

In an earlier post, I spelled out what philosophers and psychologists of mindreading call “the aspectuality of belief.” To understand the aspectuality of belief is to understand that a person can believe that Cicero was bald without believing that Tully was, if she does not know that Tully was Cicero — in spite of the fact that the state of affairs of Cicero’s being bald is no other than the state of affairs of Tully’s being bald. I also argued that the false-belief condition of the Sefo study by Southgate, Chevallier and Csibra (2010) may provide the basic ingredients required for investigating toddlers’ understanding of the aspectuality of belief on the assumption that the toddlers fully understand the content of the mistaken speaker’s utterance whereby she requests her toy while pointing to a box that does not contain the requested toy.

However, Gergo Csibra, one of the co-authors of the Sefo study, has convincingly argued that my assumption is unwarranted and he has offered an alternative interpretation of the findings, according to which this study is evidence that toddlers attribute false beliefs about an object’s location, but not that they understand the aspectuality of beliefs.

In this post, I want to reflect on a recent study of early understanding of aspectuality by Fizke, Butterfill, van de Loo, Reindl and Rakoczy (2017) based on the paradigm of active helping.

Most, if not all, the developmental studies of the early understanding of the aspectuality of beliefs by human children in the past thirty years or so have been based on false-belief tasks. These tasks can be either explicit or implicit and either aspectual or non-aspectual. In explicit tasks, but not in implicit tasks, participants are asked a direct question. Most non-aspectual false-belief tasks probe children’s capacity to attribute to others false beliefs about an object’s location. Some also probe children’s capacity to attribute to others false beliefs about the unexpected content of a box (e.g. a smarties box that is shown to contain pencils).

Most studies of children’s understanding of aspectuality so far have been based on explicit aspectual false-belief tasks. For a while, most children who were shown to pass explicit non-aspectual tasks were also shown to fail explicit aspectual tasks. [\[1\]](#) A standard example of an early explicit aspectual task is Apperly and Robinson’s (1998; 2001; 2003) study. It goes as follows. The children are first familiarized with two objects — one with a single aspect and the other with two aspects. For example, one object is a regular eraser, which visually looks like an eraser. The other is both a dice and an eraser: it visually looks like a dice (not like an eraser), but it feels like an eraser (if touched). The children watch a puppet look at the two objects without touching either. Finally, the children see the experimenter place each object in two separate boxes in the puppet’s presence. Then the children are directly asked to predict where the puppet will search for an eraser. Apperly and Robinson (1998; 2001; 2003) have reported that children who passed non-aspectual false-belief tasks were at chance in their aspectual task.

Instead of using two toys, one with two aspects and the other with a single aspect, Rakoczy, Fizke, Bergfeld and Schwartz (2015) used a single toy with two aspects, e.g. a die that was also an eraser, and got rid of the second toy with a single aspect, e.g. the regular eraser. On this new simplified basis, Rakoczy and colleagues found that the performances of 4-year-olds in explicit aspectual and non-aspectual false-belief tasks are reliably correlated.

Rakoczy and colleagues interpret this last finding as evidence for Apperly and Butterfill’s version of the two-systems approach to mindreading. On this approach, success on explicit false-belief tasks requires full-blown mindreading and implicit false-belief tasks are taken to probe minimal mindreading. Rakoczy and colleagues interpret their last finding as evidence that explicit false-belief tasks display a pattern of unified results: in other words, full-blown mindreading is thereby shown to be able to handle equally aspectual and non-aspectual explicit false-belief tasks. To put it in terms of the title of their paper, “explicit [or full-blown] theory of mind is even more unified than previously

assumed: belief ascription and understanding aspectuality emerge together—in development.”

Conversely, on this approach, implicit false-belief tasks are expected to display a dissociated pattern, according to whether the task is aspectual or non-aspectual. On this approach, minimal mindreading is taken to underlie infants’ and toddlers’ responses in implicit non-aspectual false-belief tasks alone. The fact that infants and toddlers have been shown to expect a mistaken agent to act in accordance with the content of her true or false belief about an object’s location is interpreted as early evidence of minimal mindreading. On the two-systems approach, minimal mindreading is taken to enable infants and toddlers to represent the content of an agent’s false *registration*, which is supposed to be sufficient to account for findings based on implicit false-belief tasks about an object’s location. However, minimal mindreading is also supposed to be unable to handle implicit aspectual false-belief tasks.

