

## Horizon

### The ultra-social animal

MICHAEL TOMASELLO\*

Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

#### Abstract

*In evolutionary perspective, what is most remarkable about human sociality is its many and diverse forms of cooperation. Here, I provide an overview of some recent research, mostly from our laboratory, comparing human children with their nearest living relatives, the great apes, in various tests of collaboration, prosocial behavior, conformity, and group-mindedness (e.g., following and enforcing social norms). This is done in the context of a hypothetical evolutionary scenario comprising two ordered steps: a first step in which early humans began collaborating with others in unique ways in their everyday foraging and a second step in which modern humans began forming cultural groups. Humans' unique forms of sociality help to explain their unique forms of cognition and morality. © 2014. The Authors. European Journal of Social Psychology published by John Wiley & Sons, Ltd.*

It is commonplace to refer to *Homo sapiens* as “the social animal” (e.g., Aronson, 1980). But many animal species are social, in many different ways, and so, it is not always clear exactly what this appellation means.

Recent theory and research in evolutionary psychology and anthropology have helped to specify more precisely the ways in which human beings are especially social. Briefly said, humans are especially cooperative. Somewhat analogous to the way that bees and ants are especially cooperative among insects, humans are especially cooperative among mammals and other primates (Wilson, 2012). Bee and ant ultra-sociality is based in kin selection and the special way that members of the same colony are genetically interrelated. Human ultra-sociality, in contrast, is based in some special psychological mechanisms—both cognitive and motivational—that have evolved to support humans' ultra-cooperative lifeways.

In this brief overview, I provide one possible evolutionary account of how humans became ultra-cooperative. As evidence for this account, I review recent research comparing the skills and motivations for cooperation of young human children and their nearest primate relatives, the great apes. I conclude with some speculations about how humans' special skills and motivations for cooperation have helped to create their unique forms of cognition and morality.

#### PRIMATE BACKGROUND

As most mammals, the vast majority of primate species live in social groups. For the individual, the evolutionary basis of

group living is enhanced protection against predation. But the intimacy of social life also brings with it increased competition for resources. Individuals compete with others in their social group for food, for example, by either scrambling to get to it first or else contesting others directly, which has led to the prevalence of dominance hierarchies as a way for both parties to avoid potentially damaging fights.

In this context, in many mammalian species, individuals cooperate with one another in order to better compete for resources. Among primates, such coalitions (potentially turning into more long-term alliances) are especially prevalent and require sophisticated skills of social cognition for maintaining simultaneously two social relationships of different natures (Cheney & Seyfarth, 1990). To maintain these cooperation-for-competition relationships, individuals curry favor with their best partners, for example, by engaging in mutual grooming or, less frequently, in food sharing (Muller & Mitani, 2005). One reasonable characterization is thus that the vast majority of nonhuman primate cooperation is in the context of intragroup competition (or else intergroup competition, as coalitions form to attack intruders from neighboring groups or to mob potential predators). This means that processes of social selection are, in a sense, working against the evolution of cooperation in these species, as individuals who are given favorable treatment by conspecifics are those who are best at competition and dominance.

Importantly, intragroup competition for food (and also for sexual partners) is a zero-sum game independent of whether individuals act alone or together. All individuals and coalitions are competing for one and the same fixed set of resources. There is one major exception, and it involves humans' closest living relatives, chimpanzees and bonobos.<sup>1</sup> Both species

\*Correspondence to: Michael Tomasello, Max Planck Institute for Evolutionary Anthropology, Deutscher Platz 6, D 04103, Leipzig, Germany.  
E-mail: tomas@eva.mpg.de

<sup>1</sup>Humans are members of the great ape clade, along with orangutans, gorillas, chimpanzees, and bonobos. The latter two, both from the genus *Pan*, are humans' closest living relatives, the split having occurred roughly 6 million years ago (the two *Pan* species then split roughly 2 million years ago).

engage in the group hunting of small mammals, mostly monkeys. Although the observations are sparse for bonobos, for chimpanzees, we have a large body of data from several different social groups living in different parts of equatorial Africa (Boesch & Boesch-Acherman, 2000). The key point for current purposes is that in most cases, these monkeys cannot be captured by an individual acting alone. Some form of cooperation is required, and cooperators gain access to resources not available to non-cooperators. The basic process is one in which one male chimpanzee gives chase, and then others in the area go to likely escape routes, thus surrounding the monkey. In the end, one chimpanzee actually makes the capture, and then in most cases, they all manage to eat at least something.

These observations of *Pan* suggest that humans' last common ancestor with other primates foraged for small mammals cooperatively. But human foragers do things differently: their collaborative foraging is much more cooperatively structured, as are many other dimensions of their daily lives (Tomasello, 2011). As just two examples, they help one another when hunting, and they share the food with everyone in the social group. To account for such differences, Tomasello, Melis, Tennie, Wyman, and Herrmann (2012) proposed a two-step evolutionary sequence leading to humans' species-unique forms of cooperation. The first step was new ways of collaborating in foraging, perhaps due to ecological changes that severely reduced or eliminated food sources that individuals could obtain on their own. It was collaborate or die. The second step was a scaling up of the collaboration of two or a few individuals to collaboration among all of the members of a more or less large social (cultural) group, perhaps due to increased competition with other human groups. It was identify and collaborate with our social—indeed cultural—group or submit to the invading hordes from the other side of the mountain. This means that the sense of belonging to a social group characteristic of contemporary humans has two evolutionary bases (which, interestingly, correspond quite well to the two bases most often proposed by social psychologists; e.g., Lickel, Schmader, & Spanovic, 2007): interdependent collaboration, as the more basic, and group-minded (perhaps cultural) identification built on that foundation.

