

Felix Warneken

The Development of Altruistic Behavior: Helping in Children and Chimpanzees

ONE OF THE KEY HUMAN CHARACTERISTICS IS OUR WILLINGNESS to help others in need. As adults we do this routinely, often in the absence of immediate personal gain and occasionally even at great costs to ourselves.

Proponents of a Hobbesian worldview argue that these helpful behaviors mainly depend upon the acquisition of social norms that override and control our pervasive selfish nature. It is often assumed that helping behaviors originate in cultural practices such as our parents having taught us moral norms or having rewarded us for being nice to others. Conversely, followers of Rousseau support the idea that we might have basic tendencies to care about others, which do not depend on social norms alone. Perhaps our altruistic inclinations go deeper and have a biological roots as well as social ones.

Empirical studies with young children and chimpanzees present us with a unique opportunity to investigate these questions. Focusing solely on the mature state of altruistic behaviors in human adults cannot provide us with satisfactory answers about the origins of the cognitive and motivational processes underlying altruism. However, by combining research focusing on the development of children with comparative approaches testing different species we can gain deeper insight into origins of the psychology underlying human altruistic behavior.

Studying young children allows us assess the psychological capacities with which humans are equipped early in life that prepare them to develop altruistic behaviors. By examining their development, we can elucidate the interplay between these biological predispositions and social learning. Studies of chimpanzees, one of our closest living evolutionary relatives, allow inferences concerning the evolutionary basis of these behaviors. By comparing humans with chimpanzees, we can determine which aspects of human altruism may have already been present in the last common ancestor of apes and humans versus those components of the human mind that are species-unique and emerged only in the human lineage. Thus, by integrating insights from these two lines of research, we can gain insight into the ontogenetic and phylogenetic origins of human altruistic behavior.

HELPING IN CHILDREN

One of the earliest manifestations of altruistic inclinations can be found in simple helping behaviors in which one person struggles to complete a task and the child can intervene. These behaviors are interesting with regard to the cognitive as well as the motivational underpinnings of children's social behaviors. Specifically, in order to help someone with an instrumental problem, the child has to have the social-cognitive capacity to represent an unfulfilled goal; that is, to detect the discrepancy between the person's goal (what she wanted to achieve) and what in fact happened (the actual state of the world). In addition, the child has to have a motivation to act based on this realization—performing an act that facilitates the person's goal-fulfillment. At what age do children begin to use these abilities to help others altruistically?

Children start to help surprisingly early, not long after their first birthday. In an initial study we presented 18-month-old infants with 10 different situations in which an adult was having trouble achieving a goal (Warneken and Tomasello 2006). This range of tasks placed before the children a variety of difficulties in discerning the adult's goal. For instance, in one task, while using clothespins to hang towels on a clothesline, an experimenter accidentally dropped a clothespin on

the floor and unsuccessfully reached for it. In another task the experimenter was trying to put a stack of magazines into a cabinet but could not open the doors because his hands were full; the child could thus potentially help by opening the doors for him. In the perhaps most challenging task, children brought about the experimenter's goal by different means: rather than using the experimenter's wrong approach to try to squeeze his hand through a tiny hole in order to retrieve a spoon from a box, children had to realize that they might better use an alternative strategy by lifting a flap on the side of the box and retrieving the spoon. Another study showed that even 14-month-old children act helpfully, although at this early age only with cognitively less demanding tasks (such as a person reaching for an object) (Warneken and Tomasello 2007). Thus, during the second year of life, toddlers appear to become more proficient at helping with different goals (Svetlova, Nichols, and Brownell 2010). They even seem to be able to take into the account whether the helpee is knowledgeable or ignorant when choosing how to help (Buttelmann, Carpenter, and Tomasello 2009). Taken together, these studies show that shortly after their first birthdays, human children begin to spontaneously help others, becoming more flexible in their ability to intervene in various types of situations over the second year of life.

