Evolutionary Psychology

www.epjournal.net – 2014. 12(5): 979-982

Book Review

Language Evolved in Two Stages

A review of Michael Tomasello, *A Natural History of Human Thinking*. Harvard University Press: Cambridge, MA, 2014, 192 pp., US$35.00, ISBN #978-0-674-72477-8 (Hardcover).

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Michael Tomasello is co-director of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and his work—combining studies on large apes and children—is unparalleled in the field. The theoretically-motivated and brilliant combination of infant research, studies on child language, and chimpanzee cognition is a unique mixture of the heritage of James Baldwin (1894) and Vygotsky (Luria and Vygotsky, 1992; Vygotsky, 1987) in contemporary psychology. His previous synthesis, the now classic work (5,000 citations) of Tomasello (1999), argued that it was not culture that would have created human learning, but that the evolution-based mechanisms of cultural learning created culture itself (Tomasello, 2003). This was supplemented with the message of his other successful book, which argued for human uniqueness in general and comprehensive cooperation, including information-oriented cooperation, helping conspecifics by sharing with them knowledge about the world (Tomasello, 2009).

The new book is a synthesis of the decade-long experimental work of the Tomasello labs with an eye to the theoretical discussions on the origins of the social mind. A comprehensive three-level vision is portrayed. The starting point is a characterization of the cognitive and social achievements of great apes. The novelty of the new theory is that—compared to his earlier cultural learning theory—Tomasello now postulates two dramatic changes. These changes focus on both the social level and the societal level of cooperation, if I may borrow a term from social science theory not actually used by Tomasello himself. The first change is social cooperation, based on joint intentionality with occasional partners. The second change is the creation of collective intentionality with the advent of rule systems of group life. As for communication, the first step is characterized by a rich gesture and miming system and bodily communication, whereas the second is characterized by the emergence of conventionalized language.

The entire book, as well as these new conceptions, has a strong reliance on understanding the way of life of great apes and our ancestors in order to explain cognitive changes. Food-seeking strategies become the motivating forces for underlying changes from mere competition towards cooperation.

Let us take a closer look at the two stages! As for the great apes, Tomasello presents them as smarter, but at the same time more single-minded, than contemporary evolutionary wisdom dictates. They are also assumed to be somewhat smarter than in the similar vision promoted by Donald (1991) a generation ago. The great apes, besides being highly event-based and visually schematic, as Donald proposed, would also have some protologics, being able to deal with "and" and "or," and would be capable of some event- and object-based inferences, such as *(proto) modus tollens* : "(1) the shaking cup is silent; (2) if the food were inside the shaking cup, then it would make noise; (3) therefore the food must not be in the cup (the shaken cup must be empty)" (Tomasello, 2014, p. 19).

At the same time, the intentional world of the great apes is solitary and competitive. During problem solving, they are hardly learning from each other. They do pay attention to each other, but merely to see when they would be able to take away something from the others, and when stealing would be hopeless. Great apes, similarly to what Donald (1991) has already claimed, do live in an image-based and schematic world of the here and now, but according to Tomasello, their representation system is productive and they are able to make causal inferences.

