

BELIEF IS PRIOR TO KNOWLEDGE

DAVID ROSE

drose@philosophy.rutgers.edu

ABSTRACT

Orthodoxy has it that knowledge is a composite of belief and non-mental factors. However, Timothy Williamson suggests that orthodoxy implies that the concept of belief is acquired before the concept of knowledge, whereas developmental data suggest the reverse. More recently, Jennifer Nagel reviews the psychological evidence, building a psychological case that the concept of knowledge emerges prior to belief. I assess the psychological state of the art and find support for the opposite conclusion. Overall the empirical evidence supports the orthodox view that the concept of belief is prior to the concept of knowledge.

On the orthodox view, to know is to have a belief that meets certain criteria. For instance, the belief must be *true* and, it is often thought, also *supported by evidence* or *reliably produced* or the like (e.g., Cohen 1966, 1989; Goldman 1976; Conee and Feldman 1985; Chisholm 1989; Sosa 2007, 2011; Zagzebski 2009). On this approach, knowledge is a *composite* state that factors into a mental component (belief) and non-mental components (e.g., evidence or reliability). In a radical break from orthodoxy, Timothy Williamson has argued that knowledge is not composite in the way assumed by orthodoxy. Instead, Williamson argues, knowledge is *prime*. On Williamson's view, knowledge does not decompose into mental and non-mental factors. Instead, knowledge is a paradigmatic mental state itself, and not simply by courtesy of requiring belief.

If the orthodox treatment of knowledge as composite were true, Williamson notes, then it would have certain consequences. In particular, it seems to imply certain things about how our concepts of knowledge and belief develop. If knowledge were a composite of mental and non-mental factors, then we would expect children to acquire the concept of knowledge *only after* they acquire the concept of belief. In short, belief would be conceptually prior to knowledge. However, “data on child development suggest, if anything, the reverse order” (Williamson 2000: 33, n. 7). By contrast, Williamson's hypothesis is perfectly consistent with data suggesting that knowledge is conceptually prior to belief, because Williamson rejects the assumption that knowledge is a composite concept with belief as a conceptual constituent. More recently, Williamson has become known for his very thoughtful and careful critique of the relevance of experimental evidence to philosophical disputes (e.g., Williamson 2011, 2013), which lends additional weight to his suggestion in the present context about the relevance of developmental data. More generally, if Williamson is correct that knowledge is a psychological state, then we should expect a theory of knowledge to be consistent with our best psychology, just as we would expect a theory of belief to be. Consequently, I accept Williamson's observation

about the relevance of developmental data and will proceed on the assumption that it is correct.¹

Although many have resisted Williamson's arguments for the primacy of knowledge (e.g., Brueckner 2002; Magnus and Cohen 2003; Molyneux 2007; Fricker 2009; see also papers in Greenough and Pritchard 2009), nobody has yet challenged Williamson's claim that the developmental data favor his view that knowledge is conceptually prior to belief. More recently, Jennifer Nagel (2013) has presented a much more thorough discussion of psychological data, which she takes to further support Williamson's view.

My view is threefold. First, Williamson and Nagel have underestimated the complexity and ambiguity of much of the evidence. Second, relevant evidence has escaped their notice. Third, and more importantly, the evidence supports the orthodox view that the concept of belief is prior to the concept of knowledge. Thus, on my view, the psychological evidence supports the orthodox view that belief is conceptually prior to knowledge.

I begin, in Section 1, with a brief overview of epistemological orthodoxy on the priority of belief over knowledge and Williamson's charge that the psychological evidence supports the exact opposite conclusion. In Section 2, I consider evidence on children's acquisition of the mental state lexicon, arguing that the data are inconclusive on the issue of whether knowledge is prior to belief or vice versa. In Section 3, I consider evidence on children's performance in theory of mind tasks, arguing that the empirical evidence supports the orthodox view that belief is conceptually prior to knowledge.

I. PRELUDE

The orthodox view among epistemologists is that knowledge is a composite of mental and non-mental factors: it is *not* prime. Among epistemologists, the pre- and post-Gettier project of attempting to analyze knowledge into mental and non-mental factors has taken knowledge to entail belief (e.g., Cohen 1966; Lehrer 1968; Armstrong 1969; Jones 1971; Sorensen 1982; Steup 2006),² where this entailment is taken to suggest

-
1. Those who are not yet persuaded by the assumption can treat the following discussion as explicitly conditional: if the competing views about the conceptual priority of belief or knowledge have empirical implications, then we should prefer the orthodox view because it better fits with our best psychological data.
 2. Although Williamson (2000) upholds the entailment thesis, arguing that entailment is compatible with the primeness of knowledge, he seems to suggest that he would be willing to give up entailment (see Williamson 2000: 38; see also Turri 2010: 201–2, for discussion). And perhaps one might be willing to give up entailment if ordinary judgments didn't fit entailment. Indeed, if knowledge is not a composite of belief and non-mental factors, perhaps one would expect to find cases where ordinary speakers attribute knowledge but deny belief. Though some evidence suggested that there are cases where ordinary speakers will judge that a subject knows *p* but does not believe *p* (Myers-Schulz and Schwitzgebel 2013; Murray *et al.* 2013), various problems with these initial studies have been pointed out and recent evidence provided by others suggests that ordinary speakers make judgments in conformity with the entailment thesis (Rose and Schaffer 2013; Buckwalter *et al.* forthcoming). If it would have turned out that people don't make judgments in conformity with entailment – judging that a subject knows *p* but does not believe *p* – then this might have been taken to provide support for the view that knowledge is not a composite with belief as a conceptual constituent. This isn't to say that the fact that people make judgments in conformity with entailment favors orthodoxy since as Williamson notes, even primitives can have entailments. Rather it's to say this data doesn't help decide the issue of whether knowledge is prior to belief or vice versa.

that belief – a paradigmatic mental state – is one of the basic mental building blocks of knowledge. The primary focus of orthodoxy has been to provide a closed list of non-mental factors which elevate belief to the status of knowledge.³ So, among epistemologists involved in the pre- and post-Gettier tradition of analyzing knowledge, the guiding view is that knowledge is a composite of mental and non-mental factors, that belief is prior to knowledge and that the task in analyzing the composite knowledge is providing a closed list of non-mental factors which build on belief and yield knowledge.

