Chapter 21
Mental Simulation and the Reification of Beliefs

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Abstract Simulation theory has been put forward as an account of our folk understanding of the mind. In this chapter, I examine a neglected argument to the effect that there is an essential limitation of simulation itself, which cannot explain a crucial ingredient of our ordinary, folk-psychological conception of beliefs. Even if it is conceded that simulation gives the subject some sense of what happens in the world when someone believes something, the understanding of *facts* of believing that can be extracted from simulation is incomplete; simulation must be augmented with a theory of beliefs as genuine *constituents* of such facts. Folk psychology reifies beliefs in order to deal with an essential requirement for mastery of the folk-psychological concept of belief. Hopefully, a reflection on the limits of simulation will lead to a better understanding of the role of theory in ordinary belief-ascriptions.

Keywords Mental simulation · Theory of mind · Ontology of belief · Reification of beliefs · False belief task

21.1   Introduction

In the last few decades, philosophers of mind and cognitive psychologists have debated about what our ordinary understanding of the mind consists in. The original discussion concerned the issue of whether this understanding should be explained in terms of our mastering a theory, or in terms of a general capacity for simulating others. According to the so-called *theory-theory*, we posit unobservable entities (mainly beliefs and desires) in order to explain observed facts (mainly behaviour), using our mastery of psychological laws. According to the rival, *simulation theory,* we understand others by trying to get our own mind to work in relevant ways like

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theirs. Simulation in this sense is a practical ability, which does not require a sophisticated grasp of psychological laws.[1]

What has emerged from this debate is that folk psychology probably uses both strategies to a certain extent, depending on what is relevant in the context. However, it is fair to say that the respective contributions of simulation and theory are still not entirely clear. In this chapter, I would like to examine a neglected argument to the effect that there is an essential limitation on simulation, which cannot explain a crucial ingredient of our ordinary conception of belief. Even if it is conceded that simulation gives the subject some sense of what happens in the world when someone believes something, the understanding of *facts* of believing that can be extracted from simulation is incomplete—simulation must be augmented with a theory of beliefs as genuine *constituents* of such facts. Hopefully, the following discussion will lead to a better understanding of what is involved in ordinary belief-ascriptions (namely statements of the form "*S* believes that *p*", where *S* is a subject and *p* a truth-evaluable proposition).

I should make clear at the outset that I am concerned here with the issue of what our ability to *ascribe* mental states consists in. In other words, I am interested in our *theoretical* understanding of the mind, and the extent to which such understanding also depends on practical simulation. Now, one can argue that our understanding of the mind can also be purely practical, i.e. characterized by "action, involvement and interaction based on environmental and contextual factors" rather than as "explanation or prediction based on mental contents" (Gallagher 2005, p. 212). In the present chapter, I have nothing to say about the possibility of a purely practical understanding of the mind, which arguably does not involve the explicit ascription of mental states as such.

This chapter is structured as follows. In the next three sections, I formulate what seems to me to be the most convincing version of simulation theory as an account of belief-ascriptions, which I call "the quasi-modal account of beliefs". Although it owes much to Robert Gordon's work, it is less radical than his own simulation theory, since an important objection to Gordon's theory has been taken into account. In Sect. 21.5, I try to show that simulation theory is unable to deal with an essential requirement for mastery of the concept of belief. In Sect. 21.6, I strengthen my argument by considering an analogy with tense logic. In Sect. 21.7, I suggest that folk psychology meets the relevant requirement by referring to, or quantifying over beliefs, thus going beyond the quasi-modal account. In the concluding section, I ask whether the argument of this chapter shows that the quasi-modal account is wrong, or just incomplete. I am inclined to favour the latter option.

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[1] Many of the relevant papers are collected in Davies and Stone (1995a, b) and Carruthers and Smith (1996). See also Dokic and Proust (2002) and Goldman (2006).

