aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

Perspectives on Psychological Science
2015, Vol. 10(2) 159–175

DOI: 10.1177/1745691615568998
pps.sagepub.com
SAGE

Beyond Good and Evil: What Motivations Underlie Children's Prosocial Behavior?

Alia Martin[1] and Kristina R. Olson[2]
[1]Harvard University and [2]University of Washington, Seattle

Abstract
Researchers have proposed different accounts of the development of prosocial behavior in children. Some have argued that behaviors like helping and sharing must be learned and reinforced; others propose that children have an initially indiscriminate prosocial drive that declines and becomes more selective with age; and yet others contend that even children's earliest prosocial behaviors share some strategic motivations with the prosociality of adults (e.g., reputation enhancement, social affiliation). We review empirical and observational research on children's helping and sharing behaviors in the first 5 years of life, focusing on factors that have been found to influence these behaviors and on what these findings suggest about children's prosocial motivations. We use the adult prosociality literature to highlight parallels and gaps in the literature on the development of prosocial behavior. We address how the evidence reviewed bears on central questions in the developmental psychology literature and propose that children's prosocial behaviors may be driven by multiple motivations not easily captured by the idea of intrinsic or extrinsic motivation and may be selective quite early in life.

Keywords
prosocial behavior, helping, children, motivation

The nature of human goodness has been debated for millennia, from the ancient Chinese philosophers Mencius and Xunzi, to the 17th- and 18th-century philosophers Thomas Hobbes and Jean-Jacques Rousseau, to the most central figures in psychology like Sigmund Freud and Lawrence Kohlberg. Traditionally, one side argues that children are naturally immoral, aggressive, and selfish, needing to be taught generosity. The other side contends that children are innately kind and fair and that only later, through development, teaching, or socialization, do they become selfish and corrupt.

Developmental research has long been interested in prosocial behavior—behaviors performed to benefit others—and much theoretical interest has centered on similar questions concerning just how generous or selfish children are and the types of motivations that drive their earliest prosocial actions. Many early discussions emphasized that prosocial behaviors were primarily learned later in life, through social learning or explicit instruction (Bandura, 1977; Bar-Tal, 1982; Cialdini, Kenrick, & Baumann, 1982; Rushton, 1980). However, there is now considerable evidence that even toddlers exhibit prosocial behavior in observational studies (e.g., Buckley, Siegel, & Ness, 1979; Hay, 1979; Radke-Yarrow et al., 1976) and in the lab (e.g., Dunfield & Kuhlmeier, 2010; Warneken & Tomasello, 2006).

Some researchers have used such evidence to argue that children have a "basic impulse" to be prosocial (Hay, 1994). Yet even among those who agree that prosocial tendencies are basic, there has been debate about the motives underlying children's basic prosociality and their continuity with adult prosocial motivations. Some researchers have proposed that children's prosocial behaviors are initially indiscriminate (Warneken & Tomasello, 2009a) and driven by an intrinsic desire to see others helped (Hepach, Vaish, & Tomasello, 2012). Then, later in the preschool years, these behaviors become selective as to whom they are directed, can be performed strategically, and can be driven by a motivation to benefit

Corresponding Author:
Alia Martin, Department of Psychology, Harvard University, William James Hall, 33 Kirkland Street, Cambridge, MA 02138
E-mail: aliamartin@fas.harvard.edu

Table 1. Definitions of Terms

Some dichotomies that have been used to describe prosocial behavior include selective versus indiscriminate, extrinsic versus intrinsic, and strategic versus altruistic. Here, we define what is typically meant by these terms and how we use them in this review.

Selective* versus *indiscriminate: Prosocial behavior is selective or discriminating if it is more likely to be directed at some individuals or groups than others. For instance, 3-year-olds are more likely to help someone who treated others well rather than poorly (Vaish, Carpenter, & Tomasello, 2010). Thus, children at this age are selectively prosocial on the basis of others' previous niceness. In contrast, prosocial behavior is indiscriminate if it is similarly likely to be directed at anyone. Selectivity does not necessarily suggest a selfish or strategic motive. For instance, children give more resources to poor recipients than to rich ones (Paulus, 2014), suggesting a motivation (whether selfish or selfless) to help those in need.

Extrinsic* versus *intrinsic: An extrinsically motivated behavior is maintained by a system of reinforcement imposed by other people. Prosocial behavior is considered intrinsic if it is not maintained by such a system. For instance, children's helping does not increase when they have been rewarded with gifts or verbal praise (Warneken & Tomasello, 2008) or when they are encouraged or commanded to help (Warneken & Tomasello, 2012). The word *intrinsic* is sometimes used synonymously with *altruistic* or *selfless*—driven by an internal desire to do good—but can also be used to mean simply "not driven by deliberate social reinforcement." In the last sense, prosocial behavior could be both intrinsic and strategic, for instance, if a child's goal was to affiliate with the recipient.

Strategic* versus *altruistic: Prosocial behavior is strategic if the goal of benefiting the recipient is a means to achieving another goal. For example, 5-year-olds share resources more generously if they are being observed by a peer than if they are not (Engelmann, Hermann, & Tomasello, 2012; Leimgruber, Shaw, Santos, & Olson, 2012). Thus, children at this age can be strategically prosocial with the goal of appearing generous to others. In contrast, children's prosocial behavior is often called altruistic (not the biological sense of altruism) if the only goal of the behavior is to benefit the recipient. It is important to note that calling a behavior *strategic* does not mean it is consciously strategic (i.e., that children consciously calculate the reputational benefits of prosocial giving) or that it is purely selfish (i.e., a child could strategically maximize his or her own pot of resources in order to share with someone who is not currently playing the game).

oneself in the end (Hay, 1994; Hay, Caplan, Castle, & Stimson, 1991; Sebastián-Enesco, Hernández-Lloreda, & Colmenares, 2013; Warneken, 2013a; Warneken & Tomasello, 2009a, 2009b, 2013). (See Table 1 for discussion of terms such as "selective" and "intrinsic" often used to characterize prosocial behavior.) In contrast, others have argued that even from its earliest manifestations in the 2nd year of life, prosociality may be selective in whom it is targeted toward and is sometimes performed strategically (Dunfield & Kuhlmeier, 2010; Hamlin, Wynn, Bloom, & Mahajan, 2011; Wynn, 2009).

Despite disagreements, empirical and theoretical work has moved beyond the dichotomy of innate good or evil. Since it has become clear that children engage in prosocial actions from an early age, studies now examine the various factors that influence children's tendency to engage in these actions. Here we review the research investigating those factors (features of the recipient, the situation, and the actor); disclose what we believe to be methodological gaps in the current literature and provide our suggestions for future work; and discuss how the extant evidence speaks to central questions about the motivations underlying children's prosocial behaviors.

Scope of the Current Article

The term *prosocial behavior* typically refers to a broad range of actions intended to benefit individuals other than oneself. Here we restrict our analysis to studies investigating helping and sharing, excluding other prosocial behaviors like comforting and informing.[1]

We consider studies examining both helping and sharing despite proposals that these are conceptually distinct behaviors (Brownell, Svetlova, Anderson, Nichols, & Drummond, 2013; Dunfield & Kuhlmeier, 2013; Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011; Warneken & Tomasello, 2009b, 2013) for two reasons. One reason to collapse across this distinction is that it is difficult to draw a firm line between helping and sharing in the tasks used in the existing literature. For instance, helping and sharing are often distinguished on the basis of cost, with helping as low-cost giving or problem-solving behaviors and sharing as giving up one's own resource, presumably at a higher cost (Eisenberg et al., 1999; Warneken & Tomasello, 2009b, 2013). However, tasks do not always fall on one side of this dichotomy, and it is often ambiguous whether children consider the object their own (e.g., a cracker from a cracker bowl placed directly in front of the child; Dunfield & Kuhlmeier, 2013). Other researchers separate helping and sharing by defining helping as aiding the recipient with an instrumental goal and sharing as providing a resource that the recipient desires (Dunfield & Kuhlmeier, 2013; Dunfield et al., 2011). Yet here, too, it can be unclear whether the recipient desires an object in order to attain some greater goal or because the object is inherently desirable (e.g., in a case where a child can offer stickers that the recipient can then trade for a better sticker, thereby making the interim stickers both a

resource themselves and the means to a larger goal; Leimgruber, Shaw, Santos, & Olson, 2012). Finally, the adult literature seldom makes a consistent distinction at all (e.g., Batson, 1991; J. C. Cox, 2004; Kahneman, Knetsch, & Thaler, 1986). Therefore, we use the term *prosocial behavior*, for ease of description, to mean both types of behaviors (giving resources or contributing to tasks others are trying to complete).

Factors That Influence Children's Prosocial Behavior

In this section, we review evidence for factors found to influence children's prosocial behaviors, in three parts. We ask: Are children more motivated to help or share with some individuals than others? Does children's prosocial motivation depend on the context? Does coming into the situation with a certain mind-set influence children's prosocial behavior? Although some factors can cross these distinctions, for ease of comprehension each factor is described only once and in the section where it fits most clearly. For each factor, we begin by briefly summarizing research investigating its influence on adult prosocial behavior, then review the relevant research in children between 0 and 5 years of age, and finally consider what the evidence might suggest about children's prosocial motivations.

Features of the recipient

Features of the recipient that have been studied include how the recipient has previously treated the actor and other individuals, the recipient's similarity or familiarity to the actor, and the recipient's distress or need.

How the recipient previously treated the actor. Adults are more likely to be prosocial to those who have behaved (or intended to behave) prosocially toward them in the past (e.g., Berg, Dickhaut, & McCabe, 1995; J. C. Cox, 2004; Fehr, Fischbacher, & Gächter, 2002; Gouldner, 1960; McCabe, Rigdon, & Smith, 2003; Rand, Arbesman, & Christakis, 2011). Being nicer to those who have shown prosocial intentions toward oneself is typically discussed as a concern with direct reciprocity—a motivation to help in order to be helped later in return. Indeed, adults do seem to expect return on their prosocial investment and are likely to withdraw their prosocial behavior if it is not reciprocated (Axelrod & Hamilton, 1981; Greiner & Levati, 2005; Gurven, 2006; Trivers, 1971).

Like adults, children prefer helping others who have previously helped them or have demonstrated an intention to help them (Dunfield & Kuhlmeier, 2010; see Dunfield, Kuhlmeier, & Murphy, 2013, for evidence of similar selectivity in 3-year-olds for helpful communicators). For example, 21-month-olds chose to give a desirable object to an adult who had tried unsuccessfully to help them, rather than to an adult who had refused to help them, accidentally helped them, or showed no intention at all (Dunfield & Kuhlmeier, 2010). These results suggest that a concern with reciprocity may motivate children's prosociality quite early in life. Yet there are two caveats to this conclusion. First, no studies that we know of have examined this question in children younger than 21 months of age, even though children can help with simple instrumental tasks as early as 12 months (Sommerville, Schmidt, Yun, & Burns, 2013). Second, in contrast to this demonstration of early prosocial selectivity, studies that measure how likely children are to help a single recipient who was nice or mean to them, rather than forcing them to choose between helping a nice recipient or a mean recipient, suggest that it is not until age 3 that children adjust their prosocial behavior on the basis of how others have treated them (Fujisawa, Kutsukake, & Hasegawa, 2008; Levitt, Weber, Clark, & McDonnell, 1985; Sebastián-Enesco et al., 2013; Warneken & Tomasello, 2013).