But, as Williamson notes, there are reasons to be suspicious of orthodoxy. The pre- and post-Gettier tradition of analyzing knowledge into mental and non-mental factors has been largely unsuccessful. Additionally, “a further ground for suspicion of analyses of the concept knows in terms of the concept believes is that they seem to imply that the latter concept is acquired before the former” (p. 33). But as Williamson points out: “the data on child development suggests, if anything, the reverse order” (p. 33).

Williamson does not pursue a detailed review of the developmental literature. But Nagel, noting that “the attribution of knowledge is not taken to start from an attribution of belief, on Williamson’s view; rather, the capacity to recognize belief depends on some prior mastery of the concept of knowledge” (p. 285), sets out on her foray into the psychological literature from the suggestion that “arguably, if intuitive representation of knowledge really is a composite involving intuitive representation of belief, the capacity to represent knowledge should not be available unless and until the capacity to represent belief is in place” (p. 292). And in agreement with Williamson’s claim about what the developmental literature suggests, she takes the developmental literature to show that “children acquire the concept of knowledge before the concept of belief” (p. 292).⁴

Epistemologists involved in the pre- and post-Gettier project of analyzing knowledge into mental and non-mental factors and who take belief as one of the basic building blocks of knowledge, should be interested in what the psychological literature suggests regarding the relative order of acquisition in the concepts know and believe. Insofar as it is reasonable to take orthodoxy as having psychological implications, it would seem that it gets the order of acquisition in the concepts know and believe exactly backwards. But as I will now proceed to argue, the psychological case for the primacy of knowledge is far from convincing. Indeed, I will argue that the extant empirical evidence actually supports the orthodox view that belief is conceptually prior to knowledge.

2. EVIDENCE FROM THE MENTAL STATE LEXICON

I want to consider two main lines of evidence that Nagel draws on in support of the priority of knowledge over belief. The first line of evidence concerns children’s acquisition of the mental state lexicon and the frequency of uses of “know” and “thinks” among

3 Though this is not to say that belief is the only candidate mental state involved in knowledge. As Nagel (2013) rightly points out, other mental states might be on offer e.g., confidently held belief, justified belief where justification is understood in mental terms (also see Williamson 2000, for discussion).

4 Patrick Rysiew (2013) *takes for granted* that the psychological case Nagel builds is correct and that the concept of knowledge is conceptually prior to belief. He then asks how children could reliably track knowledge without having a grip on belief and offers up a speculative psychological proposal. But there is no need to construct a speculative psychological account to explain this since, as I will be arguing, the evidence does *not* show that the concept of knowledge is prior to belief.

children and adults. My plan here is to take a closer look at the data Nagel draws on and argue that they are inconclusive on the issue of whether knowledge is prior to belief or vice versa. Setting aside evidence on the acquisition of the mental state lexicon, I will then turn to evidence on children's performance in theory on mind tasks in Section 3, presenting a case in support of orthodoxy.

Some of the work that Nagel takes to be relevant to the issue of whether the concept know is prior to belief comes from considering work on the acquisition of the mental state lexicon. Drawing on work by Bartsch and Wellman (1995) and Shatz *et al.* (1983), Nagel claims that children use "know" both earlier and much more heavily than they use "thinks" (p. 292). The earlier emergence and more frequent use of "know" over "thinks", Nagel suggests, has also been found in studies of Mandarin and Cantonese (see Tardif and Wellman 2000). Indeed, Nagel points out that some work suggests that "know" appears as the main verb in upwards of 70% of children's epistemic claims, while "thinks" appears as the main verb in only 26% of children's epistemic claims (see Bartsch and Wellman 1995). Moreover, Nagel notes that this "dominance of "know" over "think" continues into adult usage "Know" and "think" are respectively the 8th and 12th most common verbs in English . . ." (p. 293, fn. 22).

One of the primary pieces of evidence that Nagel takes to suggest that knowledge is prior to belief comes from Shatz *et al.* (1983). Recall that Nagel claims that "children use "know" both earlier and much more heavily than they use "thinks" (p. 22)".⁵ But while it is true that *overall* Shatz *et al.* found that children use "know" earlier and more frequently than "think", the crucial question is *how* these terms are being used. If the evidence is to bear at all on whether "intuitive representation of knowledge really is a composite involving intuitive representation of belief" (Nagel 2013: 285), then not any use of "think" or "know" will do. Rather one wants to know the ways in which these terms are used and their relative developmental priority in mental state ascription.

Shatz *et al.*'s focus is largely on a single child, Abe. In coding the occurrence of the verbs, "thinks", "know", etc., Shatz *et al.* created seven categories: mental state, modulation of assertion, directing the interaction, clarification, expression of desire, action-memory, and "I don't know". Importantly, "know" does occur more than "thinks". But its occurrence is largely restricted to the "I don't know" category.⁶ As Shatz *et al.* note, the initial use is restricted to either "the idiomatic phrase 'I don't know' or pragmatic social routines used to direct the conversation" (p. 311). Indeed, Shatz *et al.* report that "thinks is the first verb used for a mental state function" (p. 311).⁷ They find that the earliest use of a verb for a mental state function is at 2.8 years of age, and here only "think" is

5 It might seem a little curious to be contrasting "know" and "think" rather than "know" and "believe". But some data, e.g., Shatz *et al.*, suggest that "think" is used earlier and more frequently in referring to beliefs. Given that it seems that "think" tends to show up earlier than "belief" in mental state ascription, I will, along with Nagel, largely focus on the contrast between "know" and "think".

