

Knowledge before belief? Yes and no (depends on which type of “knowledge”).

Hannes Rakoczy & Marina Proft

Building on findings from developmental, comparative and cognitive psychology as well as from experimental philosophy, the authors of the target article present a fascinating and provocative big picture that challenges foundational assumptions of traditional Theory of Mind (ToM) research: ascription of knowledge is primary relative to ascription of belief. The primary form of Theory of Mind thus is so-called factive ToM that centres around knowledge-related mental states that are true rather than subjective meta-representational ToM that centres around subjective epistemic states like belief that may or may not be true (Nagel, 2017; Phillips & Norby, 2019).

We agree that the empirical findings reviewed here do make a strong case for the conjecture that some form of factive ToM is indeed primary. But we suspect that this claim, in unqualified form, may be somewhat incomplete and misleading. There is not necessarily one unitary form of factive ToM, and one notion of “knowledge“ in play across development and evolution, and perhaps not even in adults‘ Theory of Mind. This suspicion builds on several foundations: First, from an empirical point of view there have been, as highlighted by the authors, characteristic U-shaped developmental curves in some tasks of factive ToM – often a reliable indicator that different underlying processes are in play (Karmiloff-Smith, 1992). Second, from a theoretical point of view, conceptual change and dual process approaches to ToM and other forms of social cognition have highlighted the possibility of more complex developmental trajectories such that earlier and more basic forms of a conceptual competence may be supplemented and superseded by later and more sophisticated refinements (e.g. Apperly & Butterfill, 2009; Perner, 1991).

For the case of factive ToM, it may be that there is a basic and primitive notion of “knowledge“ in place early in ontogeny (and perhaps phylogenetically more ancient) that shares some of the essential features of our mature “knowledge” concept: “knowledge” in this broad sense, as emphasized by the authors, is factive, not modality-specific, and allows for representations of egocentric ignorance. For this basic concept, the slogan “knowledge before belief“ may well be true. However, this basic

concept is not yet our mature notion of knowledge proper and this basic form of factive ToM thus falls crucially short of our mature form of factive ToM. Why? Since essential elements of our mature concept of knowledge are missing: First of all, while Gettier cases and other considerations make clear that knowledge does not reduce to justified true belief, it at least presupposes justified true belief. Ascription of knowledge would thus presuppose ascription of belief. Now, we understand that this is one of the very traditional assumptions the present paper challenges, and given space restrictions will not focus on it here any further. But there is a second crucial aspect of knowledge proper that is missing from the basic notion: knowledge proper is *aspectual*, and consequently reports of knowledge proper are *intensional*, while neither seems to be the case of basic knowledge and reports of it. Knowledge proper is aspectual in the following sense: whether or not someone knows something depends on how, under which aspects, she has witnessed a given scene. Suppose Eve has seen Clark Kent enter the house. Does she know that Superman is in the house? It depends. If she knows about the identity Clark Kent = Superman, she does, otherwise not. Consequently, knowledge ascription is intensional in the sense that substitution of co-referential terms is not necessarily truth-value preserving: “Eve knows that Clark Kent is in the house” does not imply “Eve knows that Superman is in the house”.

Now, from the point of view of cognitive development, much research suggests that children’s appreciation of the aspectuality of propositional attitudes (and the intensionality of propositional attitude reports) develops in protracted ways not before the age of four, at the earliest (e.g., Apperly & Robinson, 1998; Fiske et al. 2014; Proft et al., 2019). In fact, recent studies suggest that around age four children undergo a fundamental cognitive revolution: they acquire a solid meta-representational notion of propositional attitudes that allows them to ascribe subjective aspectual representations that may or may not be accurate. Children thus come to solve false belief tasks that require belief ascription at the same time as tasks that require an understanding of aspectuality (Rakoczy et al. 2015).

These considerations thus evoke a somewhat modified picture of the developmental course of factive Theory of Mind: Some form of factive ToM, indeed, comes first (developmentally and phylogenetically). In this primary stage (from infancy on), subjects track agents’ cognitive relations to the world that display some of the essential

signatures of knowledge proper (factive; not modality-specific; : allow for representations of egocentric ignorance). Various approaches in ToM research over the last years have aimed at describing this basic form of knowledge-like relations, for example in terms of “cognitive connections“ (Flavell, 1988), “registration“ (Apperly & Butterfill, 2009), “experiential records“ (Perner & Roessler, 2012) or “awareness relations“ (Martin & Santos, 2016). While differing in focus and details, all these accounts converge in stressing one crucial point: this early form of factive ToM still falls short of knowledge proper because it lacks an appreciation of the essential aspectuality of propositional attitudes in general and of knowledge in particular.

Only later, around age 4, do children then develop the new meta-representational framework of propositional attitudes that goes beyond basic factive ToM. Once they have this framework and thus an understanding of aspectuality at hand, they can extend their initial and primary factive ToM to acquire the mature concept of knowledge (as at least presupposing true, justified belief, where belief is necessarily aspectual).

Obviously, this slightly modified picture raises many interesting new empirical questions: From developmental and comparative perspectives: is infants‘ and non-human primates‘ primary form of factive ToM really non-aspectual? Regarding adult functioning: do adults operate with one unitary factive ToM? Or does the more basic version remain intact over the lifespan, perhaps even as the default mode, that reveals itself under conditions of speeded responses etc.? If the latter were true, specific performance patterns should be found. First, fast factive ToM should have characteristic signature limits to do with the lacking appreciation of aspectuality (Apperly & Butterfill, 2009): Subjects under speeded conditions should be unable to systematically distinguish between “Eve knows that Clark Kent is in the house” (true) and “Eve knows that Superman is in the house” (possibly true). No such signature limits should be expected, in contrast, under reflective conditions in which subjects can use their full-fledged and mature factive ToM. Interestingly, these hypothetical developmental and adult performance patterns would correspond to those found by some of the authors of the target article in the domain of modal judgments. Adults, it seems, have both a more primitive (ontogenetically old) default notion of modality at their disposal that does not differentiate between descriptive and normative modals and

thus yield characteristic signature limits, and more differentiated and nuanced ones (ontogenetically more recent) that sharply do distinguish between different forms of modality. What works fast and gets addressed in speeded tasks is the primitive default notion whereas the more nuanced notions reveal themselves in reflective task settings (Phillips & Cushman, 2017). Modality judgments and factive ToM may thus reveal striking analogies. Just like in the area of modality, then, there may be basic and default factive ToM, present from early on and in operation throughout the lifespan in speeded responses, and more sophisticated factive Theory of Mind that develops later on the basis of full-fledged meta-representation and that reveals itself in more reflective judgements.