Simulation vs. Theory-Theory: A Plea for an Epistemological Turn

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Simulation, if used as a way of becoming aware of other people's mental states, is the joint exercise of imagination and attribution. If A simulates B, then (i) A attributes to B the mental state in which A finds herself at the end of a process in which (ii) A has imagined being in B's situation. Although necessary, imagination and attribution are not sufficient for simulation: the latter occurs only if (iii) the imagination process grounds or justifies the attribution. Depending on the notion of justification we use to make sense of the idea that an episode of imagining *serves as a reason* for attributing a mental state, the shape of the debate and the options it offers look very different. Reconfiguring the discussion in this way, we claim, shifts the focus of the simulation vs. theory-theory debate to a question located in epistemology.

How do we become aware of other people's mental states? One possibility is that we are equipped with a theory whose domain of application is constituted by other agents' mental states. On this view, becoming aware of someone else's mental state is a case of inferring from a token behavior the mental state that has caused it by applying the relevant part of a psychological theory. Another possibility is that we have the capacity to simulate other people's mental states; that is, we are able to put ourselves in other peoples' shoes, and go through in imagination the mental states we would go through were we really in the other person's circumstances. The end result of such a process, namely the mental state in which the simulator finds herself, can now serve as a guide to what mental state the simulated person is in.

In recent years, it has been widely acknowledged that these two models, the 'theory–theory' model and the 'simulation' model of our mind-reading abilities, are not so much competing theories of the same phenomenon but rather different means at our disposal to make sense of others as psychological beings. But this does not mean that the simulation vs. theory-theory debate has become obsolete. On the contrary: we argue that it should not and could not be properly examined without bringing in wider epistemological considerations. In other words, rather than providing any direct arguments in favour of or against any of these models, we would like to contribute to the debate by clarifying its framework.

We are very much aware of the fact that the contemporary debate about the attribution of mental states to others is not an either/or debate between simulationists and theory-theorists, but rather between these two views on one hand and a new contestant, the 'phenomenological' or 'enactive' view on the other (Hutto 2007, 2008, Zahavi 2008, Ratcliffe 2007, Gallagher 2005, 2007a, 2007b). According to this third option, we become aware of other agent's mental states without relying either on imagination or simulation or the explicit application of a theory (maybe by 'directly perceiving' their mental states). We will not say much about this third way of thinking about the attribution of mental states and restrict our argument to various versions of the simulationist and the theory-theory view, because the question of justification play a much clearer role in these. It would be interesting to examine the epistemological commitments of the 'phenomenological'/'enactive' view, but we will not do that here.

After examining what we take to be two crucial concepts in the specification of what simulating consists in, imagination and attribution, we argue that the focus of the simulation

vs. theory-theory debate revolves around the following question: in what way a subject A's imagining herself in subject B's situation can constitute a reason for her attribution of a mental state to B? If the answer to this question is that it is the application of a psychological theory that licenses this step then we end up with an account of our mind-reading abilities that draws on both simulation and theory: we get a 'hybrid account'. If, on the other hand, the answer is that imagination can be a reason for attribution without recourse to any theory, then we end up with an account that we could call 'pure simulation'. The result of reconfiguring the debate in that way shifts the focus of the debate away from the topic of our mind-reading abilities to a question located in epistemology.

I. Simulation: The joint exercise of imagination and attribution

A standard way of characterizing simulation is the following: an agent A imagines herself in B's circumstances, gets a grip on what she, A, would do (see, feel, think, etc.) and concludes that this is what he, B, would also do (see, feel, think, etc.) in these circumstances.[1] As Gregory Currie writes: "I imagine myself to be in the other person's position, […] I simply note that I formed, in imagination, a certain belief, desire or decision, then attribute it to the other" (Currie 1995, pp. 144-145).

      What this approximate characterization hides is that we engage in simulation in very different ways and for very different reasons. Sometimes we simulate others because we believe it is the best way to know what they will do (see, feel, think, etc.), but at other times, we simulate someone else just in order to coordinate our movements with them. Sometimes we simulate with the aim of getting to know what we should be doing at some point in the future, which is what happens if we are planning to perform some action, but at yet other times, we simulate in order to confirm or specify further an attribution that is already in our possession. Some further cases of simulation might constitute an educational or recreational project.[2] These aims often combine.