A main source of evidence for this evolutionary account (given that behavior does not fossilize) comes from the ontogeny of humans' skills and motivations for cooperation and how they compare to those of our nearest great ape relatives. We may make this comparison most usefully in terms of our two proposed evolutionary steps, succinctly: collaboration and culture.

## COLLABORATION

Chimpanzee group hunting of monkeys and human collaborative foraging both fit within the general framework of the Stag Hunt from game theory: individuals have a safe low-value option available to them (the "hare"), but if they cooperate, they can both benefit from a higher value option (the "stag"). For cooperation to become an evolutionarily stable strategy in this situation, three basic challenges must be met: (i) to keep everyone incentivized over time, there must be a way of

sharing the spoils that is mutually satisfactory to all; (ii) to make sure that no one incurs inordinate risk in leaving their hare toward no good end, there must be some way of coordinating decisions; and (iii) to make sure that everyone is incentivized to put in collaborative work, free riders (cheaters) must be excluded from the spoils.

Small groups of male chimpanzees successfully hunt monkeys, as noted, and this is stable over time, and so, they clearly have ways of meeting these challenges. But in each case, the way that they do it is different from the way that humans—even young human children—do it.

## Sharing the Spoils

In chimpanzee group hunting of monkeys, many different individuals get some meat from a captured monkey carcass. The reason is that even if the captor is dominant, he cannot monopolize the carcass himself because it is too big. As with social carnivores like lions and wolves, trying to protect a large carcass with other hungry individuals approaching is a losing battle. After the kill, non-captors harass the captor and obtain pieces of meat from the too-big-to-monopolize carcass, with those who harass most getting the most meat (Gilby, 2006). The process looks much more like food competition than a dividing of spoils.

The difference with humans may be seen quite clearly in a recent matched pair of experiments with chimpanzees and human children. Melis, Hare, and Tomasello (2006) presented pairs of chimpanzees with out-of-reach food on a platform that could be obtained only if both individuals pulled simultaneously on the two ends of a rope. When there were two piles of food, one in front of each individual, the pair often collaborated successfully. However, when there was only one pile of food in the middle of the platform, pulling it in often resulted in the dominant individual monopolizing all of the food. This naturally demotivated the subordinate for future collaboration with this individual, and so, cooperation fell apart over trials. Chimpanzees' predominant solution to food competition in general, namely, dominance, undermined the incentive to cooperate. Warneken, Lohse, Melis, and Tomasello (2011) presented pairs of 3-year-old human children with the same basic task. They found that, in contrast to the apes, the children collaborated readily both when the food was pre-divided and when it was potentially monopolizable, and they did so repeatedly over multiple trials. On each trial, the children trusted that they would be able to work out a satisfactory division of spoils at the end, almost always an equal split.

Using the same board-with-ropes apparatus, Hamann, Warneken, and Tomasello (2011) investigated more directly children's tendency to split the fruits of collaborative labor equally and how that compared with chimpanzees. They presented pairs of 3-year-old children and chimpanzees with three different experimental conditions. In one condition, participants simply walked in the room and found three versus one reward at each end of the apparatus. In this condition, both children and chimpanzees were selfish: the "lucky" individual almost never shared with their partner.<sup>2</sup> In another condition,

<sup>2</sup>Because chimpanzees actively share food only rarely, their apparatus was a bit different: if the lucky individual wanted to protect her bounty, she could do so, but if she did nothing, the other could take some. "Sharing" in the case of chimpanzees, then, meant not protecting their food from the partner.

each partner pulled her own separate rope, and this resulted in the same asymmetry rewards (3:1). In this condition, the lucky chimpanzee still almost never shared, and the lucky child shared only about one third of the time. But in a third condition, the asymmetrical rewards (3:1) resulted from an equal collaborative effort from the two participants. In this case, the lucky chimpanzee still almost never shared, but the lucky child shared with the unlucky child almost 80% of the time. The surprising finding is that collaboration engenders equal sharing in children in a way that it does not in chimpanzees.

These findings suggest that chimpanzees are basically always competing for food no matter its source. In contrast, young human children treat resources generated collaboratively in special ways, applying some sense of distributive justice in dividing the spoils. It is possible that these children have learned social norms or rules about sharing equally from their parents. But in this case, they should have divided the food equally in all three of the experimental conditions of the Hamann et al. (2011) study. It is highly unlikely that parents teach their children to share food equally with a partner only if they have collaborated in producing it. And so, the conclusion is that young children have a sense of distributive justice that is closely tied to collaborative activities.