21.2   Mental Simulation

The main tenet of simulation theory, as an account of our folk understanding of mental states, is that the ability to *imagine* or *simulate* worlds possibly different from the actual one can be exploited to adopt alien perspectives—to represent the world not only as I have found it, but as others have found it, or as I might have found it.

Sometimes, the claim is that merely imagining the world from the other's perspective is enough to ascribe the relevant beliefs to her:

> to attribute a belief to another person is to make an assertion, to state something as a fact, *within the context of practical simulation*. Acquisition of the capacity to attribute beliefs is acquisition of the capacity to make assertions in such a context. (Gordon 1995a, p. 68)

Indeed, Gordon often comes close to what might be called "the non-conceptual view of belief-ascription", according to which the capacity to ascribe beliefs does not require antecedent possession of psychological concepts. If practical simulation can ground belief-ascription, and does not require mastery of the concept of belief, belief-ascription itself does not have to deploy such a concept.

However, as many critics of Gordon have pointed out, simulating the world, even as the other has found it, falls short of ascribing a belief (Heal 1994, p. 136; Jacob 2002; Currie and Ravenscroft 2002). It is one thing to *engage* in simulation, but it is another thing to *describe* or *exploit,* in a detached way, the results of simulation. If simulation is to underlie ascriptions of mental states, the subject should be able to understand the specific consequences that it has beyond its scope, and in particular on what is the case in the real world as she conceives it. What must be explained is the significance of *embedding* a particular simulation within her own *doxastic* perspective, i.e. the perspective of her beliefs about the world.

This much should be conceded to theory-theory: The mere capacity to engage in practical simulation does not give the subject an idea of what is the case in the real world when someone believes something. This is true even if the simulation happens to be successful, i.e. if the simulator actually gets her mind to work like the simulatee's.

However, the nonconceptual view of belief-ascription is not the only option available to someone who wants to give simulation a central role in a theory of how we understand others and ourselves. Even if the exploitation of simulation in belief-ascription essentially involves psychological concepts, the latter may not include the concept of belief as a theoretical posit, as theory-theory claims. In other words, two questions should be distinguished:

1. Can simulation ground belief-ascription without deploying any psychological concepts?
2. Can simulation ground belief-ascription without deploying the concept of belief as a mental state?

What I have claimed so far is that we should give a negative answer to the first question. A nonconceptual view of belief-ascription is hopeless. However, this leaves

the second question open. Theory-theory also gives a negative answer to it. Now, perhaps a simulative account of belief-ascription can show that theory-theory over-intellectualises beliefs in this respect.

21.3   The Quasi-Modal Account of Beliefs

Compare mental simulation with games of make-believe. A child who pretends that a particular banana is a telephone needs at least the capacity to keep in mind several "situations" or "mental models" at once (Perner 1991). In one model, she is holding a banana while in the other model she is holding a telephone. The representations "I am holding a banana" and "I am holding a telephone" do not conflict with each other because they belong to different mental models. The former representation describes her doxastic world, i.e. the world as she believes it to be, whereas the latter representation describes her imaginary world, i.e. the world as she imagines it to be.

Strictly speaking, the capacity to engage in games of make-believe does not require an explicit representation of the pretence as such. There is an analogy with desire here (Currie 1998; Nichols and Stich 2000). Just as we can imagine a creature that acts on its desires without having any belief of the form "I desire that *p*", we can imagine a creature that plays games of make-believe without having any belief of the form "I pretend that *p*".

However, a minimally reflective creature will have at least beliefs, or experiences, about what is desirable (from its point of view). Similarly, a minimally reflective creature will have some beliefs about the pretence. For instance, if our child is asked what she is doing, she might be old enough to give the following answer:

(1) I am holding a banana, but in the game, I am holding a telephone.

The representation "In the game, I am holding a telephone" is a natural expression of the *embedding* of her imaginary model within her doxastic one. This complex representation, which is part of the child's model of reality, contains another representation ("I am holding a telephone"), originally produced within the child's imaginary model and now indexed to a particular game of make-believe.