6 Shatz *et al.*'s rationale for creating a separate category for "I don't know" sentences was that "In many instances, especially early ones, this appeared to be merely an idiomatic negative expression. A variety of interpretations of this phrase were virtually always possible. Thus, all instances of I don't know were separated into this one category" (p. 308).

7 Verbs were classified as falling into the mental state category "only if the mental term is judged, with regard to its context, to refer to the thoughts, memories or knowledge of the speaker, listener, or a third person." (p. 306)

used. It is not until 2.10 years of age – two months later – that “know” is first used in what they take to be genuine mental state ascription (p. 306).

Focusing on just the Shatz *et al.* data, it seems that “think” is prior to “know” in making genuine mental state ascriptions. And so it seems that this data actually end up supporting orthodoxy: intuitive representation of belief is prior to intuitive representation of knowledge.⁸

Though the Shatz *et al.* data appear to invert Nagel’s conclusion and so provide some support for the view that the concept of belief is prior to the concept of knowledge, Nagel presents other evidence which she takes to favor the priority of knowledge over belief. Nagel mentions “on a database of over 200,000 spontaneous utterances by English-speaking children up to the age of six, Bartsch and Wellman found that the verb ‘know’ figured as the main verb in 70% of children’s epistemic claims, with ‘think’ following at 26%” (p. 293).⁹ Bartsch and Wellman (1995) however, do not present a timetable regarding the emergence of “thinks” and “know” in genuine mental state ascription. Their goal is to investigate whether children acquire a conception of desire prior to belief. And so in investigating this, they simply lump “thinks”, “believe” and “know” under belief in order to make contrasts with various terms expressing desires.

Though Bartsch and Wellman are largely concerned with the issue of whether children develop an understanding of desire prior to belief, they do present some data which might bear on the issue of whether “know” is prior to “think”. They present a timetable of false belief contrastives and uses of “know” which take into account the source of knowledge.¹⁰ Table 1 shows a partial reconstruction of the timetable.

Abe appears to produce false belief contrastives before taking into account the source of knowledge when using “know”. But notice that in the second year columns each use only occurs *once*. Focusing on just Adam and Ross, they appear to take into account the source of knowledge when using “know” earlier than when they first begin producing false belief contrastives. But, this initial use only occurs *once* for Adam and *twice* for Ross. It is doubtful that a single or even a pair of isolated occurrences should be taken as evidence for the developmental priority of the concept know over believe.

8 These data – and indeed the bulk of their data – are only from a single child. Shatz *et al.* very briefly present results on 30 other children. But their analyses are not detailed as their primary focus is on Abe. Of these 30 children, only *six* used mental verbs in genuine mental state ascription at the time of the last available transcript where these children were between 2.6 and 2.8 years of age. These “children used know five times and forget twice” (p. 315). But we’re not told which children used which terms, nor are we given an exact time at which they began using the target term. At best, five out of six children used “know” only once.

9 Though the percentages are correct the description of these terms being used *epistemically* is not. The percentages reflect the overall occurrence of these verbs, regardless of whether they were used epistemically (see Bartsch and Wellman 1995: 29).

10 The production of contrastive utterances (i.e., appearance/reality contrastives) is taken to suggest a recognition that there can be mismatches in one’s mental states and reality and are taken to provide corroboration that when children use terms such as “think”, they have a reasonable grip on understanding mental states such as belief. Similarly, in this literature, evidence that children take into account a source of knowledge is taken to demonstrate that they have a reasonable grip on understanding knowledge. It is also useful to note that in Shatz *et al.*, they discuss the use of contrastives, but when presenting their data, they suggest that Abe used contrastives for “thinks” and though they mention that “Study 2 children produced two contrastives” (p. 315), they do not indicate what mental state verbs were involved (see fn. 8).

Table 1: False Belief Contrastives (Left); Knowledge Source References (Right)¹¹

| Child | Age at First Occurrence | 2 Years | 3 Years | Child | Age at First Occurrence | 2 Years | 3 Years |
|--------|-------------------------|---------|---------|--------|-------------------------|---------|---------|
| Adam | 3.3 | 0 | 10 | Adam | 2.10 | 1 | 14 |
| Abe | 2.9 | 1 | 21 | Abe | 2.11 | 1 | 27 |
| Sarah | 4.0 | 0 | 0 | Sarah | 3.5 | 0 | 3 |
| Ross | 3.3 | 0 | 3 | Ross | 2.8 | 2 | 12 |
| Others | 3.8 | 0 | 6 | Others | 2.11 | 2 | 3 |

Perhaps increased frequency of use provides better evidence for the unfolding of the relevant concepts. But focusing just on Adam and Abe – in the third year – false belief contrastives and uses of “know” occur at similar rates. Since false belief contrastives and knowledge source reference frequencies are similar for at least two of the four children, it seems these data provide us with no way of determining whether the concept of knowledge is prior to belief or whether the concept of belief is prior to knowledge.

These issues are not unique to the Bartsch and Wellman data. They arise for all of the linguistic data which Nagel draws on in support of the claim that the concept of knowledge is prior to belief.¹² For instance, in the Shatz *et al.* study, Abe only used “think” in genuine mental state reference three times. The other six children out of 30 who produced mental state verbs only produced “know” a total of five times and “forget” twice (see fn. 8). The Tardif and Wellman study of Mandarin and Cantonese speakers suffers from similar issues concerning the extremely low frequency at which mental state verbs such as “think” and “know” show up in initial mental state reference.¹³ But set all this aside and ask: even if children and adults use “know” more heavily than “thinks” – as Nagel suggests – what does this show about the conceptual priority between “know” and “believe”? Does it show that the representation of “know” is non-composite?