Why do children appear to be concerned with reciprocity in forced-choice tasks but not repeated-round games with a single recipient? There are at least two potential explanations. One is that children have an early-emerging motivation to choose good social partners, indicated by their preference for helping well-intentioned recipients in forced-choice tasks (e.g., Dunfield & Kuhlmeier, 2010). Then, by age 3 or 4, children also develop another related motivation, to punish or withdraw cooperation from bad social partners (V. A. Kuhlmeier, Dunfield, & O'Neill, 2014; Warneken & Tomasello, 2013). This view is supported by evidence that 2.5-year-olds repeatedly help or share with their partner regardless of whether their partner returns the favor, but 3-year-olds share less over time if their partner never reciprocates (Warneken & Tomasello, 2013). Yet another possible view is that younger children are simply less experienced than older children, and the forced-choice tasks easily allow them to compare the behavior of a prosocial and antisocial individual. Without the forced choice, children under 3 may be less likely to evaluate as negative an individual who does not share with them because there is no generous individual available as a comparison point, and for this reason they continue to help or share with the unhelpful person (e.g., Jensen, Vaish, & Schmidt, 2014). Further research is needed to test between these alternatives.

How the recipient previously treated third parties. Adults are selectively prosocial depending on how others have treated not only themselves but also third parties (Fehr & Gächter, 2002; Krebs, 2008; Milinski, Semmann, & Krambeck, 2002a, 2002b), demonstrating a

concern with indirect reciprocity (Nowak & Sigmund, 1998). Children as young as 19 months also prefer to reward an individual who helped over an individual who hindered a third party (Dahl, Schuck, & Campos, 2013; Hamlin et al., 2011).[2] A recent study found that even 15-month-old infants preferred to give a resource to an individual who had allocated resources fairly in the past over one who allocated unfairly, under some circumstances (Burns & Sommerville, 2014). Yet children have only shown this type of selective prosociality when the task forces them to make a choice between two recipients. For instance, 4-year-olds gave more resources to a nice puppet than a mean puppet if there were an unequal number of resources to distribute, but they gave equally if they had the option to do so (Kenward & Dahl, 2011). As noted in the previous section, children may show more prosocial selectivity in forced-choice tasks either because these tasks tap into different motivations than other open-ended measures or because of features of the tasks that make it difficult to see selectivity (in the preceding example, children's equality bias may have overwhelmed their motivation to be selective).

To what extent does evidence for children's selective helping of prosocial individuals (whether those individuals were nice to them or to third parties) reflect a concern with reciprocity? Certainly, preferentially helping those who are nice is useful for choosing good partners who might reciprocate their own prosocial acts, but it does not necessarily carry with it an expectation that the partner will do so. Some research has examined preschool-age children's expectations about reciprocity between third parties (e.g., Olson & Spelke, 2008). More work on this topic, particularly in younger children (see Meristo & Surian, 2013, for an example of a study looking at indirect reciprocity in infants), might be a start to investigating whether these expectations come along with children's early selective helping. If not, it is quite possible that selectivity for helpful partners is initially maintained by simpler mechanisms, like a feeling of positivity or a desire to affiliate with those who are nice (Kuhlmeier et al., 2014).

Familiarity, similarity, and group identity. A recipient's similarity, familiarity, and membership in an actor's group (e.g., Bernhard, Fischbacher, & Fehr, 2006; Jaspars & Warnaen, 1982; Tajfel, 1982) have been shown to influence adults' prosocial behavior. Though there is plenty of evidence that human adults are willing to help strangers on the street (e.g., Moss & Page, 1972) and to share resources with recipients they have never met (Nowak, 2006), it is also clear that adults are more prosocial toward people with whom they are familiar or close (Clark & Mills, 1979; Cole & Teboul, 2004). Familiarity and similarity are often proxies for other factors such as kinship, friendship, and group membership; those we are familiar with are probably those who like us and will reciprocate our help in the future. As such, people are typically more prosocial not only to those who are familiar or similar to them but also to those who explicitly share their group identity (e.g., Chen & Li, 2009; Levine, Prosser, Evans, & Reicher, 2005; Sherif, Harvey, White, Hood, & Sherif, 1961).

Children show signs of selectivity on these dimensions as well, though familiarity, similarity, and group membership tend to be conflated so that it is difficult to know (in some tasks) which is driving children's selectivity. Studies reporting observations of children at play (between 18 and 30 months) suggest that children are willing to help and share both with parents and relatively unfamiliar adults (e.g., Rheingold, 1982; Rheingold, Hay, & West, 1976), although some studies show higher rates for parents (e.g., Bretherton, Stolberg, & Kreye, 1981; Young, Fox, & Zahn-Waxler, 1999). Experimental work has found that 2-year-olds preferred to give an object to someone who spoke their language (i.e., someone who may seem more familiar, similar, and like a group member) than to someone who did not (Kinzler, Dupoux, & Spelke, 2012), though they did not show the same preference to give to someone of a more familiar race (Kinzler & Spelke, 2011). By age 5, children (in some tasks) prefer to give resources to those similar to them in gender, arbitrarily assigned group membership (Dunham, Baron, & Carey, 2011), and race (Weller & Lagattuta, 2012).

Selective prosocial behaviors toward one's group members may reflect a variety of motives, for instance, to affiliate with or signal one's helpfulness to ingroup members, to help those who are most likely to help in return, or to initiate friendships with others who might provide support later on. Supporting the idea that prosociality may be selective for purposes of friendship as well as ingroup affiliation, research has showed that 4- and 5-year-olds are more likely to give up their own resources to friends than to nonfriends, acquaintances, and strangers (Buhrmester, Goldfarb, & Cantrell, 1992; Moore, 2009). Thus, there are many intriguing initial findings regarding children's selective prosociality toward others who have the characteristics of likely group members. However, in future work, it will be important to explicitly disentangle the effects of familiarity, similarity, and explicit markers of group membership to determine the mechanisms that underlie children's selectivity on these dimensions.

Recipient's distress or need. An often-discussed motivator for adult prosocial behavior is a desire to help those in need. In general across a number of studies, the more a recipient is in need, the more likely adults are to help (for review, see Bekkers & Wiepking, 2011). Adults' inclination to help others in need is thought to be at least partially driven by empathy (or sympathy) in response to

others' negative experiences or expressions of need (e.g., Aronfreed, 1970; Batson, 1991; D. Krebs, 1975). Negative affect in response to viewing others in need has been positively correlated with prosocial behavior and intentions (e.g., Eisenberg et al., 1989), and manipulations thought to induce empathy make adults more likely to help even when the cost is high (e.g., Batson, Duncan, Ackerman, Buckley, & Birch, 1981).

Children also target their prosocial behavior more to recipients in need, for instance, recipients who were recent victims of harm. Eighteen-month-olds were more likely to give away their own resource if the recipient had previously been harmed than if the recipient had not (Vaish, Carpenter, & Tomasello, 2009), and 3-year-olds shared more with a recipient who expressed distress about a real harm than a recipient who expressed distress about an inconvenience (Hepach, Vaish, & Tomasello, 2013). These studies suggest that children show early signs of sympathy, even when the victim displays no overt distress (Vaish et al., 2009), and more so for legitimate harms (Hepach et al., 2013). A sympathetic concern for victims may be an early motivator of children's prosocial behavior.

Children help selectively not only on the basis of their inferences about others' distress but also on the basis of whether others seem to be more or less in need of resources. Four-year-olds preferred to give a resource to a recipient who had fewer resources than to a recipient who had more resources (Li, Spitzer, & Olson, 2014). At age 5, children were willing to take a cost (i.e., give up a resource they could acquire) to give more resources to someone poor but not to someone rich (Paulus, 2014).

Though we do not yet know how sympathy, empathy, and assessment of material need in toddlers relate to empathic helping in adults, this work demonstrates that children direct their prosocial behavior toward recipients who need it more. One possibility is that a tendency to be prosocial toward those who have experienced distress or need could be motivated by an empathic desire to reduce others' negative states. Alternatively, this selectivity could be motivated by a strategic recognition that a recipient who is more in need of help might be more grateful for one's aid and thus more likely to return the favor later on (some work shows that even 3-year-olds have some sense of the types of situations that might elicit gratitude; Nelson et al., 2013). The work on children's prosocial behavior to those in distress or need is still quite new, and investigating the specific mechanisms that maintain these tendencies is an important direction for future work.

Features of the situation

Features of the situation have also been shown to influence rates of prosociality. In particular, factors like explicit reinforcement, being observed by others, and the costs of prosocial actions have been studied.

Material rewards and verbal praise. Prosocial behavior in adults does not seem to be induced or maintained by the promise of material rewards or praise, and if anything, these incentives can undermine it (e.g., Frey & Oberholzer-Gee, 1997; Gneezy & Rustichini, 2000). Rewards may have this negative influence because they undermine an intrinsic desire, as in the classic overjustification effect (e.g., Batson & Powell, 2003; Deci, 1971; Frey & Goette, 1999; Lepper, Greene, & Nisbett, 1973), though an alternative interpretation is that rewards may undermine the ability to use prosociality for reputation enhancement (Ariely, Bracha, & Meier, 2009).

Material rewards and praise do not seem to motivate or sustain prosocial behavior in children either (Warneken, Hare, Melis, Hanus, & Tomasello, 2007; Warneken & Tomasello, 2008). In one study, 20-month-olds who had initially been rewarded actually showed decreased rates of helping later on compared with unrewarded children (Warneken & Tomasello, 2008). In older children, too, rewards and praise are generally found to be uncorrelated with prosocial behavior (Grusec, 1991), and any positive effects they have fail to generalize to new situations (Fabes, Fultz, Eisenberg, May-Plumlee, & Christopher, 1989; Grusec & Redler, 1980). This body of work suggests that children's motivation to help is sustained by something other than rewards, even at the earliest ages.

Presence and awareness of recipient. In contrast to explicit rewards and praise, reputation in the eyes of the recipient does appear to be a powerful motivator of adult prosociality (e.g., Latane & Darley, 1970; Leary & Kowalski, 1990). Yet very little work has investigated whether children's earliest prosocial behavior depends on the recipient's awareness. Two studies have found that 5-year-olds were more generous in a resource allocation task when a classmate recipient could see them and was fully aware of their choices than when the recipient lacked information (Buhrmester et al., 1992; Leimgruber et al., 2012). Looking at this question in younger children would provide important information about whether early prosocial behavior is driven by mechanisms for promoting reciprocity (which should be sensitive to recipient awareness).