      Whatever the goal is, one attributes to someone else a mental state not only as a result of having imagined being in the situation she is in, but also *because* of it. A simulates B if and only if:

(i)   A imagines being in B's situation
(ii)   A attributes a mental state to B, and
(iii)   The *reason* for (ii) is (i): the *reason* for A's attributing a mental state to B is A's imagining herself in B's situation.

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[1] A and B can be the same person.
[2] We sometimes imagine ourselves in counterfactual situations for the sheer pleasure of it. In this type of cases, the imaginative project is not undertaken as form of mind-reading: no mental state is attributed to ourselves or to anyone else. Although the term 'simulation' is often used to cover the latter cases too, here we reserve the term to refer to forms of *mind-reading* activities - for which it was introduced.

This paper will focus on the manner in which imagination can constitute a reason for attribution.[3]

Before turning to these questions, however, we need to elaborate on our characterization of simulation by examining its two central components: imagination and attribution, keeping in mind that the characterization of these concepts has to be broad enough to cover the multifaceted phenomenon that has been called simulation. We shall then be in a position to test our account against the ways in which simulation is understood in the literature (Section II). Finally, we will show how the way in which we interpret the epistemic notions of reason or justification at play in clause (iii) above illuminates an important aspect of the debate between the simulationist and the theory-theorist (Section III-V).

II. Imagination and Attribution

Imagining being in someone else's situation is, to use Kendall Walton's phrase, a case of imagining *de se*. He writes:

> "Imagining de se" [is] a form of self-imagining characteristically described as imagining *doing* or *experiencing* something (or *being* a certain way), as opposed to imagining merely *that* one does or experiences something or possesses a certain property.[4]

If I imagine being in your situation, then I do not simply imagine *that I am* in your situation, but I imagine experiencing what I would experience were I in your situation.

Imagining being in someone else's situation is often interpreted as a special case of imagining *de se*, namely, 'imagining from the inside'. An episode of 'imagining from the inside' can be broadly characterized as one in which I imagine myself in your situation from your point of view or perspective.[5]

Adopting someone else's perspective could mean at least two things. First, I can attempt to adopt your perspective in the sense that I transpose myself, in imagination, into a *physical* space from where you witness the situation.[6] Second, I can attempt to adopt your

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[3] Note that the problem we are dealing with here is not part of the global skeptical worry with regard to the existence of other minds. Our question is rather: given that others have mental states, what is the nature and the role of simulation in our becoming aware of them.

[4] Walton 1990, p. 29. Original emphasis.

[5] See Walton 1990 on a detailed discussion of imagining from the inside.

[6] This is the subcase of imagining having someone else's experiences that Wollheim calls 'central imagining'. Wollheim explicitly argues that there are other cases of imagining having someone else's experiences, namely, examples of 'acentral imagining'. Like Wollheim, we regard both cases as imagining having someone else's experiences (Wollheim 1987, p. 103ff. See also Wollheim 1974. esp. pp. 179-80, Wollheim 1984. pp. 72-83). See also Gregory Currie on 'impersonal imagination' (Currie 1995, pp. 155–180), and Peter Goldie on 'empathy' (Goldie 2000, 2001).

psychological make-up or dispositions in the circumstances.[7] Part of the reason why the notion of 'imagining from the inside' is so notoriously vague[8] may be that the notion of perspective can be interpreted in either of these two senses of perspective.

When we imagine ourselves in other people's situation, we may or may not constrain the process on these two dimensions of perspective. In other words, we may or may not imagine the other person 'from the inside'. In the spirit of accounting for as much as possible of what simulation covers, we shall remain as liberal as possible in our characterization of imagining oneself in someone else's situation. Sometimes this amounts to imagining the other person from the inside (in one or both senses of the term), but sometimes it does not. The concept of imagination relevant for simulation is *imagining oneself being in someone else's situation.*

Three observations are now in order. First, given the various goals we pursue when simulating, the phrase 'B's situation' has to be interpreted broadly. The situation in question might be actual, counterfactual, future conditional or even fictional. Second, on this picture, imagining being in someone else's situation is not necessarily a case of attempting to replicate the experiences of another person, that is, it is not a process that fails or succeeds depending on the actual degree of similarity between A's imagined mental states and B's actual mental states. In other words, imagining myself in your situation is really imagining myself in *what I take to be* your situation.[9]

Finally, although imagining can be taken to be an intentional action, we do not want to be committed to this narrow way of thinking of imagining in general and imagining oneself in the other person's situation in particular. Imagining can be unintended and even unconscious. Again, we'd like to keep the imagination component of simulation as general as possible, therefore not restricting the concept of imagining to an intentional conscious mental action.