Suppose, for instance, that children and adults speak more often of “houses” than of “board” or “bricks”. Would this show that the concept “house” is conceptually prior to “boards” or “bricks”? Would it show that the representation of “house” is non-composite? It’s unclear to me what the frequency of use between candidate concepts reveals about whether one is prior to another or whether a candidate concept is composite

11 Of all the belief-desire verbs in the data, four children out of 10 contributed 79% of the belief-desire verbs in the data set used by Bartsch and Wellman (p. 29). This is why the tables here reflect data from only four children.

12 Setting aside the data Nagel draws on, one might wonder whether there are other data which might help decide the issue. But after an extensive literature review, I was unable to locate any studies which take up the sequencing between “know” and “think”. There are studies which look at the use of mental state verbs in young children but, unfortunately, these researchers aren’t pursuing the question of whether “know” is used earlier than “thinks” in mental state ascription. Indeed, these studies tend to group “know” and “think” together to make contrasts with terms expressing belief and those expressing other mental state concepts (see e.g., Pascual *et al.* 2008). So it seems that the evidence discussed by Nagel represents the primary studies which take up the task of sequencing the use of “know” and “think” in the acquisition of the mental state lexicon.

13 Aside from issues with frequency of use in mental state verbs, there are also sample size issues with this study. Data from only 10 Mandarin-speaking children were used in study 1 while data from only 8 Cantonese-speaking children were used in study 2. See e.g., Button *et al.* (2013) for an excellent discussion of how a small sample size tends to lead to highly unreliable results.

or not. Given this and the lack of clarity in the data concerning the acquisition of the mental state lexicon, it seems that, overall, these data are inconclusive on the issue of whether knowledge is prior to belief or vice versa.

3. EVIDENCE FROM THEORY OF MIND TASKS

Given that the data on children's acquisition of the mental state lexicon and evidence concerning the frequency of use for "know" and "think" among children and adults is inconclusive on the issue of whether knowledge is prior to belief or vice versa, I now want to turn to Nagel's second main line of evidence: evidence from theory of mind tasks.

Early research on the false-belief task consistently found that children do not pass the task until around 4 years of age. These initial studies were modeled after the now standard design developed by Baron-Cohen *et al.* (1985). In this task, children listen to a story as it is enacted with dolls and toys: The first character hides a toy in one location and leaves the room; while she is gone, a second character hides the toy in a different location. The child participant is then asked where the first character will look for her toy. Researchers have consistently found that when asked where the first character will look for her toy, 4-year-olds typically say she will look in the first location and provide appropriate justifications for their answers. In contrast, most 3-year-olds say she will look in the second (actual) location, thus failing to demonstrate an understanding that the first character will hold a false belief about the toy's location.

Other research in this area has suggested that children, at a very early age, find it much easier to distinguish knowledge from ignorance than to attribute false belief: only later in their developmental trajectory does the lag between success on knowledge-ignorance and false belief tasks close. In a study by Hogrefe *et al.* (1986), pairs of children were given a familiar container with familiar contents to examine (a domino box with picture dominos in it). One child from each pair was then sent out of the room, and in his absence the other witnessed the contents being replaced with a different item. The second child was then asked two questions:

- (1) Does [name of absent child] know what is in the box now, or does he not know?
- (2) If we ask [name of absent child] what is in the box, what will he say?

The first question was aimed at probing children's ability to distinguish knowledge from ignorance while the second question was aimed at probing children's capacity to attribute false beliefs. Hogrefe *et al.* found that among 3-year-olds, 39% answered question (1) correctly, and only 6% answered question (2) correctly; among 4-year-olds there was improvement with 81% correctly answering (1) and 44% answering (2) correctly; and finally among 5-year-olds the gap finally closed with 88% answering (1) and 76% answering (2) correctly. The evidence from the Hogrefe *et al.* study seems to support the claim that knowledge is prior to belief. Indeed, as Nagel puts it "If we generally made judgments about the presence or absence of knowledge by attributing belief and then evaluating the truth or falsity of this belief, we would not expect to see such a lag between the capacity to recognize the absence of knowledge and the capacity to attribute false belief" (p. 296).

The Hogrefe *et al.* study is one of the primary pieces of data from the theory of mind literature that Nagel draws on in support of the claim that knowledge is prior to belief. What is interesting about the Hogrefe *et al.* study, in contrast to many studies investigating

theory of mind, is that it takes up a developmental sequencing of children's ability to pass various theory of mind tasks. I too am going to present some work which takes up the task of sequencing children's emerging abilities to pass theory of mind tasks. Indeed, I'm going to accept the basic findings of Hogrefe *et al.* since the sequencing pattern they found is well established. So while I ultimately agree with Nagel and many researchers in this area that false-belief tasks tend to be passed later than knowledge-ignorance tasks, I disagree with Nagel that this shows that knowledge is prior to belief. The reason why is because evidence suggests that children understand diverse belief prior to knowledge. But before getting onto this, I want to consider other work on children's performance in false belief tasks which somewhat complicates the picture of the conceptual priority between belief and knowledge which Nagel builds up from children's performance on knowledge-ignorance and false-belief tasks.

From the Hogrefe *et al.* study, take the earliest age at which children's understanding of knowledge outpaces that of belief as the standard by which to judge whether other studies conform to this pattern. Specifically, let 3 years of age be the age at which children understand knowledge but not belief. Fixing 3 years of age as the standard, one can easily find studies where children are capable of passing versions of the false belief task at this age (e.g., Siegal and Beattie 1991; Sullivan and Winner 1993; Clements and Perner 1994; Garnham and Ruffman 2001). To take just one example, Roth and Leslie (1991) found that 3-year-old children attribute false beliefs to a target character when that character makes a deceptive statement. While these children fail the standard false belief task, in a modified version where a target character makes a deceptive statement, they nonetheless attribute a false belief to the character on the basis of the character's false assertion (see Nichols and Stich, 2003 and Rose *et al.* forthcoming for further discussion).

