014).

SELECTIVE PROSOCIAL BEHAVIOR BASED ON OTHERS' INFORMATION SHARING

A communicative interaction often allows an individual to gain benefits that would be unavailable through individual learning alone. The provision of information can be construed as a prosocial act (e.g., Liszkowski, 2005), and by at least 3 years of age, children are more likely to apply the label "helpful" to a puppet who was willing to communicate the solution to a puzzle than to one who declared that he knew but was "not telling" (Dunfield et al., 2013). The evaluation of a communicative interaction also appears to influence selective helping behavior in young children; 3-year-olds will selectively deliver a dropped object or provide information to the informative puppet over the unwilling puppet (Dunfield et al., 2013).

In Dunfield et al. (2013), the accuracy of the puppets' information was not manipulated (i.e., a puppet either willingly provided accurate information or simply refused to provide any information), but at least by 5 years of age, children believe that an individual who previously provided accurate information would be more likely to "share her toys" than someone who provided inaccurate information (Brosseau-Liard and Birch, 2010). This

study did not examine whether children would also selectively direct their own prosocial behavior toward an accurate individual, but Brooker and Poulin-Dubois (2013) did not find evidence for greater helping behavior by 18-month-olds after an interaction with an accurate experimenter than after observing an inaccurate experimenter. However, unlike Dunfield et al. (2013), the between-subjects experimental procedure used in Brooker and Poulin-Dubois (2013) did not create a situation in which children were able to choose between these individuals. In sum, children's assessment of an individual's willingness to provide information does seem to influence subsequent selective helping, but future research is required to examine the influence of the accuracy of the provided information.

SELECTIVE PROSOCIAL BEHAVIOR BASED ON GROUP MEMBERSHIP

Thus far, our discussion has focused on instances in which young children have engaged in selective prosocial behavior immediately after being directly involved in, or observing, interactions with others. A past history of interactions may also influence selective prosociality. For example, Moore (2009) found that 4–6 year-old children shared stickers (at a cost to themselves) more with friends than other familiar peers and strangers, although when there was no personal cost to providing stickers, friends and strangers were treated similarly. Friends were also favored in Olson and Spelke (2008); 3-year-olds directed a doll to give more items to her friends. However, children were only selective in the distribution when resources were scarce and they were unable to give to all of the dolls.

Young children may also engage in selective helping behavior based on defined group membership and similarity to the self, even without previous observation of social interactions. At 2.5–3 years of age, children selectively helped a puppet who was previously described as being "on their team" (group membership) or as wearing the same color shirt (similarity) over non-team members and dissimilar puppets (O'Neill and Kuhlmeier, 2013, 2014). Further suggestion comes from work by Dunham et al. (2011), in which 5-year-old children allocated resources toward in-group members even when group assignment occurred randomly and group members were previously unknown to the child (though here, children were not sharing *per se*, as they could not opt to keep the resources for themselves).

WHY DO YOUNG CHILDREN SHOW SELECTIVITY?

The findings presented above suggest that toddlers and young children are often selective in relation to the recipient of their helping and sharing behaviors. We remain agnostic, however, as to the precise age at which prosocial partner choice can be observed. Helping behavior, such as picking up a dropped object, is observed at 14 months of age (Warneken and Tomasello, 2007), and informing is found at 12 months (Liszkowski, 2005), yet there have been no experimental attempts to examine selective helping in toddlers at this age. Some existing studies, though, do find age differences within their sample, with younger children (2 or 3 years of age) showing weaker effects of partner choice than slightly older children (e.g., Kenward and Dahl, 2011; Dahl et al., 2013). As noted above, one possible reason that a study may not find evidence for partner choice in very young children is simply that these children did not understand the social interaction that was enacted and

thus could not form an evaluation on which to base their selectivity. However, unless the understanding of the interaction can be measured independently of partner choice behaviors, then the hypothesis of early selectivity is unfalsifiable. It is also important to note that even if partner choice is found in young children's earliest instances of prosocial behavior, the mechanisms underlying selectivity may differ across development and situation.

At this point, however, the causes of selectivity are unclear. That is, while the interdisciplinary study of reciprocity has provided partner choice models that detail the important role of selectivity, the more proximate, cognitive mechanisms—particularly in early human development–have not been fully elaborated. In this section, we consider possible cognitive mechanisms underlying selectivity; however, we have opted not to discuss the mechanisms underlying selectivity based on group status in detail, as these have been well considered in social and developmental psychology literature (e.g., Billig and Tajfel, 1973; Nesdale, 2004; Tajfel and Turner, 2004; Bigler and Liben, 2007; Dunham et al., 2011).