The concept of attribution is less complicated. The easiest way (and perhaps the most typical in the literature) in which to think of A's attributing a mental state to B is as A's representation of B's mental state: A represents B having a certain mental state.[10]

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[7] See, for example, Smith 1995, Smith 1997 who insists that for imagining from the inside, there must be some (though not necessarily exhaustive) similarity between the experiences of the imaginer and the person imagined from the inside.

[8] Wollheim famously wrote that he "could not trust that phrase [the phrase 'imagining from the inside'] so abused in philosophy" (Wollheim 1974. p. 87).

[9] In other words, it is not required for one's imagining having someone else's experiences that one replicates in imagination, either fully or partially, the other person's experiences (see Currie 1995. See also Currie 1993, Levinson 1993, Lopes 1998, Morton 2006 on this question). This was also, arguably, Adam Smith's view on sympathy, see Nanay 2010). This being said, when the goal of simulation is epistemological, then replicating faithfully the other person's mental states become the key to a successful simulation.

[10] We have cashed out our characterization of attribution in terms of meta-representation, for it is probably the most familiar way of interpreting attribution. It is not our view however that attribution cannot occur in creatures not capable of, or not yet capable of metarepresentation. An agent may be capable of having simultaneous models of how things look for two different people without having representations of representations, and these cognitive abilities might be enough for some forms of attribution (Perner 1993, esp.chapter 3 and chapter 4). Nothing in this paper depends on taking a stance on that issue.

We can now put together our respective characterizations of imagination and attribution. (i) I imagine myself being in your situation, (ii) I attribute a mental state to you, but, crucially, (iii) the reason for my attributing this mental state to you is that I imagine myself being in your situation. In other words, the reason for (ii) is (i).

Before we examine further clause (iii) and the ways in which this analysis may shed light on the debate between the simulationist and the theory-theorist, we should explore how well our account of simulation captures the various ways in which this concept is conceived of in the literature.

Simulation theories come in many varieties. Adam Morton identified three key dimensions around which a rough taxonomy of different conceptions of simulation could be devised (Morton 2003, pp. 122-135). Different theories tend to emphasize and combine these different key dimensions in different ways. What is important for our purposes is to show that our account of simulation accommodates any combination of these dimensions.

The first dimension along which a theory of simulation might vary concerns the level of the cognitive processes that it involves. Simulation might be thought of as operating at a subpersonal level, or, alternatively, at the personal level (Morton 2003, p. 123). Our account of simulation is neutral with regard to this distinction between the personal and the subpersonal, since both imagination and attribution have been defined in such a way that is silent with respect to the processes and mechanisms in which these capacities are realized, and are therefore compatible with either personal or subpersonal instantiations of them.

The second dimension Morton talks about concerns the degree to which the particular mental processes of the simulated person are taken into consideration by the simulator. At one end of the spectrum, one would engage in what can be called *co-cognition* (Heal 1998, 2000), and at the other end of the spectrum we find *modelling* (Gordon 1995a 1995b). While the co-cognizer only takes into account the initial challenge the other person is facing, and seeks the answer to this challenge only by means of her own mental resources, the modeller tries to think through the other person's problem in a way that corresponds to the manner in which the modeller believes the other person is likely to think through her problem (Morton 2003, p. 128).

The issue here concerns one of the two notions of perspective we mentioned in connection with imagining from the inside, namely, psychological perspective. When we are simulating, we can attempt to adopt the mental set-up of the person we simulate. This might be a good idea if we know that the person we are trying to simulate thinks very differently from the way we do. That is what the modeller does. The co-cognizer, on the other hand, just imagines going through the simulated person's task herself, mobilising the same mental competences she herself would use if she were performing this task. Our account of simulation is compatible with both modelling and co-cognising, as our account is neutral with respect to whether the imagining process that is part of simulation should imply taking into consideration the other person's mental dispositions.

