Mindreading and Dynamical Functionalism

Metaphysics and the social cognition debate

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Abstract

The current debate on mindreading (understanding and predicting others in terms of their beliefs, desires, intentions, i.e. their *mental states*) is shifting from a focus on the clash between theory theory (TT) and simulation theory (ST) to a debate about whether mindreading is as pervasive as both TT and ST assume. Other 'non-mentalizing' accounts of social cognition have been put forward, which do not rely on the (pervasive) ascription of mental states for their explanation of our daily social capacities. However, a critical look at the metaphysics underlying the concept of 'mindreading' – that the mental consists of mental *states* – has the potential to show that the question whether mindreading (thus understood) is ubiquitous is an empty question. The surreptitious assumption that beliefs, desires, etc. are *states* underlies many issues in the mindreading debate, and therefore merits scrutiny. I propose an alternative metaphysical approach to mindreading, dynamical functionalism, which may turn the debate away from its current problems into a more productive line of research. This will be illustrated by a discussion of the 'spontaneous response false belief test' (SR-FBT) from this new perspective, which opens up a very natural way out of the paradox that seems to arise when young children are able to pass the SR-FBT, yet fail to pass the 'elicited response false belief test' (ER-FBT). The main goal of this article is to show that metaphysical considerations concerning mentality are highly relevant to the social cognition debate.

Keywords: mindreading, state-functionalism, dynamical functionalism, mental functions, false belief test, ontology of mental states.

Introduction

How we humans are able to navigate the social world has been the focus of debate among philosophers for quite some time. Human behavior is enormously complex, yet we are able to understand and predict with great accuracy that someone will start cursing in certain circumstances, or that they will get up and take some milk out of the fridge. Our basic intuitive explanation of this remarkable skill, often called mindreading, is that we understand others because

we recognize them as exhibiting mental phenomena: someone cursed because he was *angry* after losing a game of chess, and when someone *wants* to drink some milk, he'll probably get up and walk to the fridge to get it. Indeed, "it is hard for us to make sense of behavior in any other way than via the mentalistic (or 'intentional') framework ... It is our natural way of understanding the social environment." (Baron-Cohen 1995, 3–4).

This seems to be perfectly intuitive. However, a very common and not necessarily connected (nor equally intuitive) corollary to this idea is that un-

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derstanding mental phenomena consists of *the ascription of mental states*. In fact, mindreading has been defined as "the ability to 'infer the full range of mental states (beliefs, desires, intentions, imagination, emotions, etc.) that cause action', and use these inferences to predict and explain the behavior of others" (de Bruin, Strijbos, and Slors 2011, 499, citing Baron-Cohen 2001). These mental states are taken to be internal states which act as the *causes* of our actions. If we know other peoples' mental states, we can therefore predict their behavior.

Both theory theory (TT) and simulation theory (ST) subscribe to this conception of mindreading, although they differ in their take on how we come to ascribe or know mental states. Whereas theory theorists posit that we ascribe them through the implicit or explicit use of some theory (Stich and Ravenscroft 1994, Ravenscroft 2004), simulation theorists believe we use a process of simulation of other people's mental processes to arrive at some knowledge of their mental states (Stone and Davies 1996, Gordon 2009). Regardless of *how* we ascribe mental states, both theory theorists and simulation theorists believe that ascribing them is the core of our mindreading process. Moreover, they agree that we do it all the time – it is our basic way of navigating the social world.

Recently there has been a shift away from the debate between TT and ST[1], as several philosophers have cast doubts on whether ascribing mental states is how we achieve social cognition at all. At the very least, some say, it is not our *usual* way of understanding others. We use *non-mentalizing* ways of interacting instead, which do not rely on the ascription of mental states as the causes of actions. So "the question that takes center stage is: do the capacities for attending to and engaging with others in question involve *mindreading* or is this achieved by other means?" (Hutto, Herschbach, and Southgate 2011, 375).