Children are thus able to help—but what exactly motivates their helping? Perhaps important, helping occurs spontaneously in the parent's absence, proving that it is not due to subtle cues from the parent or obedience to parental authority (Warneken and Tomasello 2012). Moreover, children are willing to help even if it slightly costly. As an example, when children are having fun playing with a novel toy (a box with buttons that light up and produce sounds), they continue to help even if it means they have to disengage from this activity (Warneken and Tomasello 2008). As another example, children do not stop helping over repeated trials even if they have to surmount an array of obstacles, something that can be quite challenging for a toddler who just learned to walk (Warneken et al. 2007). Children are thus motivated to help another person even if it involves opportunity costs or effort to do so.

Last but not least, concrete rewards do not seem to drive children's helping. Specifically, in a study of 18-month-olds, children who were offered a toy as a reward for helping were not more likely to help than children who helped without being given a reward (Warneken et al. 2007). As a matter of fact, concrete rewards can even have a negative effect on children's helping. After adapting the paradigm by Lepper and colleagues on the "overjustification effect" (Lepper, Greene and Nisbett 1973), we found that children who had received a material reward for helping during an initial test phase were subsequently less likely to engage in further helping than those children who had not received such a reward (Warneken and Tomasello 2008). This rather surprising finding provides even further evidence for the hypothesis that children's helping is driven by an intrinsic rather than an extrinsic motivation. Rewards are often not only superfluous, but can even have detrimental effects as they may undermine children's intrinsic altruistic motivation.

In sum, this series of studies demonstrates that the ontogenetic origins of altruistic helping are apparent in early childhood. Infants as young as 14 months of age display spontaneous, unrewarded helping behaviors when another person is unable to achieve his goal. Throughout the second year of life, children become increasingly flexible in their ability to read others' goals and intervene in different kinds of situations. Human infants use their emerging goal-reading capabilities not only for their own ends but also to help others. They are willing to help multiple times and continue to help when the costs for helping are raised. Further experiments confirm that infants are actually motivated by the other's goal and not by an immediate benefit for themselves, as external rewards are not necessary to elicit helping nor do they increase the rate of helping. On the contrary, children appear to have an initial inclination to help that maybe be diminished by extrinsic rewards.

The finding that these helping behaviors emerge so early in life renders it implausible that socialization is the main or only factor accounting for the emergence of altruistic behavior in human chil-

dren. For example, it seems false to claim that children are initially oblivious to the needs of others and help only when promised concrete rewards (for example, Cialdini, Kenrick, and Baumann 1982) or that humans develop spontaneous helping behaviors only after a long reward history until ultimately helping becomes self-rewarding during adolescence (for example, Bar-Tal 1982). It is similarly implausible to assume that these young children have already adopted an explicit moral value system that guides their behavior. Moreover, there is no indication that these young children are adept at reputation management, an ability that does not seem to emerge before school age (Banerjee 2002). It is of course possible that parents had shaped these behaviors by rewarding children for helping. However, there are several issues with explanations that draw on external reinforcement through rewards alone.

First, natural observations with children show that parents do not appear to systematically reward altruistic behaviors with material rewards, but most of the time merely acknowledge the helpful act (Grusec 1991). Second, even if rewards occurred, infants 14 to 18 months of age had little opportunity to be reinforced for helping. Third, studies with older children showed that the inducement of altruistic behaviors through concrete reinforcements does not transfer to other types of situations or interactions with other people—when the incentive disappeared, so did the behavior (Moore and Eisenberg 1984). The reported studies on helping in young children, in contrast, demonstrate that they also help an unfamiliar adult in novel situations for which they could not possibly have been rewarded in the past. Fourth, as described above, external rewards can have negative effects on helping in an experimental situation. This is corroborated by a longitudinal observational study in which the amount of parental reinforcement of compliant altruistic behavior was *negatively* correlated with behaviors toward a peer two years later (Eisenberg et al., 1992). Given these data, it seems rather implausible to assume that young children are initially totally self-focused and oblivious to the needs of other, with socialization practices completely reprogramming children's motivations.

Nevertheless, it is still possible that there are certain socialization practices early in life that have not been captured in previous studies. Perhaps children are particularly adept social learners when it comes to helping behaviors, or perhaps adults are particularly motivated to raise altruistic offspring. For example, children may learn to help because they imitate other people's helping behaviors. Unfortunately, no studies with infants and toddlers directly address this topic. However, indirect evidence comes from a very different source: studies of chimpanzees.

