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Developmental Review

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Evolution of human cooperation in *Homo heidelbergensis*: Teleology versus mentalism



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ARTICLE INFO

Article history:

Received 24 June 2015

Available online 11 September 2015

Keywords:

Teleology

Theory of mind

Simulation

Cooperation

Cooperative turn in evolution

Intentional actions

Mentalism

ABSTRACT

The main thrust of this paper is to argue that teleology is the way by which we tend to understand ourselves and others in routine cases. Since teleology has an inbuilt slant towards cooperation, it may be the essence of what made *Homo sapiens*, starting with *Homo heidelbergensis*, the cooperative species it is. We present the critical features of the teleological approach in terms of justifying reasons for action. These features differentiate teleology from theory of mind (theory theory) and mental simulation. Our emphasis on justifying reasons also distinguishes our teleology from other approaches under the same heading. We also point out the limitations of teleology when it comes to competition, understanding subjective mental perspectives and cultural differences. Although our grand picture is speculative, we firm up our claims with data from children's cooperation and their appreciation of competition that appear in stages reminiscent of Piaget's view on development.

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Evolution

In his *Natural history of human thinking* Mike Tomasello (2014) made an eloquent case for cooperativeness as the decisive trait in human evolution. He speculated that it might have emerged in *Homo*

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heidelbergensis: “Paleoanthropological evidence suggests that this was the first hominid to engage systematically in the collaborative hunting of large game, using weapons that almost certainly would not enable a single individual to be successful on its own, and sometimes bringing prey back to a home base (Stiner, Barkai, & Gopher, 2009). This is also a time when brain size and population size were both expanding rapidly (Gowlett, Gamble, & Dunbar, 2012)” (pp. 36–37).

While some apes’ joint activity, e.g., chimpanzees’ group hunting of monkeys, may look complex, it is likely no more than “a kind of coercion in which each individual is pursuing his own individual goal of capturing the monkey” (p. 35). In contrast humans cooperate on a much broader and permanent basis and from very early on, as young as one year with significant developments until three years of age. This “cooperative turn” in evolution requires a new form of second-person social engagement with a commitment to joint goals. “What emerges for the first time with early humans, in the current account, is a ‘we’ intentionality in which two individuals engage with the intentional states of one another both jointly and recursively” (p. 47).

Tomasello’s approach is based on the assumption that our naïve psychology for predicting and explaining behaviour is based on mind reading abilities (theory of mind). On this view, cooperation, in particular cooperative communication, needs complex embeddings of intentional mental states. For instance, in the object choice task, in which participants know that one of several containers has been baited but do not know which one, chimpanzees need many trials of learning to be able to appreciate a helpful cue like pointing. Children even as young as 2 years old pick up on the cue quite readily (Tomasello, Call, & Gluckman, 1997). Children do so much better than chimpanzees on this task because, according to Tomasello (2014, p. 57), they are able to think in terms of embedded mental states: “With respect to inference, the key point is that the inferences used in cooperative communication are socially recursive. Thus, implicit in all of the foregoing is a kind of backing-and-forth of individuals making inferences about the partner’s intentions toward my intentional states. In the object choice task, for example, the recipient infers that the communicator intends that she knows that the food is in that bucket – a socially recursive inference that great apes apparently do not make.”

Explanations of behaviour that rely so heavily on the understanding of mental states and recursive embedding of these states we call *mentalism*.

Tomasello’s mentalist view of the cooperative turn assumes that *Homo heidelbergensis* inherited from the great apes the understanding of individual goals and added to this understanding joint goals and joint attention enabling joint action: “Joint actions, joint goals, and joint attention are thus of a piece, and so they must have coevolved together” (p. 44). In short, instead of Tomasello’s incremental step in evolution, we propose a fundamental change. *Homo* switched from a view of behaviour as pursuit of individual goals to teleology (Perner & Roessler, 2010), that is, *Homo* in contrast to great apes (and other animals) developed an understanding of actions which are done for reasons. Teleology frames goal directed behaviour as *intentional actions*, behaviour for which there are good *reasons* that justify the behaviour. In working out this position, it became apparent that teleology is a most natural ally of cooperation (Roessler & Perner, 2015). Teleology may thus provide an alternative to Tomasello’s view about the mental changes enabling the cooperative turn in human evolution.

To make our view intelligible we first explain how we understand the notion of reasons (in the section Reasons) and how they differ from causes (in the section Causes). In the section Three views of human action, we contrast teleology with the dominant views on how we understand human action, theory of mind and simulation. In the section Three principles of teleology, we state the main principles of teleology, contrast our teleology with another prevalent use of this term in the section Teleology versus teleology, and then in the section Developmental steps towards teleology, we speculate how teleology might emerge over the first 3 years in human children. In the section The cooperative turn, we return to our claim that teleology provides a good basis for cooperation. We argue that the cooperative turn in human evolution can be based on teleological reasoning by showing that the examples adduced by Tomasello in favour of an evolutionary propensity for embedded mental states can be covered by teleology. The section Limits of teleology outlines the limits of basic teleology and how these limits can be overcome in children. The section Links to the brain gives a brief foray into potential links to brain areas and the last section concludes.

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