It is interesting to see that both ToM-ists and advocates of non-mentalizing accounts of social cognition unquestioningly accept that ascribing mental states

is inextricably linked to mindreading. Particularly since, from a metaphysical point of view, it is hardly uncontroversial that mentalistic explanations necessarily involve mental states. In fact, the ontological status of such functional states is quite problematical – for reductionists and non-reductionists alike. Reductionists have a hard time defending the nomic unity of mental properties, as the only way to unite different realizations of a mental state seems to be to include them in a disjunctive property. Non-reductionists, on the other hand, seem to have no way to relate physical and mental properties without running into the supervenience problem (Kim 2005), also known as the problem of causal exclusion. Far be it from me to solve these matters here, but 1) we might not have to and 2) it goes to show that the ontological foundation of the conception of mindreading as the ascription of mental states is shady at best.

So is there an alternative to this understanding of mindreading – one that does not rely on the ascription of mental states? I think there is: a *dynamical* functionalist interpretation. From this perspective mental phenomena are not defined as functional *states* ('a belief', 'a desire') but as *functions* (believing, desiring). 'Believing' is a certain function defined in terms of what the organism that believes *does*, not what it *has*. This way we can understand that a person is believing, without ascribing to him 'a belief', just like we can understand that a plant is growing without ascribing to it 'a grow'. If we accept that mental phenomena are essentially functional, issues concerning mental states and the question whether we ascribe them all the time are rendered obsolete. There are no such states, so there is nothing to know about them. Accepting this view clearly has major implications for the debate as it touches on the very nature of what mindreading is. No longer do we 'read minds' by somehow ascribing mental states, but by recognizing functions.

In the following section I will briefly explain the functionalistic interpretation of mental states which I referred to earlier. I will show that functionalism, as broadly understood, is a *state-functionalism* aimed exclusively at (mental) states. This is important to note, because although my proposed alternative is

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[1]Both TT and ST are confusingly referred to as 'theory of mind-', or 'ToM-accounts'.

also functional in nature, it differs from the received view in a crucial way.

The subsequent section will contain a brief sketch of the dynamical functionalist alternative, as well as an explanation of how it satisfies the intuitions of ToM-ists and 'non-mentalizers' alike. My aim is not to thoroughly defend dynamical functionalism (although I believe it merits defending), but merely to indicate that ontological considerations can open up alternatives to the 'state-ascription conception' of mindreading. Even if one denies that we ascribe mental states as a means of social cognition, there is no need to abandon mentalistic explanations altogether (thereby throwing out the baby with the bathwater). Indeed, claiming that we do not ascribe mental states does not commit one to the unintuitive position that we do not mentalize or mindread at all – abandoning our tried and tested intuitive mental concepts and going against the basic intuition that "it is hard for us to make sense of behavior in any other way than via the mentalistic (or 'intentional') framework" (Baron-Cohen 1995, 3–4).

In the fourth section I will give an example of the consequences of taking a dynamical functionalist perspective on mindreading by looking at the interpretation of false belief tests (FBT) and how my account offers a way out of the paradox that arises when children pass the spontaneous response FBT, yet fail the elicited response FBT.

I will stress the fact that ontological considerations are relevant to the social cognition debate in the final section, and provide a brief recapitulation of the major advantages of a dynamical functionalist perspective on mindreading.

State-functionalism

As stated previously, the standard interpretation of mindreading revolves around the ascription of mental states. Indeed, the capacities to "attribute mental states to humans" and to "explain the behavior of humans in terms of their possessing mental states" (Ravenscroft 2010) historically belong in the most basic characterization of mindreading. The most salient contemporary position for the interpretation of mental states is *functionalism*, which, from its conception, has been construed as "a philosophical thesis about the nature of mental states" (Levin 2010). According to functionalists, "what makes something a mental state of a particular type does not depend on its internal constitution, but rather on the way it functions, or the role it plays, in the system of which it is a part" (Levin 2010). The canonical example is that of the mental state *pain*, a very limited definition of which would be 'that state which is caused by damage to the organism and which causes groaning'. Functionalists believe that a definition of mental states in functional terms is superior to one in terms of identity with certain neural or biological states. The latter theory (e.g. Place 1956, Feigl 1958 and Smart 1959) has a very hard time dealing with the idea that a mental state type can be realized by more than one neural state type – whereas functionalism readily accommodates multiple realization of mental states. Any state that is caused by damage to the organism and causes groaning can be 'pain', regardless of how this state is (physically) realized.

