A Natural History of Human Thinking. Michael Tomasello. Cambridge: Harvard University Press, 2014. 178 pages.

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Convergences across a range of emergent fields of inquiry are making it possible to think about Writing in the Disciplines and critical thinking in new and powerful ways. Work in constructionist grammar (e.g., the work of Adele Goldberg), cognitive grammar (e.g., Ronald Langacker), the theory of conceptual blending (Gilles Fauconnier and Mark Turner), and theories of modern literacy (e.g., David Olson) point to ways of thinking about pedagogy that are grounded equally in language and in sociality and that allow us to articulate the historical situating of contemporary students in very broad terms with ways of identifying their intellectual choices in very precise ways. Scholars in these diverse fields regularly refer to one another and presuppose the results of each other's inquiries—what is emerging is a network of overlapping disciplinary spaces that can revolutionize reading-and-writing pedagogy at all levels. And, arguably, the thinker most widely distributed across these networks, the thinker who is most referenced and whose work has been most indispensable, is the developmental psychologist Michael Tomasello.

Tomasello, through decades of study of primate and child cognition and learning, has identified what he calls "joint attention" as the distinguishing feature of human thinking and language. Joint attention is a simple enough concept: I indicate to you that I am attending to something and that I know you are attending to it along with me, and you indicate the same. The most basic and universal example of joint attention is pointing behavior. What Tomasello has shown, though, through very detailed studies, is that apes do not point, at least not in such a way as to provide information or attract another's interest—at most, they can indicate their desire for an object another possesses or has access to. Tomasello has also shown that the point at which infants start learning language (9 months – a year) is the time when they become capable of sustaining joint attention with their caretakers. In *A Natural History of Human Thinking*, Tomasello revises upward his previous estimates of primate cognition, detailing the various ways in which our closest relatives among the great apes can be said meaningfully to think (they can identify the motivations and anticipate the actions of others which, in turn, means they are capable of simulating scenarios), but this basic distinction holds—the great apes, even ones living in close proximity and given extensive training by humans, exhibit "individual" intention but not "joint" attention.

Before examining the model of human evolutionary and individual cognitive development Tomasello provides in this summation of his studies and reflections, I would like to insist upon the importance of the concept of joint attention for pedagogy. When someone learns, what is happening is that changes are taking place in one's attentional structures—what one is learning is how to pay and direct attention in new ways. More precisely, one is learning to pay attention in the ways others pay attention—those others being individuals collaborating in a particular activity or, in the case of academic discourse, disciplinary inquiry. And we would know one has learned what one needs to learn once one can exhibit the mode of joint attention characteristic of that space—"pointing" to something that would be intelligible and of interest to others participating in that space. The duck/rabbit image that so interested Wittgenstein is a good model for thinking through the implications of joint attention: one can see the duck or the rabbit, but not both

DOI: 10.37514/DBH-J.2014.2.1.11

simultaneously; joint attention, that is, is a matter of "seeing as" together. The only way of knowing whether one (or the other) has converted to a new way of "seeing as" would be to show how (to use Michael Polanyi's terms) attending from one element of the configuration enables us to attend to another (for example, how one part of a sentence makes sense in terms of another). It would not be an exaggeration to say that all learning, perhaps beyond rote memorization, and certainly all advances in critical thinking, involve the capacity to remake one's attentional structure in this way.

For Tomasello, joint attention, and therefore meaning making, is bound up with social cooperation. The evolutionary leap that made humanity possible was, for Tomasello, a new way of cooperating in elementary hunting and gathering activities. Early humans learned that sharing information and observations with others, as opposed to the fundamentally "selfish" mode of interaction of our closest relatives (who enforce strict pecking orders and do not share food or aid one another), increased their individual welfare along with that of the group. Once joint attention is possible, new information can be provided upon a common ground of tacit knowledge (pointing at a higher branch on a tree, for example, in the context of a collaborative search for food, takes on meaning against that background). Joint attention and sociality advance in tandem: within a cooperative framework, the individual member of the group benefits from a "reputation" as a helpful co-worker, which leads the individual to attend to the reactions of others to her own actions and, in turn, to monitor his own actions in anticipation of such reactions.