### Coordination and Commitment

In a Stag Hunt situation, if an individual can trust that another individual will be going for the stag, then it is in her interest to go too (assuming she is confident that the spoils will be shared in a satisfactory way). Perhaps reflecting their experience of dominants taking all of the food whenever they can, when chimpanzees are given the choice of obtaining food by collaborating with a partner or acting alone, they most often chose to act alone. In contrast, young human children most often chose to collaborate (Bullinger, Melis, & Tomasello, 2011; Rekers, Haun, & Tomasello, 2011).

In another recent study, Bullinger, Wyman, Melis, and Tomasello (2011) constructed a Stag Hunt situation for pairs of chimpanzees in which they knew (from pre-training) that the spoils from the stag would be distributed equally. Thus, each individual had continual access to a less preferred “hare” food, which she knew she would lose for good if she left it (spring-loaded door with lock). Then, a highly preferred “stag” food appeared that required the pair to work together for access (which they knew from previous experience). Because of the risk involved, communicating with the partner, or at least checking on the partner before forsaking the hare in hand, would seem to be called for. But what chimpanzees did in this situation was almost always bolt for the stag (90% of the time when a partner was present) without communicating or checking, presumably optimistic that the partner would be coming also. This is sometimes called a leader–follower strategy. There was basically no communication with the partner ahead of time as a way of coordinating their decisions.<sup>3</sup> This is in contrast to 4-year-old children, who engaged in some

<sup>3</sup>Other investigators have also reported a striking lack of communication among chimpanzees as they engage in collaborative tasks (e.g., Melis, Hare, & Tomasello, 2009; Povinelli & O’Neill, 2000), including in tasks in which they had previously communicated with humans (Hirata & Fuwa, 2007).

kind of communication on almost every trial, often before leaving their hare (Duguid et al., submitted).

Once humans have made a decision to collaborate, they seem to form something like a joint goal. To form a joint goal, we must know together that each of us has the goal of working with the other (Bratman, 1992). Once they have formed a joint goal, humans are committed to it. Thus, when their collaborative partner stops interacting with them, even 18-month-old infants expect her to be committed, and so, they attempt in various ways to reengage her—as opposed to human-raised chimpanzees, who just try to find ways to be successful alone (Warneken, Chen, & Tomasello, 2006). Slightly older children understand and respect their own commitment, such that they keep pursuing the joint goal until both partners have received their reward even if one receives hers prematurely (Hamann, Warneken, & Tomasello, 2012)—which, again, is not true of chimpanzees, who bolt as soon as they receive their own reward (Greenberg, Hamann, Warneken, & Tomasello, 2010). When 3-year-olds need to break away from a joint commitment with a partner, they even “take leave” through some form of implicit or explicit communication—as a way of acknowledging and asking to be excused for breaking the commitment (Gräfenhain, Behne, Carpenter, & Tomasello, 2009).

Young children also understand the role of the partner in the collaborative activity in a way that chimpanzees do not, and they communicate about roles as well. Thus, when they are forced to switch roles in a collaborative activity, young children already know what to do from having observed their partner earlier from the “other side” of the collaboration—whereas chimpanzees seemingly do not (Fletcher, Warneken, & Tomasello, 2012). And even prelinguistic children communicate with others to help them play their role in a joint activity, for example, by using a pointing gesture to direct them to the part of an apparatus they should be acting on—whereas, once more, chimpanzees do not (Warneken et al., 2006). Humans, but not chimpanzees, thus seem to comprehend joint activities and their different roles from a “bird’s eye view” in which all roles are interchangeable in a single representational format. This conceptual organization is foundational for everything from bi-directional linguistic conventions to social institutions with their publicly created joint goals and individual roles that can be filled by anyone.

Overall, then, we may say that humans coordinate their decisions in collaborative situations, especially by communication, in ways that great apes do not. Once they have done so, they are committed to follow through until everyone gets their just desserts, again in a way that great apes are not. And cognitively, they seem to understand the collaborative activity as a dual-level structure of jointness (joint goal and attention) and individuality (individual roles and perspectives) in ways that pre-figure the organization of many complex human institutional structures.

### Excluding Free Riders

In Stag Hunt situations with no excess of labor available (all individuals present are needed for success), free riding is not possible: if I do not participate, then I (and everyone else) get nothing. The proposal is thus that the earliest manifestations of human collaborative foraging were not so vulnerable

to free riding because they involved very small numbers of collaborators, each of whom believed their participation to be necessary. Interestingly, contemporary children seem to have virtually no interest in free riding, as participating in collaboration seems to be rewarding in itself (Gräfenhain et al., 2009).

So, how does it work in chimpanzee hunting of monkeys, when there are often excess participants around? The answer is that pretty much everyone around gets plenty of meat. Boesch (1994) reported that individuals get a bit more meat when they are actually in the hunt than if they are either bystanders or latecomers to the party, but bystanders still get plenty of meat (83% of bystanders get at least some meat), and they get more than latecomers. This suggests that the main variable in obtaining meat is proximity to the kill at the key moment, with the captor getting most, those in the immediate vicinity getting next most, and latecomers getting least.

