Cooperation and Communication in the 2nd Year of Life

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ABSTRACT—Although primates have evolved complex cognitive skills and strategies for competing with others in their social group, only humans have developed complex cognitive skills and motivations for collaborating with one another in joint endeavors. This cooperative dimension of human cognition emerges most clearly around the first birthday as children begin to collaborate and communicate with joint intentions and joint attention. This collaboration is also grounded in social motivations for helping and sharing with others that are unique to humans. In using the skills of shared intentionality that underlie these cooperative interactions, 1-year-olds come to create perspectival cognitive representations.

KEYWORDS—cooperation; communication; shared intention; joint attention

Primates have evolved complex cognitive skills and strategies for competing with others in their social group for valued resources—the sine qua non for survival and reproduction in a complex animal society. But human beings have also developed complex cognitive skills and motivations for collaborating with one another in everything from having a conversation to building a house together to practicing a religion together, and it is this cooperative dimension that gives human cognition and cultural life its most distinctive qualities (Tomasello, 1999; Vygotsky, 1978).

In human development, these special cooperative skills and motivations begin to emerge in earnest at around one’s first birthday. One way to understand this crucial developmental step is in terms of skills and motivations for shared intentions (e.g., Bratman, 1992; Gilbert, 1989; Searle, 1995). Shared intentionality is necessary for engaging in uniquely human forms of collaborative, joint attentional activity (Bratman 1992; Gilbert, 1989; Searle, 1995) and equally unique social motives for helping and sharing with others (Tomasello, Carpenter, Call, Behne, & Moll, 2005). Scaled up, we can even get to phenomena in which “we” intend things together in such a way that they take on new powers, such as when pieces of paper become money and ordinary people are transformed into presidents (Searle, 1995).

In this short article, I first give a brief account of the initial emergence of shared intentionality in human development. I then focus on two types of child activity in which shared intentionality seems especially important: collaboration (including instrumental helping) and communication. Of special importance is the second year of life, when the truly shared dimension of these activities first emerges as children begin to construct with others joint intentions and joint attention for various cooperative ends.

THE EMERGENCE OF SHARED INTENTIONALITY

Recent research has established, to the surprise of many, including myself, that our nearest primate relatives, the great apes, understand the basics of intentional action. They understand that others have goals, that others perceive things, and that others’ actions are guided by their goals and perceptions (see Tomasello & Call, 2006, for a review and see Povinelli & Vonk, 2006, for a different view). For the most part, these skills seem to have evolved for engaging in competition with conspecifics, as it is often difficult to elicit them in more cooperative contexts (see, e.g., Hare & Tomasello, 2004; Melis, Hare, & Tomasello, 2006; Tomasello, Call, & Hare, 2003).

Given this fact about great apes in general, Tomasello et al. (2005) proposed that human skills of shared intentionality emerged ontogenetically as the primate line of development for understanding intentional action, which evolved for competition, interacts with the human line of development for sharing psychological states, which evolved for cooperation. Interestingly, though it came evolutionarily later, the sharing line
emerges first in human development. By all accounts, human infants from 2 to 3 months of age share emotions with others in interactions, which have sometimes been called “proconversations” (Rochat, 2001; Trevarthen, 1979). This places everything that comes later in infant development into a rich social context.

The general primate line of understanding intentional action in terms of underlying goals and perceptions seems to emerge in humans at about 9–12 months of age (Tomasello, 1995). It is possible that the human version of understanding intentional action has some unique dimensions beyond those of other primates, but the proposal here is that it is the coming together of these two lines, the sharing line and the understanding-intentions line, that makes the real difference. This coming together leads human infants not only to understand the intentional actions of others but also to be capable of and motivated to share intentions with others. This is most readily apparent in the emergence, at around 9–12 months, of triadic activities—activities that involve the child, an adult, and some outside entity on which both parent and child act together. These are concrete activities such as giving and taking objects, rolling a ball back and forth, or getting the child dressed (Hay, 1979; Hay & Murray, 1982; Ross & Lollis, 1987). During these activities, infants coordinate their attention with the adult and the object of shared interest; these activities have sometimes been called joint attentional activities (e.g., Bakeman & Adamson, 1984; Tomasello, 1995). The interaction is thus more than sharing behavior or emotions dyadically, as in early infancy. It is sharing a goal triadically with respect to some external entity (Bruner, 1983).