The existence of behavior in humans and non-human animals that is consistent with partner choice models (e.g., Bshary and Noë, 2003; Warneken, 2013b) suggests both that partner choice is a fundamental system for the maintenance of reciprocity and that the proximate mechanisms that support it may range from highly constrained innate predispositions to more flexible individual and social learning processes and rational inference. An initial proposal we can make regarding early human selectivity is that at least by 3 years of age, it is *not* based on an imitative processes in which children respond to one prosocial action by re-enacting the same action; children in Dunfield et al. (2013) and Kenward and Dahl (2011) engaged in selective prosocial behaviors that differed from the previously observed behaviors.

One possibility, though, is that partner choice in young children is, in some instances, based on an expectation of reciprocity. For adults, pre-existing beliefs and the observation of behavior give rise to inferences about others' dispositions (e.g., Kelley, 1973; Choi et al., 1999; Molden et al., 2006). It is possible that young children also engage in a process by which they form an expectation of future behavior on the part of the individual they have selected as a recipient of prosocial behavior. That is, the previous observation of an individual's actions may lead to an attribution of a prosocial disposition, in turn leading to the assumption that the child's own prosocial behavior is being selectively directed toward someone with whom future interactions will be generally positive (i.e., a sensitivity to the likelihood of reciprocity).

This type of attribution may be present by 3 years of age, yet further research is needed. As noted above, 3-year-old children labeled an actor who provided information as "helpful" and selectively helped that actor in return, though expectations regarding the actor's future actions were not measured in this study (Dunfield et al., 2013). Additional initial support comes from a task in which a social partner was fixed (i.e., a task associated with partner *control* models). Warneken and Tomasello (2013) found that 3-year-old children based their sharing behavior on the sharing behavior of a fixed partner over repeated encounters (i.e., showing "contingent reciprocity"); however, there was no evidence that the actor's behavior influenced 2-year-old children's sharing. Thus, a preliminary proposal is that by 3 years of age, selective partner

choice may also, in some situations, be based on the attribution of a prosocial disposition coupled with an expectation of reciprocity.

The attribution of a prosocial disposition (such that an individual is expected to engage in prosocial actions) may also be formed without the direct observation of prosocial behavior by that individual. For example, by at least 4 years of age, children view lucky individuals as more likely to engage in prosocial behavior (Olson et al., 2008). It is thus possible that during the first 5 years of life, children's selective helping and sharing toward certain individuals, even in the absence of direct observation of those individuals' prosocial actions (e.g., selective prosociality directed toward in-group members), may also be based on the attribution of a prosocial disposition. Future experimental paradigms may consider examining whether children engage in selective prosocial behavior toward individuals who demonstrate other positive traits that are not directly related to prosociality (e.g., health, strength, prestige, or intelligence).

A viable, alternative proximate cause of selective prosocial behavior is that children may simply find some individuals more positive in a general sense and engage in selective partner choice based on this positivity. That is, at some ages and in some situations, a general sense of positivity may not be translated to a dispositional attribution, yet still may lead to selectivity. When a choice is available, children may, for example, direct their own positively valenced actions toward those who have engaged in positively valenced actions themselves or those who have a positively valenced trait (e.g., member of in-group) without an explicit expectation of reciprocity. Importantly, this is not a "kill joy" explanation. Indeed, similar proposals have been made for a possible mechanism guiding partner choice based reciprocity in non-human animals (e.g., Brosnan and de Waal, 2002; Schino and Aureli, 2010). Thus, consideration of the breadth of mechanisms that can lead to effective partner choice will provide a better understanding of both the ontogeny and phylogeny of prosocial behavior.

CONCLUSION

In sum, we suggest that many instances of early prosocial behavior produced by young children fit partner choice models of reciprocity. Recent findings suggest that early helping and sharing behaviors are often selective in terms of recipient, with selectivity based on the observation of previous actions and interactions, as well as featural characteristics of the potential recipients. The proximate causes of selective partner choice in early development require further study and may differ across age and situation, but likely candidate mechanisms range from expectations of reciprocity based on the attribution of prosocial dispositions to a more general motivation to direct positively valenced behaviors toward positively valenced individuals. The application of partner choice and partner control models to the study of childhood prosocial development—in sum, the study of reciprocity—in turn sheds light on the factors that encourage or discourage prosocial behavior in our early social interactions.

