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THE NATURE OF THOUGHT

The Objective-Reflective-Normative Thinking of Only Humans

Ann Long

In his book *Subjective, Intersubjective, Objective* (2001), Donald Davidson wrote:

In both the evolution of thought in the history of mankind, and the evolution of thought in an individual, there is a stage at which there is no thought followed by a subsequent stage at which there is thought. What we lack is a satisfactory vocabulary for describing the intermediate steps.

Davidson died in 2003. Michael Tomasello published *A Natural History of Human Thinking* in 2014. And I wonder, had he lived to read it, whether Davidson might not have thought that *it* provides at least *some* of that vocabulary.

And 'vocabulary' matters. So, if only with a wry smile, let me mention a difference already in evidence between that of the philosopher and the scientist. Davidson uses 'thought' - - - as do we in the 'Nature-of-Thought' title for our weekend. Tomasello uses 'thinking'. Davidson's is an abstract noun, a reification from a verb. Tomasello's is just the verb. And I think this difference, far from being accidental, flows from a difference of method.

The philosophical approach appears somewhat essentialist: determine the essence of the phenomenon 'thought', and *then* turn to the world to discover in which entities it exists: in spiders no, in humans yes; in rattlesnakes no, in bonobos yes; in thermostats no, in computers - - - maybe? The scientific approach, by contrast, is to *begin* in the world: to observe, form hypotheses about, experiment on, and if you're lucky come to (tentative) theories about not an essential *thing*, but a changing developmental *process* or *happening*: not the abstract *thing* 'thought' but the specific, changing, developmental *process* 'thinking'. It's one of the two main aims of this paper to suggest that it's the second approach which is the most useful.

Michael Tomasello is a Co-Director of the Max Plank Institute for Evolutionary Anthropology in Leipzig. He's an American developmental psychologist who, after two decades in American academe, moved to Germany in 1994. There he and his team have studied two groups of subjects: the great apes at the Wolfgang Kohler Primate Research Centre; and human children, particularly their language acquisition, around the world. His aim has been to try to identify what it is which distinguishes us from our nearest primate relatives. And his whole answer, as we shall see, is couched in terms of intentionality. However, being not a philosopher but a *developmental* psychologist, a scientist, it's couched also in what he takes to be the *development* of intentionality.

He's long argued that what makes human *cognition* unique is not any **natural** characteristic of species members, but the fact that each new generation matures amidst **cultural** artefacts and practices. The young internalise those practices as 'what *we* do' and 'how *we* do it'. And then pass them on to their own offspring. That theme is still present in this his most recent book. But here he's discussing not human *cognition* in general, but human *thinking* in particular. And here he's suggesting that what makes **it** unique, while again not a natural but a cultural factor, is fundamentally that it's cooperative.

The development in his ideas here comes as a consequence of much experimental work, his own and that of others, which has taken place across the past couple of decades. Earlier texts had claimed that only humans recognise their fellows as intentional agents. And that it's this recognition which forms the basis of cultural development, as opposed to natural evolution. But there's now a problem with this view. We now know two things that we didn't know before: first, that many great ape species **do** show signs of understanding intentional agency, yet **have not** developed anything like the cultural capacities of humans; second, that human infants, designated pre-linguistic, have **already** acquired some of the cognitive processes that apes don't have. So what's going on?

Tomasello argues that the critical variable which distinguishes specifically **human** thinking is not the recognition of others as intentional agents, but the **cooperation** involved in what he calls **shared intentionality**. Human culture is not just transmissive. It's also coordinative. And the specifically **human** thinking which underpins that coordination has, he suggests, been transformed, twice, across human history. On each occasion, the transformations were driven by changes in the circumstances in which humans were required to live, demanding the development of greater cooperation amongst them which thereby transformed, twice, their thinking.

This, of course, is quintessentially a materialist as opposed to idealist explanation of human thinking. But there's nothing necessarily reductive about materialism - - - as there is, I think, about the physicalism with which it's often confused. Some people register it as the view that 'everything's made of matter'. That's wrong. Democracy isn't made of matter. Love isn't made of matter. And **thought** isn't made of matter either. In this last case, which is our concern, it's not that thoughts are *made of* matter but that they *emerge from* matter: that they are contained as potential within it; that they cannot exist but as its offspring. Indeed, it's interesting that the same 'mater' which is etymologically the source of 'mother' is also, etymologically, the source of 'matter'. Matter 'mothers' everything. And it's the 'matter' which is a nervous system which 'mothers' thought. No thought ever emerged from anywhere other than from a functioning material nervous system. No thought ever lodged anywhere other than in the gesture or pantomiming of a material body; the sound of a material voice; the writing of a material hand.