HELPING AND COLLABORATION IN THE 2nd YEAR

Nonhuman primates show signs of emotional empathy in various situations (see Preston & de Waal, 2005, for a review), and human infants show concern for others in distress from at least the middle of the 2nd year of life (see Eisenberg, Fabes, & Spinrad, 2000, for a review). Moreover, in more instrumental situations, both chimpanzees and human infants 14–18 months old help others attain their goals (Warneken & Tomasello, 2006), which requires both an understanding of others’ goals and a social motivation to help them. Collaboration with others toward a shared goal requires, if not a social motivation to help, at least a mutual understanding that we will share the reward. Despite some seemingly collaborative activities such as group hunting, it is not clear that chimpanzees and other primates are able to form shared goals with others in this way. Chimpanzee group hunting, for example, may just be each individual attempting to catch a swift-climbing monkey, which results in the monkey being surrounded but without any joint goal or plan (Tomasello et al., 2005). Following on the pioneering work of others (Brownell & Carriger, 1990, 1991; Eckerman, 1993; Ross & Lollis, 1987), Warneken, Chen, and Tomasello (2006) presented human-raised apes and 18- to 24-month-old human infants with four collaboration tasks: two problem solving and two social games, with a human adult as partner. The apes showed no interest in the social games, whose only point was collaboration for fun. The apes had some success at the problem-solving tasks, but when the partner ceased playing her role (an experimental manipulation), they mostly continued trying to solve the task on their own; they did not attempt to reengage the partner. Warneken et al. interpreted these results as indicating that the apes had not really formed with the partner a shared goal.

The infants, in contrast, engaged enthusiastically in both the problem-solving tasks and the social games, and indeed, in the problem-solving tasks, they often replaced the goal after solving the task, in essence turning the problem-solving tasks into games. When the partner ceased interacting in both types of task, all the infants attempted to reengage her, most often by pointing to the role she was supposed to be playing. These results indicated that the infants had formed a shared goal with the adult partner. Warneken and Tomasello (in press) found similar results, though less robust, with 14-month-old infants. Interestingly, these younger infants received helping tasks as well, and there was no correlation with performance in collaboration tasks, possibly indicating that forming a shared goal is something over and above a social motive for helping.

In a separate study, Carpenter, Tomasello, and Striano (2005) found that in some very simple collaborative tasks, 12- to 18-month-old infants were able to reverse roles: to play the adult’s role after having only played theirs, with an understanding of both roles. Tomasello and Carpenter (2005) found that young chimpanzees were unable to reverse roles in this same way on these same tasks. Tomasello et al. (2005) argued that such role reversal indicates that the infants conceived of the collaboration from “a bird’s eye view” in which all roles, including their own, are in the same third-person representational format. This means that in addition to a shared goal, infants at this age also understand the different roles involved in the collaboration in a way that apes may not. There are no experimental studies in which apes have demonstrated comprehension of reciprocal (as opposed to parallel) roles in any kind of collaboration task.

Infants continue to develop their ability to collaborate during the 2nd year of life. Eckerman (1993), Brownell and Carriger (1990, 1991), and Warneken et al. (2006) all found that 24-month-old children were much more skillful than 18-month-old children at collaborating with others, for example, by initiating collaboration more frequently, by adapting to changing circumstances, and by being more capable of collaborating with peers. Nevertheless, by early in the 2nd year of life, humans already are capable of engaging with others collaboratively in ways that nonhuman primates are not: They form with others a shared goal and they understand the complementary roles involved in the collaboration. They interact with others employing both the skills and the motivations for shared intentionality.
COOPERATIVE COMMUNICATION IN THE 2nd YEAR

Human infants communicate through gesture before they speak, and this prelinguistic communication shows features unique to human skills and motivations for shared intentionality. Of special interest is the pointing gesture, which seems incredibly simple but which turns out to be unique to the human species and much more complex than one might imagine (see Tomasello, Carpenter, & Liszkowski, in press, for a review of recent research).

Although apes do sometimes use a pointing gesture—not with one another but with humans (Leavens & Hopkins, 1998)—it is always used for imperative purposes—to request things from humans—not in more cooperative ways, such as informing others of things they need to know or sharing an experience with others declaratively. (Why apes help others instrumentally but not communicatively by supplying needed information is an important question for future research.) Human infants point for these more cooperative reasons from the beginning.

First, from around 12 months, infants point declaratively to share interest in something with others. This is also the age when they first point imperatively (Carpenter, Nagell, & Tomasello, 1998). That their motive is indeed to share experience and emotions was demonstrated by Liszkowski, Carpenter, Henning, Striano, and Tomasello (2004), who explained that when an adult simply expressed positive emotions to the infant while ignoring what the infant was pointing to or when the adult simply looked to the object while ignoring the child, infants were not satisfied. Infants in these conditions (as well as in a control condition) tended to repeat their pointing gesture more often, apparently in persistent attempts to establish shared attention and interest. Their pointing also decreased across trials, apparently indicating growing dissatisfaction with the adult, given that he or she did not respond by sharing their interest in the object. Liszkowski, Carpenter, and Tomasello (2007) also had the adult correctly identify the infant’s intended referent, but in different conditions, the adult expressed either interest (“Cool!”) or disinterest (“Uh . . .”). When the adult expressed disinterest, infants did not prolong or repeat their pointing, presumably because they understood that the adult did not share their enthusiasm, and they also decreased pointing for this adult across repeated trials compared with adults who expressed interest. These results specifically isolate the infants’ motive to share their attitude and emotions with an adult.