Indeed, there is even evidence that children can pass versions of the false belief task before the age of 3 (Chandler *et al.* 1989; Southgate *et al.* 2007; Surian *et al.* 2007; Buttelmann *et al.* 2009; Kovács *et al.* 2010) with some evidence suggesting that children as young as 15 months can pass some versions of the false belief task (Onishi and Baillargeon 2005). Again, to take just one example, in a study where children had to actively deceive a protagonist, Chandler *et al.* (1989) found that children as young as 2½ years of age were successful in misleading a target protagonist. As they put it, "the results of this study show that even 2½-year-olds are capable of already successfully employing a range of deceptive strategies that both trade upon an awareness of the possibility of false beliefs and presuppose some operative theory of mind" (p. 1263). Taken together, if we use the Hogrefe *et al.* as our standard and let 3 years of age be the age at which children understand knowledge but not belief, we find evidence where children can pass versions of the false-belief task at 3 years of age and other evidence where they can pass versions of false belief tasks before the age of 3.

Perhaps one might be suspicious of the contrast between these studies and the Hogrefe *et al.* study. One might want evidence that the same sample of children display more ease in passing versions of the false-belief task compared with versions of knowledge-ignorance tasks. To this, Wellman and Liu (2004) present a meta-analysis of various studies on the theory of mind tasks. For various studies where children engaged in both a knowledge-ignorance and false-belief task, Wellman and Liu computed the risk difference between performance on the two tasks.¹⁴ While in many cases they found that children displayed

¹⁴ The risk difference is a measure of the observed difference in proportions of individuals displaying some outcome of interest between two groups.

more ease in passing knowledge-ignorance tasks, in other cases they found that “some studies actually report false-belief judgments to be easier than ignorance judgments” (p. 529). Computing the risk difference in studies with children between 4½ and 5½ years of age from Fabricius and Khalil (2003), Wellman and Liu found evidence that children display more ease in attributing false beliefs over ignorance (pp. 525–6).¹⁵ Again computing the risk difference – but this time with studies involving children averaging 3½ years of age – Wellman and Liu report that in some studies by Sullivan and Winner (1993) children displayed more ease in attributing false belief than ignorance, even when a standard false-belief task was used (p. 526). In one study from Sullivan and Winner – which involved modifying the false belief task in such a way that it involved deception of the protagonist – Wellman and Liu found an even larger split, again with children displaying more ease in attributing false belief over ignorance (p. 526). If knowledge is conceptually prior to belief, then it’s surprising that some studies suggest that children display more ease in passing versions of false-belief tasks in comparison to knowledge-ignorance tasks.

But I don’t take any of this as definitive or as clearly favoring orthodoxy. I only mean to suggest that the developmental picture is complicated – especially concerning the contrast between performance on various false-belief and knowledge-ignorance tasks – and sometimes turns up conflicting results. Indeed, along with many other researchers I accept that overall the data suggest that children display more ease in passing knowledge-ignorance tasks than false-belief tasks. I would only ask whether this, by itself, shows that children understand knowledge but not belief. Perhaps probing whether children understand beliefs by using false-belief tasks sets the bar too high. Instead, perhaps all that is required for probing whether children understand beliefs are tasks designed to determine whether children understand that others can hold and act on beliefs that are different from their own.

Indeed Wellman *et al.* (2001) claim that children “can correctly judge persons’ diverse beliefs before they can judge false beliefs” (Wellman and Liu 2004: 528).¹⁶ More specifically, the claim is that:

[I]n cases where the child does not know what is true, young children can first (a) correctly judge that two persons have different beliefs, and (b) correctly judge how a person’s action follows from their belief (in contrast to the child’s own opposite belief). Only later can children correctly make the same judgments when they do know what is true and hence can (c) correctly judge that one person’s belief is true and the other person’s belief is decidedly false, and (d) correctly judge how a person’s actions mistakenly follow from a false belief. (Wellman and Liu 2004: 528)

15 I would clarify that I’m not claiming that this is how Fabricius and Khalil interpret or present these results. They actually defend a perceptual access view in which knowledge is acquired prior to belief. My claim here isn’t that they actually take their work to support epistemological orthodoxy. I’m only reporting on the analyses conducted by Wellman and Liu (2004) which do show that in some cases children displayed more ease in understanding belief over knowledge.

16 Though I’ll follow Wellman *et al.* in referring to these cases as understanding *diverse belief*, the label is somewhat misleading. It’s not simply that the task probes whether children understand that subjects have beliefs about different propositions. Rather the task probes whether children understand that two subjects have conflicting beliefs about a single proposition. That is, the task probes whether children understand that two people can have *inconsistent beliefs*.



Fig. 1. Developmental Sequencing of Theory of Mind Tasks

In a meta-analysis, Wellman and Liu (2004) provide support for the hypothesis that understanding diverse beliefs is easier than understanding false beliefs. More importantly, in a study of their own, Wellman and Liu found both that understanding diverse beliefs emerged earlier and was easier for children than tasks involving false-belief or knowledge attribution. Children were given a range of theory of mind tasks involving (1) diverse desires (do children understand that people can have different desires for the same thing?), (2) diverse beliefs (do children understand that people can have different beliefs about the same situation), (3) knowledge-ignorance (do children understand that something can be true, but someone might not know that),¹⁷ (4) false belief (do children understand that something can be true, but someone might believe something different?), and (5) hidden emotion (do children understand that someone can feel one way but display a different emotion?). Wellman and Liu then constructed a scale – the Theory of Mind Scale – which modeled the level of difficulty that children had in passing these various tasks. They found a clear sequence which can be seen in Figure 1.

The scale proceeds from easiest to hardest, where later tasks are successfully passed at older ages. It establishes a progression of conceptual achievements in theory of mind understanding. Importantly – concerning the sequencing from diverse belief, knowledge-ignorance and false belief – Wellman and Liu found that at an average of 3.9 years children showed an understanding of diverse beliefs, while it was not until around an average of 4.6 years of age that children displayed an understanding of knowledge, followed by false belief at an average of 4.11 years of age (p. 532).