Wilfrid Sellars, in *Empiricism and the Philosophy of Mind* (Sellars 1997), was the first to give an "explicit formulation of a functionalist treatment of intentional states" (deVries 2011). Sellars interprets mental states as postulated 'theoretical entities' that can be attributed to others (and oneself) to explain behavior and dispositions. A correct attribution of a mental state means that the person with the mental state exhibits the dispositions and behavior that are generally associated with the mental concept.

After Sellars, functionalism has diversified into different strands, each characterized by the psychological theory underlying the roles that are played by mental states. Putnam (1975), for example, is a *machine state* functionalist who equates mental states with machine table states from a Turing machine[2]. On the other hand, *psycho*-functionalists like Fodor (1968) believe that mental state roles should originate in cognitive psychological theory. Consequentially, a potential problem for psycho-functionalists is that their definitions of mental state roles differ substantially from common-sense definitions as used in folk-

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[2]See Turing (1950) for an explanation.

psychology. *Analytic* functionalists do not face this problem, as they believe that "our ordinary mental state terms or concepts" (Levin 2010) should be used to inform the relations between our mental states (Lewis 1972). The key point to mention is that whatever their differences, each of these strands of functionalism have in common the idea that it is *mental states* that should be approached functionally. Functionalism (as it stands) is functionalism *about mental states*, or *state-functionalism*.

This fits in seamlessly with a notion of mindreading and mentality that revolves around mental states. Mindreading supposedly involves the ascription of mental states to other people, and state-functionalism offers an account of what these states are. Yet functionalists "seem to have been more interested in providing explanations than in directing their conceptual scrutiny to the *explanandum* their theories were targeting" (Strijbos 2012, 9). Instead of explaining *mindreading* functionally, state-functionalists have aimed their efforts at explaining *mental states* functionally, without questioning the state-ascription based version of mindreading. In fact, mindreading and mental states have become so interwoven, that any account of social cognition that turns away from the use of mental states, is taken to turn away from *mental* explanations of behavior altogether.

I believe there are many reasons for turning away from a state-conception of mentality and mindreading, not the least of which is that there are major conceptual problems with the notion of a functional state (see Van Caspel 2012a). I will not go into detail about these matters here, because for present purposes the above suffices as a background to distinguish the established view from my own interpretation – which is also functional in nature. The basic functionalist idea of analyzing concepts *as functions* is not intrinsically linked to states at all, and I believe a *dynamical* functionalist perspective on mentality can bypass the ontological problems that state-functionalists currently face.

Dynamical functionalism

In this section I present a rough sketch of an alternative account of mindreading that does not depend on the ascription (or existence) of mental states, yet is fully compatible with our intuitive notions of mental phenomena like believing, desiring and intending. It avoids the ontological problems associated with dualist views on mentality (be it property- or substance dualism) and is as compatible with a physicalist framework as can be.

The crucial idea is to understand mental phenomena not as states causing actions, but as functions being performed. I take **functions** to be *a type of activity or process*. A function can be done, performed, realized, or ascribed as a task. Anything that can be denoted by a verb is a function: adding, running, wishing, thinking, etc.. Some functions may even be indicated by nouns, e.g. pain or fun[3]. Functions can only be understood dynamically, as activities being performed – not as static states[4]. Nothing about a function specifies anything in regard to *how* it can be performed, though sometimes objects involved may be specified (e.g. running involves moving of the

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[3]We should be wary not to reify these functions because of how they are colloquially referred to. 'Having fun' is indubitably an activity that one can perform. Someone who is having fun does not 'have a fun' like he would have a hat, but is instead engaged in the process of 'performing' fun, i.e. performing a type of activity.