The specific feature of humans is the existence of joint intentionality. As most clearly summarized in the BBS paper of Tomasello and colleagues (Tomasello, Carpenter, Call, Behne, and Moll, 2005), humans do have some social behavioral adaptations, like gaze following, learning from peers, cooperation, and coordination in problem solving that leads to the situation where we are already social learners in infancy. We accomplish tasks with common aims, in a joint intentional system, and learn from these interactions. The new conception bifurcates the origins of this "social intentionality," connecting it with the assumed ecology. During hominid evolution, a process was initiated roughly 2 million years ago, culminating 400,000 years ago in *Homo heidelbergensis*. Joint foraging, later joint hunting, became an ecological necessity due to increasing terrestrial monkey competition. The appearance of joint intentions did correspond to this change in lifestyle. Joint attention, joint goals, and joint self-control were developed. The very fact of joint attention is well documented (see Tomasello et al., 2005), however the timing is somehow speculative, as seen by Tomasello himself. In the framework of this joint intention system, communication itself has become increasingly full of content. In the world of gestures, rudimentary distinctions between communicative force (give it, take it) and content (the apple, the stick) has appeared, and alongside this, communicative relevance emerged as a cementing force of communication. Gestures and pantomime play a similar role in Tomasello's conception as they did for Donald (1991, 2001). However, Tomasello provides a more detailed version of similarity-based pantomimics and its conventionalization, and the gradual progression of gestures to "real language." Shared cognitive perspective and shared control were crucial in this process. Incidentally, since we are talking about a lab in Leipzig, this vision of how gestures played a central role towards grammar is reminiscent of Wundt (1900), whom Tomasello never refers to. Recently, Levelt (2013) has reanalyzed Wundt along these lines.

In the new vision promoted by Tomasello, joint intentionality and its corresponding communication system undergo further refinement, most likely due to the growing size of prehuman groups and their intergroup competition. The cognitive aspect of the coordination needs of larger groups is the transformation of joint intentionality into community-based collective intentionality, accompanied by an increased

conventionalization and "we" consciousness. Imitation, already a cognitive possibility of apes, becomes a tool of cultural conventionalization. This happens basically according to the natural pedagogy framework of Gergely and Csibra (Csibra and Gergely, 2011; Gergely and Csibra, 2005). This would also lead to an increasing role of ontogenesis in humans. This change of acculturation would be paralleled by a gradual move towards explicit communication. The endpoint is a proposition-like organization, differentiating illocutionary Force and Content, Attitude and Proposition, and Topic-Focus, Subject-Predicate within the proposition (pp. 103–104). All of this leads to normative culture and to language as we know it today. Tomasello seems to be more careful in proposing a time period for these changes towards more explicit communication, compared to the birth of joint intentionality. Specifically, the reader misses a detailed interpretation of the gesture/sound shift (see Corballis, 2003 for an example). Conventionalization itself can certainly be proven on the basis of contemporary sign language data. The idea that whatever was originally a discourse function could be grammaticalized can be argued for on the basis of child language data from Tomasello (2003) himself. However, a reconstruction of the genesis of sound structure from gestures is still missing from this complex argumentation.

The summarizing chapter entitled "Human Thinking as Cooperation" positions the author in the world of contemporary evolutionary conceptions. His engagement with the central role of joint intentionality is clear-cut. This is the key for his critique of the different modular visions, from EP to Fodor. There has to be a key factor in hominid evolution, and that is the social distribution of intentionality leading to coordination. At the same time, this rich book mirroring a general vision of Tomasello does not deal much with the brain preconditions of hominid evolution (Arbib, 2005; Dehaene and Cohen, 2007, Dunbar, 2003). On the social side, possible changes in sexual strategies and offspring care are not analyzed. In the vision provided by Tomasello, all social relations are interpreted with the basic metaphor of competition for food resources and cooperation leading to the access to food.

These last remarks should not be interpreted as sour notes. Tomasello's new book shall indeed become a new frame of reference for the next decade of research towards understanding the genesis of language and culture. Its provocative novelty is the evolutionary (re)introduction of a differentiation between social and societal. The temporal organization and structure of the assumed second step will see many further refinements yet.

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from mere competition towards cooperation. Language evolved in two stages. Evolutionary Psychology â€“ ISSN 1474-7049 â€“ Volume 12(5). 2014. -980-. Let us take a closer look at the two stages! As for the great apes, Tomasello presents.Â During the past two million years humans have passed through three major cognitive transitions, each of which has left the human mind with a new way of representing reality and a new form of culture. Modern humans consequently have three systems of memory representation that were not available to our closest primate relatives: mimetic skill, language, and external symbols. These three systems are supported by new types of "hard" storage devices, two of which (mimetic and linguistic) are biological, one technological.