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Children's early helping in action: Piagetian developmental theory and early prosocial behavior

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After a brief overview of recent research on early helping, outlining some central problems, and issues, this paper examines children's early helping through the lens of Piagetian moral and developmental theory, drawing on Piaget's "Moral Judgment of the Child" (Piaget, 1932/1997), "Play, Dreams, and Imitation in Childhood" (Piaget, 1945/1951), and the "Grasp of Consciousness" (Piaget, 1976). Piaget refers to a level of moral development in action that precedes heteronomous and autonomous moral reasoning. This action level allows children to begin to interact with people and objects. In his later work, Piaget explores the gradual construction of understanding from this activity level. Taken together, these elements of Piagetian theory provide a promising conceptual framework for understanding the development of early helping.

Keywords: prosocial behavior, moral development, social interaction

Young children begin to help others soon after their first birthday (Warneken and Tomasello, 2007). In the lab, toddlers will assist adults who have encountered a variety of problems, with a progression of helping behaviors. Children's earliest form of helping, appearing as early as 14 months (Warneken and Tomasello, 2007), is often called *instrumental helping*, as it involves aiding an adult complete a thwarted goal, such as retrieving a dropped object, or opening a door (e.g., Warneken and Tomasello, 2006; Svetlova et al., 2010; Dunfield et al., 2011). Early in the second year of life, children begin to display *empathic* helping, which is oriented at relieving those in distress, such as providing a blanket to someone who is cold. Closer to 30 months of age, children also begin to show *altruistic* helping, which involves sharing and distributing resources, including those belonging to the child (e.g., loaning a favorite toy). In many traditional models of prosocial behavior, these forms of helping would be attributed to skills such as emotion understanding and perspective taking. Yet developmentally, the appearance of early helping precedes these forms of complex social emotional understanding, leaving the emergence of help, its developmental trends, and sources of individual differences poorly understood (Svetlova et al., 2010; Paulus, 2014).

Doubtlessly, some of the difficulties in understanding early help are conceptual. Help is a term of natural language, not a technical or psychological term, and does not have a precise psychological correlate. Helping can involve many different actions and situations, ranging from doing something explicitly requested or commanded (e.g., "Can you hand me that hammer?"; "Come here!") to doing something that we feel is another's interest (e.g., opening a door for someone coming into a building behind us; assisting someone who is hurt). As Paulus (2014) remarks, helping in these situations could involve a plethora of psychological skills, despite the superficial unity implied by the word "help." There is also a moral connotation to the term help, which again may or may not apply to the particulars of a situation. In the lab, helping opportunities are generally structured such that children's participation is prosocial. But in real life, assisting another achieve a goal (e.g., retrieving car keys for someone who is drunk) is not always the right thing to do. Furthermore, help can be in the eye of the beholder; for example, a parent's decision to prevent their child from playing video games, even if aimed at assisting the child achieve in school, may go unappreciated by the child. The issue of perspective may be important to the development of helping, as young children's assistance in routines and chores in the home, although often unhelpful to parents, slowing down and stymying their efforts, is also regarded by many parents as worthy of encouraging and supporting (Rheingold, 1982; Hammond and Brownell, 2014).

Despite the unresolved complexities that surround the concept of help, recent studies on early helping have many raised questions about human evolution, development, and morality. For some, the early appearance of helping could suggest – in the sense of behavioral ontogeny recapitulating behavioral phylogeny – that human cooperativeness emerged at an earlier evolutionary time (Warneken and Tomasello, 2009). This would suggest that a predominant view of human nature as selfish is misguided (Hay, 2009). The precocity of helping also raises questions about how it is learned. Although socialization seems like a plausible route, Warneken and Tomasello (2013) found that instrumental helping is not influenced by social praise and reinforcement. Furthermore, they argue that because young children are unlikely to encounter situations where an adult needs their help in the home, they have few opportunities to learn about helping. Instead, it seems that "very young children have a natural tendency to help other persons solve their problems" (Warneken and Tomasello, 2006, p. 1302). With evolutionary roots and early, unexplained, appearance, helping seems to be a good candidate for the larger movement in developmental psychology that posits infants possess some elements of an innate morality (e.g., Hamlin et al., 2007; Bloom, 2012).

However, Warneken and Tomasello's (2006) argument relies on a relatively narrow view of learning, one that omits situations in which children apply skills learned in one context to other contexts. Hebb et al. (1971) call this latter form of learned behavior, behavior "that is not learned, but *is* dependent on prior learning" (p. 213). Although no one has systematically investigated the frequency with which adults encounter problems that require a child's aid, children clearly can and do get involved in helping their parents in the home (Rheingold, 1982; Hay, 2009). The social ecology of the home reveals a rich context in which children could develop skills that may allow them to offer instrumental help, i.e., helping in a situation where an adult encounters a problem, even if they have never encountered this particular situation outside the lab.

