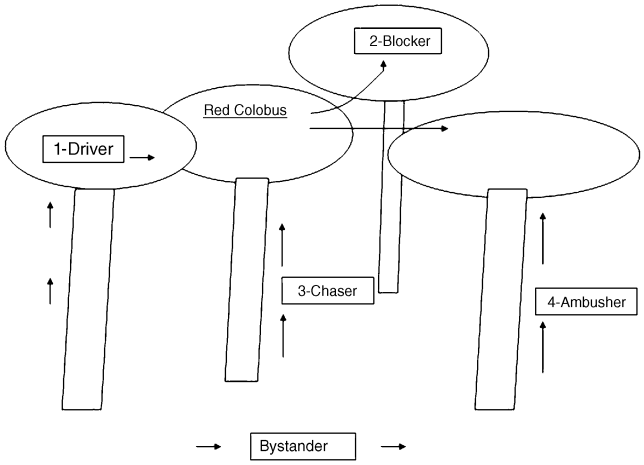


Figure 1 (Boesch). Illustration of a "typical" joint collaborative hunt in Taï chimpanzees indicating the spatial coordination of the different roles. The numbering indicates the approximate order in which the roles are joining into the hunt.

and therefore not a distinct human feature. One possible difference might be that human soccer players sometimes explicitly plan movements or strategies before the play starts and we have not yet seen this kind of shared planning in chimpanzees.

In the broader interest of the field of comparative psychology one further aspect is worth addressing: Why did Tomasello et al. ignore the published evidence on wild chimpanzee group hunting? Such an attitude is far from being isolated as illustrated by the conspicuous scarcity of reference to observations on wild animals in some of the cognitive literature claiming human superiority (e.g., Evans 2003; Heyes 1994; 1998; Povinelli 2000; Tomasello 1999). Generally, there is a tendency in comparative psychology to accept only experimental data. Observational data are dismissed as mere anecdotes or are discredited as not conclusive because alternative scenario could always been constructed. However, if we want to understand the specificity of cognitive abilities in humans and chimpanzees we have to take in account what they do in real life. Such data are irreplaceable as they provide the necessary information about how human and non-human primates perform. My point is not that field data answer all the questions about mental processes. What I am suggesting is that we need to formulate our hypothesis about human uniqueness in terms of performance that we should confront to the known performance of animals. The outcome could then be used as a guide for the aspects requiring more evidence, including experimental studies. Had that been done in Tomasello et al.'s article, I would probably have had no critical comment to forward on shortcomings or premature conclusions.

ACKNOWLEDGMENT

The author wants to thank Hedwige Boesch, Josep Call, and Peter Walsh for helpful comments.

Early development of shared intentionality with peers

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Abstract: In their account of the origins of human collaborative abilities, Tomasello et al. rely heavily on reasoning and evidence from adult–child collaborations. Peer collaborations are not discussed, but early peer collaborations differ from early adult–child collaborations. Describing and explaining the similarities and differences in shared intentionality with peers and adults will bring us closer to understanding the developmental mechanisms.

What are the origins of human collaborative abilities? Tomasello et al. hypothesize that humans possess a species-unique motivation to "feel and act and perceive together with others." This special motivation to share intentions, combined with intention understanding acquired in the context of adult–child collaborations, is proposed to drive the genesis of collaborative activity. By this account, at the end of the first year of life human infants are able to understand others' emotions, perceptions, intentions, goals, and plans. And, because they are uniquely motivated to share their psychological states with others – that is, to represent others' psychological states in concert with their own – human infants are able to collaborate with others and become, effectively, members of and contributors to human culture.

Although there is much to recommend this account, it depends exclusively on the role of adult–child collaborations. Nowhere are peer collaborations discussed. In our lab, we have studied early peer collaboration on tasks that require sharing a simple goal, and we find little evidence of either collaborative understanding or motivation to collaborate with peers until the close of the second year of life or well into the third year of life (Brownell & Carriger 1990, 1991; Brownell et al. 2003). Others have likewise suggested that collaborative peer play emerges toward the end of the second year of life (Asendorpf & Baudonniere 1993; Eckerman & Whitehead 1999; Eckerman et al. 1989). Only in the third year does cooperative play and communication with peers explicitly take into account the peer's actions, desires, and intentions (Ashley & Tomasello 1998; Smiley 2001).