Tomasello's is a stage-theory of development: *individual* intentionality transformed into *joint* intentionality transformed into *collective* intentionality. Each transformation was driven by 'changes in the circumstances in which humans were required to live', bringing about consequent changes in the way they thought. This stage-theoretical approach draws inspiration, clearly, from Piaget and from Vygotsky. But maybe even more fundamentally from John Maynard-Smith.

In his very influential book *Major Transitions in Evolution* (1995), Maynard-Smith had identified eight major transitions in the evolution of living things - - - among them such landmarks as the emergence of chromosomes, of multi-cellular organisms, of sexual reproduction. And Tomasello's comment on this is:

Astoundingly, in each case the transition was characterised by the same two fundamental processes. First, in each case there emerged some new form of cooperation-with-interdependence: entities that were capable of independent replication before the transition can replicate only as part of a larger whole after it. Second, in each case this new form of cooperation was made possible by a concomitant new form of communication: a change in the method of information transmission'.

In the Maynard-Smith account, the most recent transition was the one which saw the emergence of human cultures. And what Tomasello aims to do is further to explore that emergence by way of a study of the different forms of thinking that it required.

In his introductory chapter he begins by challenging the idea that thinking is an individual and private phenomenon: a solitary activity. This is a notion much more prevalent, I think, among philosophers than psychologists. And it's the second of the two main aims of this paper that it **should** be challenged. So let me quote the lovely image with which he opens his remarks:

Thinking would seem to be a completely solitary activity. And so it is for other animal species. But for humans, thinking is like a jazz musician improvising a novel riff in the privacy of his own room. It is a solitary activity all right, but on an instrument made by others for that general purpose, after years of playing with and learning from other practitioners, in a musical genre with a rich history of legendary riffs, for an imagined audience of jazz aficionados. Human thinking is individual improvisation enmeshed in a sociocultural matrix.

The rest of the book then offers an hypothesis – a candidate theory – as to how this unique form of 'socially infused' thinking came into being. It's a stage theory – three stages, two transitions – of the way in which humans came to think in the way they do: a way shared by no other animals, and by no non-living entities either. The three stages are (1) individual intentionality (or thinking like an ape); (2) joint intentionality (or the view from here *and there*); and (3) collective intentionality (the view from nowhere). And after the introduction, Chapters Two, Three and Four outline these three stages in turn.

Individual intentionality is that which humans shared with the great apes before their evolution separated some six million years ago. At this level, **thinking** occurs when instead of immediate overt behaviour, an individual organism first represents – that is, simulates 'off line' – *potential* perceptual experience. The overt behaviour would be exposed to natural selection: to what Tomasello calls 'the unrelenting sieve of natural selection'. But the covert representation – the thought – is not. This rudimentary form of thinking is, in all the great apes, about both their physical and their social worlds, and has several discrete characteristics. It's *imagistic*: that is, it's iconic, and based on prior motor experience. It's *schematic*: that is, it's not just about un-interpreted pictures, but images understood as exemplars (we might say it has a type-token structure.) It has *situational content*: that is, it concerns whole situations, not just discrete perceptions. It's *inferential*: great apes make both causal and intentional inferences - - - or as Tomasello puts it, they possess 'proto-versions of

everything from modus tollens to disjunctive syllogism'. It's *cognitively self-monitoring*: great apes can monitor not just actual outcomes – a basic characteristic of any self-regulating mechanism, even a thermostat – but simulated outcomes as well. They seem to know, for example, when they don't have enough information to know.

This is how he characterises the thinking capacities not only of the common ancestor, but also (probably) of the specifically human Australopithecines of the ensuing four million years of the specifically human lineage. It exhibits intentionality: it is 'about' things. But that intentionality is fundamentally *individual* intentionality. As he expresses it:

Individual intentionality is what is needed for creatures whose social interactions are mainly competitive, that is, creatures that act on their own or, at most, join in with others to choose sides when there is a good fight going on. Great apes are all about cognition for competition. But human beings, in contrast, are all about (or mostly about) cooperation.