Unfortunately for parents, and in contrast with the view that children come into the world biologically prepared to help others, young children's "help" is often less than helpful. One- and 2-year-olds' involvement in activities in the home often involves interfering with whatever their parents are doing, smearing spills instead of wiping them up, or setting clean dishes from the dishwasher on the floor. Many young children insist that they be allowed to assist with these activities, and may grow angry if they are excluded (Forman, 2007). Children's "uncooperative cooperativeness" leads many parents to wait until their children are napping to take care of household tasks (Rheingold, 1982). But, parents also report that they want to have their children take part in this help, as, in the words of one mother, "it is usually unhelpful and makes everything take longer, but she loves learning new things and it is my job as mommy to teach her all of these things" (Hammond and Brownell, 2014). Eventually, children do learn to help in the home. As diary and ethnographic studies show, young children can come to play important, and genuinely helpful, roles in the home and larger community (e.g., Rogoff, 2003; Hay, 2009). However, children also come lose their zeal for some of these tasks, and must be coaxed to do chores and help their parents, suggesting developmental changes in motivation.

How can these diverse pictures of children's early helping, of children as natural altruists and unhelpful helpers, be reconciled? At this juncture in research on early helping, there may be value in revisiting an older theory of moral development for a better understanding of early helping. The recent trend in developmental research towards innate morality is in some ways a pushback against the seminal work of Piaget (1932/1997), whose explorations of morality are largely restricted to later childhood (e.g., Hamlin, 2013). The reaction against Piaget's influence, which has occurred in many other areas of developmental psychology (e.g., object knowledge; numerical cognition; social cognition, etc.), has had the positive effect of demonstrating that many phenomena appear earlier in the lifespan than expected (Hay, 2009). However, these efforts to frame early helping as unlearned, and infant morality as largely equivalent to its adult forms, risk missing out on the unique developmental features of early helping, which are particularly evident in observations of children in the home, and the developmental trends in helping such as the transition from instrumental to empathic and altruistic helping.

Although early helping clearly precedes the period of morality that Piaget was particularly interested in, the broad features of the Piagetian developmental program, which focuses on change and transformation, may be able to make some positive contributions to the study of early helping, highlighting features of early helping that have been overlooked and presenting some revised expectations about its emergence and subsequent development. In particular, Piaget's theory, which is at its heart an account of how knowledge emerges from action (Chapman, 1988), may have something to say about how children manage to begin to help others before they have develop complex social cognitive representations. The present paper will draw on a few elements Piaget's works, namely his early works the *Moral Judgment of the Child* (Piaget, 1932/1997) and *Play, Dreams, and Imitation in Childhood* (Piaget, 1945/1951), and his later work on the transition from action to reflective cognition, the *Grasp of Consciousness* (Piaget, 1976), to explore the emergence of early helping, the transition to more complex forms of helping, and what may happen to helping in later development.

BEFORE MORALITY REASONING: THE EMERGENCE OF EARLY HELPING

At first glance, Piaget's moral developmental theory, which is largely focused on children aged 5 to 12, has little to contribute to the study of early helping, which occurs in the first few years of life. Furthermore, in the opening line of the *Moral Judgment of the Child*, Piaget (1932/1997) declares that he offers, "no direct analysis of child morality as it is practiced in home and school life" (p. 10). Instead, his moral theory unfolds as a critique of the prominent moral education theory of sociologist Émile Durkheim (Durkheim, 1925/1961; Fedi, 2008). Whereas Durkheim saw morality and moral rules thrust on the child by adult society, Piaget countered that this was only one part of the story. Adults' unilateral exertion of rules on the child resulted in the child developing a *heteronomous* understanding of morality, where moral rules and norms were unchangeable and externally regulated through punishment. Piaget argued that children were also exposed to a different societal structure through social interactions with peers, characterized by a rough equivalence of power, and which lead to the development of an *autonomous* understanding of morality, where moral rules and norms could be constructed and negotiated in social interaction through a coordination of perspectives (Carpendale, 2009). Interestingly, despite their disagreements, both Durkheim (1888/1970) and Piaget found the idea that humans were born with innate knowledge deeply implausible.