This hypothesis is supported by a recent study in which pairs of chimpanzees again worked with the board-with-ropes apparatus. The food package (not easily monopolizable) came to one of the individuals (modeling what happens when one chimpanzee captures the monkey). In a 2 × 2 experimental design, the other individual either collaborated or not, and was either close by (in the same room) or not. Results were perfectly clear-cut. Whether or not an individual collaborated was irrelevant to how much food he got. The only thing that mattered was how close he was to the food when it arrived (Melis, Schneider, & Tomasello, 2011). In a study designed to be similar as possible, 3-year-old human children excluded someone who had previously chosen to engage in another activity rather than collaborate (Melis, Altricher, Schneider, & Tomasello, 2013).

It is clear from everyday observations, as well as the study with children, that humans have negative attitudes toward free riders who contribute nothing but who expect to share in the rewards of others' efforts. Chimpanzees do not like it when others try to take their food (e.g., Jensen, Call, & Tomasello, 2007), but they do not seem to tie this in any way to the work contribution of those others. We might thus expect that if early humans have a choice of partners, they would exclude those who attempted to minimize their work contribution and maximize the rewards. This means that less cooperative individuals would be socially selected against and cooperative individuals would be socially selected for (Tomasello et al., 2012; see Boehm, 2012, for a similar hypothesis).

### Prosocial Behavior

In the analysis of Tomasello et al. (2012), the emergence of obligate collaborative foraging in human evolution provided a new basis for prosocial behavior and helping: interdependence. The basic idea is that when individuals must collaborate or die, their partners become very valuable to them, and so, they must care for them. Within the collaborative activity, this is obvious. If my partner drops his spear, it is in my interest to help him fetch it so that we can continue the collaboration. In addition, if individuals have any sense of the future, then they should also help any of their potential collaborative partners outside of such situations, as they might be needing them tomorrow. Importantly from a theoretical point of view, this account is not based on reciprocity; there is no

cost accounting and no contingency of helpful acts on one another. Interdependence creates a motivation for individuals to help others for direct fitness benefits.

The "because I might be needing a partner for tomorrow's outing" is a part of the evolutionary logic of interdependence, but it need not be a part of the individual's proximate mechanism for helping at all. Indeed, in recent experimental research, even very young children—1- and 2-year-old toddlers—have been found to be intrinsically motivated to help other persons almost indiscriminantly. For example, infants as young as 14 months of age will help adults with all kinds of problems, from fetching out-of-reach objects to opening doors to stacking books with no concrete reward (Warneken & Tomasello, 2007). They do this in a wider variety of contexts than do chimpanzees, and they also do it at some cost to themselves (e.g., providing a distressed adult with a resource that the child values keeping for herself; Svetlova, Nichols, & Brownell, 2010). Human infants also provide others with information that they need (e.g., the location of an object they are seeking) with no external reward (Liszkowski, Carpenter, Striano, & Tomasello, 2006; Liszkowski, Carpenter, & Tomasello, 2008). Moreover, when young children are given concrete rewards for helping others, if the rewards are then taken away, their helping actually goes down (relative to children who were never rewarded in the first place; Warneken & Tomasello, 2008). In studies of other phenomena, this pattern of results is taken to mean that children have an intrinsic motivation to do something which the external rewards undermine (overjustification effect). Relatedly, Warneken and Tomasello (2013) found that young children do not help more when their mother or others are watching or encouraging them than when they are by themselves.

There is also very good evidence that young children's intrinsically motivated helping behavior is underlain by something like sympathetic concern for the other person. Thus, Vaish, Carpenter, and Tomasello (2009) found that when 18-month-old children have sympathetic concern for someone as measured in their facial expressions—for example, because she just had her toy destroyed—they subsequently help her more often than in a neutral condition. Critically, the amount of sympathetic concern shown for the victim correlates positively across individuals with their tendency to help her. Even more dramatically, using a direct physiological measure of arousal, pupil dilation, Hepach, Vaish, and Tomasello (2013) found that young children are equally satisfied when they help someone in need and when they see that person being helped by a third party—and more satisfied in both of these cases than when the person is not being helped at all. Young children's motivation is not so much to help but to see the other helped. This means that a concern for self-reputation and reciprocity cannot be the main motivation for young children's helping behavior—because to benefit one's reputation, one has to perform the act oneself.

Overall, then, even young human children seem intrinsically motivated to help others in many situations. The evolutionary basis of this prosocial behavior might be the interdependence of individuals who need one another for foraging success, and so, they are naturally concerned with each others' welfare. The proximate, psychological motivation of individuals, however, seemingly does not involve considerations of this type; it is

simply intrinsically motivating to help others when possible (a result consistent with Batson's, 2006, studies with adults).