This prediction has been recently tested in a study by Fizke, Butterfill, van de Loo, Reindl and Rakoczy (2017), in which they adapt the active helping paradigm first designed by Buttelmann, Carpenter and Tomasello (2009) to compare the capacity of 31-month-olds to help an agent open an empty box in either a non-aspectual or in an aspectual task when the agent either had a true or a false belief about the toy’s location. (I have already discussed this paradigm in an earlier post.)

In the non-aspectual study (which mirrors the study by Buttelmann and colleagues, 2009), in the puppet’s absence, the toddlers were first shown how to open a pair of boxes that were difficult to open. After the puppet was introduced, she was shown the toy with a single aspect; she expressed a liking upon receiving it and she placed it in one of the two boxes with the experimenter’s help because the boxes were hard to open. Then the experimenter moved the single-aspect toy from one box to the other, either in the presence or in the absence of the puppet. In the false-belief condition alone, when the puppet was absent, the experimenter proposed to play a trick on the puppet and sneakily moved the toy from one box to the other. Like Buttelmann and colleagues (2009), Fizke and colleagues compared the toddlers’ helping behavior when the puppet tried unsuccessfully to open the empty box when she either knew that the box was empty or when she falsely believed the toy to be there.

In the aspectual study, Fizke and colleagues (2017) used the same kind of stimuli as Rakoczy and colleagues (2015), e.g. a bunny toy that could be transformed into a carrot toy. In the puppet’s absence, the toddlers were first shown how the bunny could be transformed into a carrot. After the puppet was introduced, she was shown the toy under its bunny aspect; she expressed a liking towards it; she placed it in one of the two boxes with the help of the experimenter. Then the experimenter transformed the bunny into a carrot before returning it into the same box, either in the presence or in the absence of the puppet. In the false-belief condition alone, when the puppet was absent, the experimenter proposed to play a trick on the puppet when she transformed the bunny into a carrot, “giggling, gesturing, and whispering ‘Shh’.” Finally, the puppet saw the toy under its carrot aspect be taken out of the box by the experimenter and placed, not in the other box, but visibly in front of the puppet. Fizke and colleagues compared the toddlers’ helping behavior when the puppet tried unsuccessfully to open the empty box either when she knew that the box was empty because she was aware of the two aspects of the toy or when she falsely believed the toy to be in the empty box because she was not aware of the two aspects of the toy.

In accordance with the prediction of the two-systems model, Fizke and colleagues found that the toddlers’ helping behavior was significantly different in the true- and the false-belief condition of the non-aspectual study, but *not* in the aspectual study. In a nutshell, in the false-belief condition of the non-aspectual study, most toddlers helped the mistaken puppet by opening the non-empty box; in the true-belief condition most helped the non-mistaken puppet open the empty box. Thus, they replicated Buttelmann and colleagues’ (2009) findings. But in both the true- and the false-belief

conditions of the aspectual study, most helped the puppet open the empty box: in the false-belief condition of the aspectual study, most failed to help the mistaken puppet by picking up and giving to the puppet the carrot toy that was also the bunny.

I now wish to question Fiske and colleagues' conclusion that their findings support the prediction based on Apperly and Butterfill's two-systems approach. The prediction was that the minimal mindreading system should enable toddlers to know the difference between helping a mistaken agent and a non-mistaken agent when the relevant object has only one aspect, but not when the relevant object has two aspects.

What is to be explained is the asymmetry between the findings based on the non-aspectual study and on the aspectual study. In the non-aspectual study, most 31-month-old toddlers helped the mistaken puppet by opening the non-empty box, but most helped the non-mistaken puppet by opening the empty box. However, in the aspectual study, most helped the puppet by opening the empty box in the true-belief condition and in the false-belief condition as well.

What I take to be uncontroversial is that in the aspectual study, only if toddlers could confidently attribute to the puppet *the false belief that the visible carrot is not the bunny* could they efficiently help the mistaken puppet by picking up the carrot and by showing her that (contrary to her expectation) the carrot is the bunny. However, there are at least three good independent reasons why the toddlers are unlikely to attribute to the puppet the false belief that the carrot is not the bunny in the false-belief condition of the aspectual study. According to one line of reasoning, the so-called "false-belief" condition turns out to be an *ignorance* condition. According to the other line of reasoning, it turns out to be a *true belief* or a *knowledge* condition.