[4]Some have made a distinction between standing mental states and occurrent mental states. From a dynamical functionalist perspective mentality is *the performance* of mental functions, which excludes 'standing' (non-occurrent) mental states. 'Standing beliefs' – which Ryle (1949) characterizes as dispositions – refer to the physical state of a realizer of the believing-function in those cases where he is *primed* for that specific function, but not in the process of performing it. A person who is said to believe that Amsterdam is the capital of the Netherlands without the belief being occurrent (the person is not believing it right now) does not have a standing mental state, but is primed to perform the function 'believing that Amsterdam is the capital of the Netherlands'. This does not mean that in those cases the person has the function as a property, nor that he has a functional state. By analogy, a calculator can be primed for performing the adding-function by typing in '3 + 2' without pressing '='. The calculator is then primed to perform one of the many functions it can perform, but from this does not follow that it possesses 'an add' or an 'adding property' which it did not have before it was primed.

legs). Some (mathematical) functions (like adding) can be defined as a relation between inputs and outputs, but not all functions have to be describable in these terms. To define 'rolling' in terms of inputs and outputs seems rather contrived, yet rolling is as much a function as adding is.

It is important to note that this definition of function is completely unconnected to the teleological interpretation. The function *of* items (or when an item can be said to *have* a function[5]) is not at stake here, merely the concept of 'function' simpliciter. To define the function 'running' is not to define the function *of* running in a purposeful sense (Cummins 1975).

Anything that, according to our folk psychology (or whatever other source), is part of a certain mental function can be included in its definition[6]. 'Believing' can be defined as 'responding positively to certain questions' or 'feeling that something is true'[7], or whichever other function one is inclined to include. *Being minded* is performing these types of mental functions, like thinking, believing and acting in pursuit of a particular goal. *Mindreading, from this perspective, is understanding that people perform very complex mental functions, and recognizing that someone is performing such a function.* Knowledge of the function 'growing' allows one to understand

that if a plant is growing, it will increase in size. Likewise, a familiarity with the (mental) function 'believing' allows one to predict the behavior of someone who is performing this function.

Ontologically speaking, this simplifies matters quite a lot in comparison to a view that relies on mental states as the causes of actions. All dynamical functionalism needs for mentality are realizers which, on account of their *physical* properties, are able to perform that subclass of functions we label as 'mental'. A **realizer** is an object which has properties such that it has the capacity to perform a function. A calculator is a realizer of the addition-function, while my body is a realizer of the thinking-function. The performance of a function by a realizer is called a **process**. So for there to be growing, there have to be things that grow – realizers that are engaged in the process of growing. For there to be believing, there has to be someone who believes. This does not commit us to accept 'grows' and 'beliefs' into our ontology as causally efficacious functional properties. The fact that mental functions are performed does not entail their existence as a property or entity (Jackson 1998). The processes that the objects in our ontology perform are not themselves objects or properties of those objects – we do not have to 'locate' the processes or functions in our inventory of things that exist. Ontology is about finding a "limited number of ingredients" (Jackson 1998, 5), and whatever these ingredients *do* should not be on the list. Instead of having to "eliminate or locate" (Jackson 1998, 5) mental functions, we should understand that trying to fit functions in the inventory is wrong in the first place. The only properties[8] needed are the physical properties that allow objects/organisms to perform functions. In fact, a function cannot be a property of an object at all. I agree with Haugeland (1998, 280) that "market price, functional role, ecological niche, and so on, are not properties of things, they can never 'belong to' an individual independently and all by itself". So although functions can be performed by objects, they

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[5] My point is unrelated to Millikan's argument concerning 'proper functions' (Millikan 1989). Her account deals with the question of assigning teleological functions to entities, whereas my account deals with types of functions. The term 'proper function' is misleading because it may seem – at first glance – to be a term for a certain type of function. In reality, Millikan uses it as a kind of two-place predicate for ascribing teleological functions to items (under certain historically specified conditions).

[6] That mental concepts are not clearly defined does not pose a problem – at least not ontologically.