Piaget (1932/1997) used the example of children learning the game of marbles, a social game with manifold rules (and a widespread popularity in his day and age) as a proxy for learning moral rules. As children develop, they begin to understand that the rules of marbles and morals are not unchangeable, handed down from generation to generation, but are living and breathing systems used to coordinate social interaction with others, and can be negotiated and changed. But, before children learn to think and reason about the rules of marbles, they must actually learn how to play marbles. And analogously, before children can learn to think about morals, they must actually engage in morally relevant activity. Piaget acknowledges from the outset that the practice and consciousness of morality is different, and, importantly, that the former emerges before the latter (p. 14). Even though the bulk

of Piaget's system of moral development is focused on moral reasoning, it is rooted in the practice of moral activity (Carpendale, 2009).

Piaget's recognition that there is moral practice before complex moral representations transforms one of the developmental mysteries of children's early helping. As Svetlova et al. (2010) remark, the central problem of early helping is how children manage to engage in it before they have developed advanced forms of social cognition and social understanding. But in a Piagetian account, this is precisely what we would expect to happen: young children should begin to learn some aspects of helping before the appearance of complex mental representations. For Piaget, moral development begins in a "stage of a purely *motor* and *individual* character... [leading to] the formation of more or less ritualized schemas" (Piaget, 1932/1997, p. 26). The child is learning to interact with objects, and people, in the world, and organize this action.

It should be noted that Piaget uses the term individual, and social, in a somewhat idiosyncratic way (Chapman, 1988). Piaget's point is that the child's early moral interactions are not entirely social, or not social in the same way that older children are social (Carpendale, 2009). Piaget (1932/1997) observes the child operating "in an individualistic manner with material that is social" (p. 37). By this he means that children's interactions often reflect their own interests, rather than reflecting the goal of the other. Although children are using the same objects as others (e.g., marbles), and interacting with others to some extent, in other ways their interactions are quite different than mature forms. Children are learning to engage in some aspects of the regularity of organized practices, but they do not understand these practices' larger goals. We could expect, transposing the theory to early helping that children may develop skills such as cleaning with others without a fully developed understanding of why these tasks are being accomplished, and of course with far more limited motor skills.

As children master the basic motor aspects of activities, they possess only a limited understanding of the greater context of these activities. As Piaget (1932/1997) puts it, these early interactions "may be called *egocentric...* the child imitates... without trying to win [i.e., the game of marbles]" (p. 27). Transposing the point about winning a game to the context of early helping, the child can be involved in activities without a good knowledge of their greater goal (e.g., play with marbles without understanding what it is to win a game of marbles; wipe a table with a cloth without understanding the goal of cleaning up the house). This fits with parental reports that children's helping is not always helpful (Rheingold, 1982). The child is capable of participating in some aspects of the task alongside their parents, but they do not necessary have a full understanding of the goals of the task at hand.

In fact the child's own version of the task may be quite eccentric. As one parent describes the process of doing laundry with her child, "[w]hen helping to fold laundry she often just wads it up into little balls. I try and show her the right way which lasts all of three items before she's back to wadding them up again" (Hammond and Brownell, 2014). For a young child, collaborative helping opportunities, like putting away laundry, is a sort of game, one in which they may fixate on particularly enjoyable aspects, to

the detriment of the task as a whole. The child is clearly able to take part in most aspect of the task at hand in isolation (e.g., move dirty laundry into the washing machine). But systematically, their understanding of how actions should be coordinated within the task is such that their help is unlikely to be helpful, without heavy management from parents.

Children's unconventional manner of helping is rarely remarked upon in lab-based studies of children's early helping. This may be because helping tasks in the lab are structured to rely largely on isolated components of helping, in such a way in that they artificially make the child seem more competent than they really are (Carpendale et al., 2013). In these studies, children are required to carry out relatively modest acts, e.g., pick up a dropped object and return it to someone's hand. This task is explicitly structured so that if the said act is performed, it is helpful to the adult.

In the motor and individualistic aspects of early moral development, Piaget (1932/1997) also alights on some unique developmental aspects of early moral development, which is the joy children express as they come to engage in regular and ritualized interactions (p. 33). Rheingold (1982) describes children's early helping as marked by "alacrity," engaging in "quick and energetic movements, excited vocal intonations, animated facial expressions, and with delight in the finished task" (p. 119). Again, this feature of children's early helping, though present in the subjects of contemporary lab-based studies of children's early helping, are rarely remarked upon as an important feature of help in these studies, which have largely been concerned with the outcome of help (e.g., its presence and rapidity), and much less interested in its process and character.

