Is shared intentionality widespread among and unique to humans?

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Abstract: We agree that motivation to share emotions and other mental states is crucial for communicative development, but human infants are highly selective in sharing mental states, and this is well taken evolutionarily. Young chimpanzees may also have motivation to imitate mothers. Thus, uniquely human cognition and culture may not be reduced to a few basic abilities and/or inclinations.

Because we assume that emotion influences cognition, with effects ranging from what is given processing priority to how widely information is used (Hatano et al. 2001), we welcome Tomasello et al.'s adding the motivational prerequisite of shared intentionality for uniquely human cognition and culture. However, we must point out two problems that their formulation seems to have, one technical and the other philosophical.

Shared intentionality with whom? In their formulation, Tomasello et al. almost neglected the issue of whom infants share intentionality with. We are afraid this neglect is a serious problem for our understanding of "we intentionality" that mediates cultural learning. We believe that human infants and toddlers do not want to share emotions and other mental states with every conspecific. We offer two arguments for the selectivity in sharing intentionality. Evolutionarily, whereas mind-reading ability is always useful, an overly extended intentionality sharing may be dangerous. Thus, infants and toddlers are expected to be highly selective in sharing those mental states initially and extend the act of sharing only gradually from the attachment or most reliable figure to other humans who are like the attachment figure and/or whom the figure interacts with positively.

In fact, studies on attachment strongly suggest this is the case. Here we indicate two essential features of social relationships of infants that inevitably affect the nature of shared intentionality. First, as soon as attachment is established toward the end of the first year, infants tend to share intentionality mostly with the attachment figure. As Campos and Stenberg (1981) demonstrated, the attachment figure, usually the caregiver, is the target of *social referencing*. Through references to facial, vocal, and gestural affect-specifying messages of the mother, 1-year-old infants can recognize her evaluation of a given situation. Also by referencing, the infants vicariously learn appropriate responses to the situation (Sorce et al. 1985). This evidence supports the affect-facilitation assumption of socialization; that is, affective figures can draw infants' attention and convey social influence (e.g., see Bandura & Huston 1961). For instance, attachment studies indicate that securely attached infants are characterized as compliant toward the mother, whereas incompliance and deviant behaviors toward the mother characterize insecurely attached infants (e.g., see Londerville & Main 1981). Thus, we can reasonably assume that infants share intentionality with special figures that they consider important.

Second, we know that infants and toddlers sometimes refuse to share intentionality. We agree with Tomasello et al. that infants in their early months are very sensitive to social contingencies. However, infants do not direct the hardwired capacity of sharing mental states indiscriminately toward others. Infants not only identify and love to interact with the specific attachment figure, but they also avoid other people. A *fear of strangers* is common among infants at around 8 months of age, which arguably shows that, for their safety, they reject unfamiliar people. Moreover, infants can often interact with a stranger if the mother stays in the room, but they reject proximal and physical contact with the stranger (Ainsworth et al. 1978).

Investigators of social relationships generally assert that even infants have multiple social figures, including parents, siblings, and grandparents (e.g., see Lewis 1982). In fact, infants are reported to have affective interactions not only with the mother but also with the father (Takahashi 1990). However, even these investigators do not believe that infants' sharing of intentionality is so widespread that it can be applied to virtually all conspecifics.

More evidence of that attachment-based selectivity comes from the case report of a long-term intervention of socially and physically deprived children in Japan (Fujinaga et al. 1990). When a 6-year-old girl and her 5-year-old brother were rescued from a small shack after 19 months of deprivation and taken into custody, their developmental levels were evaluated as equivalent to those of 1-year-olds or even younger normal children. However, they caught up on their development when they began to express attachment behavior toward each specific caregiver.