Morton's third dimension, the centered vs. non-centered dimension of simulation is again best understood with the help of the notion of perspective: in this case, physical perspective. As we have seen, if I imagine having someone else's experiences, I can do so in two different ways. I can envisage this person's situation entirely from her own physical perspective. However, I can also envisage the other person's situation from the point of view that I occupy. Morton calls the former case 'centered simulation', whereas the latter he calls

'non-centered simulation'.[11] Our characterization covers both centered and non-centered simulation, as our notion of imagination covers both those cases where we take the other person's physical perspective into consideration and those cases where we don't.

Thus, our account of simulation does not rule out any obvious candidate for a theory of simulation expounded in the literature, while it is capable of accommodating the most important ones: the question is whether and in what way this account can illuminate the simulation vs. theory-theory debate.

III. Simulating vs. Theorizing

Simulation involves taking imagining oneself in another person's situation to be a reason for making attributions concerning this person's mental states. We argue that the shape of the simulation vs. theory-theory debate depends on the way in which we spell out what 'reason' is taken to mean in this context.

As a first approximation, the difference between simulation and theory-theory could be articulated in the following way: Simulation is attribution that happens as a result of imagination, whereas theory-theory is attribution that happens as a result of applying a theory. In other words: A simulates B if A attributes a mental state to B and her reason for doing so is imagining being in B's situation. If A attributes a mental state to B and her reason for doing so is that it follows from the application of a psychological theory, then A is theorizing.

The picture, however, is more complicated. If it is A's application of a psychological theory, rather than her imagining herself in B's situation, that constitutes the reason or justification for attributing a mental state to B, then A's attribution falls under the theory-theory model of our mind-reading abilities. If, by contrast, A's imagining herself in B's situation is indeed the reason for A's attribution of a mental state to B, then a further question needs to be asked: in what way a person's imagining can constitute a reason for her attribution?

There are many ways in which the idea of reason or justification for attributing mental states can be understood. What is crucial in the present context is whether such justification presupposes the application of a psychological theory. Imagining being in someone else's situation might constitute a reason for an attribution in virtue of the application of a psychological theory, or, alternatively, it might constitute a reason for an attribution without any such theory being applied. However, note that while both of these models qualify as simulation given that in both cases imagining ourselves in the situation of others justifies the attribution of a mental state, the former also looks very much like a version of the theory-theory view in as much as it claims that the attribution of a mental state is (at least partly) justified by the application of a psychological theory.

In order to elaborate on the significance of the distinction between these two versions of simulation, we need to clarify the difference between justification by means of theorizing and justification without any such appeal. These models we call respectively the hybrid model of simulation and pure simulation.

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[11] This distinction is similar to the one Wollheim makes between central and acentral imagining (Wollheim 1984, see also Goldie 1999, 2000). It is important to note, however, that Morton's distinction is a distinction between two kinds of *simulation*, whereas Wollheim's differentiates between two kinds of *imagining processes*.

IV. The hybrid simulation account

The application of a theory might be thought to be best understood with the help of the notion of *inference*. A straightforward way in which imagining can justify attribution in the process of applying the relevant theory is if we *infer* on the basis of imagining ourselves in someone else's situation that we can attribute a certain mental state to this person. The problem with an appeal to inferences (besides the notorious difficulties surrounding this concept) is the following. Inference may be sufficient for theorizing,[12] but it is much less clear that it is necessary. One could make the case for the claim that, for example, we may engage in theorizing without really drawing any inferences if, for example, the theory in question becomes so entrenched that its application happens quasi-automatically.

Fortunately, we do not need to appeal to the concept of inference to cash out the notion of theorizing at stake here. A weaker requirement on theorizing can be used when trying to differentiate between justification by means of theorizing and justification without theorizing. One such requirement might consist in context-independent representations of the connection between types of imaginings and types of attributions. If it is theorizing in virtue of which imagining justifies attribution, then the agent must have some kind of context-independent representation of the connection between types of imaginings and types of attributions. These representations may be explicit and conscious, as is the case when deliberately drawing inferences. But this is not necessarily the case: they may as well be unconscious representations that nevertheless enable the agent to apply a theory.