Presence and awareness of third parties. Adults are also concerned about their reputations in the eyes of third-party observers, and many studies have found that adults are more likely to be prosocial under public than private conditions (e.g., Forsythe, Horowitz, Savin, & Sefton, 1994; Hoffman, McCabe, Shachat, & Smith, 1994;

Reis & Gruzen, 1976; Satow, 1975). Children are similarly influenced by third-party awareness by age 5. Five-year-olds were more likely to give away toys or prizes in the presence rather than absence of a classmate (Engelmann, Herrmann, & Tomasello, 2012) or familiar teacher but not an unfamiliar observer (Barton, Olszewski, & Madsen, 1979). This strategic sharing is likely driven by concerns with reputation and reciprocity, as children at this age shared more if they were being observed by an ingroup (rather than outgroup) member or someone who would clearly have the opportunity to share with them later on (Engelmann, Over, Herrmann, & Tomasello, 2013).

There is currently no evidence that children younger than 4 or 5 use prosocial behavior to signal their helpfulness to observers. One study found that a parent's presence did not influence 2-year-olds' tendency to help an experimenter retrieve dropped objects, suggesting that observers may play less of a role early on (Warneken & Tomasello, 2012). However, it is not clear whether 2-year-olds are insensitive to observer presence altogether or whether the presence of a parent does not provide any extra influence over and above the presence of an experimenter. Thus, more evidence is needed to conclude that the prosocial behavior of children under 4 is completely insensitive to being watched. Of course, it is unlikely that 2-year-old children are managing reputation in the sense of forming a representation of another person's representation of themselves. However, adults are consistently more prosocial when presented with subtle cues of being watched, such as eyespots on the wall, which likely do not elicit complex representations of reputation (e.g., Haley & Fessler, 2005); children's prosocial behavior might vary with similar manipulations.

Energy and resource costs. Another feature of the situation that clearly affects occurrence and rates of prosocial behavior is the cost involved (Piliavin, Dovidio, Gaertner, & Clark, 1981; Warneken & Tomasello, 2009a). Factors like ownership of the resources that can be shared and amount of work required to provide help influence adults' prosocial tendencies (Cappelen, Nielsen, Sørensen, Tungodden, & Tyran, 2012; Cherry, Frykblom, & Shogren, 2002; List, 2007). Research comparing children's prosocial behavior in a high- and low-cost situation has yielded similar results. In observational studies, 4- and 5-year-olds were more likely to help their peers to complete tasks than to offer objects that were in their own possession, presumably because sharing one's own object might result in a permanent loss (Eisenberg-Berg, Haake, Hand, & Sadalla, 1979). Consistent with this finding, research has found that both 18- and 30-month-old children were much more likely to help a distressed experimenter by offering an object if there was an object available that was not the children's own (Svetlova, Nichols, & Brownell, 2010).

Although costs reduce rates of helping and sharing, most research suggests that children are consistently willing to take some cost in order to help others. For instance, 12- and 24-month-old children were similarly likely to offer objects to their peers when resources were scarce as when they were ample (Hay et al., 1991), and 18-month-olds helped an experimenter complete tasks even when helping required disengaging from fun distractor toys (Warneken & Tomasello, 2008) or overcoming physical obstacles (Warneken et al., 2007). Rates of helping in these more costly tasks tend to be comparable to rates in tasks with no such costs (e.g., Warneken & Tomasello, 2006).

Resource advantage. Another feature of the situation that influences the extent to which adults and children prosocially allocate resources to others is how their actions will affect their own advantage relative to another person. That is, in noncostly sharing tasks, participants often receive a fixed number of resources (e.g., the participant gets four) and must choose how many resources to give to a recipient (e.g., the participant can give a recipient four or one; Leimgruber et al., 2012). In this type of task, participants could look at their decision in one of two ways. First, participants could think in absolute terms of whether to give the recipient more or less, disregarding their own payoff, which is the same no matter what they decide. Second, participants could think in relative terms of how many resources they themselves will have with respect to the recipient, considering that they could choose to have either the same number of resources as the recipient or more resources than the recipient. Adults in this type of task show a preference for relative advantage over disadvantage or equality (C. A. Cox, 2013; Dohmen, Falk, Fliessbach, Sunde, & Weber, 2011; Festinger, 1954; Fiske, 2011). A desire for relative advantage is likely motivated by social comparison (comparing one's resources or standing to another individual).

Five-year-old children also show a preference for relative advantage. In one study, they chose an option that maximized the number of their own resources relative to a recipient child, over an equal option that would result in more overall resources for themselves (e.g., choosing seven for self and zero for recipient over eight for self and eight for recipient: Sheskin, Bloom, & Wynn, 2014). No work that we know of has examined whether a concern with relative advantage influences the prosocial behavior of children under the age of 5. However, there is evidence that by age 3 children react negatively to relative disadvantage, receiving less than another person

when the distributor could have allocated resources equally (Lobue, Nishida, Chiong, DeLoache, & Haidt, 2011). Thus, children may engage in social comparison by age 3, but we do not yet know how this motivation influences their prosocial behavior at this age.

Features of the actor

Finally, we review factors that are thought to influence the mind-set of the actor and by doing so influence his or her subsequent actions when given a chance to be prosocial. These situational factors include the actor's mood and a desire to affiliate with others.

Positive or negative mood. Researchers studying adults have long been interested in the question of how mood might influence people's prosociality (Cialdini, Darby, & Vincent, 1973; Isen & Levin, 1972; Manucia, Baumann, & Cialdini, 1984). A number of studies have shown that positive mood induction makes adults more prosocial (Batson, Coke, Chard, Smith, & Taliaferro, 1979; Bizman, Yinon, Ronco, & Shachar, 1980; Blevins & Murphy, 1974; Forgas, 1998; Harris & Smith, 1975; Isen & Levin, 1972), both for instrumental helping (e.g., helping someone pick up dropped objects; Guégen & De Gail, 2003) and for generosity with one's time or money (e.g., tipping; Rind, 1996; Weyant, 1978). However, there is also some evidence that negative mood induction leads to increased prosocial behavior (e.g., Cialdini & Kenrick, 1976). Researchers have proposed that acting prosocially is experienced as rewarding and may be partially motivated by a desire to maintain a positive mood (Batson & Powell, 2003; Wegener & Petty, 1994) or to reduce a negative mood (Cialdini et al., 1973).

Some work has suggested that 6-year-olds were more generous in a donation task after a negative mood induction (Cialdini & Kenrick, 1976; Kenrick, Baumann, & Cialdini, 1979). However, no work that we know of has examined the influence of mood on prosocial behavior in children under the age of 5. In a suggestive study, 22-month-old children showed more signs of happiness when giving rewards to a puppet than when receiving rewards themselves (Aknin, Hamlin, & Dunn, 2012). This finding is consistent with work demonstrating that adults are happier after performing prosocial actions (Dunn, Aknin, & Norton, 2008) and with a view that mood plays a role (though here as a consequence rather than cause) in early prosocial behavior. It is important to note that if prosocial behavior can be experienced as rewarding and can lead to a more positive emotional state, this is not an alternative to other motivations but may be a mechanism that promotes those other motivations. For instance, children may be more prosocial toward someone who helped them previously because they feel more positive about that person, and this positive feeling contributes to fostering reciprocity.

Affiliative priming. Adults exposed to an affiliative behavior (e.g., a confederate smiling at them) show elevated rates of subsequent helping (e.g., picking up dropped objects for another person; Guéguen & De Gail, 2003). Relatedly, adults who were recently mimicked (a behavior associated with affiliation) were more likely to engage in instrumental helping (van Baaren, Holland, Kawakami, & van Knippenberg, 2004), to donate more money to charity (van Baaren et al., 2004), and to give higher tips (van Baaren, Holland, Steenaert, & van Knippenberg, 2003).

Similarly, witnessing affiliation appears to increase children's prosocial behavior. Eighteen-month-olds were more likely to help an experimenter pick up dropped objects when they had previously seen an affiliation prime (two dolls facing each other) than a nonaffiliation prime (two dolls facing apart) or a neutral prime (one doll; Over & Carpenter, 2009). Children at this age were also more helpful if they had previously been mimicked than if they had not, regardless of whether they were helping the mimicker or someone else (Carpenter, Uebel, & Tomasello, 2013).

In both adults and children, exposure to affiliation primes seems to induce a general prosocial disposition rather than a motivation to help a specific person (e.g., (Carpenter et al., 2013). Additionally, the effects of positive social primes do not seem to be specific to prosocial behavior, but instead these primes promote affiliative behaviors more generally; for instance, adults were more likely to unconsciously mimic others after being primed with words related to the affiliation and friendship (Lakin & Chartrand, 2003). One explanation for the positive effects of mimicry and witnessing affiliation on prosocial behavior is that these behaviors tend to be most frequently observed in the presence of group members. Responding positively to potential group members may reflect a motivation to affiliate with one's group, show that one is a good cooperator, and promote ingroup harmony (Carpenter et al., 2013; Over & Carpenter, 2009; van Baaren et al., 2004).

Summary

Taken together, the work reviewed above demonstrates that children's prosocial behavior is influenced by features of the recipient, the context, and the actor's mind-set. The evidence suggests that there are important parallels between the motivations underlying prosociality in young children and the motivations underlying prosociality in adults. However, several outstanding questions remain about prosocial motivations in children under 3

and regarding the mechanisms by which the factors exert their effects. Before we turn to those questions, however, we briefly discuss methodological and reporting issues in the study of children's prosocial behavior.

Methods and Reporting Standards for Research on Early Prosocial Behavior

In this section, we first present what we consider to be methodological challenges in the study of prosocial behavior—in particular, the difficulty of comparing across age groups to investigate development. Then we note the importance of reporting certain aspects of methods and behaviors that would be especially informative in this area of study.

Comparing behaviors and motivations across age groups

How does prosocial behavior differ by age when participants are tested in tasks that are tightly controlled as well as similarly understandable and relevant to the different age groups? Comparing prosocial behavior across age groups is critical for understanding the development of prosocial motivations, yet there are substantial methodological challenges in making such comparisons. Though adult social psychologists and developmental psychologists have identified and tested many of the same features that could influence prosocial behavior, the two fields tend to use different manipulations and measures that make it difficult to compare motivations across development. For example, some have proposed that helping and sharing may be driven by different motivations (e.g., Dunfield & Kuhlmeier, 2013), but most of the recent adult work uses resource sharing as a measure of prosocial behavior, and much of the child work uses instrumental helping, especially at the youngest ages. More work using similar methods could delineate what makes these behaviors different if they are so and compare the factors that influence behaviors in each category across development.