If socialization practices such as teaching helpful behavior or internalizing social norms are a necessary prerequisite for the emergence of the kinds of altruistic behaviors we see in young children, we would not expect to find them in chimpanzees. Although chimpanzees show flexible social-cognitive skills (Tomasello et al. 2005) and may transmit some cultural information about some domains of life such as tool use (Whiten et al. 2009), there is currently no empirical evidence that chimpanzees transmit cultural norms regarding social behavior or actively reward their offspring for helping others. Therefore, studies with chimpanzees can inform us whether these types of socialization factors are actually necessary for helping behaviors to emerge. In addition, comparative studies of humans and chimpanzees enable us to time-travel into our evolutionary past, differentiating between those aspects that might have characterized the common ancestor of humans and nonhuman apes 5 to 7 million years ago from those behaviors that evolved only in the human lineage.

HELPING IN CHIMPANZEES

In the behavioral sciences, it is currently a matter of debate whether chimpanzees display altruistic behaviors that are similar to those of humans. On the one hand, several experiments found that chimpanzees did not take the opportunity to act on behalf of another individual. In particular, chimpanzees did not systematically deliver food to a conspecific by pulling a board within reach of them (Jensen et al. 2006) and did not choose a food distribution that benefits the self and a

conspecific over one that benefits only the self (Silk et al. 2005). On the other hand, an increasing number of studies of instrumental helping provide evidence that chimpanzees might in fact have altruistic motivations. Under certain circumstances, chimpanzees do in fact act on behalf of others.

The first piece of experimental evidence came from a study on instrumental helping in human-reared chimpanzees. When we tested them in the same tasks as the 18-month-old toddlers described above, we found that chimpanzees would also help their caregiver when she was reaching for an object (Warneken and Tomasello 2006). Chimpanzees performed these acts of helping without being offered a reward. Importantly, they did not pick up the objects in matched control conditions in which there was no indication by the caregiver that she needed help. After these initial results, several further studies showed that this phenomenon is not restricted to human-raised chimpanzees that interact with their human surrogate mother. Specifically, Warneken et al. (2007) tested a sample of semi-free-ranging chimpanzees who were born in the wild and now live in a sanctuary in Uganda. These chimpanzees spend the day in the forest of an island where they come to a human shelter for feeding and sleeping. They thus have regular contact with humans, but have not been exposed to rearing practices comparable to those of human-raised chimpanzees in zoos (as the chimpanzees from the initial helping study had been). Most important, they were tested by a human who had not interacted with them before the experiment.

One major finding of this study was that, just like human infants tested in a similar situation, chimpanzees helped over consecutive trials by handing the out-of-reach object when the experimenter indicated that he was trying to get the object, and they did so irrespective of being rewarded. This indicates that the chimpanzees were motivated to help the experimenter with his unachieved goal, and not by the possibility of retrieving a material reward for themselves. Moreover, chimpanzees continued to help even when doing so involved not only picking up the object, but also required that they first climb into a race-

way to retrieve the object for the other (Warneken et al. 2007). Thus, chimpanzees were willing to exert some effort to help the human.

To test whether chimpanzees would also help their conspecifics, we created an experimental situation in which one chimpanzee (the recipient) was faced with the problem that a door leading to a room with a piece of food was fixed with a chain that she could not unlock (Warneken et al. 2007). But if another chimpanzee (the actor) released this chain from an adjacent room, the recipient would be able to enter. Results showed that chimpanzees often released the chain (and significantly more often than in various control conditions). This shows that subjects were attentive to the recipient's goal, intervening on the recipient's behalf when she was unsuccessfully trying to open the door. This line of experiments indicates that chimpanzees also have the cognitive and motivational prerequisites to perform acts of instrumental helping.

In a related study, Yamamoto and colleagues showed that cues by the recipient are critical in eliciting altruistic behaviors. In their study, chimpanzees passed a tool to another individual who needed it to retrieve food, but did so almost exclusively in situations in which they previously observed the conspecific attempting to reach for the tool (Yamamoto, Humle, and Tanaka 2009). Chimpanzees virtually never handed over the tool proactively in the absence of such a cue. The importance of cues was also found in a study by Melis and colleagues (2010) in which the subject could release a bag containing a reward to allow it to slide down a chute toward a recipient. Chimpanzees performed this behavior more often when the recipient was actively trying to access the reward (by pulling a rope, which in some conditions was attached to the bag) or communicate with the subject, than when the recipient remained passive. In addition, Melis and colleagues manipulated whether the reward was a piece of food or a token (that the recipient could later exchange for food), testing the hypothesis that the presence and necessity to actively provision food might impede helping. However, this study revealed that the tendency to help was not diminished with food rewards (as compared to tokens). The main factor predicting helping was again the activity of the recipient.