Whether inferential and conscious or automatic and non-conscious, if the step from one's imaginings to one's attributions involves the application of theory, we get what we call a hybrid account of simulation. According to the hybrid model of simulation, when A imagines being in B's situation and finds herself in a mental state, it is a psychological theory that justifies her attribution of this mental state to B. On this picture, simulation and theory-theory would not be two mutually exclusive ways of figuring out someone else's mental state: simulation would presuppose, as a necessary ingredient, the mastery and the application of a theory. Our imaginings can justify our attribution only because of a psychological theory.[13] This would give rise to a hybrid theory-simulation account.

In the last fifteen years or so, more and more contributors to the simulation-theory debate have suggested that pure simulation and pure theory-theory should not be thought of as mutually exclusive candidates to account for our mind-reading abilities (Heal 1995, 1998, Goldman 2000, Stone&Davies 1996). The thought is that mind-reading does not have to consist in either pure simulation or pure theorizing: it integrates both simulation and theorizing. Note that the hybrid view on offer here echoes this recently popular suggestion of a compromise in as much as we also talk about a way of attributing mental states to others that combines simulation and theorizing. However, what we call the hybrid model consists not merely of a mix of (pure) simulation and (pure) theorizing. The suggestion here is that

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[12] Even the sufficiency claim is questionable. One possible problem is that while the notion of theory is often taken to presuppose lawlike generalizations, inferences can take place in the absence of these.

[13] Note that this interdependence of simulation and theory is very similar to what Davies 1994 suggested (for different reasons) when he examined whether simulation presupposes having tacit knowledge of a psychological theory.

there is a way of simulating that necessarily involves theorizing since imagination justifies attribution by means of theorizing. In other words, the bonds between simulation and theorizing in the hybrid account are much tighter than it has been suggested.

V. The pure simulation account

According to the pure simulationist account, A attributes a mental state to B as a result of her imagining herself in B's situation without relying on any theory. In other words, A's imagination can justify her attribution of a mental state to B without appeal to any theory. Thus, theory would not play any role in simulation; we get a pure (that is, not hybrid) simulationist account. The aim of this section is not to give arguments for the correctness of the pure simulationist account but to show that this is a coherent view and, importantly, to point out how it differs from the hybrid account of simulation.

An analogy with some views in the philosophy of perception may be helpful. Some philosophers argue that perceptual beliefs are justified, not because one uses any theoretical apparatus (of justification), but because perception is a reliable process: p reliably causes perceptual beliefs that p. Thus, when p causes the belief that p reliably (however that is to be understood), p in itself is enough to justify having a perceptual belief that p, without the use of any theoretical apparatus or even inferences.[14]

The same kind of relation might hold between imagination and attribution. It could be argued that the fact that A imagines herself being in mental state M in B's situation reliably indicates that B is being in mental state M. But why would imagination be a reliable process? While it makes sense to say that perception is reliable process (after all, it is a causal one), why claim the same with regard to imagination? The answer is that imagination is not a reliable process in general: if I imagine how my grandchild will look like, it is unlikely that I will get it right. But a special case of imagination, namely, imagining being in someone else's situation, may reliably indicate the other person's mental states, provided that the mental setup of the simulator and that of the simulated person are sufficiently similar.[15] Thus, we can say that A's imagining herself being in mental state M in B's situation justifies A's attribution of M to B without any appeal to theory. If this is the case, then it is possible to take one's imagination to be the reason for one's attribution without the use of any theory.

An example may be useful. Gordon (1995a 1996) has attempted to articulate such a non-hybrid view under the label 'radical simulation'. According to Gordon, at least a sub-set of simulation episodes are cases of simply recentering oneself in the simulated person's location and concerns through what he calls 'an egocentric shift' (Gordon 1995a, p. 56). On this picture, one simply sees the situation from the perspective of the other and registers how the world is for this other person. The distinguishing feature of this way of adopting someone else's perspective on the world, Gordon argues, is that it does not require the

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[14] Reliabilism is one way in which the idea we are after can be cashed out (see, e.g., Goldman, 1967, 1976, Plantinga 1993, Dretske 1981, Nozzick 1981, Swain 1981, Armstrong 1973). We are not interested in adjudicating between different versions of reliabilism or to take sides with any view in epistemology or in philosophy of perception. The role of this analogy is to point out that there are perfectly consistent and even fashionable views regarding justification that do not appeal to the application of any theory.
[15] See Morton's observations (Morton, 2006) about the circumstances under which imagining someone else is likely to be successful.