These differences in development are not trivial. Such evidence does not call into question the assertion of Tomasello et al. that cultural cognition depends on shared intentionality, a point with which we fundamentally agree. But it does raise potential alternative developmental sequences and pathways, which in turn may introduce new explanatory demands and the possibility of other mechanisms. In particular, it suggests that shared intentionality may itself develop.

On the whole, infants and young toddlers do not appear particularly interested in social exchange with agemates, in contrast to their interest in collaborating socially with adults or even older siblings (Dunn 1988). Among 12-month-olds, familiar peers engage in simple social exchanges, such as looking and vocalizing to one another, less than once per hour. This increases over the second year to about once per five minutes at 24 months (Eckerman & Peterman 2001). Cooperative play with peers emerges between 20 and 24 months (Eckerman & Whitehead 1999; Eckerman et al. 1989; Howes 1988), and increases markedly between 24 and 28 months of age (Eckerman et al. 1989). Thus, the motivation to share intentions does not apply equally to all other persons early in development. One possibility for such a motivational difference is the developmental preeminence of attachment relationships during infancy (Brownell & Hazen 1999). Perhaps, in fact, it is their attachment relationships that make social engagement emotionally rewarding for infants and that first motivate them to share their emotions, desires and intentions.

Not only is children's interest in peer collaboration relatively late developing, but their ability to represent the peer's goals, in-

https://doi.org/10.1017/S0140525X05240128 Published online by Cambridge University Press

tentions, and desires may also be relatively late to develop. On gamelike cooperation tasks, 12-month-olds cannot coordinate their behavior with one another to achieve a goal; 18-month-olds do so only serendipitously; 24- to 30-month-olds can do so once they have accidentally discovered the relation between their activity, the peer's activity, and the outcome (Brownell & Carriger 1990). When 24-month-olds' peer partners do something that interrupts or interferes with their joint activity, the children are stymied, rarely responding to their peer partner, and they do not try to influence the partner's behavior; instead, they continue their own individual activity. By 30 months, they monitor their partner's behavior and sometimes direct the partner verbally or gesturally (Brownell & Carriger 1991), and, by 36 months, children can plan ahead, exchange roles, and teach a cooperation game to another child (Ashley & Tomasello 1998). It appears that very young children do not recognize the relevance of their peers' behavior for their own efforts toward a common goal, nor the relevance of their behavior for their peers' attempts to achieve the goal; that is, they do not understand or represent the joint causal structure of their own and their peers' behavior in relation to the goal. This sort of understanding may depend on advances in complex causal reasoning independent of the ability or motivation to share activities, emotions, or experiences.

Another key developmental ingredient is developing self-awareness. As a 12-month-old, without a sense of who I am as an individual, a peer's approach is not *about* me; it is merely an interesting change in the surround. I may watch in interest, or even smile since I know that smiles get positive responses. As a more self-reflective 24-month-old, I know that a peer's behavior may be directed to and about me. I can infer, for example, that his approach means that he desires something of mine, and I can respond accordingly. At 36 months, we can negotiate our shared or conflicting desires, intentions, and goals. With progressive differentiation of reflective self-awareness and corresponding advances in reciprocal understanding of others as mental agents, a young child can increasingly share mental states with peers.

How does the child come to understand and share behavior, emotion, and intention with others? Perhaps it is an outgrowth of the child's emotional relationships with adults, combined with growth in causal reasoning and the differentiation of self- and other-understanding, and driven by the need to explain or predict others' behavior in an increasingly complex and unpredictable social world (Zerwas et al. 2004). Any or all of these components may be uniquely human; or perhaps it is their coalescence late in the second year of life that is unique to humans. Describing and explaining the similarities and differences in the course of shared intentionality with peers and adults will bring us closer to understanding the mechanisms underlying the genesis and development of collaboration.