It can also be difficult to draw firm developmental conclusions from studies comparing prosocial behavior between older and younger children tested in the same task. In particular, it is challenging to interpret low rates of helping or equal helping across conditions in younger age groups. It is often the case that a behavior or motivation is thought to be present only in later childhood but is then found much earlier when using a more sensitive measure. As an example, Vaish et al. (2009) found evidence that 18-month-olds are more prosocial toward victims of harm, suggesting an affective perspective-taking ability previously thought to emerge only around age 3 (Denham, 1986; Wellman, Phillips, & Rodriguez, 2000). More work using such methods that tap into a particular motivation and that are appropriate for all age groups tested (e.g., Warneken & Tomasello, 2013) is important for exploring the development of prosocial motives.

A further question concerns how infants' expectations and preferences when viewing third-party social interactions (e.g., Hamlin, Wynn, & Bloom, 2007; Meristo & Surian, 2013) relate to the motivations for early prosocial behavior. Researchers could gain traction on this question by taking advantage of stimuli we know infants use as a basis for social preferences (e.g., Hamlin et al., 2007; Kinzler, Dupoux, & Spelke, 2007), as well as work using measures of prosocial behavior that we already know infants produce (e.g., helpfully informing someone by pointing out the location of an object; Liszkowski, Carpenter, Striano, & Tomasello, 2006).

Reporting relevant aspects of procedure, design, and null results

Reporting details of the warm-up phase. Most, if not all, of the studies we reviewed include a warm-up phase before children's prosocial behavior is observed or measured. There is a tendency in the prosocial literature to leave out the details of warm-ups from the analysis. This tendency likely comes from the history of warm-ups: Most labs previously studied other topics in cognitive development in which children's behavior toward the experimenter is not the key response in question, but rather children's willingness to interact with the experimenter is necessary in order to ask an unrelated question. However, in prosocial tasks, the length and type of warm-up could have a very clear impact on children's subsequent behavior, for instance, rendering the recipient of help a familiar interaction partner who children are more motivated to help. In addition to familiarity, warm-ups might also unintentionally prompt motivation to engage in reciprocal helping or sharing or even prime affiliation, all factors shown to influence children's likelihood of helping. Indeed, 12-month-olds were more likely to offer objects to others after engaging in give-and-take exchanges or interacting with an experimenter who requested objects by holding out her hand (Hay & Murray, 1982). We recommend reporting the length of warm-up and training phases, specific activities that occurred (and controlling these activities across participants), who the child interacted with, and who was present.

Reporting rates of prosocial behavior in studies with multiple trials. One challenge in comparing results across articles is a lack of consistency in how rates of prosocial behavior are reported. In some articles, helping or sharing rates are reported collapsed across trials, in others they are reported by trial, and in yet others children receive only a single trial. Similarly, some studies

report helping in terms of time to help (e.g., percentage of children who helped in the first 10 s; Over & Carpenter, 2009), others in terms of cue to help (e.g., assigning a score based on the number of cues the experimenter provided that help was needed; Svetlova et al., 2010), and others in terms of whether children helped at all (e.g., Hepach et al., 2012). Our recommendation is to generally report data both for the first trial or opportunity to help as well as collapsed across all trials. In this way, readers can understand both the cumulative effects of the manipulation (including the ways in which helping may increase or decrease across time) as well as the data in a form that can easily be compared across trials (by always reporting the first trial data). Similarly, in support of a growing trend (e.g., Warneken & Tomasello, 2007), we recommend reporting helping in the first 10 s of an action (e.g., after a pen is dropped) as well as across whatever maximum time frame the experimenters determine to be ideal for their study. Although, of course, time to object will vary as a function of features such as room size, in general, helping within 10 s would indicate fairly immediate helping, whereas helping after 60 s would indicate a pause and likely additional cues.

Reporting null results. Along with recent discussions in the field on reporting standards (e.g., Simmons, Nelson, & Simonsohn, 2011), increased reporting of null results—for instance, experiments in which children help at very low rates or do not help differently across the conditions tested—would be useful to help researchers know whether the lack of effects at younger ages reflects a lack of testing or a consistent lack of effect. Noting whether null results were likely obtained because children did not understand some feature of the task as indicated by a control condition or manipulation check (see discussions in Burkart & Rueth, 2013; Dahl et al., 2013) is also important for distinguishing whether a lack of prosocial behavior (or sensitivity of prosocial behavior to a given factor) is due to a lack of prosocial motivation.

Prosocial Behavior in Children: Outstanding Questions

In this section, we address three questions that have been central in the study of prosocial development: First, how indiscriminate or selective are children's earliest prosocial behaviors? Second, are children's prosocial behaviors intrinsically or extrinsically motivated? Third, how do the motivations for prosocial behavior develop in the first 5 years of life? For each question, we comment on what the current evidence suggests and note where further research is needed.

To what extent is early prosocial behavior indiscriminate versus selective?

Many researchers have proposed that children are initially fairly indiscriminate in their helping and sharing behavior—that is, that children will help anyone as long as they feel sufficiently comfortable to approach the person at all (Warneken & Tomasello, 2009a). The argument continues that *selective* prosociality, which might include different rates of helping kin versus nonkin, ingroup versus outgroup members, those who have helped in the past versus those who have not, and those whom one might want to impress versus those whom one might not care to impress, emerges later, with many studies suggesting emergence around age 3 (e.g., Hay, 1994; Hay et al., 1990; Hay et al., 1991; Sebastián-Enesco et al., 2013; Warneken, 2013a; Warneken & Tomasello, 2009a, 2009b, 2013). Some of the evidence used to support this view comes from studies showing that children by around age 14 months help unfamiliar experimenters in both experimental (e.g., Warneken & Tomasello, 2006, 2007) and observational (e.g., Rheingold, 1982; Rheingold et al., 1976) studies. Further evidence comes from recent studies providing converging evidence that 3-year-olds share less over time with a consistently selfish partner, but 2-year-olds continue to share at high rates (Sebastián-Enesco et al., 2013; Warneken & Tomasello, 2013). Proponents of an indiscriminate-to-selective view of prosocial behavior suggest that from an evolutionary perspective, children in the first few years of life tend to be surrounded by kin and thus may not require active motivations to be selectively prosocial until their social circle expands to strangers (Warneken & Tomasello, 2009a).

We believe that there are both methodological and conceptual reasons to question the indiscriminate-to-selective view. First, there are methodological reasons to doubt the conclusion that early prosociality is indiscriminate on the basis of findings illustrating children's willingness to help strangers (e.g., Warneken & Tomasello, 2006). Though an experimenter who children met earlier in the testing session is to some extent a stranger, children have typically participated in a warm-up phase with this person before having the opportunity to help him or her. As noted above, including a warm-up phase (depending on the activities involved and individuals present) could influence many factors known to influence prosocial behavior and could diminish the likelihood that the recipient is seen as a stranger.

Second, the studies investigating features of the recipient suggest that children selectively provide objects to recipients who intended to help them in the past over those who did not by 21 months (Dunfield & Kuhlmeier,

2010) and to those who helped rather than hindered a third party by around age 19 months (Dahl et al., 2013; Hamlin et al., 2011), hinting at some selectivity much earlier than the 3rd birthday. Critically, almost no studies have explored the question of selective prosocial behavior in children younger than 19–21 months of age. In addition, some have suggested that indiscriminate prosociality even in infancy is unlikely given that infants are remarkably discriminating in their general social preferences (Wynn, 2009). For example, infants prefer helpful agents to harmful agents (e.g., Hamlin, 2013; Hamlin et al., 2007) and similar others to dissimilar others (Kinzler et al., 2007; Mahajan & Wynn, 2012), produce genuine smiles more to their mothers than to strangers (e.g., Fox & Davidson, 1988), and look longer to faces of individuals who are from familiar rather than unfamiliar groups (e.g., Bar-Haim, Ziv, Lamy, & Hodes, 2006; Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002)—all in the first year of life. This previous work in diverse domains of social cognition suggests that there is good reason to believe that infants should be discriminating in their prosocial actions as well, from the earliest ages these actions are observed, precisely because they are recognizing and seemingly evaluating differences between the potential beneficiaries.

As Warneken (2011) points out, it is possible for children to favor some individuals or groups over others on looking time or evaluation tasks and still not exhibit a tendency to help one over the other (see Howard, Henderson, Carrazza, & Woodward, in press, for an example of such a disconnect in the domain of imitation and selectivity for ingroup members). Nonetheless, Wynn's (2009) argument should challenge researchers to design tasks that allow for direct comparisons of the factors that influence prosocial behavior at different ages. One starting place might be to systematically examine the types of selectivity and the diversity of motivations we see in the prosocial behavior of adults and older children (e.g., similarity and group status, familiarity and relationship, presence and awareness of recipients and third-party observers) in infants and toddlers, as Warneken and Tomasello (2009a) have suggested. We believe the question of how infants' social selectivity on a number of dimensions (group membership, similarity, niceness, and so on) and their sensitivity to situations involving third-party prosocial interactions (e.g., Kuhlmeier, Wynn, & Bloom, 2003; Meristo & Surian, 2013) connects (or not) to their prosocial actions is one of the most exciting puzzles for future work.

To what extent is early prosocial behavior intrinsically versus extrinsically motivated?

A popular question in the study of prosocial behavior is whether it is intrinsically or extrinsically motivated. This question has been central to social psychology for decades (e.g., Batson, 1991; Cialdini, Baumann, & Kenrick 1981; Dovidio, Piliavin, Schroeder, & Penner, 2006). There is some evidence from developmental research that prosocial motivations are at least initially intrinsic in nature (rather than extrinsic). For instance, as cited above, 14- to 18-month-olds are willing to take some costs to help or share with no promise of a reward (e.g., Hay et al., 1991; Warneken et al., 2007; Warneken & Tomasello, 2008), and indeed helping in children at these ages is undermined by material rewards and praise (Warneken & Tomasello, 2008). If children were helping to gain rewards or credit or to secure future cooperative relationships, their helping behavior should be sensitive to the identity of the beneficiary, the audience present, and the likelihood of external reward (all factors that at least sometimes motivate adult helping).

Although the finding of an overjustification effect in 18-month-olds' helping behavior compellingly suggests that the promise of attractive material rewards undermines some other motivation to help, the question of what that motivation is remains open. In one adult study, material rewards undermined adults' motivation to use prosociality for reputation enhancement (Ariely et al., 2009); it is possible that a motivation like this is at play in young children as well. This is not to suggest that 18-month-olds are actively managing their reputations but rather that we should look for the specific factors that drive and maintain children's helping. Material rewards could be supplanting a motivation to maintain a positive mood, to derive satisfaction from seeing the beneficiary's positive affect, or to affiliate with the beneficiary (i.e., if rewards suggest to children that they are in a relationship of exchange rather than affiliation; e.g., Clark & Mills, 1979).