[7] The definitions of our mental functions need not be restricted to outward, 'objective', behavior. Mental functions can include 'internal' processes as well, like *how it feels* to believe something. Behaviorism turns away from mentalistic explanations and focuses solely on behavior, but this behavior – or at least the functions that are performed through it – is part of what mentality is. Experiences, emotions, actions: each of these can (and usually are) included in our folk psychological understanding of what it means to perform a mental function. The full spectrum of this understanding can be included in the definition of the mental function, without having to confine oneself to outward behavior or to be goaded into equating mentality with behavior (in the behaviorist's sense).

[8] A property is a characteristic that "is 'proper to' or 'owned by' a substance all by itself, that which a substance 'has' regardless of anything else" (Haugeland 1998, 280). Examples of properties are shape or configuration, composition and mass.

cannot be 'had' by them. What sense would it make to say that when an airplane is flying, it 'has' flying, in the same way as it has wings? When an airplane is in flight it has the same properties as when it sits in the hangar; whatever function the airplane performs bears no (direct) relation to its properties.

Colloquially people are said to *have* 'beliefs'[9], but that does not commit us to say that they have those beliefs as a property. This saves us the trouble of having to characterize the relation between such functional properties and the person's physical properties (realization, constitution, emergence, ...). Believing is as simple as any function: it is performed by things, but does not have a thinglike ontological status. Confusing the two amounts to making a category mistake. 'Beliefs' are like 'walks in the park' – it's something that you *do*, not something you *have*.

This view fits seamlessly with the physicalist intuition that the only causally efficacious properties are physical properties. Yet it allows for the full spectrum of mental functions to be performed[10]. It also renders the mental causation debate obsolete. If there are no longer both physical and mental properties, there is no problem with inter-domain efficacy. The question 'how is it that my desire for milk caused me to want milk?' is just as odd as 'how is it that my walk in the park caused my legs to move?'. Walking in the park is a process (a *causing* if you will) involving the moving of your legs. 'Walking in the park' is not the cause of any part of itself (including its product). In Dretske's words: "Killing a person doesn't cause the person to die. It is a causing, not a cause, of death" (Dretske 1988, 37). Likewise, desiring something does not cause the experience of longing, experiencing longing *is* desiring something. All of this is not to say that our mental processes are not caused, or that they themselves cannot cause other processes or states[11].

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[9] In Dutch there is no noun for 'belief' that can be used in a context like 'Cecily has the belief that her shoes are red'. The Dutch would say something that literally translates to 'Cecily is believing that her shoes are red' – which makes no references to 'beliefs' as things that we have, but rather to believing as a function or activity that we perform.

[10] This is not to say that some mental functions (like telekinesis) may turn out to be physically impossible.

[11] See Van Caspel (2012b) for a discussion of causal (David-

Yet the cause of experiencing pain, or whatever an episode of pain causes, is not what the contemporary mental causation debate is about. When someone is 'performing' pain we can ask what caused him to do that, or we can ask how the fact that someone feels pain causes him to perform some other action (processes can be causally efficacious). This is different from asking how 'a pain' or some *mental property* caused the very behavior we associate with having pain itself.

But how to justify taking this dynamical functionalist perspective, thereby forsaking mental states? Besides important metaphysical considerations, our everyday intuitions about social understanding also provide an answer to this question. A close look at our intuitive understanding of mindreading reveals that mental states *actually have no place in it*. ToMists would have us believe that "in most, if not all, of our everyday encounters with others, our normal procedure is to treat them as bearers of mental states hidden behind their embodied, behavioral manifestations" (Gallagher 2004, 201). Yet this is quite an unintuitive idea; not because this account of mindreading refers to mental phenomena, but because mental phenomena do not involve *states*.