Tomasello distinguishes between "joint intentionality" and "collective intention" (the distinction between "attention" and "intention" is not very important here, as Tomasello sees attention as always involving some shared concern, and speaks of "intention" in phenomenological terms of constituting objects as much as a more narrow notion of purposefulness). The latter is the kind of intentionality characteristic of fully human communities, involving abstract or "arbitrary" signs and an "objective" standpoint that transcends any member of the collective but that any individual can strive toward and seek to model his own perspective on. Tomasello assumes, reasonably enough, that the earliest forms of human communication involved, along with pointing, iconic signs such as pantomime and mimicry. Over time, for reasons Tomasello associates with increases in group size, on the one hand, and the combination of individual gestures, on the other hand, these iconic gestures become less and less imitative of actual objects and actions and more conventionalized and abstract. Prodigious advances in human intellectual capacity follow: with the articulation of abstract signs defined by their relation to each other (that is, grammatically), individual items within a given structure can be replaced by others that fit into the same "slot," liberating thought from its dependence upon immediate reference and local context.

Here, again, I would like to note the highly significant pedagogical consequences. Although Tomasello doesn't say this, joint intention must continue to co-exist within collective intention, but with the difference that joint intention now focuses on a specialized domain of language use. In enabling students to transform their attentional structures, what we might call (alluding to the subtitle of Tomasello's 2003 study of language learning, *Constructing a Language: A Usage-Based Theory of Language Acquisition*) a "usage-based" pedagogy is interested in having students learn to attend to the way "items" ("words") operate in differing ways within (backgrounded) grammatical constructions. Tomasello has shown that language is learned in "chunks," that is, first of all holophrases and then grammatical constructions (as opposed to individual words and grammatical rules), in which case language is learned (for the initiate in a discipline no less than for a small child) by deploying novel uses of terms against the "common ground" of shared chunks. When students learn, which is to say when they transition from one mode of literacy to another, what they learn is to attend to this interplay of construction and item

in order to generate new observations and ideas.

By relying so heavily upon the relation between language use and thinking, on the one hand, and cooperation and what we would have to call altruism, on the other hand, Tomasello leaves himself open to charges of naivete regarding the ways language can be used to wound, exclude, oppress, and worse. He briefly addresses this charge, in a footnote, resorting, insufficiently in my view, to a kind of Rousseauian primitivism, claiming that violence enters human communities along with the introduction of social hierarchies as communities become larger and more complex:

> Of course, contemporary human societies are also full of selfishness and non-cooperation, not to mention cruelty and war. Much of this is generated by conflicts between people from different groups (however this is defined) and concerns competition for private property and the accumulation of wealth that began only in the last 10,000 years or so, after the advent of agriculture, that is, after humans had spent many millennia as small-group collaborative foragers. (156)

This would relieve joint intention (if not, interestingly, collective intention) of "complicity" with violence. But what, in that case, made hierarchies, which presumably involved some form of subjugation, possible?

Rather than press this charge against Tomasello, though, I would like to articulate it with another issue: Tomasello's seemingly complete identification of human thinking with sharing observations of a surrounding reality, offering information and, finally, more abstract objective accounts of reality. Imagination, fantasy, irony, humor, faith and other modes of thought are left unaccounted for (Tomasello does, it should be said, show an awareness of the potential paradoxes of self-reference implicit in joint attention.). I think that both of these elisions share a common source in Tomasello's account of language's origins. How, exactly, those early humans became capable of pointing is not clear—however long we spread out the evolutionary time frame, if pointing is genuinely a new mode of signifying, there must have been some point at which our ancestors did not point and another at which they did.

Tomasello speaks of pointing, along with iconic signs, but these problems might be resolved if we were to consider that pointing itself might be an iconic sign. What would pointing be "similar" in appearance to? For Eric Gans, who has argued along lines consistent with Tomasello's for the originary nature of pointing in human signification, the first sign is an "aborted gesture of appropriation" carried out on a scene of potential conflict over a collectively desired object. When humans point on this scene, they are signifying their readiness to renounce appropriation of the object in the name of deferring violence—the pointing finger "resembles" such a renunciation. As with Tomasello, this originary sign makes a kind of shared "disinterested" contemplation of the object possible, with the consequences Tomasello has explored so thoroughly—but in such a way that desire and violence are always implicated, even if via their deferral, in language use. And this observation has its pedagogical implications as well, as we consider that our students' learning always takes place on a stage, or scene, (for what is a disciplinary space if not a virtual stage, and scene?) and is strongly mediated by desire (for inclusion in "collective intention") and resentment (of the implicit disparagement, inseparable from education, of their "native" knowledge or more localized forms of "joint attention"). In that case, learning is no mere matter of imparting information or ramping up mental computational capacities, but, rather, a more complex process of emulation, appropriation, and negation. ⌛