Another study that argues for the intrinsic nature of young children's prosocial behavior demonstrated a smaller increase in pupil dilation in children who helped a recipient or observed a third party helping the recipient than in children who were held back from helping while the recipient struggled (Hepach et al., 2012). Although this study suggests that children process the event differently when helping has occurred than when it has not, whether pupil dilation can be interpreted as evidence of intrinsic motivation remains unclear. In particular, pupil dilation, a reflection of activity in the sympathetic nervous system, like all psychophysiological measures, can be an indicator of many possible underlying psychological states—for example, emotional arousal (Bradley, Miccoli, Escrig, & Lang, 2008; Partala & Surakka, 2003), stimulation (Janisse, 1973), effort, processing or cognitive load (Beatty, 1982; Hyona, Tommola, & Alaja, 1995; Just & Carpenter, 1993; Marshall, 2002), and surprise (Preuschoff, Hart, & Einhauser, 2011), all of which are

likely to differ between situations involving a person being handed an object they reach for and those involving a person not being handed an object they reach for. In infants, increased pupil dilation has been consistently associated with viewing irrational or unusual conclusions to events both physical and social (for review, see Laeng, Sirois, & Gredebäck, 2014). According to this logic, infants' pupil dilation may decrease in response to a helping action because helping is the typical or expected response to an event in which a person struggles to complete a task when others are present.

Our stance is that thinking about early prosocial behavior in terms of the intrinsic versus extrinsic dichotomy has produced important results (e.g., Warneken & Tomasello, 2008) but oversimplifies a more complex conceptual terrain that is now emerging with more evidence of proximate motivations for children's prosociality (e.g., a desire to affiliate with others, look like a good helper to others, or act on feelings of empathy or sympathy). Ultimately, prosocial behavior must have evolved because it provided some benefit to the self, for instance, through direct or indirect reciprocity (Trivers, 1971; West, El Mouden, & Gardner, 2011). Research should both examine at what age children begin to behave in line with these principles and consider the mechanisms that maintain these behaviors, which may change over the course of development.

Developing Motivations for Prosocial Behavior

The question of how prosocial behavior changes over the first 5 years of life has been one of the most central questions to researchers across disciplines and also one of the most difficult to answer. We believe that the work we reviewed here suggests that there are at least hints that many of the factors that influence adult prosocial behavior also influence helping and sharing in young children. Yet we are far from having a complete picture of the number of prosocial motivations present in early life, how they develop, and how they interact. It is important to note that, although we discussed what each factor might tell us about prosocial motivation, we do not mean to suggest that the various motivations are mutually exclusive. Proximate motivations, for instance, to affiliate with individuals who are likely to help you in the future or to sympathize with those who are more in need and would more likely appreciate your help, might be mechanisms for ultimate motivations like reciprocity that maintain cooperative behavior. It is also important to note from a developmental perspective that motivations could be built up over time. For instance, we might find that infants' early helping behaviors are more likely to be directed toward adults than children, which Wynn (2009) has suggested might be a sign that children's behaviors are driven by an ultimate motivation to signal their helpfulness to their kin and wider community (who would then be more likely to invest in the child). This sort of prosocial selectivity might represent a precursor to a motivation to improve one's reputation, which could be enriched as children mature in their sociocognitive abilities.

Indeed, a major issue with investigating motivations is that another aspect of prosocial behavior besides motivation that clearly undergoes substantial development early in life is children's abilities to identify others' goals and desires, to recognize when these goals and desires will go unfulfilled without help, and to understand the appropriate prosocial response. Many studies finding differential rates of prosocial behavior across age groups have concluded that children become better at identifying more subtle cues of the help that is needed with age (e.g., Brownell, Svetlova, & Nichols, 2009; Dahl et al., 2013; Dunfield & Kuhlmeier, 2013; Dunfield et al., 2011; Kenward & Dahl, 2011; Svetlova et al., 2010; Warneken & Tomasello, 2007). Children's abilities in other areas, for instance, perspective taking, emotion understanding, or sensitivity to fairness, have also been found to be correlated with their prosocial behaviors (Brownell et al., 2013; Sommerville et al., 2013). As research continues to progress and we are better able to identify the cues that children are sensitive to at different ages, it will be easier to design studies to directly compare motivations for prosocial behaviors across children of different ages. A good example of a task in the current literature that we know children are able to understand at an early age is Warneken and Tomasello's (2006) out-of-reach-object task. In this task, an experimenter accidentally drops objects, and children have the opportunity to help by handing the objects back to the experimenter (Warneken & Tomasello, 2006). Many studies have used versions of the out-of-reach-object task successfully with children from 12 to 24 months (e.g., Dunfield & Kuhlmeier, 2013; Sommerville et al., 2013; Warneken & Tomasello, 2006, 2007). Because we know that children understand the relevant cues (e.g., reaching for objects), this task is a good candidate for comparing motivations for helping across age groups. The more we can rule out the possibility that ability (e.g., ability to recognize a cue that help is needed) is playing a role in any given study, the closer we can get to looking at the motivations underlying prosocial behavior across development.

Some researchers have also pointed out that it is important to separate prosocial behavior from merely social behavior in early childhood, for example, suggesting that in some cases children might engage in behavior that has the effect of being prosocial but that is motivated primarily by a desire to engage socially with the

recipient. For instance, children might offer objects to others to engage in joint attention rather than to share resources with them (Hay, 1994; Paulus & Moore, 2012), or they might help with others' goals in some cases whether help is needed or not (Paulus & Moore, 2012). Clearly, there is insufficient evidence at this point to draw firm conclusions about the extent to which children's helping and sharing actions are intended to benefit the recipient, but we raise this question as an interesting avenue for future work. Some research is already beginning to tease apart the prosocial versus merely social aspects of children's helping, for instance, by looking at correlations between children's prosocial responding and understanding of related but not identical prosocial interactions between third parties (e.g., Paulus, 2014; Sommerville et al., 2013).

Conclusion

One of the most exciting domains in the area of social cognitive development over the last decade has surely been the burgeoning field of prosocial behavior. In the last decade, research using experimental methods has built on findings from observational studies, incorporating evolutionary claims and connections to research in areas as diverse as social, economic, and cognitive psychology. The work reviewed here suggests that many of the motivations underlying adult prosocial behavior are also present in young children. However, there are still many critical open questions for future work. For instance, do infants' early preferences for some individuals over others translate to selective prosociality? This question is central to understanding how the mechanisms driving prosocial behavior unfold early in life and we hope will be approached in future work by combining innovative methods developed by infant researchers with the questions researchers have asked about the factors influencing prosocial behavior in adults and older children. Further work is needed to carefully consider the situations that promote or discourage helping and sharing behavior and the many motivations (e.g., motivations to see goals completed, to feel useful, to receive future benefits, and to advance one's reputation) likely to underlie prosocial behavior at the earliest ages.

Acknowledgments

We would like to thank Yarrow Dunham, Felix Warneken, and Alex Shaw for helpful comments on previous versions of this article.

Declaration of Conflicting Interests

The authors declared no conflicts of interest with respect to the authorship or the publication of this article.

Notes

1. Comforting (which can refer to a variety of behaviors, but often physical or verbal reassurance intended to reduce someone else's distress) appears to be a distinct type of prosocial behavior that shows low cross-task correlations with helping and sharing and a different developmental trajectory (Dunfield & Kuhlmeier, 2013; Dunfield et al., 2011; Paulus, Kühn-Popp, Licata, Sodian, & Meinhardt, 2013), as well as distinct neural correlates (Paulus et al., 2013). Research on children's helpful informing is still fairly new, with most studies validating the idea that infants' pointing can have the goal of helpfully providing information (Knudsen & Liszkowski, 2012a, 2012b; Liszkowski et al., 2006; Liszkowski, Carpenter, & Tomasello, 2008) rather than examining what factors influence children's tendency to communicate helpfully.
2. See Vaish, Carpenter, and Tomasello (2010) for a demonstration that selectivity for those who helped over those who harmed third parties is based on recipient intentions rather than outcomes at age 3.

References

Aknin, L. B., Hamlin, J. K., & Dunn, E. W. (2012). Giving leads to happiness in young children. *PLoS ONE*, *7*(6), e39211. doi:10.1371/journal.pone.0039211

Ariely, D., Bracha, A., & Meier, S. (2009). Doing good or doing well? Image motivation and monetary incentives in behaving prosocially. *American Economic Review*, *99*, 544–555. doi:10.1257/aer.99.1.544

Aronfreed, J. (1970). The socialization of altruistic and sympathetic behavior: Some theoretical and experimental analyses. In J. Macauly & L. Berkowitz (Eds.), *Altruism and helping behavior* (pp. 103–126). New York, NY: Academic Press.

Axelrod, R., & Hamilton, W. D. (1981, March 27). The evolution of cooperation. *Science*, *211*, 1390–1396. doi:10.1126/science.7466396

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bar-Haim, Y., Ziv, T., Lamy, D., & Hodes, R. M. (2006). Nature and nurture in own-race face processing. *Psychological Science*, *17*, 159–163. doi:10.1111/j.1467-9280.2006.01679.x

Bar-Tal, D. (1982). Sequential development of helping behavior: A cognitive-learning approach. *Developmental Review*, *2*, 101–124. doi:10.1016/0273-2297(82)90006-5

Barton, E. J., Olszewski, M. J., & Madsen, J. J. (1979). The effects of adult presence on the prosocial behavior of preschool children. *Child Behavior Therapy*, *1*, 271–286. doi:10.1300/J473v01n03_05

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

Batson, C. D., Coke, J. S., Chard, F., Smith, D., & Taliaferro, A. (1979). Generality of the "glow of goodwill": Effects of mood on helping and information acquisition. *Social Psychology Quarterly*, *42*, 176–179. doi:10.2307/3033698

Batson, C. D., Duncan, B. D., Ackerman, P., Buckley, T., & Birch, K. (1981). Is empathic emotion a source of altruistic motivation? *Journal of Personality and Social Psychology*, *40*, 290–302. doi:10.1037/0022-3514.40.2.290

Batson, C. D., & Powell, A. A. (2003). Altruism and prosocial behavior. In T. Millon & M. J. Lerner (Eds.), *Handbook of psychology, Vol. 5: Personality and social psychology* (pp. 463–484). Hoboken, NJ: Wiley. doi:10.1002/0471264385.wei0519

Beatty, J. (1982). Task-evoked pupillary responses, processing load, and the structure of processing resources. *Psychological Bulletin*, *91*, 276–292. doi:10.1037/0033-2909.91.2.276

Bekkers, R., & Wiepking, P. (2011). A literature review of empirical studies of philanthropy: Eight mechanisms that drive charitable giving. *Nonprofit and Voluntary Sector Quarterly, 40*, 924–973.