How could an analysis of what 'believing' means involve something other than the things that someone *does* when he believes? No one ever intuitively takes 'believing' to mean having a certain state, comparable to how they would take 'having a certain weight' to be a state. Rather, believing is explained in terms of what someone does given a certain belief. Some would say it's 'having a state such that x'. Yet in such cases the crucial part is the *'such that x'*, where x is some function. I would be very surprised if anyone could pinpoint something critical to our understanding of 'believing' that is not functional. Even if someone would go as far as to insist that our definition of believing should include the firing of certain sets of neurons, we could include this in the definition as one of the (sub)functions associated with performing 'believing'. It is truly and essentially

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son 1963) and teleological (Wilson 1989, Sehon 1994, Schueler 2003) reasons for actions.

a functional concept, like all mental concepts. So why are philosophers desperately trying to accommodate *mental states*, entities that do not feature in or follow from the common understanding of mentality? It seems to me that it is perfectly reasonable and justified to cast such philosophical specters aside and re-conceptualize mindreading and mentality as involving mental functions and their realizers only.

A strong point of this perspective is that it explains both ToM-ist and non-mentalizing intuitions about social cognition. The ToM-ist believes that mindreading is ubiquitous – and I believe it is too. We do understand each other as performing mental functions all the time. Navigating our social world would be quite impossible without being able to recognize (and perform) such functions. On the other hand I agree with the non-mentalizing intuition that mindreading is not what ToM-ists take it to be, i.e. it does not mean that we "ubiquitously interpret the behaviour of others in terms of a hidden mental realm" (Slors 2012, 525).

Although much more can be said about the dynamical functionalist approach to mentality and its ontological consequences, fleshing out the sketch that has been given so far goes beyond the scope of this article. For present purposes it is enough if I have been able to show that rethinking the ontological basis of mentality and mindreading has the potential to drastically change the debate. Since most complications for mindreading arise from the ontological assumption that mentality consists of states causing actions, the importance of ontological and metaphysical considerations in the social cognition debate should not be underestimated.

In the following section I will give an example of how a paradox in the mindreading debate may turn out less problematical when examined from a dynamical functionalist perspective.

False belief tests & dynamical functionalism

The classic false-belief test (FBT) is a very simple test designed to show whether children can understand that other persons can have beliefs that differ from their own (Wimmer and Perner 1983). Basically a child is presented with a situation in which two people are present, e.g. Tychus & Raynor, as well as two containers (A & B). Tychus places an object into container A and then moves away. While Tychus is away, Raynor moves the object to container B, after which Tychus returns. The child is then asked: 'where will Tychus look for the object?'. If the child answers 'B' (the actual location of the object) it will not have understood that Tychus falsely believes that the object is in container A (where he left it). If, on the other hand, the child answers 'A', it will have understood that others can have beliefs that differ from how it knows the world to be. As it turns out, children up to the age of three generally fail the FBT, whereas four-year-olds pass it (Perner and Ruffman 2005).

Recently, however, there have been new experiments showing that children as young as two years old (Southgate, Senju, and Csibra 2007) or even 15 months old (Onishi and Baillargeon 2005) can pass a 'spontaneous' version of the FBT. In these experiments children are presented with a similar situation as in the classic, elicited response FBT (ER-FBT), but instead of asking them where Tychus will look, the child's looking-behavior is taken as a measure of where it expects Tychus to look (spontaneous response, or SR-FBT). In these tests, "infants looked significantly longer at those scenes in which the protagonist searched at the correct location despite her false belief about where the toy was hidden" (de Bruin, Strijbos, and Slors 2011, 507), which Onishi and Baillargeon took to indicate that these children are able to understand false beliefs and are capable of social cognition. Yet these same children fail the ER-FBT – if you ask them where Tychus will look, they will usually give the wrong answer, even though their looking-behavior suggests they understand perfectly well what is going on.