To see why it might be construed as an ignorance condition, consider the following instance of Frege's puzzle. Suppose you know that Cicero was Tully. Suppose you have evidence that Jane believes that Cicero was a Roman orator and you also have evidence that Jane does not believe that Tully was a Roman orator. Then all you can conclude is that Jane does not know whether Cicero was Tully. You are *not* entitled to further attribute to Jane the *false belief* that Cicero was *not* Tully. Similarly, from the fact that the toddlers think that the puppet does not know that the carrot is the bunny, it does *not* follow that they could conclude that the puppet falsely believes that the carrot is not the bunny. If this is correct, then it follows that the so-called "false-belief condition" of the aspectual study is really an *ignorance* condition. It is an open question for further research whether toddlers can *help* an ignorant agent fulfill her goal as efficiently as they can help a mistaken agent fulfill her goal. This could be tested in a non-aspectual study as well as in an aspectual study.

But it might also be construed as a *knowledge* condition along the following lines. In the non-aspectual study, the relevant property of the single-aspect toy is its location, which is an episodic, non-enduring, property of the toy. Either the puppet was present when the experimenter moved the toy from one box to the other or not. If not (as in the false-belief condition), then toddlers can confidently attribute to the puppet the relevant false belief about the toy's location.

Not so in the aspectual study. There, the relevant properties of the toy are its two aspects, which are two non-episodic, enduring, properties of the toy. The mere fact that the puppet was absent when the experimenter demonstrated that the bunny can be transformed into a carrot and back does not conclusively establish that the puppet does not know that the bunny is also a carrot. The toddlers might assume that it is shared knowledge that the bunny is also a carrot and that the puppet might have had antecedent knowledge of the two aspects of the toy.

The fact that in the aspectual study, unlike the non-aspectual study, the helping behavior of most toddlers was not significantly different in the true-belief condition and in the so-called "false-belief"

condition strongly suggests that the alleged “false-belief” condition is really a knowledge condition, i.e. that they assumed that it is shared knowledge that the bunny is also a carrot and that the puppet knows it.

There is yet a further reason why toddlers are likely to construe the “false-belief” condition as a knowledge (rather than as an ignorance) condition. Suppose the toddlers had seen the puppet place a real-life rabbit into the box with the experimenter’s help and they had seen the experimenter pull a real-life carrot out of the same box and place it visibly in front of the puppet. Then the toddlers would arguably rely on their own belief that a real-life carrot cannot be a real-life rabbit in order to ascribe to the puppet the true belief that the real-life carrot cannot be a real-life rabbit. They could confidently rule out the possibility that the experimenter could turn the real-life rabbit into a real-life carrot by manipulating it inside the box. Arguably they could also confidently assume that the puppet also would rule out the possibility that the experimenter could turn the real-life rabbit into a real-life carrot by manipulating it inside the box.

However, in the aspectual study, the toddlers have been expressly taught by the experimenter that the new fascinating toy is similar to both a real-life rabbit and a real-life carrot, and thus that it is entirely different from either a real-life rabbit or a real-life carrot precisely because it is both a bunny toy and a carrot toy. If they have understood the experimenter’s pedagogical demonstration, then they cannot rule it out that the experimenter could turn the bunny into the carrot by manipulating it inside the box. But if so, then they cannot either confidently assume that the puppet has ruled it out that the experimenter could turn the bunny into a carrot toy by manipulating it inside the box. If so, then they are likely to assume that the puppet is likely to know that the bunny is also the carrot. The knowledge interpretation is a likely consequence of the experimenter’s pedagogical demonstration about how to transform the bunny into a carrot and back again.[\[2\]](#)

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unified than previously assumed: Belief ascription and understanding aspectuality emerge together in development. *Child Development*, 86, 486-502.

[1] Here, I entirely ignore the interesting issue highlighted by Perner, Huemer and Leahy (2015) and further explored by Oktay-Gür and Rakoczy (2017), namely that there is a puzzling window when children pass false-belief tasks but fail true-belief tasks.

[2] I am grateful to Gergo Csibra and Dan Sperber for conversations on this post.