Berg, J., Dickhaut, J., & McCabe, K. (1995). Trust, reciprocity, and social history. *Games and Economic Behavior*, *10*, 122–142. doi:10.1006/game.1995.1027

Bernhard, H., Fischbacher, U., & Fehr, E. (2006, August 24). Parochial altruism in humans. *Nature*, *442*, 912–915. doi:10.1038/nature04981

Bizman, A., Yinon, Y., Ronco, B., & Shachar, T. (1980). Regaining self-esteem through helping behavior. *The Journal of Psychology*, *105*, 203–209. doi:10.1080/00223980.1980.9915152

Blevins, G. A., & Murphy, T. (1974). Feeling good and helping: Further phonebooth findings. *Psychological Reports*, *34*, 326.

Bradley, M. M., Miccoli, L., Escrig, M. A., & Lang, P. J. (2008). The pupil as a measure of emotional arousal and autonomic activation. *Psychophysiology*, *45*, 602–607. doi:10.1111/j.1469-8986.2008.00654.x

Bretherton, I., Stolberg, U., & Kreye, M. (1981). Engaging strangers in proximal interaction: Infants' social initiative. *Developmental Psychology*, *17*, 746–755. doi:10.1037/0012-1649.17.6.746

Brownell, C. A., Svetlova, M., Anderson, R., Nichols, S. R., & Drummond, J. (2013). Socialization of early prosocial behavior: Parents' talk about emotions is associated with sharing and helping in toddlers. *Infancy*, *18*, 91–119. doi:10.1111/j.1532-7078.2012.00125.x

Brownell, C. A., Svetlova, M., & Nichols, S. (2009). To share or not to share: When do toddlers respond to another's needs? *Infancy*, *14*, 117–130. doi:10.1080/15250000802569868

Buckley, N., Siegel, L. S., & Ness, S. (1979). Egocentrism, empathy, and altruistic behavior in young children. *Developmental Psychology*, *15*, 329–330. doi:10.1037/0012-1649.15.3.329

Buhrmester, D., Goldfarb, J., & Cantrell, D. (1992). Self-presentation when sharing with friends and non-friends. *Journal of Early Adolescence*, *12*, 61–79. doi:10.1177/0272431692012001004

Burkart, J. M., & Rueth, K. (2013). Preschool children fail primate prosocial game because of attentional task demands. *PLoS ONE*, *8*(7), e68440. doi:10.1371/journal.pone.0068440

Burns, M. P., & Sommerville, J. A. (2014). "I pick you": The impact of fairness and race on infants' selection of social partners. *Frontiers in Psychology*, *5*, Article 93. doi:10.1371/journal.pone.0023223

Cappelen, A. W., Nielsen, U. H., Sørensen, E. Ø., Tungodden, B., & Tyran, J. R. (2012). Give and take in dictator games. *Economics Letters*, *118*, 280–283. doi:10.1016/j.econlet.2012.10.030

Carpenter, M., Uebel, J., & Tomasello, M. (2013). Being mimicked increases prosocial behavior in 18-month-old infants. *Child Development*, *84*, 1511–1518. doi:10.1111/cdev.12083

Chen, Y., & Li, S. X. (2009). Group identity and social preferences. *The American Economic Review*, *99*, 431–457. doi:10.1257/aer.99.1.431

Cherry, T. L., Frykblom, P., & Shogren, J. F. (2002). Hardnose the dictator. *American Economic Review*, *92*, 1218–1221.

Cialdini, R. B., Baumann, D. J., & Kenrick, D. T. (1981). Insights from sadness: A three-step model of the development of altruism as hedonism. *Developmental Review, 1*, 207–223. doi:10.1016/0273-2297(81)90018-6

Cialdini, R. B., Darby, B. L., & Vincent, J. E. (1973). Transgression and altruism: A case for hedonism. *Journal of Experimental Social Psychology*, *9*, 502–516. doi:10.1016/0022-1031(73)90031-0

Cialdini, R. B., & Kenrick, D. T. (1976). Altruism as hedonism: A social development perspective on the relationship of negative mood state and helping. *Journal of Personality and Social Psychology*, *34*, 907–914. doi:10.1037/0022-3514.34.5.907

Cialdini, R. B., Kenrick, D. T., & Baumann, D. J. (1982). Effects of mood on prosocial behavior in children and adults. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 339–359). New York, NY: Academic Press.

Clark, M. S., & Mills, J. (1979). Interpersonal attraction in exchange and communal relationships. *Journal of Personality and Social Psychology*, *37*, 12–24. doi:10.1037/0022-3514.37.1.12

Cole, T., & Teboul, B. (2004). Non-zero-sum collaboration, reciprocity, and the preference for similarity: Developing an adaptive model of close relational functioning. *Personal Relationships*, *11*, 135–160. doi:10.1111/j.1475-6811.2004.00075.x

Cox, C. A. (2013). Inequity aversion and advantage seeking with asymmetric competition. *Journal of Economic Behavior & Organization*, *86*, 121–136. doi:10.1016/j.jebo.2012.12.020

Cox, J. C. (2004). How to identify trust and reciprocity. *Games and Economic Behavior*, *46*, 260–281. doi:10.1016/S0899-8256(03)00119-2

Dahl, A., Schuck, R. K., & Campos, J. J. (2013). Do young toddlers act on their social preferences? *Developmental Psychology*, *49*, 1964–1970. doi:10.1037/a0031460

Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, *18*, 105–115. doi:10.1037/h0030644

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

Dohmen, T., Falk, A., Fliessbach, K., Sunde, U., & Weber, B. (2011). Relative versus absolute income, joy of winning, and gender: Brain imaging evidence. *Journal of Public Economics*, *95*, 279–285. doi:10.1016/j.jpubeco.2010.11.025

Dovidio, J. F., Piliavin, J. A., Schroeder, D. A., & Penner, L. (2006). *The social psychology of prosocial behavior*. Mahwah, NJ: Erlbaum.

Dunfield, K. A., & Kuhlmeier, V. A. (2010). Intention-mediated selective helping in infancy. *Psychological Science*, *21*, 523–527. doi:10.1177/0956797610364119

Dunfield, K. A., & Kuhlmeier, V. A. (2013). Classifying prosocial behaviour: Children's responses to instrumental need, emotional distress, and material desire. *Child Development*, *84*, 1766–1776. doi:10.1111/cdev.12075

Dunfield, K. A., Kuhlmeier, V. A., & Murphy, L. (2013). Children's use of communicative intent in the selection of cooperative partners. *PLoS ONE, 8*(4), e61804.

Dunfield, K. A., Kuhlmeier, V. A., O'Connell, L., & Kelley, E. (2011). Examining the diversity of prosocial behavior: Helping, sharing, and comforting in infancy. *Infancy*, *16*, 227–247. doi:10.1111/j.1532-7078.2010.00041.x

Dunham, Y., Baron, A. S., & Carey, S. (2011). Consequences of "minimal" group affiliations in children. *Child Development*, *82*, 793–811. doi:10.1111/j.1467-8624.2011.01577.x

Dunn, E. W., Aknin, L. B., & Norton, M. I. (2008, March 21). Spending money on others promotes happiness. *Science*, *319*, 1687–1688. doi:10.1126/science.1150952

Eisenberg, N., Fabes, R. A., Miller, P. A., Fultz, J., Shell, R., Mathy, R. M., & Reno, R. R. (1989). Relation of sympathy and personal distress to prosocial behavior: A multimethod study. *Journal of Personality and Social Psychology*, *57*, 55–56. doi:10.1037/0022-3514.57.1.55

Eisenberg, N., Guthrie, I. K., Murphy, B. C., Shepard, S. A., Cumberland, A., & Carlo, G. (1999). Consistency and development of prosocial dispositions: A longitudinal study. *Child Development*, *70*, 1360–1372. doi:10.1111/1467-8624.00100

Eisenberg-Berg, N., Haake, R., Hand, M., & Sadalla, E. (1979). Effects of instructions concerning ownership of a toy on preschoolers' sharing and defensive behaviors. *Developmental Psychology*, *15*, 460–461. doi:10.1037/0012-1649.15.4.460

Engelmann, J. M., Herrmann, E., & Tomasello, M. (2012). Five-year olds, but not chimpanzees, attempt to manage their reputations. *PLoS ONE*, *7*(10), e48433. doi:10.1371/journal.pone.0048433

Engelmann, J. M., Over, H., Herrmann, E., & Tomasello, M. (2013). Young children care more about their reputation with ingroup members and potential reciprocators. *Developmental Science*, *16*, 952–958. doi:10.1111/desc.12086

Fabes, R. A., Fultz, J., Eisenberg, N., May-Plumlee, T., & Christopher, F. S. (1989). Effects of rewards on children's prosocial motivation: A socialization study. *Developmental Psychology*, *25*, 509–515. doi:10.1037/0012-1649.25.4.509

Fehr, E., Fischbacher, U., & Gächter, S. (2002). Strong reciprocity, human cooperation, and the enforcement of social norms. *Human Nature*, *13*, 1–25. doi:10.1007/s12110-002-1012-7

Fehr, E., & Gächter, S. (2002, January 10). Altruistic punishment in humans. *Nature*, *415*, 137–140. doi:10.1038/415137a

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117–140.

Fiske, S. T. (2011). Envy up, scorn down: How comparison divides us. *American Psychologist*, *65*, 698–706. doi:10.1037/0003-066X.65.8.698

Forgas, J. P. (1998). Asking nicely? The effects of mood on responding to more or less polite requests. *Personality and Social Psychology Bulletin*, *24*, 173–185. doi:10.1177/0146167298242006

Forsythe, R., Horowitz, J. L., Savin, N. E., & Sefton, M. (1994). Fairness in simple bargaining experiments. *Games and Economic Behavior*, *6*, 347–369. doi:10.1006/game.1994.1021

Fox, N. A., & Davidson, R. J. (1988). Patterns of brain electrical activity during facial signs of emotion in 10-month-old infants. *Developmental Psychology*, *24*, 230–236. doi:10.1037/0012-1649.24.2.230

Frey, B. S., & Goette, L. (1999). *Does pay motivate volunteers?* Zurich, Switzerland: Institute for Empirical Research in Economics, University of Zurich.

Frey, B. S., & Oberholzer-Gee, F. (1997). The cost of price incentives: An empirical analysis of motivation crowding-out. *American Economic Review*, *87*, 746–755.

Fujisawa, K. K., Kutsukake, N., & Hasegawa, T. (2008). Reciprocity of prosocial behavior in Japanese preschool children. *International Journal of Behavioral Development*, *32*, 89–97. doi:10.1177/0165025407084055

Gneezy, U., & Rustichini, A. (2000). Pay enough or don't pay at all. *Quarterly Journal of Economics*, *115*, 791–810. doi:10.1162/003355300554917

Gouldner, A. W. (1960). The norm of reciprocity: A preliminary statement. *American Sociological Review*, *25*, 161–178.

Greiner, B., & Levati, M. V. (2005). Indirect reciprocity in cyclical networks: An experimental study. *Journal of Economic Psychology, 26*, 711–731.

Grusec, J. E. (1991). Socializing concern for others in the home. *Developmental Psychology*, *27*, 338–342.