Consider now mental simulation. Just as one can index an imaginary situation to a particular game of make-believe, perhaps one can index an imaginary situation to a particular person. Even though I believe that it is raining, I can imagine the world as it would be if it were sunny. Furthermore, I can imagine such a world from the perspective of a particular person, for instance Pierre. I can thereby form a complex representation such as the following:

(2) It's raining, but according to Pierre, it's sunny.

The representation "According to Pierre, it's sunny" is a natural expression of the embedding of my imaginary model within my doxastic one. The expression "according to Pierre" is, like "in the game", an intensional operator modifying a representation which the subject may not consider true. Of course, much more has to

be said about such operators if we are to explain the significance of embedding one mental model within another. However, it is worth observing that intuitively, "According to Pierre, it's sunny" is true if and only if my simulation of Pierre is reliable (I am getting my mind to work like Pierre's), and the latter is reliable if and only if Pierre *believes* that it is sunny.

On what I shall call "the quasi-modal account of beliefs", the phrase "Pierre believes that" has more or less the same sense as "according to Pierre". Prior and others have defended the view that this phrase is a unary sentential operator, on a par with the operators used in modal logic (Prior 1963; and, for a sympathetic account of Prior's view, Recanati 2000, § 3.2). What is added here is the idea that its use is based on mental simulation. I understand "Pierre believes that *p*" as "According to Pierre, *p*", namely by running and exploiting a simulation of Pierre. Just as modal operators like "it is possible that" and "it is necessary that" do not explicitly refer to or quantify over possible worlds, judgements of the form "According to Pierre, it's sunny" do not represent doxastic perspectives or beliefs as such. On the quasi-modal account, belief-ascriptions deploy psychological concepts, namely those expressed by "according to *X*", but do not introduce beliefs as *objects* (in the broad Fregean sense of the term, which includes abstract entities). The quasi-modal account of beliefs is ontologically *neutral* in this respect.

21.4   Nested Simulations

On Gordon's view, the ability to simulate the world from the other's perspective gives sense to the idea of a "mental location", i.e. "to the notion of something's being a fact *to* a particular individual" (1996, p. 18). It could be argued that a representation such as "According to Pierre, it's sunny" gives expression to this idea; I can use it to represent that it is a fact *to* Pierre that it is sunny although I myself believe that it is raining.

However, Gordon makes clear that a subject who imagines the world from the other's perspective, even if it is incompatible with her own perspective, still falls short of manifesting possession of the ordinary concept of belief. The problem is that she "is not yet in a position to understand that *her own present beliefs* may themselves deviate from the facts". Indeed, "she will not come to understand this as long as she ascertains what her own present beliefs are by asking what the facts are" (1995b, p. 62). Now what is remarkable is that Gordon thinks that an appropriate *nesting* or *embedding* of simulations can yield the more sophisticated notion of belief:

> To see her own present beliefs as distinguishable from the facts she will have to simulate another for whom the facts are different—or, more broadly, adopt a perspective from which the facts are different, whether this perspective is occupied by a real person or not—and then, from the alien perspective, *simulate herself.* (1995b, p. 62)

Gordon describes another way in which, according to him, one can come to understand that one's present worldview can be wrong. It can arise with "the capacity to demote some of one's own *memories* to off-line status" (1995b, p. 62). I seem to remember that this was a rock but I now know that it is a sponge. I come to understand that my previous worldview was wrong:

> by simulating a possible later perspective of her own the child may come to conceptualize in a more sophisticated way what she now counts naïvely as fact pure and simple. She comes to think of it instead as fact relative to her present perspective. (1995b, p. 62)

Now, what Gordon says about embedded simulations also applies to the representations that give expression to such embeddings. In effect, the claim is that one has to understand that the operator "according to *X*" is *recursive,* so that one can form sophisticated representations such as the following:

(3) *p*, and according to someone (¬*p* and according to me (*p*)).