The Theory of Mind Scale developed by Wellman and Liu is robust and maps a clear conceptual progression among diverse populations. The same sequencing that Wellman and Liu found for US children (see Figure 1) has been corroborated with other data from US children (Wellman *et al.* 2008), data from Australian children (Peterson *et al.* 2005; Peterson and Wellman 2009) and data from deaf children (Peterson and Siegal 2000; Peterson *et al.* 2005). The scale has also been used with autistic children and children with Asperger's (Peterson *et al.* 2012) and though the order between false belief and hidden emotion is reversed – with hidden emotion being easier to understand than false belief – the order between understanding diverse desire, diverse belief and knowledge-ignorance is the same as in other populations studied (see Figure 1). Though many of these studies are cross-sectional studies (probing children of different ages at one point in time) like the Hogrefe *et al.* study, Wellman *et al.* (2011) conducted a longitudinal study, obtaining the same results as in the various cross-sectional studies. Thus the scale captures conceptual development of individual children over time.

17 Wellman and Liu actually refer to this task as knowledge-access. But the label is misleading. Indeed, in other papers Wellman and colleagues refer to this task as probing for an understanding of knowledge-ignorance. Moreover, the task is structurally the same as knowledge-ignorance tasks and so should be understood this way.

I take the robust pattern of results obtained with the Theory of Mind Scale – whereby children understand belief prior to knowledge – to provide support for epistemological orthodoxy. But there is some work which seems to threaten this. In a study by Wellman *et al.* (2006) with Mandarin-speaking Chinese children, they found that these children understood knowledge prior to belief. Whereas a range of diverse populations pass diverse belief tasks well before they pass knowledge-ignorance tasks, Mandarin-speaking children showed the opposite pattern, passing knowledge-ignorance tasks before diverse belief tasks. In light of these cross-cultural differences, epistemological orthodoxy – and indeed a knowledge-first view – seems to be threatened since whether one upholds the view that the representation of knowledge is composite, with belief as a conceptual constituent, or not, would amount to nothing more than a piece of cultural epistemic chauvinism.

It is well established that linguistic input about the mind plays an important role in influencing theory of mind development (e.g., Bartsch and Wellman, 1995; Brown *et al.* 1996; LaBounty *et al.* 2008; Turnbull *et al.* 2008). And as Wellman *et al.* (2011) point out, parents of Chinese children speak more often of “knowledge” while parents of US children speak more often of “thinking”. So, it seems that, at least in part, early linguistic input about mental states plays an important role in conceptual development with the result that Chinese children, who receive early emphasis on “knowing”, and US children, who receive early emphasis on “thinking”, show opposite patterns between understanding diverse belief and knowledge-ignorance. If early linguistic input plays a role in influencing theory of mind development, a key question is: when linguistic input about the mind is impoverished, what developmental sequencing in theory of mind development will show up? Since linguistic input about the mind influences theory of mind development, examining the developmental unfolding of various mental state concepts when linguistic input about the mind is impoverished will provide good evidence about the natural conceptual unfolding in theory of mind understanding.

As Wellman *et al.* (2011) note “children who are born deaf into hearing families . . . are unlikely to have anyone at home to converse freely about mind-related topics like thoughts and beliefs” (p. 784). Since children born deaf into hearing families are unlikely to receive substantial input about the mind, the linguistic input they receive about the mind is impoverished relative to their hearing counterparts. Although deaf children born into hearing families show delays in theory of mind development relative to their hearing counterparts, they nonetheless conform to the same developmental pattern as shown in Figure 1 (Peterson *et al.* 2005; Peterson and Wellman 2009). That is, children who are born deaf into hearing families understand belief prior to knowledge. So, once differing linguistic input about the mind (i.e., Chinese parents’ emphasis on talk about “knowledge”; US parents’ emphasis on talk about “thinking”) is substantially stripped away, we find evidence of a natural progression in theory of mind understanding, with belief being understood prior to knowledge. Given this and its coherence with a wide swath of results from diverse populations – ranging from US children, Australian children and children with autism and Asperger’s – it seems that epistemological orthodoxy is not threatened. Taken together, this work provides support for epistemological orthodoxy: *belief is prior to knowledge*.

4. CONCLUSION

Timothy Williamson has argued that knowledge is prime, that it is not a composite of mental and non-mental factors. Moreover, he has claimed that the orthodox view that knowledge is

composite implies that the concept of belief is prior to the concept of knowledge, but that the developmental evidence suggests the exact opposite pattern. Though Williamson does not himself take up the task of assessing the psychological evidence, Nagel does.

Drawing on a range of psychological evidence, Nagel claims support for the Williamsonian view that knowledge is prior to belief. Concerning evidence from children's acquisition of the mental state lexicon, I argued that this evidence that has been misinterpreted (Section 2): it is mixed and thus lends no support to the view that knowledge is prior to belief or vice versa. Aside from this, Nagel draws on only a single study on children's performance in knowledge-ignorance and false-belief tasks – the Hogrefe *et al.* study (Section 3) – claiming that it supports the view that the concept of knowledge is prior to the concept of belief. But I went on to present a range of more recent evidence which supports the exact opposite view. This research suggests that children acquire an understanding of diverse belief much earlier than they acquire an understanding of either knowledge or false belief. There is, however, one final piece of evidence that might be brought to bear on the issue of whether knowledge is prior to belief: data on non-human primates.

Nagel claims that “Nonhuman primates consistently fail false-belief tests, even in competitive situations and using apparatus that enables them to pass very closely matched knowledge-ignorance tests” (p. 298). I accept – along with Nagel and many researchers – that non-human primates do tend to pass knowledge-ignorance tasks but fail false-belief tasks (for an excellent overview see Martin and Santos 2015). In this regard, non-human primates display a similar pattern to children who also tend to pass knowledge-ignorance tasks but fail false-belief tasks. That said, I take the range of data presented in Section 2 – which shows a robust pattern whereby diverse belief is understood prior to knowledge – to support the orthodox view that belief is prior to knowledge. And as far as I'm aware, no studies have been conducted with non-human primates which explicitly look at diverse belief attribution as opposed to false-belief attribution. The extant studies have largely proceeded to contrast performance in knowledge-ignorance and false-belief tasks. If probing for an understanding of diverse belief is relevant for discerning whether subjects understand belief, then the non-human primate data doesn't speak to the relevant issue. It's an open question whether non-human primates understand knowledge prior to belief or vice versa.