mastery and the application of any mental concepts on behalf of the simulator and thus excludes the possibility that simulating presupposes an episode of theorizing. Although the idea of undergoing an 'egocentric shift' is a notoriously difficult one to cash out (see Heal 1995, p. 44), from our perspective, what is important is that Gordon's theory, whatever its merits, falls under the category that we labeled 'pure simulation' (see also Jeannerod & Pacherie 2004). [16]

We have considered two ways in which imagination can justify attribution. If this justification happens with the help of a theory, then we get hybrid simulation. If, on the other hand, the justification does not require any theory, then we face pure simulation.

VI. Conclusion: An Epistemological Turn?

The aim of this paper was to show that the simulation vs. theory-theory debate is in a large part epistemological. We found that we need to distinguish three different ways in which one could be said to justifiably attribute a mental state to someone else:

(1) Imagining oneself in the other person's situation justifies the attribution of mental states to her without recourse and deployment of a psychological theory (pure simulation)
(2) Imagining oneself in the other person's situation justifies the attribution of mental states to her with recourse and deployment of a psychological theory (hybrid simulation)
(3) The attribution of mental states is justified without any use of imagination (theory-theory)

The debate regarding which of these three is the right way to think about mental attribution in the present context is an epistemological one in at least three distinct senses.

First, general epistemological considerations put constraints on the simulation vs. theory-theory debate. Depending on what epistemological background theory one has, the simulation vs. theory-theory debate will look very different. If one denies the possibility of justification without the deployment of at least some theoretical apparatus, then (1) is not an option: the debate will be between (2) and (3), both of which involves some reference to theories. If, on the other hand, one favors reliabilist accounts of justification and thus allows for justification without the deployment of any theory, then the debate will revolve around the question of whether it is possible that imagination justifies attribution without any use of a theory (or, to put it differently, whether our psychology could serve as a guide for someone else's psychology): the real divide will be between (1) on the one hand and (2) and (3) on the other. In short, one's general views in epistemology will determine the shape of the simulation vs. theory-theory debate.

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[16] Some are persuaded that pure simulation finds at least some confirmation by recent neuro-anatomical findings (Gallese & Goldman 1998, Adams 2001, for example). The suggestion is that mirror neurons provide the physiological basis for simulation. If this suggestion is correct, then there is a way of simulating other people that does not require the use of any theory: thus, this proposal is also a version of the 'pure simulation' account. It is not our aim here to evaluate this proposal, but to point out that this would count as an example of a 'pure simulation' view.

Second, we aimed to point out that all three accounts of mind-reading appeal to some notion of justification. Hence, they could not be fully spelled out without using one or another specific notion of justification. Depending on what notion of justification we plug in into these accounts, we will get different theories of mind-reading with varying plausibility.

Third, the stance we take with regard to the simulation vs. theory-theory debate put constraints on one's general epistemological considerations. Depending on what account of mind-reading one finds plausible, one ends up with different implications with regard to more general epistemological claims. If one finds it plausible that our imagining episode can serve as a reason for attributing mental states to others without relying on any theoretical apparatus, for example, this commits one to a version of reliabilism about justification. Thus, when adjudicating between the accounts of mind-reading we differentiated, the epistemological assumptions behind these accounts should not be ignored.

Let us conclude by observing that the claim we are making is not that the simulation vs. theory-theory debate is *just* an epistemological debate and nothing more. Even if we resolved all general epistemological disagreements, this would not settle the simulation vs. theory-theory debate. This debate is partly psychological and we do not want to deny this. Our contention is that it is *partly* psychological, but it is also partly epistemological: psychology alone, without bringing in epistemological considerations, will not settle this debate. In fact, the failure to distinguish clearly the epistemological issues discussed here from the psychological ones could have contributed to the confusion of the various dimensions of this debate.

Thus, we suggest an epistemological turn in the simulation vs. theory-theory debate: in order to settle, or even to take a stance on, this issue, we need to bring in epistemological considerations. But this does not mean that we should forget about the psychological nature of this debate. The suggested epistemological turn in the simulation vs. theory-theory debate is really only a half turn.

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