The **joint intentionality** which next emerges is, he suggests, a specifically human type of thinking. It emerged among groups of early humans not yet living primarily in cultures, and not yet using conventional languages. But as the result of changes in their habitat, foraging had to become a more collaborative undertaking, ushering in more cooperatively oriented behaviours than before. We can think of it as the first 'we' intentionality, even the first 'I and thou' intentionality, as it was always undertaken, he suggests, with a particular other. The two collaborators have individual roles, each an individual perspective, but their new form of communication, taking place via gesturing, was unique to human beings. And brought about huge changes in their thinking.

For anyone familiar with child developmental psychology, an 'aha' moment is probably occurring here. Proud up-bringers like to register their offspring's first smile, first tooth, first step. But psychologists have long latched on to the first point – something often not noticed at all by parents – as probably rather more significant. Picture the scene - - - we've all seen this. The infant gazes at something, and then points at it. Then keeping its pointing finger in place, it shifts its gaze from the something to the eyes of, let's say, its mother. When it's sure that it's captured those eyes, it returns its own gaze to the something - - - and then back again to the mother to see if her gaze has followed. This back-and-forth can go on for several 'moves' until the infant is convinced that 'we' are now looking at the same thing: at 'that'. Our joint intentionality, our joint 'aboutness', is of 'that'. The amount of experimental work on joint attention is phenomenal, much of it referenced in this third chapter. Picking out just one experiment from this plethora borders on the ridiculous. But given time constraints, here is Tomasello summarising Rekers and Bullinger (2011).

Importantly, young children also seem to have a species-unique motivation for collaboration, as shown in recent studies in which children and chimpanzees had to choose between pulling in a certain amount of food collaboratively with a conspecific or pulling in that same amount of food (or more or less) in a solo activity. Children very much preferred the collaborative option, whereas chimpanzees went wherever there was most food regardless of opportunities for collaboration.

Joint intentionality has a dual-level structure: a joint goal, but with individual roles in achieving it; or at one and the same time, sharedness and individuality. The essence of the situation is an understanding of perspective. There is a single target of joint attention on which we have different perspectives. We are both considering the same thing – 'that' – and

we each know that the other is attending to it. Again from his book *Subjective, Intersubjective, Objective* (2001) Davidson suggests that it's in this way that 'space is created' for an understanding of different perspectives to arise. But what Tomasello establishes, anyway to my satisfaction, is that while the thinking of young children is such that they 'get it', the thinking of great apes is such that they don't. As he puts it: 'they do not understand the notion of simultaneously different perspectives on the same situation or entity **at all'.**

The rest of this chapter deals with the detail of the construction of joint intentionality: with the role of symbolising in pantomimic gestures; with the combination of such gestures; with all the characteristics of second-person 'thou' thinking. With its perspectival, symbolic representations, its quasi propositional nature, its socially recursive and combinatorial features, the self-monitoring that it involves, this is thinking which is unique to humans. Once it's in place, it enables thinking which can accommodate the view from here *and from there*. And the way is opened for the next great transition: that from joint intentionality to the collective intentionality which gives us 'objective, reflective and normative' thought.

Collective intentionality is root-and-branch social. This, of course, is an idea which, in its general formulation, has a long history. But to go back only across two centuries, Hegel (1807) had argued that the social practices, institutions and ideologies of a particular culture at a particular historical epoch constituted a necessary conceptual framework for individual human thinking. Peirce had claimed more specifically that virtually all of the more sophisticated types of thinking of humans, including most especially mathematics and formal logic, are possible only because individuals have available to them what are essentially culturally created symbolic artefacts, such as Arabic numerals and logical notation. And Vygotsky (1978) emphasised that human children grow up in the midst of the tools and symbols of their culture, including especially the linguistic symbols that pre-organise their worlds for them: and that it is during development that they internalise the use of these artefacts, leading to the kind of internal dialogue which is the prototype of fully-human thinking. As they came to live in a world of group-created cultures, modern humans came increasingly to think collectively. They undertook 'negotiated coordination' with each other in ways not available to other primates, forming thereby a 'we' that acts as a kind of plural agent to create everything from a collaborative hunting party to a cultural institution. It's these fundamentally social differences which lead to an identifiably different type of thinking; which, for example, led Piaget to claim (*Sociological Studies*) that 'only co-operation constitutes a process that can produce reason'; and which lead Tomasello to suggest that the different type of thinking concerned is 'objective-reflective-normative thinking'. I quote:

'- - - modern human individuals came to imagine the world in order to manipulate it in thought via 'objective' representations (anyone's perspective), reflective inferences connected by reasons (compelling to anyone) and normative self-governance so as to coordinate with the group's (anyone's) normative expectations.'