The idea is that I must go through a representation of someone else, or of myself at a different time, to access my present beliefs conceived as one fallible perspective among others. Thus, on the quasi-modal account of beliefs, my understanding of false beliefs can be fully manifest in my use of "according to *X*" as a recursive operator.

21.5   The Limits of Simulation

Does the quasi-modal account of beliefs really succeed in dealing with belief-ascriptions? What Moore's paradox shows (among other things) is that although there is something odd about a statement like "I believe that it's raining, but it's not raining", it is not a logical contradiction. I might believe something false. Indeed, it is a minimal requirement for mastery of the concept of belief that one can make sense of the metaphysical possibility that I believe that *p* while ¬*p:*

> *Minimal Requirement (for mastery of the concept of belief):* Anyone who masters the concept of belief can conceive of the truth of "Possibly, I believe that *p* but ¬*p*" for at least some contingent propositions *p*.[2]

Independently of whether the competent subject reifies beliefs, she should be able to understand that the fact that she believes that *p* is consistent with ¬*p* being a fact, or equivalently with *p* being a mere (i.e. nonfactual) state of affairs.

What I would like to show is that the quasi-modal account of beliefs goes no way toward explaining how the Minimal Requirement can be met. Let us consider again the kind of representation that according to the quasi-modal account manifests our understanding of the notion of false belief:

(4) It's raining, but according to Pierre (it's sunny, and according to me, it's raining).

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[2] It has been objected (by Josh Mozersky) that this formulation does not allow for an essentially omniscient being. My answer is that an essentially omniscient would not have *beliefs,* and so would not use folk psychology as we know it.

The fact that a subject makes sense of (4) does not yet show that she understands that the embedded representation, "It's sunny, and according to me, it's raining", expresses a metaphysical *possibility*. Note that in general, the quasi-modal account must deal with the ascription of beliefs with impossible contents, such as the following:

(5) Hesperus is Phosphorus, but according to Pierre, Hesperus is not Phosphorus.
The square root of 4 is 2, but according to Pierre, the square root of 4 is 3.

Perhaps one can understand the representation "According to Pierre, Hesperus is not Phosphorus" by running a simulation in which there seem to be two planets, but it does not follow that the simulator thinks that there is a possible world in which Hesperus is not Phosphorus. On the contrary, she pictures Pierre's world as an *impossible* one. Similarly, I can simulate a world in which it seems that the square root of 4 is 3 (for instance, I simulate Pierre doing a calculation whose result is that the square root of 4 is 3), but it by no way follows that I picture Pierre's world as a possible one. Now the point is that (4) could be in the same boat as the examples in (5). The mere fact that the representation "It's sunny, and according to me, it's raining" is used in the scope of the quasi-modal operator "according to Pierre" does not entail that Pierre's world is a possible one *according to the subject*.

In other words, it is far from obvious that embedding quasi-modal operators can yield an understanding of the notion of false belief. Such embedding can at best yield an understanding that others *think* that one is actually wrong; it cannot yield an understanding that others are *possibly right* in thinking that one is wrong. Similarly, the capacity to demote some of one's own memories to offline status, as well as the capacity to simulate a possible later perspective of one's own, are insufficient to ground mastery of the notion of belief. On the quasi-modal account of beliefs, a subject can conceive of a later perspective according to which she is now wrong, but this is not how she understands the possibility that such a perspective is the correct one. By embedding appropriate quasi-modal operators, she can give expression to the idea that she was wrong in the past but not that she might have been right then. In general, the subject cannot express in purely quasi-modal terms the possibility that one of her own beliefs is false, *independently of anyone's opinion on the matter*. The Minimal Requirement is left unexplained.