Grusec, J. E., & Redler, E. (1980). Attribution, reinforcement, and altruism: A developmental analysis. *Developmental Psychology*, *16*, 525–534. doi:10.1037/0012-1649.16.5.525

Guéguen, N., & De Gail, M. A. (2003). The effect of smiling on helping behavior: Smiling and good Samaritan behavior. *Communication Reports*, *16*, 133–140. doi:10.1080/08934210309384496

Gurven, M. (2006). The evolution of contingent cooperation. *Current Anthropology*, *47*, 185–192. doi:10.1086/499552

Haley, K. J., & Fessler, D. M. (2005). Nobody's watching?: Subtle cues affect generosity in an anonymous economic game. *Evolution & Human Behavior*, *26*, 245–256. doi:10.1016/j.evolhumbehav.2005.01.002

Hamlin, J. K. (2013). Moral judgment and action in preverbal infants and toddlers: Evidence for an innate moral core. *Current Directions in Psychological Science*, *22*, 186–193. doi:10.1177/0963721412470687

Hamlin, J. K., Wynn, K., & Bloom, P. (2007, November 22). Social evaluation by preverbal infants. *Nature*, *450*, 557–559. doi:10.1038/nature06288

Hamlin, J. K., Wynn, K., Bloom, P., & Mahajan, N. (2011). How infants and toddlers react to antisocial others. *Proceedings of the National Academy of Sciences, USA*, *108*, 19931–19936. doi:10.1073/pnas.1110306108

Harris, M. B., & Smith, R. J. (1975). Mood and helping. *The Journal of Psychology*, *91*, 215–221. doi:10.1080/00223980.1975.9923945

Hay, D. F. (1979). Cooperative interactions and sharing between very young children and their parents. *Developmental Psychology*, *15*, 647–653. doi:10.1037/0012-1649.15.6.647

Hay, D. F. (1994). Prosocial development. *Journal of Child Psychology and Psychiatry*, *35*, 29–71. doi:10.1111/j.1469-7610.1994.tb01132.x

Hay, D. F., Caplan, M., Castle, J., & Stimson, C. A. (1991). Does sharing become increasingly "rational" in the second year of life? *Developmental Psychology*, *27*, 987–993. doi:10.1037/0012-1649.27.6.987

Hay, D. F., & Murray, P. (1982). Giving and requesting: Social facilitation of infants' offers to adults. *Infant Behavior & Development*, *5*, 301–310. doi:10.1016/S0163-6383(82)80039-8

Hepach, R., Vaish, A., & Tomasello, M. (2012). Young children are intrinsically motivated to see others helped. *Psychological Science*, *23*, 967–972. doi:10.1177/0956797612440571

Hepach, R., Vaish, A., & Tomasello, M. (2013). Young children sympathize less in response to unjustified emotional distress. *Developmental Psychology*, *49*, 1132–1138. doi:10.1037/a0029501

Hoffman, E., McCabe, K., Shachat, K., & Smith, V. (1994). Preferences, property rights, and anonymity in bargaining games. *Games and Economic Behavior*, *7*, 346–380. doi:10.1006/game.1994.1056

Howard, L. H., Henderson, A. M., Carrazza, C., & Woodward, A. L. (in press). Infants' and young children's imitation of linguistic in-group and out-group informants. *Child Development*. doi:10.1111/cdev.12299

Hyona, J., Tommola, J., & Alaja, A. (1995). Pupil dilation as a measure of processing load in simultaneous interpretation and other language tasks. *Quarterly Journal of Experimental Psychology*, *48*, 598–612. doi:10.1080/14640749508401407

Isen, A. M., & Levin, P. F. (1972). Effect of feeling good on helping: Cookies and kindness. *Journal of Personality and Social Psychology*, *21*, 384–388. doi:10.1037/h0032317

Janisse, M. P. (1973). Pupil size and affect: A critical review of the literature since 1960. *Canadian Psychologist*, *14*, 311–329. doi:10.1037/h0082230

Jaspars, J. M. F., & Warnaen, S. (1982). Intergroup relations, ethnic identity, and self-evaluation in Indonesia. In H. Tajfel (Ed.), *Social identity and intergroup relations* (pp. 335–366). Cambridge, England: Cambridge University Press.

Jensen, K., Vaish, A., & Schmidt, M. F. (2014). The emergence of human prosociality: Aligning with others through feelings, concerns, and norms. *Frontiers in Psychology*, *5*, Article 822. doi:10.3389/fpsyg.2014.00822

Just, M. A., & Carpenter, P. A. (1993). The intensity dimension of thought: Pupillometric indices of sentence processing. *Canadian Journal of Experimental Psychology/Revue Canadienne de Psychologie Experimentale*, *47*, 310–339. doi:10.1037/h0078820

Kahneman, D., Knetsch, J. L., & Thaler, R. (1986). Fairness as a constraint on profit seeking: Entitlements in the market. *American Economic Review*, *76*, 728–741.

Kenrick, D. T., Baumann, D. J., & Cialdini, R. B. (1979). A step in the socialization of altruism as hedonism: Effects of negative mood on children's generosity under public and private conditions. *Journal of Personality and Social Psychology*, *37*, 747–755. doi:10.1037/0022-3514.37.5.747

Kenward, B., & Dahl, M. (2011). Preschoolers distribute scarce resources according to the moral valence of recipients' previous actions. *Developmental Psychology*, *47*, 1054–1064. doi:10.1037/a0023869

Kinzler, K. D., Dupoux, E., & Spelke, E. S. (2007). The native language of social cognition. *Proceedings of the National Academy of Sciences, USA*, *104*, 12577–12580. doi:10.1073/pnas.0705345104

Kinzler, K. D., Dupoux, E., & Spelke, E. S. (2012). "Native" objects and collaborators: Infants' object choices and acts of giving reflect favor for native over foreign speakers. *Journal of Cognition and Development*, *13*, 67–81. doi:10.1080/15248372.2011.567200

Kinzler, K. D., & Spelke, E. S. (2011). Do infants show social preferences for people differing in race? *Cognition*, *119*, 1–9. doi:10.1016/j.cognition.2010.10.019

Knudsen, B., & Liszkowski, U. (2012a). Eighteen- and 24-month-old infants correct others in anticipation of action mistakes. *Developmental Science*, *15*, 113–122. doi:10.1111/j.1467-7687.2011.01098.x

Knudsen, B., & Liszkowski, U. (2012b). 18-month-olds predict specific action mistakes through attribution of false belief, not ignorance, and intervene accordingly. *Infancy*, *17*, 672–691. doi:10.1111/j.1532-7078.2011.00105.x

Krebs, D. L. (1975). Empathy and altruism. *Journal of Personality and Social Psychology*, *32*, 1134–1146. doi:10.1037/0022-3514.32.6.1134

Krebs, D. L. (2008). Morality: An evolutionary account. *Perspectives on Psychological Science*, *3*, 149–172. doi:10.1111/j.1745-6924.2008.00072.x

Kuhlmeier, V. A., Dunfield, K. A., & O'Neill, A. C. (2014). Selectivity in early prosocial behavior. *Frontiers in Psychology*, *5*, Article 836. doi:10.3389/fpsyg.2014.00836

Kuhlmeier, V. A., Wynn, K., & Bloom, P. (2003). Attribution of dispositional states by 12-month-olds. *Psychological Science*, *14*, 402–408. doi:10.1111/1467-9280.01454

Laeng, B., Sirois, S., & Gredebäck, G. (2012). Pupillometry: A window to the preconscious? *Perspectives on Psychological Science*, *7*, 18–27. doi:10.1177/1745691611427305

Lakin, J. L., & Chartrand, T. L. (2003). Using nonconscious behavioral mimicry to create affiliation and rapport. *Psychological Science*, *14*, 334–339. doi:10.1111/1467-9280.14481

Latane, B., & Darley, J. M. (1970). *The unresponsive bystander: Why doesn't he help?* New York, NY: Appleton-Century Crofts.

Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin*, *107*, 34–47. doi:10.1037/0033-2909.107.1.34

Leimgruber, K. L., Shaw, A., Santos, L. R., & Olson, K. R. (2012). Young children are more generous when others are aware of their actions. *PLoS ONE*, *7*(10), e48292. doi:10.1371/journal.pone.0048292

Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology*, *28*, 129–137. doi:10.1037/h0035519

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and emergency intervention: How social group membership and inclusiveness of group boundaries shape helping behavior. *Personality and Social Psychology Bulletin*, *31*, 443–453. doi:10.1177/0146167204271651

Levitt, M. J., Weber, R. A., Clark, M. C., & McDonnell, P. (1985). Reciprocity of exchange in toddler sharing behavior. *Developmental Psychology*, *21*, 122–123. doi:10.1037/0012-1649.21.1.122

Li, V., Spitzer, B., & Olson, K. R. (2014). Preschoolers reduce inequality while favoring individuals with more. *Child Development*, *85*, 1123–1133. doi:10.1111/cdev.12198

List, J. A. (2007). On the interpretation of giving in dictator games. *Journal of Political Economy*, *115*, 482–493. doi:10.1086/519249

Liszkowski, U., Carpenter, M., Striano, T., & Tomasello, M. (2006). 12- and 18-month-olds point to provide information for others. *Journal of Cognition and Development*, *7*, 173–187. doi:10.1111/j.1467-8624.2007.01025.x

Liszkowski, U., Carpenter, M., & Tomasello, M. (2008). Twelve-month-olds communicate helpfully and appropriately for knowledgeable and ignorant partners. *Cognition*, *108*, 732–739. doi:10.1016/j.cognition.2008.06.013

LoBue, V., Nishida, T., Chiong, C., DeLoache, J. S., & Haidt, J. (2011). When getting something good is bad: Even three-year-olds react to inequality. *Social Development*, *20*, 154–170. doi:10.1111/j.1467-9507.2009.00560.x

Mahajan, N., & Wynn, K. (2012). Origins of "us" versus "them": Prelinguistic infants prefer similar others. *Cognition*, *124*, 227–233. doi:10.1016/j.cognition.2012.05.003

Manucia, G. K., Baumann, D. J., & Cialdini, R. B. (1984). Mood influences on helping: Direct effects or side effects? *Journal of Personality and Social Psychology*, *46*, 357–364. doi:10.1037/0022-3514.46.2.357

Marshall, S. P. (2002). The index of cognitive activity: Measuring cognitive workload. In *Proceedings of the IEEE 7th Human Factors Meeting*, 7.5–7.9. Piscataway, NJ: Institute of Electrical and Electronics Engineers. doi:10.1109/HFPP.2002.1042860

McCabe, K. A., Rigdon, M. L., & Smith, V. L. (2003). Positive reciprocity and intentions in trust games. *Journal of Economic Behavior & Organization*, *52*, 267–275. doi:10.1016/S0167-2681(03)00003-9

Meristo, M., & Surian, L. (2013). Do infants detect indirect reciprocity? *Cognition*, *129*, 102–113. doi:10.1016/j.cognition.2013.06.006