Taken together, these studies show that not unlike human infants, chimpanzees instrumentally help others—at least when the problem is made salient. It is important to note, however, that despite this similarity, altruistic behaviors in chimpanzees appear to be much more restricted than what we see in humans. This is particularly true when it comes to food sharing, as chimpanzees rarely share food that they could keep for themselves or in food transfers occurring mainly in instances of “tolerated theft,” in which one individual allows another individual to take food, often after being harassed rather than handing over food (Gilby 2006). However, in situations with other demands, such as a concrete instrumental problem, chimpanzees appear to be willing to lend a hand. Thus, to compare species, it seems important to assess a variety of behaviors. This will enable us to better understand the proximate factors that enable and constrain altruistic behaviors in humans and our closest relatives.

These findings elucidate both the ontogenetic and phylogenetic origins of human altruism. Human children possess social-cognitive capacities that enable them to express altruistic tendencies in a variety of ways, as highlighted by the early emergence of helping, informing, and sharing. This challenges the view that altruism is imposed by the social environment (Bar-Tal 1982; Dovidio et al. 2006; Henrich et al. 2005). Infants show altruistic tendencies at an age when socialization could not yet have had a major impact on their development. Also, the internalization of norms or value systems is inapplicable to 1-year-old children. Moreover, we can assume that these infants had few opportunities to help and receive reinforcement for helping. And even if it is the case that they have had some exposure to helping and reinforcement, they also help in novel situations with unfamiliar adults. These early achievements are unlikely to be due to socialization practices alone. A more plausible explanation for the various results from these studies is that altruistic acts in young children reflect a natural predisposition to develop these altruistic behaviors. Socialization, in turn, can then build on these early, preexisting tendencies.

These behaviors are not completely absent in chimpanzees, providing further evidence for the notion that the ontogenetic emergence of such behavior is based on a biological predisposition. Moreover, it indicates that the altruistic tendencies seen in humans have deep phylogenetic roots, potentially dating back at least to the last common ancestor of humans and chimpanzees. The fact that chimpanzees show some flexibility in helping (toward different recipients who pursued different goals) indicates that they can utilize their social-cognitive skills in reading others' goals for altruistic purposes.

However, chimpanzee altruism appears to be much more restricted and more fragile than what we see already in young humans. This appears to be due in part to limitations on their social cognition, since they do not seem to engage in the communicative acts that characterize human intentional communication and neither comprehend nor produce gestures aimed at helping other individuals. Moreover, chimpanzees appear to have a strong tendency to monopolize food, which often predominates and in particular precludes instances of sharing. Rather than asking whether altruistic tendencies are present or absent in chimpanzees, research should explore the specific circumstances under which chimpanzees do or do not act altruistically.

CONCLUSION

Young children engage in helping behaviors and so do chimpanzees. These findings indicate that the basic social cognitive and motivational processes have deep roots in ontogeny and phylogeny. In particular, these results challenge the idea that human altruistic behaviors are due to socialization practices in the form of parental instruction or the internalization of norms alone. There is no doubt that socialization practices can profoundly influence children's basic altruistic tendencies (for better or worse). However, it seems that these practices build on processes that we share with our closest evolutionary relatives, rather than completely reshaping our biological endowment.