21.6 An Analogy with Tense Logic

An analogy with tense logic might be useful at this point. Tense logic in the modern form invented by Prior involves "tensed" sentences which are true or false only relative to a time. Tensed sentences can be uttered on their own, or embedded in temporal operators, such as "in the past" and "in the future". When a tensed sentence like "Brown is ill" is uttered on its own, it is understood as "implicitly characterizing" the time of the utterance, so that the sentence is true if and only if Brown is ill at that time. The sentence can also characterize other times when it is used in the

scope of some temporal operator. For instance, an utterance of "In the past, Brown is ill" is understood as characterizing some time before the time of the utterance.

Now as Prior was perfectly aware, this introduces an *asymmetry* between the time which is *present* from the speaker's point of view and other times:

> It is clear that although the […] tensed language *mentions* no instants there is a sense in which it *implicitly refers* to the time of utterance, and by tensing what is implicitly said of the time of utterance it can indirectly characterise other times too, also these are referred to rather indefinitely. […] But every complete tensed sentence characterises the time of utter-ance in some way or other, and *other times only through their relation to that one*. (Prior, 2003, pp. 224–225; last italics mine)

In its simplest form, tense logic makes "now" redundant in the sense that whenever it is correct to assert a tensed sentence on its own, it is correct to assert this sentence modified by "now". At some point, Prior was tempted to go further, and defend what he calls "a redundancy theory of the present tense", which he formulates as follows:

> I have argued that, whatever the proposition that *p* might be, the proposition that *it is (now) the case that p* is the very same proposition as the proposition that *p*. For instance, the proposition *that it is now the case that I am sitting down* is the very same proposition as the proposition *that I am sitting down* […]. (2003, p. 171)

However, Prior quickly realized that there are counterexamples to the redundancy theory of the present tense. As is now well known, the statement "In the future, Brown is ill" is not equivalent to the statement "In the future, it is now the case that Brown is ill". The former statement is true if and only if Brown will be ill (relative to the time of utterance), whereas the latter statement is true if and only if it will be true that Brown is ill at the time of utterance. In David Kaplan's words, "now" can-not be controlled by an operator, for it will simply "leap out of its scope to the front of the operator" (1989, p. 510). A plausible explanation of this phenomenon is that "now" directly *refers* to the time of utterance. This explanation puts in jeopardy the ontological neutrality of tense logic.

Now, consider the following analogy between tense logic and the quasi-modal account of beliefs. In the latter account, there is also an asymmetry, between one's own doxastic perspective and others'. When a sentence is used on its own, it im-plicitly characterizes the subject's perspective, at least in the sense that she sincerely asserts *p* if and only if her doxastic world includes the fact that *p*. As a consequence, whenever it is correct to assert *p,* it is correct to assert "According to me, *p*". The quasi-modal operator "according to me" corresponds to the adverb "now" in the temporal case. Other doxastic perspectives are characterized only through their re-lation to the subject's, for instance as "According to *X*, it's sunny", where *X* is con-ceived to be someone else.

It does not follow that "*p*" and "According to me, *p*" can be substituted *salva veritate* in any context, at least if the latter is intended to have the same sense as "I believe that *p*". In particular, the statement "According to Pierre (it is sunny and according to me, it is raining)" is not equivalent to "According to Pierre (it is sunny and it is raining)". In contrast to the first statement, the second ascribes to

Pierre a belief with an impossible content.[3] Similar remarks can be made about the behaviour of "according to me" in the scope of modal operators. For instance, the true statement "It is possible that (it is sunny and according to me, it is raining)" is not equivalent to the necessarily false statement "It is possible that (it is sunny and it is raining)".

The friend of tense logic must meet the challenge of explaining the behaviour of "now" in the scope of modal and quasi-modal operators while staying ontologically neutral as far as times are concerned. The point of the analogy is that the friend of the quasi-modal account of beliefs must also meet the challenge of explaining the behaviour of "according to me" in the scope of modal and quasi-modal operators while staying ontologically neutral as far as doxastic perspectives are concerned.

Perhaps, a sophisticated simulationist will find a way of meeting this challenge, and explaining the Minimal Requirement within the quasi-modal account of beliefs. For my part I have been unable to think of any such way. In the rest of this chapter, I shall rather try to show that folk psychology goes beyond the quasi-modal account of beliefs in order to deal with the Minimal Requirement.