Second, infants also point simply to inform others of things they do not know. Infants must first therefore have an understanding that others can be knowledgeable or ignorant, and second, they must have a social motive to help by supplying them with the needed information. Liszkowski, Carpenter, Striano, and Tomasello (2006) placed 12-month-old infants in various situations in which the infants observed an adult misplace an object or lose track of it in some way and then start searching for it. Infants pointed to the needed object (more often than to distractor objects that were misplaced in the same way but were not needed by the adult) and in doing so showed no signs of wanting the object for themselves (no whining, reaching, etc.) or of wanting to share emotions or attitudes about it. In a follow-up study, Liszkowski, Carpenter, and Tomasello (2007) presented infants once again with an adult searching for objects, but in this case the adult had seen one object but not the other (one of the objects he himself had placed aside, whereas the other had fallen away accidentally while he was not looking). Again infants pointed more often to the object the adult had not seen (and they showed no signs of wanting the object or wanting to share emotions about it). These results suggest that infants sometimes point simply because they want to help the adult by providing needed or desired information.

Beyond cooperative motives for pointing, human infants interpret the pointing gesture of others within the context of a joint attentional frame—another aspect of shared intentionality. Liebal, Behne, Carpenter, and Tomasello (2007) had 18-month-old infants clean up an adult by picking up toys and putting them in a basket. At one point, the adult stopped and pointed to a toy, which infants then picked up and placed in the basket, presumably to help clean up. In a control condition, the infant and adult cleaned up in exactly the same way, but a second adult entered the room and pointed to the toy in exactly the same way as the first adult in the other condition. In this case, infants did not put the toy away into the basket, presumably because the second adult had not shared the cleaning context with them. Because they had no shared frame with this adult, the children seemed most often to interpret the new adult’s point as a simple invitation to notice the toy. In other words, infants’ interpretation of an adult-pointing gesture depends on their recently shared experience (joint attention) with that specific adult. Other evidence for infants’ understanding of joint attention comes from studies in which an adult makes an ambiguous request for an object, and infants choose an object based on which ones they have and have not shared with that adult previously (Moll, Koring, Carpenter, & Tomasello, 2006; Moll & Tomasello, in press-b; Tomasello & Haberl, 2003).

The upshot is that although other primates communicate with one another and with humans, they do not communicate in the manner of human infants, who both rely on joint attention as a manifestation of shared intention and communicate for cooperative purposes, such as helpfully informing people of things and emotionally sharing experience with them. Of course, during the 2nd year of life, young children begin to acquire competence with communicative conventions, including linguistic conventions, which are shared in the sense that everyone knows that everyone does it this way, and language takes children’s cognitive skills in many new directions.

SHARED INTENTIONALITY AND PERSPECTIVE

In the current hypothesis, young children’s participation in activities involving shared intentionality creates perspectives,
given that one must share attention to something before different perspectives on it become possible (Moll & Tomasello, in press-a). Shared intentional action thus creates new forms of cognitive representation, specifically those in which the child has a bird’s eye view of the collaboration. In this view, the child also comprehends, with a single representational format, both commonalities and differences from both first- and third-person perspectives. Such perspectival representations are necessary for creating and using certain cultural artifacts, such as linguistic and other symbols. These symbols are socially constituted and simultaneously contain the perspective of both speaker and listener.

Perspective of this sort also paves the way for what may be called, very generally, collective intentional (Searle, 1995). That is, the essentially social nature of employing perspective enables children, later in the preschool period, to construct the generalized social norms that make possible later collective practices, such as marriage or the creation of governments, whose reality is grounded totally in the collective practices and beliefs of a social group conceived generally (Tomasello & Rakoczy, 2003). When children internalize collective conventions and norms and use them to regulate their own behavior, they operate within a new kind of social rationality involving desire-independent reasons for action. At this point, children have become norm-following participants in society, that is to say, fully functioning members of their cultural group.

CONCLUSIONS

Human cognition is of course to some degree an individual enterprise, as individuals perceive the world and decide how to act in it. But it is also to some degree a collective enterprise, as individuals learn from and collaborate with others and use artifacts, including symbolic artifacts, that others have created. Our nearest primate relatives comprehend the world individually in very similar ways, but they seem to have developed very little of this collective dimension. This distinction is most clear in infants’ earliest collaborative and communicative interactions with others, beginning around the first birthday. By their second birthdays, infants are no longer infants but rather young children who collaborate flexibly and effectively with others and who communicate cooperatively and in extremely complex ways. Investigating in more detail the nature of the skills and motives of shared intentionality that are responsible for development during this important ontogenetic period is an ongoing focus of much research.

REFERENCES


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