The recognition of children's joy in helping stands in contrast to a great deal of work in moral psychology and moral philosophy that has emphasized that helping uniquely emerges from concern and sadness (Wispé, 1991). As Adam Smith's friend and fellow philosopher David Hume pointed out long ago in a letter to Smith, if shared misery is the basis of our moral interactions with others, then morality would play a wholly onerous role in human existence (Ross, 1995, p. 179). Developmentally, it is unclear how morality would develop if children could learn about it only in situations of pain and distress. Extending Warneken and Tomasello's (2006) argument, these distressing situations are probably relatively rare in the child's life to form a basis for learning to help. Children have far more experience helping others in collaborative and playful contexts, with shared joy and enjoyment (Brownell et al., 2002).

FROM INSTRUMENTAL HELP TO EMPATHIC UNDERSTANDING: IMITATION AND SYMBOLIC UNDERSTANDING

The picture presented by Piaget's work on early morality is that of a child learning to engage collaboratively with others, without a full understanding of others' goals. In the rest of the *Moral Judgment*, Piaget largely leaves the early action level behind, turning instead to how children understand rules in relations of heteronomy and autonomy, an issue that lies beyond early helping, and will be returned to briefly below. However, we can turn elsewhere in the corpus of his work to learn more about how early helping might develop as children begin to reflect on helping.

In *Play, Dreams, and Imitation in Childhood* (Piaget, 1945/1951), Piaget provides many examples of children's early activity in the context of exploratory play. The imitation of people has been accorded a great deal of importance in both recent psychological literature, such as on mirror neurons (e.g., Keysers, 2009), and early learning (Paulus et al., 2011), as well as in earlier sociological literature (e.g., Tarde, 1903). Piaget finds many examples of children imitating others' actions and activities, such as modeling another person crossing their arms, or stamping their feet. However, perhaps setting his work apart from the focus on imitating other humans' actions, Piaget's work on imitation acknowledges that children imitate both people and objects. For example, Piaget (1945/1951) observes a 1-year-old child imitating "the sound of a rattling window and sway[ing] to the same rhythm" (p. 66).

As such, Piaget is not referring to imitation as merely a type of copying or mirroring, as a child cannot truly produce a copy of a rattling window as they can a walking adult, but rather as a form of learning by which they can integrate aspects of rattling window into their own repertoire of action. As children develop, they can produce these imitations, with greater ease, and manipulating them, reversing them, applying them in new situations and so on. As children manipulate these action schemes, they can accomplish a wide variety of tasks based on sensorimotor knowledge (i.e., practical knowledge) alone. This class of tasks would undoubtedly include helping others in many instrumental contexts. Young children, by the age at which helping first appears, have uncontestably experienced many of the components of helping others, whether handing over objects, or opening doors, throughout their lives. Indeed, and although Piaget badly underplayed the role of observational learning in his action theory, they have been experiencing and observing others handing objects to them for even longer. Furthermore, in the context of his larger theory of sensorimotor development, Piaget would clearly expect children to be able to apply action schema (e.g., handing an object to someone) in new contexts and novel situations (e.g., after someone has dropped it).

Piaget's expectation that children have the ability to apply action schema to new contexts is relevant to Warneken and Tomasello's (2006) argument that instrumental helping is likely unlearned because problem contexts are so rare in the young child's life. As noted early, the helping paradigms in the lab focus on problem situations where an adult feigns incapacitation (e.g., that they are unable to reach a dropped object), which the child has an opportunity to resolve. These types of situations may indeed be rare in children's lives, and when children encounter these situations in the lab, their help seems to come from nowhere. But according to Piaget, just because certain situations are rare, or novel, for the life of the child, does not necessarily mean that the child has no pertinent learning to apply in this rare or novel context. Echoing Hebb et al. (1971) view, Piaget would likely argue that children's instrumental helping is dependent on prior learning. A great deal of the earliest instrumental helping, which involves returning dropped and out-of-reach objects to the hands of an adult (e.g., Warneken and Tomasello, 2007), could in principle be explained by this ability to quickly emulate, and reverse, the movement of people

and of the objects. The act of returning something to someone's hand is something the child has likely seen, and experienced themselves (e.g., when they have dropped their bowl of food), many times, and is not particularly difficult for a young child to do.

That said, children encounter situations in which their prior learning cannot aid them. A likely candidate seems to be empathic helping, which appears later in the lifespan than instrumental helping. Empathic helping occurs in situations such as someone shivering with cold, and who needs a blanket (e.g., Svetlova et al., 2010). In this type of scenario, young children clearly have the requisite skills to lift and carry a blanket over to a shivering adult. But how do they learn to connect the blanket to a person shivering? This helping situation is structured radically differently than instrumental helping tasks. When a person is shivering, there is no interaction between person and object. Instead the interaction is situated only with the experimenter in their shivering. Shivering can be symbolically linked to needing a blanket, but there is no direct interaction with this blanket. To solve the empathic task at a stage where no interaction has taken place, the child must recognize the meaning of someone shivering and its relation to a blanket somewhere else in the room.