21.7   The Reification Argument

According to what I shall call "the Reification Argument", the Minimal Requirement is explained by *reference* to or *quantification* over doxastic perspectives or beliefs. We ordinarily conceive the fact that someone believes something in terms of the existence of a mental state, belief, which is posited as a real object. In other words, folk psychology *reifies* beliefs:

> *Reification: S* believes that $p \rightarrow$ There is a belief b such that b is true iff p.

Reification of beliefs is what allows us to place what we see as a true belief in a possible world in which it is false. In particular, it allows us to make sense of the following statement:

> (6) My belief that p is true, but it is metaphysically possible that it is false.

This statement is *de re* relative to my current doxastic perspective, since the anaphor "it" in the scope of the modal operator "it is possible that" points back to the nominalization "my belief that p", which is outside the scope of the operator. Thus, the truth of "It is possible that I believe that p while $\neg p$" (which requires, for instance, the possible coexistence of the fact that I believe that it is raining and the fact that it is sunny) is understood in terms of the independence of a *belief* from what makes it true or false in the world. In (6), I identify my belief *across* possible worlds, thus expressing the idea that the same belief can be true in one world and false in another. Reification explains the Minimal Requirement.

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[3] I presuppose that a single place is in question, and that the feature sunny excludes the feature rainy.

The claim that folk psychology reifies mental states such as beliefs has a surprising implication for the interpretation of well-known empirical data in cognitive psychology. Following an initial suggestion by Dennett (1978), so-called false belief tasks have been designed to determine whether children have the ability to attribute false beliefs to others. The classical version of these tasks, due to the developmental psychologists Hans Wimmer and Josef Perner (Wimmer and Perner 1983), involves a character called "Maxi". Maxi hides a chocolate bar in a blue box, and then leaves the room. In Maxi's absence, another character moves the chocolate bar from the blue box to another, red box. Maxi returns, and the child is asked to indicate where Maxi is likely to look for the chocolate bar. The well-known results are that children around the age of three tend to indicate the red box (where the chocolate bar really is), while older children tend to indicate the blue box (where Maxi falsely believes the chocolate bar to be). Wimmer and Perner's conclusion was that only the older children, around the age of four, master the concept of false belief.

In recent years, many psychologists have objected that the classical version of the false belief task is too intellectualistic. Indeed, it seems to be quite difficult for the children even independently of the requirement to reason about false belief. So, 3-year-olds might fail the false belief task because of general task demands (Bloom and German 2000). Other versions have been designed, including nonverbal ones, that seem to show that children much younger than three, including babies, already have some capacity to understand that others can have false beliefs (Onishi and Baillargeon 2005; Surian et al. 2007; Baillargeon et al. 2010).

If the argument of the present chapter is on the right track, most of these experiments, including the original versions by Wimmer and Perner, do not really test the mastery of the folk-psychological concept of belief. Insofar as they involve the ascriptions of mental states to *others,* no conclusion can be drawn about whether children understand that one of their own present beliefs might be false. Again, a quasi-modal conception of beliefs is enough to understand that someone else has a wrong picture of reality, in the sense of having a set of beliefs that are at odds with one's own picture of reality. Genuine false beliefs tasks should have essentially a self-referential component, which is lacking in many tasks described in the current literature.

So, what do these versions test? One possible answer is that some of them test the presence of a form of purely practical understanding of the mind, which does not involve the ascription of mental states as such. Another answer is that they test the presence of a conception of a type of mental states less sophisticated than beliefs, for instance some epistemic or proto-doxastic relation to, rather than a separate doxastic representation of, the external world.[4] In order to understand such an epistemic relation, the child should be able to distinguish a situation in which the relation holds, and a situation in which it does not hold. In contrast, understanding the folk-psychological concept of belief requires being able to distinguish three types

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[4] See Bartsch and Wellman (1995), who draw on both conceptual and developmental grounds a distinction between understanding mental states as mere connections and understanding them as genuine representations.

of situation: a situation in which the other has a true belief, a situation in which she has a false belief, and a situation in which she does not hold the belief at all. The former requires only a quasi-modal conception of mental states, whereas the latter involves the reification of beliefs as mental entities ontologically distinct from the state of affairs they are about.