Taken together, the evidence supports the orthodox view that the concept of belief is prior to the concept of knowledge. Thus, the psychological evidence reconciles the developmental unfolding of the concepts of knowledge and belief with longstanding philosophical consensus that belief is prior to knowledge.¹⁸

REFERENCES

- Armstrong, D. 1969. 'Does Knowledge Entail Belief?' *Proceedings of the Aristotelian Society*, 70: 21–36.
- Baron-Cohen, S., Leslie, A., and Frith, U. 1985. 'Does the Autistic Child have a "Theory of Mind"?' *Cognition*, 21: 37–46.

18 I would like to thank Robert Beddor, Wesley Buckwalter, David Danks, Alvin Goldman, Kareem Khalifa, Josh Knobe, Jonathan Livengood, Shaun Nichols, Mary Salvaggio, Jonathan Schaffer, Ernest Sosa and Stephen Stich for helpful comments and discussion on earlier versions of this paper. I would especially like to thank John Turri for his helpful comments and discussion as well as his encouragement and support.

- Bartsch, K. and Wellman, H. 1995. *Children Talk About the Mind*. New York, NY: Oxford University Press.
- Brown, J., Donelan-McCall, N., and Dunn, J. 1996. 'Why Talk About Mental States? The Significance of Children's Conversations with Friends, Siblings, and Mothers.' *Child Development*, 67: 836–49.
- Bruceckner, A. 2002. 'Williamson on the Primeness of Knowing.' *Analysis*, 62: 197–202.
- Buckwalter, W., Rose, D., and Turri, J. Forthcoming. 'Belief Through Thick and Thin.' *Nous*.
- Buttelmann, D., Carpenter, M., and Tomasello, M. 2009. 'Eighteen-month-old Infants show False Belief Understanding in an Active Helping Paradigm.' *Cognition*, 112: 337–42.
- Button, K. S., Ioannidis, J. P., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E., and Munafò, M. R. 2013. 'Power Failure: Why Small Sample Size Undermines the Reliability of Neuroscience.' *Nature Reviews Neuroscience*, 15: 365–76.
- Chandler, M., Fritz, A., and Hala, S. 1989. 'Small-scale Deceit: Deception as a Marker of Two-, Three-, and Four-year-olds' Early Theories of Mind.' *Child Development*, 60: 1263–77.
- Chisholm, R. 1989. *Theory of Knowledge*, 3rd edition. Englewood Cliffs, NJ: Prentice-Hall.
- Clements, W. and Perner, J. 1994. 'Implicit Understanding of Belief.' *Cognitive Development*, 9(4): 377–97.
- Cohen, L. J. 1966. 'More about Knowing and Feeling Sure.' *Analysis*, 27: 11–16.
- . 1989. 'Belief and Acceptance.' *Mind*, 98: 367–89.
- Conee, E. and Feldman, R. 1985. Evidentialism. *Philosophical Studies*, 48, 15–34.
- Fabricius, W. V. and Khalil, S. L. 2003. 'False Beliefs or False Positives? Limits on Children's Understanding of Mental Representation.' *Journal of Cognition and Development*, 4: 239–62.
- Fricke, E. 2009. 'Is Knowing a State of Mind? The Case Against.' In P. Greenough and D. Pritchard (eds), *Williamson on Knowledge*, pp. 31–60. New York, NY: Oxford University Press.
- Garnham, W. and Ruffman, T. 2001. 'Doesn't See, Doesn't Know: Is Anticipatory Looking Really Related to Understanding or Belief?' *Developmental Science*, 4: 94–100.
- Goldman, A. 1976. 'Discrimination and Perceptual Knowledge.' *Journal of Philosophy*, 73: 771–91.
- Greenough, P. and Pritchard, D. 2009. *Williamson on Knowledge*. New York, NY: Oxford University Press.
- Hogrefe, G. J., Wimmer, H., and Perner, J. 1986. 'Ignorance Versus False Belief: A Developmental Lag in Attribution of Epistemic States.' *Child Development*, 57: 567–82.
- Jones, O. R. 1971. 'Knowing and Guessing: By Examples.' *Analysis*, 32: 19–23.
- Kovács, Á. M., Téglás, E., and Endress, A. D. 2010. 'The Social Sense: Susceptibility to Others' Beliefs in Human Infants and Adults.' *Science*, 330: 1830–4.
- LaBounty, J., Wellman, H., Olson, S., Lagattuta, K., and Liu, D. 2008. 'Mothers' and Fathers' Use of Internal State Talk with their Young Children.' *Social Development*, 17: 757–75.
- Lehrer, K. 1968. 'Belief and Knowledge.' *Philosophical Review*, 77: 491–9.
- Magnus, P. and Cohen, J. 2003. 'Williamson on Knowledge and Psychological Explanation.' *Philosophical Studies*, 116: 37–52.
- Martin, A. and Santos, L. 2015. Origins of mental state representations in infants and non-human primates. Unpublished manuscript.
- Molyneux, B. 2007. 'Primeness, Internalism and Explanatory Generality.' *Philosophical Studies*, 135: 255–77.
- Murray, D., Sytsma, J., and Livengood, J. 2013. 'God knows (But does God believe)?' *Philosophical Studies*, 166: 83–107.
- Myers-Schulz, B. and Schwitzgebel, E. 2013. 'Knowing that P without believing that P.' *Nous*, 47: 371–84.
- Nagel, J. 2013. 'Knowledge as a Mental State.' *Oxford Studies in Epistemology*, 4: 275–310.
- Nichols, S. and Stich, S. 2003. *Mindreading: An Integrated Account of Pretense, Self-Awareness and Understanding Other Minds*. Oxford: Oxford University Press.
- Onishi, K. H. and Baillargeon, R. 2005. 'Do 15-month-old Infants Understand False Beliefs?' *Science*, 308: 255–8.
- Pascual, B., Gerardo, A., Sotillo, M., and Masdeu, J. 2008. 'Acquisition of Mental State Language in Spanish Children: A Longitudinal Study of the Relationship Between the Production of Mental Verbs and Linguistic Development.' *Developmental Science*, 11: 454–66.