In experimental studies, should the child fail to initially retrieve the blanket, the experimenter subsequently begins to reach for the blanket. It is here that an imitatable interaction emerges, and this also seems to be the point when younger children begin to retrieve the blanket (Svetlova et al., 2010). Thus, the empathic forms of helping may emerge later for children, not because they rely on "hidden" emotions or mental states (after all, shivering is an overt behavior), but because the emotional displays involved do not initially include a direct interaction between the experimenter and object needed to solve the task, but rely on a more symbolic form of understanding ("a blanket is for a person who is cold"; "a person who is shivering is cold"). This relation between shivering and a blanket is not apparent in the undifferentiated action context, because there is no interaction between the person and the blanket. Although it is possible "solve" empathic helping tasks with sensorimotor skills, a far more elegant solution lies in the child learning to understand the world more symbolically, explicitly bringing actions (e.g., shivering) into relation with objects (e.g., a blanket).

UNDERSTANDING HELPING OTHERS: THE GRASP OF CONSCIOUSNESS

Piaget's work suggests that children can learn to help with sensory and motor skills. However, children eventually learn to differentiate the world into self and other, object and person, and gain more mentalistic and reflective skills. In the *Grasp of Consciousness*, Piaget (1976) lays out that the process by which children gain reflective understanding, as their practical knowledge is reconstructed on a conscious plane, or level, of thought. This conscious reconstruction isn't merely an "illumination" of what was occurring on the plane of action, i.e., a direct isomorphism of that activity, but a reconstruction that moves beyond what they see in direct interaction, and thereby allows them to reorganize their existing activity in more sophisticated ways (Campbell and Bickhard, 1986).

In Piaget's account, reflective understanding arises first in what Piaget (1976) calls the *periphery*, and only gradually moving to what he calls the *center*. In this somewhat misleading terminology, the periphery refers to the site of interaction between subject and object, whereas the center(s) refers to characteristics associated with the subject(s) and object(s) involved in the interaction. Piaget assigns the terms periphery and center on the basis of their importance to explaining causality, i.e., the characteristics of subject and object are centers in terms of a causal explanation of an interaction, where the interaction itself only offers some peripheral aspects. Although Piaget lays out the periphery-center model in the context of the child-as-subject interacting with some object, there seems to be no reason why cognizance could not also involve other subjects as other centers.

In this periphery-center model, children's understanding will first form around aspects of interaction between object and subject, and only later begin to form around the properties of objects and subjects contribute to these interactions. So for example, early on, a child may understand that opening a door will allow toys to be retrieved from a closet (an interaction), but the same child is unlikely to understand the properties of the mechanisms of the door (central characteristics of the object), nor successfully reflect on how they learned to open the door (central characteristics of the subject).

In that children focus on the periphery, i.e., the point of interaction, Piaget's work suggests that in the early stages of development, children begin to understand objects and people in a relatively undifferentiated way. When a child sees someone drop a pen they likely approach the situation holistically, understand something about people and pens, i.e., that pens belong in a hand, rather than segmenting the situation into one in which they must read the mind of the other. The child's knowledge begins with interactions between people and objects (e.g., a marker falling out of someone's hand). These are only later constructed into differentiated knowledge about objects (e.g., blankets can make people warm) and subjects (e.g., shivering means cold) proper. The fact that early practical knowledge blends subject and object in interaction means that children do not *a priori* distinguish people/minds as one form of knowledge, and objects and things as another (Bibok et al., 2008). However, research on children's early helping, like so much of psychology, has fixated on the problem of other minds, such that one part of the reason we are surprised by the precocity of children's early helping is that we presuppose that this helping must involve a knowledge of other minds, rather than framing the issue as skills in interaction.

If this principle of periphery to center is applied to the context of helping, children would be expected to first understand aspects of interaction, such as retrieving a dropped object and placing it in the hand of an experimenter, long before they understand the central social cognitive questions of why the experimenter was unable to retrieve the dropped object. Nearly all lab-based instrumental helping tasks are structured with peripheral components, such as an experimenter with an arm full of books bumping up against a door he or she cannot open. Only later will children be able to differentiate and reflect on the more central aspects of helping, such as the larger goals and capacities and needs of the helpee.