Let me conclude this section with a few points of clarification. First, the Reification Argument is independent of the issue of whether beliefs should be conceived as concrete objects, like brain states, or as more abstract ones. Beliefs are objects that one cannot easily count, and it has been argued (notably by Steward 1997) that the type-token distinction, which has a point in the case of concrete objects, does not apply to beliefs, just as it does not apply to numbers. Perhaps folk psychology itself is neutral on this issue.

Second, the Reification Argument does not entail that there is a source of direct knowledge of beliefs, such as introspection. I take Frege to have shown, in opposition to an influential Kantian tradition, that objects can be given independently of a source of (internal or external) knowledge. Frege thought, perhaps wrongly, that numbers are such objects. One goes beyond the Reification Argument if one claims that beliefs are like numbers in this respect.

Third, the Reification Argument leaves open the possibility of further analysis of beliefs, for instance as involving relations to propositions. I am not sure that this analysis is the correct one, but it is at least prima facie consistent with the picture of beliefs as entities whose existence or instantiation can be independent of what makes them true or false in the world.

Finally, the Reification Argument does not rest on purely linguistic grounds. It is plausible that the verb "believe" is grammatically prior to the nominalization "belief". It might then be argued that such nominalization is harmless and does not come with genuine reification of beliefs.[5] In contrast, the Reification Argument shows that reification is needed to make sense of our ordinary concept of belief. It is a genuine ontological step in our conception of facts of believing.

21.8   Conclusion

According to the main argument of this chapter, a language that can be used to ascribe full-blown beliefs should have enough expressive power to refer to, or quantify over them. Arguably, this means that we have to make an important concession to "theory-theory": Our ordinary concept of belief as a propositional attitude cannot be extracted from simulation alone but results from a theory of mind that posits beliefs as (abstract or concrete) *objects*. Simulation is not in itself metarepresentational, and modal constructions of the form "According to Pierre, it's sunny" are metarepresentational only in a weak sense: They are representations involving other representations as semantic proper parts (Bermúdez 2003, § 9.4). In contrast, ascriptions

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[5] Friederike Moltmann raised this objection to me about an earlier version of this chapter.

of beliefs such as "Pierre believes that it's sunny" involve, at least tacitly, the identification of a mental representation as such. Thus, they are metarepresentational in a strong sense, insofar as they explicitly involve an ontology of mental objects.

Does it follow that simulation fails to play any role in an account of our capacity to ascribe beliefs to others? Everyone agrees, of course, that simulation can play an important *epistemological* role, if it is set against the appropriate theoretical background. If I succeed in getting my mind to work like Pierre's, i.e. if my simulation of Pierre is reliable, I have a warrant for my ascription to him of the belief that it is sunny. The question is rather whether simulation plays any role in our *understanding* of belief-ascriptions.

As far as the argument of this chapter is concerned, there seem to be two alternatives. On the first alternative, the notion of simulation should simply be banned from the account of our understanding of belief-ascriptions. Following theory-theory, such understanding is pictured as relying on our mastery of psychological laws. These laws relate objects, namely beliefs, whose existence is independently acknowledged by the Reification Argument.

The second alternative is, I think, more interesting and promising. The Reification Argument does not show that the quasi-modal account of beliefs is wrong. Rather, it shows that it is incomplete, and must be augmented with an appropriate reflection on the nature of beliefs. On the second alternative, the quasi-modal account of beliefs yields some understanding of *facts* of believing, and the Reification Argument shows that such facts must be further analysed as involving mental states as *constituents*. A virtue of this hybrid or two-tiered account of our understanding of belief-ascriptions is that although beliefs are posited as objects, an important insight of simulation theory is taken on board: Our understanding of the beliefs of others and the rational connections between them is not based on explicit consideration of psychological laws. Rather, as Jane Heal (1996, 1998) has suggested, the connections between beliefs follow the connections between facts in the imagined world of the other.