Another attempt to justify "human exceptionalism"? The foregoing concerns variations within the human species. Can this affective factor explain the between-species differences in individual and collective intellectual achievements? To generalize, can we maintain that *human exceptionalism* (i.e., unique human cognition and culture) be causally attributed to a few basic abilities and/or inclinations or perhaps a single one? Tomasello et al. seem to believe so, but their data are persuasive only with regard to the inadequacy of mind-reading ability alone, and not with regard to the adequacy of mind reading plus the motivation to share. This is the second philosophical problem.

A few recent studies by Japanese primatologists suggest that the "general ape line" has the motivation to share. Hirata and Morimura (2000) found that, in honey fishing (an experimental simulation of ant/termite fishing found in the wild), naive chimpanzees often observe after their failure their experienced partners and use the experienced partners' leftover tools. Hirata and Celli (2003) further suggest that infant chimpanzees acquire honey-fishing behaviors earlier than recorded in the wild not only by repeatedly observing the behaviors of experienced mothers but also by selectively using the tools often used by mothers. Matsuzawa et al. (2001), taking nut cracking as an example, suggest that young chimpanzees develop a strong affective bond with their mothers, who they use as models for imitative learning, like human apprentices do who are expected to possess a strong motivation to imitate. The mothers, like human masters, do not offer any form of active teaching but just tolerate the youngs' observation of their behavior. Matsuzawa et al. claim that infant chimpanzees' extended imitative learning is supported "by the motivation to copy the mothers' behavior" (p. 574). Why, then, are human intellectual achievements so different from those of chimpanzees? Our speculation is that there is only a small, quantitative difference in many basic aspects (including sharing intentionality) between humans and great apes, but the aggregate of a number of these small differences produces the remarkable qualitative difference in collaborative skills, culture, and cognition.

The interpersonal foundations of thinking

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Abstract: Tomasello et al. provide a convincing account of the origins of cultural cognition. I highlight how emotionally grounded sharing of *experiences* (not merely or predominantly intentions) is critical for the development of interpersonal understanding and perspective-sensitive thinking. Such sharing is specifically human in quality as well as motivation, and entails forms of self–other connectedness and differentiation that are essential to communication and symbolic functioning.

Some years ago, evidence emerged from studies in autism that there is a dissociation between affected children's relatively intact

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abilities to perceive and understand actions, and impaired abilities to perceive, engage with and understand subjective/emotional states (Hobson 1995; Moore et al. 1997). The developmental psychopathology of autism suggested that specifically in the domain of registering, responding to, sharing and co-ordinating *attitudes* we might find the developmental foundations for interpersonal understanding (theory of mind) and creative symbolic functioning – two areas of specific weakness in individuals with autism (Hobson 1993). For the past decade, Tomasello has stressed how it is vital for social interaction and understanding that an individual can read and relate to the intentions of others, and in the present article, he and his colleagues give fresh prominence to emotional relatedness in their theoretical scheme. Not only is this re-balancing welcome and important for integrating findings from research with non-human primates, but also it is vital for an understanding of the development of social and cognitive functioning in both typical and atypically developing young children.

But have Tomasello et al. gone far enough in this direction to accomplish their theoretical aims? True, they stress the developmental significance of person-to-person emotional engagement early in life, mostly to emphasize "the motivation to share psychological states," and at times they refer to (unspecified) "skills" that such engagement might involve. By and large, however, as their title suggests, the account pivots around the claim that "the foundational skill is understanding intentions," even though there is now the added dimension of *sharing* intentions and goals. What remains ambiguous is how the process of emotional engagement yields the forms of sharing that are critical for specifically human communication and thinking.

Perhaps what Tomasello et al. fail to convey is the role played by infants' responsiveness to *attitudes* in the story of early human development. It is not merely that emotional engagement is essential to sharing experiences (Hobson 1989), and that it motivates involvement with the bodily-expressed psychological states of others such that infants want to share, to communicate, to help and to inform others. It is also that infants' responsiveness to and identification with the attitudes of others, as these attitudes are directed both to the infant and to a shared world, structures experience in such a way that infants are in a position to learn about the nature of person-anchored subjective perspectives or takes on the world. In human interpersonal engagement, one is drawn to be aligned with the subjective states and outer-directed attitudes of others, while at the same time registering other-centred and self-centred aspects of experience. To express this differently, there is preconceptual mental architecture in primitive, cognitively unelaborated forms of social experience to provide the structure for what becomes mutual and reciprocal role-taking later in development.