Homo sapiens, a localized species

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Abstract: Tomasello et al. point up the mutual interdependency of the unique human capacity for intersubjectivity and the evolution and institutionalization of culture. Since both intersubjectivity and cultural cooperation require localized knowledge, *Homo sapiens* is highly reliant on such knowledge and in that sense is a highly localized species, requiring special means to surmount cultural misreadings and to achieve translocal, or global, interconnection.

The references listed at the end of the article by Tomasello et al. confirmed my first impression. Comparative studies of the emergence of intersubjectivity in *Homo sapiens* and his primate forebears began only yesterday. Of the 149 references cited by Tomasello et al., 81% have appeared since 1990, with most of the rest of them in the 1980s. The exception is Meredith Crawford's famous 1937 study showing how individual chimpanzees got one of their fellows to help haul in a food tray too heavy for either of them to manage alone, a paper shallowly read at the time as "proving" primate cooperativeness. Note, by the way, that few indeed of the great classics of evolutionary writing are cited in this bibliography – not Darwin and not LeGros Clark, to take only two examples.

The study of human evolution has taken a new and astonishing inward turn, far more concerned now with whether and how primates recognize (or fail to recognize) each other's intentions, or whether and how they manage (or fail to manage) to collaborate with each other in support of their respective intentions, or (in general) what evolutionary steps were required for *Homo sapiens* to have achieved the ability to recognize what their conspecifics have in mind prior to their acting it out. The emphasis is on the preconditions of human culture. The sweep and freshness of these new inquiries come through stunningly in this lucid and fair-minded overview.

Reading it leads me to a rather odd conjecture. May it not be the case that the unique result of human evolution – our newly acquired reliance upon conventionalized or institutionalized procedures for relating to each other and to the social world in general – that this is what makes ours the first and only "unspecies-like" species in the animal kingdom? I mean that in the sense that *unless* one human being has come to appreciate the "rules" of the cultural setting of those with whom he is interacting, he is unable to proceed collaboratively. In this sense, we as a species have become subdivided locally to a degree beyond any species that has ever existed. And this is not wholly by dint of being separated by different languages and their underlying perspectives, *pace* the Sapir-Whorf hypothesis.

The paradox, rather, is that *Homo sapiens* has become "localized" by having to depend upon learned, *culture*-specific modes of interacting. This local culture-specificity often *misguides* intercultural perceptions in a manner to create undesirable tensions and dangerous rivalry between local cultures. Localness has its costs: the tensions and misreadings it generates often deepen intercultural troubles at both the personal and institutional levels.

Our species has evolved in a most atypical way. We certainly did *not* evolve into some uniform steady-state species, as most speciation does. *Homo sapiens* has simply gone on changing, often massively, and in ways that confound the usual definition of species specificity. Once we develop a written language, for example, we begin leaving out of account even local intersubjective cues. And any monocultural technological innovation easily leads to misreadings of "other minds." When I and a medical colleague taught a priestly *marabou* how to use penicillin on the seriously ill in his Wolof Senegalese village, it was the success of his "renewed gaze" to Allah that most impressed the locals.

History, of course, further increases human localness, given its inevitably local perspectives. As devotees of the French *Annales* school put it, historians rightly search for the emergence of new *mentalités* produced by changing cultures (Furet 1985). They appreciate the power of the local.

As a species, then, we seem always to be *becoming* – differentiating, localizing, and even sublocalizing (as with class formation and the division of labor).

The universal-one-species dogma has, of course, been the dogma of colonialism in all its guises – that everybody everywhere *could* be the same if they were given the same cultural opportunities, the ones *we* have on offer. Beneath the compassionate surface of this ancient dogma lies the belief that *Homo sapiens* everywhere is capable of reading and appreciating what others in the human species have in mind – a dogma given a new lease on life by what's now called evolutionary psychology.

The enormous contribution of Tomasello et al. is to highlight the critical role of culture in support of human intersubjectivity and to demonstrate how this is made possible by our uniquely hu-

https://doi.org/10.1017/S0140525X05240128 Published online by Cambridge University Press