References

Baillargeon R, Scott RM, He Z (2010) False-belief understanding in infants. Trends Cogn Sci 14(3):110–118

Bartsch K, Wellman HM (1995) Children talk about the mind. Oxford University Press, Oxford

Bermúdez JL (2003) Thinking without words. Oxford University Press, Oxford

Bloom P, German TP (2000) Two reasons to abandon the false belief task as a test of theory of mind. Cognition 77:B25–B31

Carruthers P, Smith PK (eds) (1996) Theories of theories of mind. Cambridge University Press, Cambridge

Currie G (1998) Pretence, pretending and metarepresenting. Mind Lang 13(1):35–55

Currie G, Ravenscroft I (2002) Recreative minds. Clarendon Press, Oxford

Davies M, Stone T (eds) (1995a) Folk psychology. Blackwell, Oxford

Davies M, Stone T (eds) (1995b) Mental simulation. Blackwell, Oxford

Dennett D (1978) Beliefs about beliefs. Behav Brain Sci 1:568–570

Dokic J, Proust J (eds) (2002) Simulation and knowledge of action. Benjamins, Amsterdam

Gallagher S (2005) How the body shapes the mind. Oxford University Press, Oxford

Goldman G (1996). Simulating Minds. Oxford University Press. New York.

Gordon R (1995a) Folk psychology and simulation. In: Davies M, Stone T (eds) Folk psychology. Blackwell, Oxford

Gordon R (1995b) Simulation without introspection or inference from me to you. In: Davies M, Stone T (eds) Mental simulation. Blackwell, Oxford

Gordon R (1996) Radical simulationism. In: Carruthers P, Smith PK (eds) Theories of theories of mind. Cambridge University Press, Cambridge

Heal J (1994) Simulation vs. theory theory: what is the issue? In: Peacocke C (ed) Objectivity, simulation, and the unity of consciousness. Oxford University Press, Oxford, pp 129–144

Heal J (1996) Simulation, theory and content. In: Carruthers P, Smith PK (eds) Theories of theories of mind. Cambridge University Press, Cambridge

Heal J (1998) Co-Cognition of off-line simulation: two ways of understanding the simulation approach. Mind Lang 13(4):477–498

Jacob P (2002) The scope and limits of mental simulation. In: Dokic J, Proust J (eds) Simulation and knowledge of action. Benjamins, Amsterdam, pp 87–109

Kaplan D (1989) Demonstratives. In: Almog J, Perry J, Wettstein H (eds) Themes from Kaplan. Oxford University Press, New York

Nichols S, Stich S (2000) A cognitive theory of pretense. Cognition 74:115–147

Onishi KH, Baillargeon R (2005) Do 15-month-old infants understand false beliefs? Science 308(5719):255–258

Perner J (1991) Understanding the representational mind. The MIT Press, Cambridge

Prior AN (1963) Oratio Obliqua. Reprinted. In: Prior AN (1976) Papers in logic and ethics. Duckworth, London, pp 147–158

Prior AN (2003) Papers on time and tense. Oxford University Press, Oxford

Recanati F (2000) Oratio Obliqua, Oratio Recta. An essay on metarepresentation. MIT Press, Cambridge

Steward H (1997) The ontology of mind. Events, processes, and states. Clarendon Press, Oxford

Surian L, Caldi S, Sperber D (2007) Attribution of beliefs by 13-month-old infants. Psychol Sci 18:580–586

Wimmer H, Perner J (1983) Beliefs about beliefs: representation and the containing function of wrong beliefs in young children's understanding of deception. Cognition 13:103–128