One recent study of helping in slightly older children shows that with development, children's helping seems to become more attuned to discriminate when someone actually needs help versus someone who is capable of solving the problem on their own (Paulus and Moore, 2011). In the home, this restriction to the peripheral may explain why children can initially carry out many of the components of helping, e.g., picking up laundry, even if they do not understand their parents' larger goals, nor quite see some important characteristics of the objects involved (e.g., dirty vs. clean clothes). As children develop, they may learn to reflect on these more central aspects. Interestingly, and in what is an important point of future longitudinal investigation, this may mean that children help less as they get older, even as they become more competent helpers.

DIFFERENTIATING HELP: FUTURE DIRECTIONS OF CHILDREN'S EARLY HELPING

The literature on children's early helping has thus far largely focused on the presence of help, rather than individual differences. In reviewing Piaget's moral theory, an important point to address, and correct, is the role that Piaget sees for parent–child social interaction in moral development, and how this might be a source of these differences. Piaget is somewhat infamous for emphasizing the deleterious role of parent in moral development. However, Piaget's characterization of adult society as being detrimental to the development morality was in fact an emphasis on an ideal type of authoritarian parenting (Vidal, 1998). Piaget did not programmatically view parental involvement as necessarily injurious to the children's moral development (Carpendale, 2009).

A more serious lacunae in Piaget's model of social development was his tendency to generally downplay the content of early interactions, and the way in which these expose children to skills in a variety of social and cultural contexts (e.g., caring for children; preparing food). Instead, Piaget largely focused on the power structure of these interactions, in so far as these promoted obligation or mutual respect (Moessinger, 2008). These structural issues may be important in terms of the quality of parent-child interactions, such as scaffolding, which may provide a route to explaining individual differences in children's helping (Pettygrove et al., 2013). Nevertheless, Piaget's writing on early moral development leaves room for profound parental influences on children's early helping activities, as parents socialize and introduce the child to a variety of different practices (Grusec et al., 2013). Parents, and social institutions, provide opportunities for children to learn a wide variety of skills. As Rogoff (2003) remarks, in some cultures, young children are trained in skills, such as using machetes to cut food, that but seem almost mind-boggling dangerous in Western society.

Beyond the issue of the types helping children become proficient in, there is the issue of the connection between this early form of moral behavior and later moral development. In Piaget's theory, aspects of children's early helping behavior will become conceptualized by the child and become part of the child's moral understanding. Here we may expect further individual differences. The joy that children display in early helping, their enthusiasm and

insistence to get involved in the tasks of adults, changes in structure and motivation in early and middle childhood. Following Piaget's theory of moral development, children may come to conceptualize certain forms of helping heteronomously and imposed by obligation. So a chore, such as vacuuming, which was interesting when the child was delighted in the action of pushing the vacuum might becomes something they feel forced to do. But children may come to understand other forms of helping differently, particularly if these are negotiated in a relation of respect and caring for the other. An example of this sort of helping might be feeding the family pet.

CONCLUSION

In this brief first pass, Piaget's theory offers some interesting avenues to rethink some of the major problems facing research on children's early helping. In the Piagetian account, children should be expected to begin to help before the formation of complex mental representations (Svetlova et al., 2010). However, this early helping will also be characterized by properties such as enthusiasm and unhelpful helping that we would not expect of its mature forms (Rheingold, 1982). Piagetian theory also suggests a way to resolve Warneken and Tomasello's (2006) view that children's help in problem situations cannot be learned because these situations are so rare in the child's life. The Piagetian concept of learning would allow children's skills learned in one context to transfer to novel contexts (e.g., a problem scenario).

Piaget's action theory suggests some developmental expectations for why certain forms of helping are more difficult for children than others. Early on, children are best able to understand interactions (e.g., someone reaching for a dropped marker), only later do they begin to be able to understand more disassociated aspects of helping (e.g., someone shivering with cold). The types of practical activities the child is exposed to by both their parent and culture may form the basis of their early helping. Finally, Piaget's theory suggests how children might come to understand their help in different ways, and with different consequences, depending on whether they view this help in the context of obligation or mutual respect.

In her own seminal work on early helping, Rheingold (1982) wondered whether the "attribution of the terms 'sharing,' 'comforting,' or 'helping' to very young children may appear unjustified to those who wish to reserve the terms for persons old enough to verbalize their intentions and… be explicitly aware of their motives" (p. 114). As he did with other developmental phenomena, Piaget would likely give a developmental answer, rather than a clear-cut yes or no (e.g., Piaget and Inhelder, 1966) and suggest that children's early helping may be only the first step of a much longer journey.

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