## CULTURE

The small-scale, *ad hoc* collaborative foraging characteristic of early humans was a stable adaptive strategy—for a while. In the hypothesis of Tomasello et al. (2012), it was destabilized by two essentially demographic factors. First was competition with other humans. Competition with other humans meant that a loosely structured group of collaborators had to turn into a more tightly knit social group in order to protect their way of life from invaders. The end result was group competition. Second was increasing population size. As human populations grew, they tended to split into smaller groupings, leading to so-called tribal organization in which a number of different social groupings were still a single super-group or "culture". This meant that recognizing others from one's cultural group became far from trivial—and of course, one needed to ensure that one could be recognized by others as well. Such recognition in both directions was important because only members of one's cultural group could be counted on to share one's skills and values and so be good and trustworthy collaborative partners, including for group defense. Contemporary humans have many diverse ways of marking group identity, but one can imagine that the original ways were mainly behavioral: people who talk like me, prepare food like me, and otherwise share my cultural practices are very likely members of my cultural group.<sup>4</sup>

### Conformity

Early humans' skills of imitation thus became modern humans' active conformity, both to coordinate activities more effectively with ingroup strangers and to display group identity so that others will choose me as a knowledgeable and trustworthy partner. Teaching others the proper way to do things, perhaps especially one's children, became a good way to assist their functioning in the group and to ensure even more conformity in the process.

Great apes engage in some forms of social learning and have some forms of behavioral traditions. They differ from humans in that great ape "culture" is mainly "exploitive" as individuals socially learn from others who may not even know they are being watched (in contrast to cooperative human culture with teaching and conformity; Tomasello, 2011). In any case, given a relatively simple task—deciding which one of three holes to insert a ball to get a reward—it turns out that both chimpanzees and human children are biased to follow the majority. Individuals of both species were shown a demonstration in which one individual placed a ball into one of the holes three times, whereas three other individuals each placed a ball into a different hole once each. With frequency thus controlled, individuals of both species followed the three individuals, not the one individual (Haun, Rekers, & Tomasello, 2012). However, in a follow-up study, subjects first had

<sup>4</sup>In most of what follows, I am thinking about the first human cultures, living mainly a hunter-gatherer lifestyle, and not contemporary large-scale civil societies after agriculture.

success with one of the holes via their own individual learning. Now, when they saw three demonstrators successful with a different hole, the species differed in their reaction. Chimpanzees continued to use the hole that had been successful for them in the past—even when the other hole gave a higher reward—whereas the human children went with the majority over their own experience (Haun & Tomasello, in press).

Finally, Haun and Tomasello (2011) used the famous Asch paradigm with 4-year-old human children and found that, like adults, they also conform to others even when those others are expressing clearly unreasonable views of things. Also, like adults, the children conform much more when their behavior is made in public—the previous demonstrators see and hear their response—than when it is made in private, suggesting that indeed they are conforming to peer pressure from the majority. Although no such study has been carried out with chimpanzees, Engelmann, Herrmann, and Tomasello (2012) found that when given the opportunity to engage in either cooperative or selfish behavior, chimpanzees behaved the same whether they were being watched by conspecifics or not. In contrast, and as expected, 5-year-old children were more prosocial and less antisocial when they were being watched than when they were alone. Interestingly and importantly, Engelmann, Over, Herrmann, and Tomasello (2013) also found that children of this same age are much more concerned with their reputation with ingroup members than with outgroup members.

### Enforcing Social Norms

And so humans do not just learn from others, they actively conform to others, and from early in ontogeny, in ways that other primates do not. This might be based on a desire to fit in with the group and/or to avoid negative sanctions from group members who are expecting conformity. The mutual expectations of the group—that is, standards of behavior that are mutually known to all and expected by all—are often called social norms. And these expectations are indeed normative in the sense that those who deviate will suffer some sort of negative consequence, at the very least some sort of negative evaluation of their reputation.

And so, it is clear why children grow up following social norms. But they also—from around 3 years of age—begin enforcing social norms on others. In this case, it is difficult to find prudential reasons for their actions, as enforcing social norms can be risky if the person whose behavior is being corrected objects or retaliates. Nevertheless, from around 3 years of age, when young children observe someone, for example, preparing to destroy another person's piece of artwork, they object and intervene (Vaish, Missana, & Tomasello, 2011). They do this as well when someone threatens to steal someone's property (Rossano, Carpenter, & Tomasello, 2012). Perhaps surprisingly, they even object and intervene when someone begins playing a novel game in a way that does not conform to the rules as the child knows them (Rakoczy, Warneken, & Tomasello, 2008). In this case, no harm is being done (the game is an individual game), but children still want to make sure that others play the game correctly. Young children thus not only follow but also enforce both moral and conventional norms (where conventional norms, but not moral norms, are conceived by the children themselves as changeable if sanctioned by an authority or a different cultural group).

But there is a difference. Following the theoretical ideas of Turiel (1998), Schmidt, Rakoczy, and Tomasello (2012) had children observe violations of both conventional norms (game rules) and moral norms (harm producing), and these were perpetrated by both ingroup and outgroup members. Perhaps surprisingly, young children enforced moral norms on both ingroup and outgroup individuals equally, but they enforced conventional norms on ingroup members only. Thus, even though they favor their ingroup, young children at the same time hold them to a higher standard (the so-called black sheep effect), as outgroup members cannot be expected to know how “we” do things correctly. Perhaps even more surprising, Schmidt, Rakoczy, and Tomasello (2013) found that 3-year-olds even engaged in defending the entitlements of others. That is to say, when one individual was authorized to do something, and a second individual objected that she could not do that, the child intervened against that second person’s objection. This is a kind of second-order norm enforcement in which the child objects to an illegitimate objection so as to stand up for the rights of another person.