REFERENCES

- Banerjee, R. 2002. "Children's Understanding of Self-Presentational Behavior: Links with Mental-State Reasoning and the Attribution of Embarrassment." *Merrill-Palmer Quarterly* 48: 378–404.
- Bar-Tal, D. 1982. "Sequential Development of Helping Behavior: A Cognitive-Learning Approach." *Developmental Review* 2: 101–124.
- Buttelmann, D., M. Carpenter, and M. Tomasello. 2009. "Eighteen-Month-Old Infants Show False Belief Understanding in an Active Helping Paradigm." *Cognition* 112: 337–342.
- Cialdini, R. B., D. T. Kenrick, and D. J. Baumann. 1982. "Effects of Mood on Prosocial Behavior in Children and Adults." In *The Development of Prosocial Behavior*, edited by N. Eisenberg. San Diego: Academic Press.
- Dovidio, J. F., J. A. Piliavin, D. A. Schroeder, and L. A. Penner. 2006. *The Social Psychology of Prosocial Behavior*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Eisenberg, N., S. Wolchik, L. Goldberg, and I. Engel. 1992. "Parental Values, Reinforcement, and Young Children's Prosocial Behavior." *Journal of Genetic Psychology* 153: 19–36.
- Gilby, I. C. 2006. "Meat Sharing among the Gombe Chimpanzees: Harassment and Reciprocal Exchange." *Animal Behavior* 71: 953–963.
- Grusec, J. 1991. "Socializing Concern for Others in the Home." *Developmental Psychology* 27: 338–342.
- Henrich J., R. Boyd, S. Bowles, C. Camerer, E. Fehr, H. Gintis, and R. McElreath. 2005. "Economic Man" in Cross-Cultural Perspective: Behavioral Experiments in 15 Small-Scale Societies." *Behavioral and Brain Sciences* 28: 795–855.
- Jensen, K., B. Hare, J. Call, and M. Tomasello. 2006. "What's in It for Me? Self-Regard Precludes Altruism and Spite in Chimpanzees." *Proceedings of the Royal Society B* 273: 1013–1021.
- Lepper, M. R., D. Greene, and R. E. Nisbett,. 1973. "Undermining Children's Intrinsic Interest with Extrinsic Reward: A Test of the "Overjustification" Hypothesis." *Journal of Personality and Social Psychology* 28: 129–137.

- Melis, A. P., F. Warneken, K. Jensen, A.-C. Schneider, J. Call, and M. Tomasello. 2010. "Chimpanzees Help Conspecifics Obtain Food and Non-Food Items." *Proceedings of the Royal Society B*. October 27. <http://rspb.royalsocietypublishing.org/content/early/2010/10/26/rspb.2010.1735.full>.
- Moore, B., and N. Eisenberg. 1984. "The Development of Altruism." *Annals of Child Development* 1: 107–174.
- Silk, J., S. Brosnan, J. Vonk, J. Henrich, D. Povinelli, and A. S. Richardson. 2005. "Chimpanzees Are Indifferent to the Welfare of Unrelated Group Members." *Nature* 437: 1357–1359.
- Svetlova, M., S. R. Nichols, and C. A. Brownell. 2010. "Toddlers' Prosocial Behavior: From Instrumental to Empathic to Altruistic Helping." *Child Development* 81: 1814–1827.
- Tomasello, M., M. Carpenter, J. Call, T. Behne, and H. Moll. 2005. "Understanding and Sharing Intentions: The Origins of Cultural Cognition." *Behavioral and Brain Sciences* 28: 675–735.
- Warneken, F., B. Hare, A. P. Melis, D. Hanus, and M. Tomasello. 2007. "Spontaneous Altruism by Chimpanzees and Young Children." *PLoS Biology* 5: 1414–1420.
- Warneken, F., and M. Tomasello. 2006. "Altruistic Helping in Human Infants and Young Chimpanzees." *Science* 311: 1301–1303.
- . 2007. "Helping and Cooperation at 14 Months of Age." *Infancy* 11: 271–294.
- . 2008. "Extrinsic Rewards Undermine Altruistic Tendencies in 20-Month-Olds." *Developmental Psychology* 44: 1785–1788.
- . 2012. "Parental Presence and Encouragement Do Not Influence Helping in Young Children." *Infancy (Early View)*: 1–24.
- Whiten, A., N. McGuigan, S. Marshall-Pescini, and L. M. Hopper. 2009. "Emulation, Imitation, Overimitation and the Scope of Culture for Child and Chimpanzee." *Philosophical Transactions of the Royal Society B* 364: 2417–242.
- Yamamoto, S., T. Humle, and M. Tanaka. 2009. "Chimpanzees Help Each Other upon Request." *PLoS ONE* 4 (10).