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The emergence of contingent reciprocity in young children

Felix Warneken [a,*], Michael Tomasello [b]

[a] Department of Psychology, Harvard University, Cambridge, MA 02138, USA
[b] Department of Developmental and Comparative Psychology, Max Planck Institute for Evolutionary Anthropology, 04103 Leipzig, Germany

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ABSTRACT

Contingent reciprocity is important in theories of the evolution of human cooperation, but it has been very little studied in ontogeny. We gave 2- and 3-year-old children the opportunity to either help or share with a partner after that partner either had or had not previously helped or shared with the children. Previous helping did not influence children's helping. In contrast, previous sharing by the partner led to greater sharing in 3-year-olds but not in 2-year-olds. These results do not support theories claiming either that reciprocity is fundamental to the origins of children's prosocial behavior or that it is irrelevant. Instead, they support an account in which children's prosocial behavior emerges spontaneously but is later mediated by reciprocity.

Introduction

From early on in development, children engage in prosocial behaviors such as helping and sharing (Eisenberg, Fabes, & Spinrad, 2006; Hay & Cook, 2007; Warneken & Tomasello, 2009b). Specifically, during the second and third years of life, children begin to help others with their goals (e.g., Rheingold, 1982; Warneken & Tomasello, 2006) and share resources with others (e.g., Brownell, Svetlova, & Nichols, 2009; Dunfield, Kuhlmeier, O'Connell, & Kelley, 2010; Svetlova, Nichols, & Brownell, 2010). However, it is not known whether these prosocial behaviors of young children are based on direct reciprocity. Direct reciprocity refers to cases in which favors are exchanged over repeated encounters between the same two individuals. Direct reciprocity is a powerful strategy to stabilize cooperation

* Corresponding author.
E-mail address: warneken@wjh.harvard.edu (F. Warneken).

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among individuals who interact repeatedly because if individuals take turns in who pays a cost and who benefits, both individuals can create a greater long-term benefit (Axelrod & Hamilton, 1981; Nowak, 2006; Trivers, 1971). Thus, both theoretical models and empirical studies with adults (e.g., Gurven, 2006) show that direct reciprocity is an important strategy explaining the emergence of human cooperation. Therefore, the question arises at what point in development children use contingent reciprocity to guide their prosocial behaviors with others.

A few naturalistic observations have explored whether children engage in reciprocity. In studies with young children, reciprocity was often difficult to establish because of low base rates (Murphy, 1937; Strayer, Wareing, & Rushton, 1979), because the situation was too unstructured (Peterson, Ridley-Johnson, & Carter, 1984), or because reciprocal effects were strongly intercorrelated with the overall rate of social interaction (Hay, Castle, Davies, Demetriou, & Stimson, 1999). However, one study provided evidence for weak, but statistically significant, correlations in the domain of helping and sharing among 3- and 4-year-old peers, controlling for friendship and affiliation (Fujisawa, Kutsukake, & Hasegawa, 2008). These observational studies can provide suggestive positive evidence and external validity for reciprocity in young children, but due to the correlational nature of the analyses, they cannot establish what causes the variation in children's prosociality. In particular, they cannot determine whether a child's decision to cooperate or defect is contingent on the partner's previous behavior. Alternatively, reciprocity could be the result of friendship (so-called attitudinal reciprocity) or external factors beyond the child's control (Schino & Aureli, 2010).

One recent study used a more structured situation by using a card game in which children could choose between a selfish distribution of rewards (1 for self, 0 for other) or, at no additional cost, an equal outcome (1 for self, 1 for other) (House, Henrich, Sarnecka, & Silk, 2013). Results showed that children at 5 to 7 years of age were more likely to choose the equal option over the unequal option, with equal choices being more likely if the partner had made the same choice previously. By contrast, children at 3 and 4 years of age chose the equal and unequal options at the same rate throughout the session. These results are intriguing because they indicate that a peer's current choice was associated with the other peer's previous behavior. However, conclusions about the causal effect of previous sharing must be interpreted with caution because they are based on a quasi-experimental setup in which the partner's behavior (the independent variable) was not experimentally controlled and regression statistics cannot fully account for potentially confounding predictor variables. Thus, a stronger test would involve a design with random assignment to different experimental conditions. Moreover, the tendency of younger children to choose cards randomly even though creating equal outcomes came at no additional costs to themselves raises concerns about the validity of the task for a younger age group, especially considering that no task comprehension check was included. Most important for our current purposes, children could benefit the partner without incurring a cost, and thus it is unclear whether a similar result would be obtained if children needed to give up a resource or exert effort in order to benefit the partner.

Overall, although naturalistic and semi-structured studies suggest that the first signs of reciprocal interactions might emerge during middle childhood, because of their correlational nature or the possibility of confounding factors in quasi-experimental designs, it remains unclear whether children in fact respond to the partner's previous cooperativeness. For these reasons, other studies have experimentally manipulated the partner's behavior and the opportunity for reciprocation to assess whether children respond in a reciprocal manner. However, the vast majority of experimental studies have focused on children at 5 years or older, leaving it open whether reciprocity operates when prosocial behaviors first emerge in early ontogeny (e.g., Berndt, 1979; Dreman, 1976; Fishbein & Kaminski, 1985; Keil, 1986; Peterson, Hartmann, & Gelfand, 1977; Staub & Sherk, 1970).

Indirect evidence on the emergence of reciprocity in younger children comes from controlled experiments in which children decide for third parties (dolls) how these agents should divide up resources between other dolls. Specifically, in Olson and Spelke (2008), in a forced-choice situation with unequal numbers of rewards, 3.5-year-olds recommend that the donor should give more to a recipient who had previously shared with them than to the recipient who had not. This result shows that by at least 3.5 years of age, children use the concept of reciprocity to make decisions about sharing situations. Therefore, the question arises as to whether children use these rules for their own prosocial behaviors as well.