One of the most noteworthy characteristics of social norms is that they are even applied to the self, especially as they are internalized into feelings of guilt and shame. Evolutionarily, one may think about guilt and shame as feelings that help an individual to avoid potentially punishable behavior in the future by punishing it internally now. But displays of guilt and shame have a different function; they serve to preempt others from punishing on the spot (because they feel sympathy for how bad the guilty person is feeling) and/or judging them to be either ignorant or disrespectful of the social norm they are breaking. Guilt and shame displays thus serve an appeasement and an affiliative function. Vaish, Carpenter, and Tomasello (2011) thus looked to see if young children—similar to adults—judge people differently when they do or do not display guilt after a transgression. Like adults, even 5-year-old children showed more positive evaluations of those who expressed regret for the harm they had caused in comparison to those who did not.

The question of social norms does not really arise with great apes, as they do not have the cognitive capacities to entertain mutually shared expectations. But even on a more behavioral level, they are missing a key ingredient. Chimpanzees will retaliate against those who steal food from them (Jensen et al., 2007), but they do not intervene or punish an individual who is attempting to steal food from a third party (even if it is their kin; Riedl, Jensen, Call, & Tomasello, 2012). If great apes do not intervene in situations from a third-party perspective, then they are not observing social norms, which apply in an agent-neutral manner to all. Combined with the fact that they do not seem to care about how others are evaluating them (Engelmann et al., 2012), they could not be expected to feel the pressure of social norms or to feel guilty about breaking them. Social norms, guilt, and shame are uniquely human phenomena, generated, at least in part, by our need to be accepted by our group.

### Group-mindedness

Contemporary human beings thus actively identify with their cultural group. They conform to its conventions and norms,

and participate in its social institutions. They feel collective pride, shame, or guilt if one member of their cultural group does something especially noteworthy. They become involved in issues of national and linguistic identity when these become threatened from political forces. They care about the history of their culture, as well as its future. In all, on top of their general skills and inclinations for collaborating with other individuals, modern human beings are also thoroughly group-minded and care deeply for their group as an independent entity.

## IMPLICATIONS FOR COGNITION AND MORALITY

Humans have thus become ultra-social in two major evolutionary steps: one in which individuals became more collaborative with one another and another in which individuals became more identified with their cultural group and its conventions, norms, and institutions. These new ultra-social ways of life are notable on their own, but in addition, they are also responsible, in the current hypothesis, for the unique ways in which human beings (i) think about the world and (ii) relate to one another not just as social but as moral agents.

It seems obvious that, as compared with other animal species, humans think in special ways (see Tomasello, 2014). First, although great apes and other primates can cognitively represent situations and entities at least somewhat abstractly, only humans can conceptualize one and the same situation or entity under differing, even conflicting, social perspectives (leading ultimately to a sense of “objectivity”). This perspectival ability results from individuals’ attempts to coordinate with others during collaborative and communicative interactions (given cognitive processes of shared intentionality). Second, although many primates make simple causal and intentional inferences about external events, only humans make socially recursive and self-reflective inferences about others’ or their own intentional states (e.g., she thinks that I think ...). These special kinds of inferences are part and parcel of humans’ unique forms of cooperative communication in which individuals must discern “what he intends towards my intentional states.” Third, although many animals monitor and evaluate their own actions with respect to instrumental success, only humans self-monitor and evaluate their own thinking with respect to the normative perspectives and standards (“reasons”) of others or the group. Such social self-monitoring is responsible for human norms of rationality.

Humans also relate to one another socially in special ways, some of which are commonly referred to as moral (see Tomasello & Vaish, 2013). Thus, as previously noted, obligate collaborative foraging requires individuals to care about their potential partners, because their own well-being depends on those partners. Interdependence breeds altruism. Moreover, if collaborators have a choice of partners, then it is in the interest of each individual both to choose her partners wisely and to make sure that she is perceived as a good cooperative partner herself. One way of doing this is to do such things as divide the spoils of a collaborative foraging effort equitably. But individuals are not being fair and just only to please others strategically, they also judge themselves in the same ways that they judge others base on values shared in the group—they have a

conscience. And of course, individuals also appreciate that to be a good member of the cultural group, one must not only be helpful and fair, but also one must conform. Human morality is thus intimately bound up with humans' ultra-social ways of being.

Great apes and other primates are highly social, but because they are not interdependent with one another in the same ways as humans, they are not prosocial in the same ways as humans; because they are not obligate collaborative foragers, they do not deal with issues of distributive justice; and because they do not identify with their social group, they do not possess a group-mindedness that leads them to conform to their groups' conventions and norms as an end in itself. Human morality represents the internalized interactive processes—both cognitive and motivational—that structure humans' ultra-cooperative ways of living and being.