Episodes of emotional engagement – and the processes of identification that configure human self–other connectedness and differentiation to make human emotional engagement specifically intense and moving – serve not only to establish sharing, but also to re-orientate an individual in attitude. Here it is critical that intentionality, and *a fortiori* shared intentionality, involves more than intentions. The intentional nature of mental orientations means that the world falls under such-and-such a description for one person, but may fall under another description for someone else, or indeed for the same person at a different moment. People can construe the world this way or that. Children come to understand this, and before their second birthday: They come to grasp that bodily-endowed people have different mental perspectives, and potentially different ways of experiencing as well as acting towards or understanding a shared world. Indeed, children come to realize their own potential to take up different orientations to reality, including those involved in symbolizing. My point is that, as Werner and Kaplan (1984) described, infants start from a primordial sharing situation and come to understand others' mental orientations as *both* similar to *and* distinct from their own, through their responsiveness to and assimilation of the attitudes of others.

Tomasello et al. consider that special forms of representation underpin human-specific forms of sharing intentions, but also entertain the possibility that dialogic representations are the developmental outcome of modes of interpersonal relatedness. However, they (more or less) reject the idea that identification might hold the key to the emergence of progressively supra-individual forms of representation, apparently because they are working with an impoverished notion of what identification entails.Identification proper includes a partial assimilation of the attitude and mental orientation of someone else, such that one preserves something of the "otherness" of the attitude perceived and assimilated. Tomasello et al. take the view that young children come to understand that others have minds on the basis of simulation and analogy with experiences of their own minds, a stance that Wittgenstein and other philosophers have revealed to be highly problematic (although such reasoning by analogy is commonplace, once other people are understood as such). For example, there would be no basis for infants to identify instances of their own mental states correctly if this were a precondition for understanding others, nor would there be adequate grounds for analogy if other persons were not *already* apprehended to be similar to themselves in having mental states.

If it is the case that the experience of dwelling in, and being moved by, the feelings of others is foundational not only for human relations, but also for increasingly articulated *understanding* of the nature of human takes on reality, then there is no need for simulation or reasoning by analogy to underpin knowledge of the nature of persons. It is highly likely that, as Tomasello et al. explicate, the ability to interpret goal-directed action makes its own contribution to growth in understanding minds – both one's own and those of others – and therefore to the emergence of creative, flexible, symbolic thinking. But human beings need more than a special form of *motivation* to complement their ability to interpret actions if they are to connect with (and cognitively benefit from) the subjective orientations of other people.

Identifying the motivations of chimpanzees: Culture and collaboration

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Abstract: Tomasello et al. propose that shared intentionality is a uniquely human ability. In light of this, we discuss several cultural behaviors that seem to result from a motivation to share experiences with others, suggest evidence for coordination and collaboration among chimpanzees, and cite recent findings that counter the argument that the predominance of emulation in chimpanzees reflects a deficit in intention reading.

Tomasello et al. suggest that differences in the cultural cognition of chimpanzees and humans can be explained by evolutionary differences in the ability to understand the intentions of others. These authors propose that, at some point after the divergence of humans and chimpanzees, the human lineage evolved an adaptation that increased our motivation to share emotional states, experiences, and activities with others, leading to a unique ability to engage in shared intentionality. This ability is argued to underlie many human cultural behaviors, from the use of language to the construction of social institutions. Although chimpanzees understand some aspects of intentions, Tomasello et al. argue that they show little evidence for the behavioral markers of shared intentionality that emerge during the course of human ontogeny, such

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