- Peterson, C. and Siegal, M. 2000. 'Insights into Theory of Mind from Deafness and Autism.' *Mind and Language*, 15: 123–45.
- and Liu, D. 2005. 'Steps in Theory of Mind Development for Children with Autism and Deafness.' *Child Development*, 76: 502–17.
- and Wellman, H. 2009. 'From Fancy to Reason: Scaling Deaf and Hearing Children's Understanding of Theory of Mind and Pretence.' *British Journal of Developmental Psychology*, 27: 297–310.
- and Slaughter, V. 2012. 'The Mind Behind the Message: Advancing Theory-of-Mind Scales for Typically Developing Children, and Those with Deafness, Autism or Asperger Syndrome.' *Child Development*, 83: 469–85.
- Rose, D. and Schaffer, J. 2013. 'Knowledge Entails Dispositional Belief.' *Philosophical Studies*, 166: S19–50.
- , Buckwalter, W., and Turri, J. Forthcoming. 'When Words Speak Louder than Actions: Delusion, Belief and the Power of Assertion.' *Australasian Journal of Philosophy*.
- Roth, D. and Leslie, A. 1991. 'The Recognition of Attitude Conveyed by Utterance: A Study of Preschool and Autistic Children.' *British Journal of Developmental Psychology*, 9: 315–30.
- Rysiew, P. 2013. 'Is Knowledge a Non-Composite Mental State?' *Oxford Studies in Epistemology*, 4: 333–45.
- Shatz, M., Wellman, H. M., and Silber, S. 1983. 'The Acquisition of Mental Verbs: A Systematic Investigation of the First Reference to Mental State.' *Cognition*, 14: 301–21.
- Siegal, M. and Beattie, K. 1991. 'Where to Look First for Children's Knowledge of False Beliefs.' *Cognition*, 38: 1–12.
- Sorensen, R. 1982. 'Knowing, Believing, and Guessing.' *Analysis*, 42: 212–13.
- Sosa, E. 2007. *A Virtue Epistemology: Apt Belief and Reflective Knowledge*, Volume One. Oxford: Oxford University Press.
- . 2011. *Knowing Full Well*. Oxford: Oxford University Press.
- Southgate, V., Senju, A., and Csibra, G. 2007. 'Action Anticipation Through Attribution of False Belief by Two-year-olds.' *Psychological Science*, 18: 587–92.
- Steup, M. 2006. *The Analysis of Knowledge*. In E. N. Zalta (ed.), *Stanford Encyclopedia of Philosophy* (Spring 2006 Edition).
- Sullivan, K. and Winner, E. 1993. 'Three-year-olds' Understanding of Mental States: The Influence of Trickery.' *Journal of Experimental Child Psychology*, 56: 135–48.
- Surian, L., Caldi, S., and Sperber, D. 2007. 'Attribution of Beliefs by 13-month-old Infants.' *Psychological Science*, 18: 580–6.
- Tardif, T. and Wellman, H. 2000. 'Acquisition of Mental State Language in Mandarin- and Cantonese-speaking Children.' *Developmental Psychology*, 36: 25–43.
- Turnbull, W., Carpendale, W., and Racine, T. 2008. 'Relations Between Mother-Child Talk and 3- to 5-year-old Children's Understanding of Belief: Beyond Mental State Terms to Talk about the Mind.' *Merrill-Palmer Quarterly*, 54: 367–85.
- Turri, J. 2010. 'Does Perceiving Entail Knowing?' *Theoria*, 76: 197–206.
- Williamson, T. 2000. *Knowledge and its Limits*. New York, NY: Oxford University Press.
- . 2011. 'Philosophical Expertise and the Burden of Proof.' *Metaphilosophy*, 42: 215–29.
- . 2013. 'Review of J. Alexander, Experimental Philosophy: An Introduction.' *Philosophy*, 88: 467–74.
- Wellman, H., and Liu, D. 2004. 'Scaling of Theory of Mind Tasks.' *Child Development*, 75: 523–41.
- , Cross, D., and Watson, J. 2001. 'Meta-Analysis of Theory of Mind Development: The Truth about False Belief.' *Child Development*, 72: 655–84.
- , Fang, F., Liu, D., Zhu, L., and Liu, G. 2006. 'Scaling Theory of Mind Understanding in Chinese Children.' *Psychological Science*, 17: 1075–81.
- , Lopez-Duran, S., LaBounty, J., and Hamilton, B. 2008. 'Infant Attention to Intentional Action Predicts Preschool Theory of Mind.' *Developmental Psychology*, 44: 618–23.
- , Fang, F., and Peterson, C. C. 2011. 'Sequential Progressions in a Theory of Mind Scale: Longitudinal Perspectives.' *Child Development*, 82: 780–92.
- Zagzebski, L. 2009. *On Epistemology*. Belmont, CA: Wadsworth.

DAVID ROSE is currently a graduate student in the Department of Philosophy at Rutgers University. Before coming to Rutgers, he earned an M.S. in Logic, Computation and Methodology from Carnegie Mellon University and a B.A. in Philosophy and Psychology from Ohio University. He is currently working on issues at the intersection of cognitive science and metaphysics and cognitive science and epistemology.