Milinski, M., Semmann, D., & Krambeck, H. (2002a). Donors to charity gain in both indirect reciprocity and political reputation. *Proceedings of the Royal Society B: Biological Sciences*, *269*, 881–883. doi:10.1098/rspb.2002.1964

Milinski, M., Semmann, D., & Krambeck, H. J. (2002b, January 24). Reputation helps solve the "tragedy of the commons." *Nature*, *415*, 424–426. doi:10.1038/415424a

Moore, C. (2009). Fairness in children's resource allocation depends on the recipient. *Psychological Science*, *20*, 944–948. doi:10.1111/j.1467-9280.2009.02378.x

Moss, M. K., & Page, R. A. (1972). Reinforcement and helping behavior. *Journal of Applied Social Psychology*, *2*, 360–371. doi:10.1111/j.1559-1816.1972.tb01287.x

Nelson, J. A., Freitas, L. B., O'Brien, M., Calkins, S. D., Leerkes, E. M., & Marcovitch, S. (2013). Preschool-aged children's understanding of gratitude: Relations with emotion and mental state knowledge. *British Journal of Developmental Psychology*, *31*, 42–56. doi:10.1111/j.2044-835X.2012.02077.x

Nowak, M. A. (2006, December 8). Five rules for the evolution of cooperation. *Science*, *314*, 1560–1563. doi:10.1126/science.1133755

Nowak, M. A., & Sigmund, K. (1998). The dynamics of indirect reciprocity. *Journal of Theoretical Biology*, *194*, 561–574. doi:10.1038/31225

Olson, K. R., & Spelke, E. S. (2008). Foundations of cooperation in young children. *Cognition*, *108*, 223–231. doi:10.1016/j.cognition.2007.12.003

Over, H., & Carpenter, M. (2009). Eighteen-month-old infants show increased helping following priming with affiliation. *Psychological Science*, *20*, 1189–1193. doi:10.1111/j.1467-9280.2009.02419.x

Partala, T., & Surakka, V. (2003). Pupil size variation as an indication of affective processing. *International Journal of Human-Computer Studies*, *59*, 185–198. doi:10.1016/S1071-5819(03)00017-X

Paulus, M. (2014). The early origins of human charity: Developmental changes in preschoolers' sharing with poor and wealthy individuals. *Developmental Psychology*, *5*, Article 344. doi:10.3389/fpsyg.2014.003344

Paulus, M., Kühn-Popp, N., Licata, M., Sodian, B., & Meinhardt, J. (2013). Neural correlates of prosocial behavior in infancy: Different neurophysiological mechanisms support the emergence of helping and comforting. *NeuroImage*, *66*, 522–530. doi:10.1016/j.neuroimage.2012.10.041

Paulus, M., & Moore, C. (2012). Producing and understanding prosocial actions in early childhood. *Advances in Child Development and Behavior*, *42*, 271–305. doi:10.1111/1469-7610.00508

Piliavin, J. A., Dovidio, J. F., Gaertner, S. L., & Clark, R. D., III. (1981). *Emergency intervention*. New York, NY: Academic Press.

Preuschoff, K., Hart, B. M., & Einhauser, W. (2011). Pupil dilation signals surprise: Evidence for noradrenaline's role in decision making. *Frontiers in Neuroscience*, *5*, Article 115. doi:10.3389/fnins.2011.00115

Quinn, P. C., Yahr, J., Kuhn, A., Slater, A. M., & Pascalis, O. (2002). Representation of the gender of human faces by infants: A preference for female. *Perception*, *31*, 1109–1122. doi:10.1068/p3331

Radke-Yarrow, M., Waxler, C. Z., Barrett, D., Darby, J., King, R., Pickett, M., & Smith, J. (1976). Dimensions and correlates of prosocial behavior in young children. *Child Development*, *47*, 118–125. doi:10.2307/1128290

Rand, D. G., Arbesman, S., & Christakis, N. A. (2011). Dynamic social networks promote cooperation in experiments with humans. *Proceedings of the National Academy of Sciences, USA*, *108*, 19193–19198. doi:10.1073/pnas.1108243108

Reis, H. T., & Gruzen, J. (1976). On mediating equity, equality, and self-interest: The role of self-presentation in social exchange. *Journal of Experimental Social Psychology*, *12*, 487–503. doi:10.1016/0022-1031(76)90079-2

Rheingold, H. L. (1982). Little children's participation in the work of adults, a nascent prosocial behavior. *Child Development*, *53*, 114–125. doi:10.2307/1129643

Rheingold, H. L., Hay, D. F., & West, M. J. (1976). Sharing in the second year of life. *Child Development*, *47*, 1148–1158. doi:10.2307/1128454

Rind, B. (1996). Effect of beliefs about weather conditions on tipping. *Journal of Applied Social Psychology, 26*, 137–147. doi:10.1111/j.1559-1816.2001.tb00168.x

Rushton, J. P. (1980). *Altruism, socialization, and society*. Englewood Cliffs, NJ: Prentice-Hall.

Satow, K. L. (1975). Social approval and helping. *Journal of Experimental Social Psychology*, *11*, 501–509. doi:10.1016/0022-1031(75)90001-3

Sebastián-Enesco, C., Hernández-Lloreda, M. V., & Colmenares, F. (2013). Two and a half-year-old children are prosocial even when their partners are not. *Journal of Experimental Child Psychology*, *116*, 186–198. doi:10.1016/j.jecp.2013.05.007

Sherif, M., Harvey, O. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961). *Intergroup conflict and cooperation: The Robbers Cave experiment* (Vol. 10). Norman, OK: University Book Exchange.

Sheskin, M., Bloom, P., & Wynn, K. (2014). Anti-equality: Social comparison in young children. *Cognition*, *130*, 152–156. doi:10.1016/j.cognition.2013.10.008

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*, 1359–1366. doi:10.1177/0956797611417632

Sommerville, J. A., Schmidt, M. F., Yun, J. E., & Burns, M. (2013). The development of fairness expectations and prosocial behavior in the second year of life. *Infancy*, *18*, 40–66. doi:10.1111/j.1532-7078/2012.00129.x

Svetlova, M., Nichols, S. R., & Brownell, C. A. (2010). Toddlers' prosocial behavior: From instrumental to empathic to altruistic helping. *Child Development*, *81*, 1814–1827. doi:10.1111/j.1467-8624.2010.01512.x

Tajfel, H. (1982). Social psychology of intergroup relations. *Annual Review of Psychology*, *33*, 1–39.

Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, *46*, 35–57.

Vaish, A., Carpenter, M., & Tomasello, M. (2009). Sympathy through affective perspective taking and its relation to prosocial behavior in toddlers. *Developmental Psychology*, *45*, 534–543. doi:10.1037/a0014322

Vaish, A., Carpenter, M., & Tomasello, M. (2010). Young children selectively avoid helping people with harmful intentions. *Child Development*, *81*, 1661–1669. doi:10.1111/j.1467-8624.2010.01500.x

van Baaren, R. B., Holland, R. W., Kawakami, K., & van Knippenberg, A. (2004). Mimicry and prosocial behavior. *Psychological Science*, *15*, 71–74. doi:10.1111/j.0963-7214.2004.01501012.x

van Baaren, R. B., Holland, R. W., Steenaert, B., & van Knippenberg, A. (2003). Mimicry for money: Behavioral consequences of imitation. *Journal of Experimental Social Psychology*, *39*, 393–398. doi:10.1016/S0022-1031(03)000014-3

Warneken, F. (2011). Digging deeper: A response to commentaries on The roots of human altruism. *British Journal of Psychology*, *100*, 487–490. doi:10.1348/000712609X459430

Warneken, F. (2013). The development of altruistic behavior: Helping in children and chimpanzees. *Social Research: An International Quarterly*, *80*, 431–442.

Warneken, F., Hare, B., Melis, A. P., Hanus, D., & Tomasello, M. (2007). Spontaneous altruism by chimpanzees and young children. *PLoS Biology*, *5*(7), e184. doi:10.1371/journal.pbio.0050184

Warneken, F., & Tomasello, M. (2006, March 3). Altruistic helping in human infants and young chimpanzees. *Science*, *311*, 1301–1303. doi:10.1126/science.1121448

Warneken, F., & Tomasello, M. (2007). Helping and cooperation at 14 months of age. *Infancy*, *11*, 271–294. doi:10.1080/15250000701310389

Warneken, F., & Tomasello, M. (2008). Extrinsic rewards undermine altruistic tendencies in 20-month-olds. *Developmental Psychology*, *44*, 1785–1788. doi:10.1037/a0013860

Warneken, F., & Tomasello, M. (2009a). The roots of human altruism. *British Journal of Psychology*, *100*, 455–471. doi:10.1348/000712608X379061

Warneken, F., & Tomasello, M. (2009b). Varieties of altruism in children and chimpanzees. *Trends in Cognitive Sciences*, *13*, 397–402. doi:10.1016/j.tics.2009.06.0082

Warneken, F., & Tomasello, M. (2012). Parental presence and encouragement do not influence helping in young children. *Infancy*, *18*, 345–368. doi:10.1111/j.1532-7078.2012.00120.x

Warneken, F., & Tomasello, M. (2013). The emergence of contingent reciprocity in young children. *Journal of Experimental Child Psychology*, *116*, 338–350. doi:10.1016/j.jecp.2013.06.002

Wegener, D. T., & Petty, R. E. (1994). Mood management across affective states: The hedonic contingency hypothesis. *Journal of Personality and Social Psychology*, *66*, 1034–1048. doi:10.1037/0022-3514.66.6.1034

Weller, D., & Lagattuta, K. (2012). Helping the in-group feels better: Children's judgments and emotion attributions in response to prosocial dilemmas. *Child Development*, *84*, 253–268. doi:10.1111/j.1467-8624.2012.01837.x

Wellman, H. M., Phillips, A. T., & Rodriguez, T. (2000). Young children's understanding of perception, desire, and emotion. *Child Development*, *71*, 895–912. doi:10.1111/1467-8624.00198

West, S. A., El Mouden, C., & Gardner, A. (2011). Sixteen common misconceptions about the evolution of cooperation in humans. *Evolution & Human Behavior*, *32*, 231–262. doi:10.1016/j.evolhumbehav.2010.08.001

Weyant, J. M. (1978). Effects of mood states, costs, and benefits on helping. *Journal of Personality and Social Psychology, 36*, 1169–1176. doi:10.137/0022-3514.36.10.1169

Wynn, K. (2009). Constraints on natural altruism. *British Journal of Psychology*, *100*, 481–485. doi:10.1348/000712609X441312

Young, S. K., Fox, N. A., & Zahn-Waxler, C. (1999). The relations between temperament and empathy in 2-year-olds. *Developmental Psychology*, *35*, 1189–1197. doi:10.1037/0012-1649.35.5.1189