## CONCLUSION

*H. sapiens* is thus “the social animal” in some very specific ways. Our own view is that humans set off down their ultra-social, cooperative pathway when some changes in ecological conditions forced them to become obligate collaborative foragers. Human individuals became interdependent with one another in ways that changed not only their social behavior but also their cognitive processes. Whereas other great apes engage in complex social interactions and cognitive processes, in the end, it is all a kind of instrumental rationality aimed at the individual's personal gains. Interdependence of the human variety led humans to put their heads together in acts of shared intentionality in which they acted on and understood the world together as a kind of plural subject. Individuals came to feel commitments and obligations toward one another as they worked together. They divided the spoils of their collaborative efforts fairly and justly because they cared about one another, because they wanted to be perceived as cooperative, and because they were judging themselves in the same way that they were judging others. And all of this became even more intense as individuals came to identify with their cultural group in an even larger social context of interdependent collaboration.

All of which is to say that calling humans “the social animal” is accurate but not as precise as it could be. The most felicitous alternative might be something more specific like “the cooperative animal” or “the ultra-social animal”. These phrases would capture more precisely something of the unique evolutionary trajectory by which humans came to interact with the world cognitively via species-unique processes of shared intentionality and to interact with one another socially via species-unique processes of interpersonal and group morality.

## REFERENCES

- Aronson, E. (1980). *The social animal*. New York: Palgrave Macmillan.
- Batson, C. D. (2006). Not all is self-interest after all: Economics of empathy-induced altruism. In D. De Cremer, M. Zeelenberg, & J. K. Murnighan (Eds.), *Social psychology and economics* (pp. 281–299). Mahwah, NJ: Lawrence Erlbaum.
- Boehm, C. (2012). *Moral origins: The evolution of virtue, altruism and shame*. New York: Basic Books.
- Boesch, C. (1994). Cooperative hunting in wild chimpanzees. *Animal Behaviour*, 48(3), 653–667.
- Boesch, C., & Boesch-Acherman, H. (2000). *The chimpanzees of the Tai forest: Behavioural ecology and evolution*. Oxford: Oxford University Press.
- Bratman, M. (1992). Shared cooperative activity. *Philosophical Review*, 101, 327–341.
- Bullinger, A. F., Melis, A. P., & Tomasello, M. (2011). Chimpanzees, *Pan troglodytes*, prefer individual over collaborative strategies towards goals. *Animal Behaviour*, 82(5), 1135–1141.
- Bullinger, A. F., Wyman, E., Melis, A. P., & Tomasello, M. (2011). Coordination of chimpanzees (*Pan troglodytes*) in a stag hunt game. *International Journal of Primatology*, 32(6), 1296–1310.
- Cheney, D. L., & Seyfarth, R. M. (1990). *How monkeys see the world: Inside the mind of another species*. Chicago: University of Chicago Press.
- Engelmann, J. M., Herrmann, E., & Tomasello, M. (2012). Five-year olds, but not chimpanzees, attempt to manage their reputations. *PLoS ONE*, 7(10), e48433.
- Engelmann, J., Over, H., Herrmann, E., & Tomasello, M. (2013). Young children care more about their reputation with ingroup members and possible reciprocators. *Developmental Science*, 16, 552–558.
- Fletcher, G., Warneken, F., & Tomasello, M. (2012). Differences in cognitive processes underlying the collaborative activities of children and chimpanzees. *Cognitive Development*, 27(2), 136–153.
- Gilby, I. C. (2006). Meat sharing among the Gombe chimpanzees: Harassment and reciprocal exchange. *Animal Behaviour*, 71(4), 953–963.
- Gräfenhain, M., Behne, T., Carpenter, M., & Tomasello, M. (2009). Young children's understanding of joint commitments. *Developmental Psychology*, 45, 1430–1443.
- Greenberg, J. R., Hamann, K., Warneken, F., & Tomasello, M. (2010). Chimpanzee helping in collaborative and non-collaborative contexts. *Animal Behaviour*, 80, 873–880.
- Hamann, K., Warneken, F., & Tomasello, M. (2011). Children but not chimpanzees share more equitably after cooperation. *Nature*, 476, 328–331.
- Hamann, K., Warneken, F., & Tomasello, M. (2012). Children's developing commitments to joint goals. *Child Development*, 83(1), 137–145.
- Haun, D. B. M., Rekers, Y., & Tomasello, M. (2012). Majority-biased transmission in chimpanzees and human children, but not orangutans. *Current Biology*, 22(8), 727–731.
- Haun, D. B. M., & Tomasello, M. (2011). Conformity to peer pressure in preschool children. *Child Development*, 82(6), 1759–1767.
- Hepach, R., Vaish, A., & Tomasello, M. (2013). A new look at children's prosocial motivation. *Infancy*, 18(1), 67–90.
- Hirata, S., & Fuwa, K. (2007). Chimpanzees (*Pan troglodytes*) learn to act with other individuals in a cooperative task. *Primates*, 48, 13–21.
- Jensen, K., Call, J., & Tomasello, M. (2007). Chimpanzees are vengeful but not spiteful. *Proceedings of the National Academy of Sciences*, 104, 13046–13051.
- Lickel, B., Schmader, T., & Spanovic, M. (2007). Group-conscious emotions: The implications of others' wrongdoings for identity and relationships. In J. L. Tracy, R. W. Robins, & J. P. Tangney (Eds.), *The self-conscious emotions: Theory and research*. New York: Guilford Press.
- Liszkowski, U., Carpenter, M., Striano, T., & Tomasello, M. (2006). Twelve- and 18-month-olds point to provide information for others. *Journal of Cognition and Development*, 7, 173–187.
- Liszkowski, U., Carpenter, M., & Tomasello, M. (2008). Twelve-month-olds communicate helpfully and appropriately for knowledgeable and ignorant partners. *Cognition*, 108, 732–739.
- Melis, A., Altricher, K., Schneider, A., & Tomasello, M. (2013). Allocation of resources to collaborators and free-riders by 3-year-olds. *Journal of Experimental Child Psychology*, 114, 364–370.
- Melis, A., Hare, B., & Tomasello, M. (2006). Chimpanzees recruit the best collaborators. *Science*, 31, 1297–1300.
- Melis, A., Hare, B., & Tomasello, M. (2009). Chimpanzees coordinate in a negotiation game. *Evolution and Human Behavior*, 30, 381–392.
- Melis, A., Schneider, A., & Tomasello, M. (2011). Chimpanzees (*Pan troglodytes*) share food in the same way after individual and collaborative acquisition. *Animal Behaviour*, 82, 485–493.
- Muller, M., & Mitani, J. C. (2005). Conflict and cooperation in wild chimpanzees. In P. J. B. Slater, J. Rosenblatt, C. Snowdon, T. Roper, & M. Naguib (Eds.), *Advances in the study of behavior* (pp. 275–331). New York: Elsevier.
- Povinelli, D. J., & O'Neill, D. K. (2000). Do chimpanzees use their gestures to instruct each other? In S. Baron-Cohen, H. Tager-Flusberg, & D. J. Cohen (Eds.), *Understanding other minds: Perspectives from developmental cognitive neuroscience* (pp. 459–487). Oxford: Oxford University Press.
- Rakoczy, H., Warneken, F., & Tomasello, M. (2008). The sources of normativity: Young children's awareness of the normative structure of games. *Developmental Psychology*, 44(3), 875–881.