It's very important to stress something here. Collective intentionality is fundamentally a cultural, not a natural phenomenon. They are *developmental* changes note, not *evolutionary* changes, which move us from initial individual perspectives (thinking like apes), via subsequent joint perspectives (thinking from here and from there) to an eventual collective perspective (thinking collectively to a single 'objective' perspective). Importantly, this is not

just a type of thinking which adds up many individual and joint perspectives. Instead it's a new type of thinking which generalises from the both to something not seen before.

To spell that out, changes in ways of thinking are not, and cannot be, evolutionarily sourced. Natural selection cannot even 'see' thinking. It can only 'see' the effects of thinking in organising and regulating overt actions. In evolution, *being* smart counts for nothing if it does not lead to *acting* smart. Which means that the (now very fashionable) evolutionary perspective which sees humans today as 'hardwired' to think in these new ways is mistaken. By contrast, a developmental perspective is what we need. A modern child raised on a desert island would not construct fully human, that is fully collective, processes of thinking on its own. Quite the contrary. Children are born with adaptations for collaborating and communicating and learning from others in particular ways: evolution selects for adaptive *actions*. But it's only via experience in exercising these skills *in social interaction with others during development* that children create new representational formats, new ways of thinking, new inferential reasoning possibilities, as they internalise, in Vygotskian fashion, their coordinative interactions with others. With all these new features of human thinking in place, says Tomasello, the view 'from any possible perspective' becomes steadily more and more available: for example, and quintessentially, via the creation of science.

But there is, I think, a problem. Tomasello finishes his chapter on collective intentionality with a section sub-headed 'Objectivity: the View from Nowhere'. This of course is referencing Nagel's book *The View from Nowhere* (1986). And in much contemporary philosophy, and particularly contemporary theology, we are perhaps more used to thinking of 'the view from nowhere' as being the God's eye view, unavailable to mere mortals. So that when Tomasello (the scientist talking in terms of process) talks about collective intentionality bringing about 'a more and more objective conception', that's not Nagel et al (the philosophers talking in terms of reifying abstractions) entertaining the possibility of 'an objective conception, period'. So what's this about the 'objectivity, period' of human thinking?

Well, while I would thoroughly recommend this book to anyone interested in human thinking, I'm not without reservations. While often Tomasello quite clearly distinguishes between *evolutionary* change (that which takes place in biological organisms at one level) and *developmental* change (that which takes place in persons at another) he's not totally consistent on that score. And the main reason for this, I think, is that he doesn't advance any candidate theory, any hypothesis, any mechanism – if only for fun and for now, let's call it 'cultural election' -- which would do for the latter what 'natural selection' does for the former. His whole argument is grounded in the concept of 'intentionality'. But he nowhere tries to justify that grounding. And reading 'intentionality' in its rather more colloquial form as 'aboutness' – our thought is 'about' the world – I would ask whether it might not be more appropriate to analyse it not as being 'about' the world, but as being 'of' the world. If we do that, the problem becomes not one of understanding 'about-ness' (intentionality) but one of understanding 'of-ness' (to invent a word, 'inclusionality'). Or as our own Michael Lockwood once put it: 'Science is giving us an ever clearer picture of the world. But we still have very little idea as to how to put ourselves into it'.

This is where my own work is focusing at the moment. I *have* proposed a candidate theory, an hypothesis, a mechanism -- to Tomasello and to others – which I think *could* do for developmental change what 'natural selection' has done for evolutionary change. It involves

taking determinism-all-the-way-down very seriously; taking the end of free will very seriously; making real Hegel's suggestion that 'freedom is the recognition of necessity'. And it would mean that what I've here referred to as 'objectivity, period' would not only be possible but inevitable - - - as the end point of the sort of process whose beginnings Tomasello is delineating so well. But all that's for a time and place other than this one.