- Rekers, Y., Haun, D. B. M., & Tomasello, M. (2011). Children, but not chimpanzees, prefer to collaborate. *Current Biology*, *21*(20), 1756–1758.
- Riedl, K., Jensen, K., Call, J., & Tomasello, M. (2012). No third-party punishment in chimpanzees. *Proceedings of the National Academy of Sciences of the United States of America*, *109*(37), 14824–14829.
- Rossano, F., Carpenter, M., & Tomasello, M. (2012). One-year-old infants follow others' voice direction. *Psychological Science*, *23*(11), 1298–1302.
- Schmidt, M. F. H., Rakoczy, H., & Tomasello, M. (2012). Young children enforce social norms selectively depending on the violator's group affiliation. *Cognition*, *124*(3), 325–333.
- Schmidt, M. F. H., Rakoczy, H., & Tomasello, M. (2013). Young children understand and defend the entitlements of others. *Journal of Experimental Child Psychology*, *116*(4), 930–944.
- Svetlova, M., Nichols, S., & Brownell, C. (2010). Toddlers' prosocial behavior: From instrumental to empathic to altruistic helping. *Child Development*, *81*, 1814–1827.
- Tomasello, M. (2011). Human culture in evolutionary perspective. In M. Gelfand (Ed.), *Advances in culture and psychology*. Oxford: Oxford University Press.
- Tomasello, M. (2014). *A natural history of human thinking*. Cambridge: Harvard University Press.
- Tomasello, M., Melis, A. P., Tennie, C., Wyman, E., & Herrmann, E. (2012). Two key steps in the evolution of cooperation: The interdependence hypothesis. *Current Anthropology*, *53*(6), 673–692.
- Tomasello, M., & Vaish, A. (2013). Origins of human cooperation and morality. *Annual Review of Psychology*, *64*, 231–255.
- Turiel, E. (1998). The development of morality. In W. Damon (Series Ed.), & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (pp. 863–932). New York: Wiley.
- 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.
- Vaish, A., Carpenter, M., & Tomasello, M. (2011). Young children's responses to guilt displays. *Developmental Psychology*, *47*(5), 1248–1262.
- Vaish, A., Missana, M., & Tomasello, M. (2011). Three-year-old children intervene in third-party moral transgressions. *British Journal of Developmental Psychology*, *29*(1), 124–130.
- Warneken, F., Chen, F., & Tomasello, M. (2006). Cooperative activities in young children and chimpanzees. *Child Development*, *77*(3), 640–663.
- Warneken, W., Lohse, K., Melis, A. P., & Tomasello, M. (2011). Young children share the spoils after collaboration. *Psychological Science*, *22*(2), 267–273.
- Warneken, F., & Tomasello, M. (2007). Helping and cooperation at 14 months of age. *Infancy*, *11*(3), 271–294.
- Warneken, F., & Tomasello, M. (2008). Extrinsic rewards undermine altruistic tendencies in 20-month-olds. *Developmental Psychology*, *44*, 1785–1788.
- Warneken, F., & Tomasello, M. (2013). The emergence of contingent reciprocity in young children. *Journal of Experimental Child Psychology*, *116*, 338–350.
- Wilson, E. O. (2012). *The social conquest of earth*. New York: Norton