For a ToM-ist, this is quite a startling result. Tra-

ditionally, judging from the ER-FBT, it was understood that children develop a theory of mind, i.e. the capability to ascribe mental states at the age of four. So how can it be that younger children seem to pass the same test? Do these children also possess the capability to ascribe mental states, and if so, why can they not pass the ER-FBT? Baillargeon et al. (2010) argue that in ER-FBT a child must not only 'represent a false belief' (like in the SR-FBT), but also select and inhibit certain responses. Yet as De Bruin, Strijbos and Slors (2011) point out, "it seems arbitrary to argue that spontaneous response versions of the FBT only require false belief representation, whereas elicited response versions also require selection processing and response inhibition. If we accept that the SR-FBT involves false belief representation, then it is not clear why it does not require selection processing and response-inhibition as well" (de Bruin, Strijbos, and Slors 2011, 510).

The anti-ToM-ists claim that there are other means of achieving social cognition besides mindreading (understood as the ascription of mental states). They have suggested several 'non-mindreading' accounts of (early) social cognition (e.g. Hutto 2008, Gallagher 2001 & de Bruin, Strijbos, and Slors 2011). In these accounts, the authors avoid any dependence on 'mentalistic' explanations of social cognition, in an attempt to show that mindreading is not our basic (or pervasive) method to achieve social cognition. Yet such accounts are met with fierce criticism (e.g. Spaulding 2010 & Herschbach 2008) and cannot unproblematically account for the paradoxical results with the SR-FBT either.

The affordance-based account of social cognition given by De Bruin, Strijbos and Slors (2011), for example, simply redresses the issue. The authors suggest that children can understand and predict behavior of others by tracking their *affordances*[12]. Or to be more precise: "they track relations between objects-at-locations and *the actions that these objects afford*. What qualifies this as *social* cognition is precisely the fact that infants track affordances *for other people*" (de Bruin, Strijbos, and Slors 2011,

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[12]Generally, "the *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill" (Gibson 1979, 127).

511). Yet merely tracking affordances is not enough to even pass the ER-FBT. If a child would *only* track affordances, there would be no reason for it to expect Tychus to look in either of the containers at all. Tychus' environment contains many affordances (opening container A, opening container B, lie on the floor, etc.) and those affordances *are neutral.* Understanding which affordances are presented to Tychus gives the child no clue whatsoever as to which of those Tychus will act upon (if any). So something more is required: "the infant's perception of goal-directedness in the agent's behavior" (de Bruin, Strijbos, and Slors 2011, 512). The child must understand that Tychus has the goal of grabbing the object, and it is exactly this crucial aspect that the authors do not explain. That the child learns of these goals during familiarization trials is clear, but *how* the child perceives these goals in the agent is unclear (does it *ascribe* goal-states to the agent?). What is clear though is that it is something *about the agent* that the child must grasp – but that brings us back to our starting point: how do children understand and predict other's behavior? And why is it that 15-month-old children can 'perceive goals' but not pass the ER-FBT? An answer to that question depends on what exactly is meant by 'perceiving goals', which is essentially a rephrasing of the basic question of how we understand others in intentional terms. Although tracking affordances for other people is a requirement for social cognition, I do not believe that it alone can account for it.

When we understand mentality from a dynamical functionalist perspective, as I suggest we should do, a more substantial account of what goes on in a FBT can be produced. If mindreading is *understanding that people perform very complex mental functions*, and *recognizing* whether someone is performing such a function, a child in a FBT must learn (from the familiarization trials) that Tychus *wants* the object (or is 'goal-directed' at the object). This doesn't mean that the child is ascribing a desire (or whatever other state) to Tychus, but that it understands that Tychus is prone to grab the object. That is the *function* Tychus performs, and later in life the child will learn that performing this function (and many other

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related functions) is what we call *wanting* or *desiring*. Results from SR-FBT's have shown that children from the age of 15 months can understand and recognize these very basic functions. Note that observing affordances (and tracking them for others) is a crucial prerequisite for this kind of understanding, but performing a function (like Tychus does) goes beyond affordances. It is *acting upon specific affordances.*

This account of social cognition opens the way for a developmental explanation of the skills involved. Besides recognizing and tracking affordances, children must also learn about autonomous actors in their environment (intentional systems) which act upon affordances in a certain way (a function). There is no need to introduce ontological objects (like desires) or mental states – that are hard to embed in such an explanation, and at the same time we can genuinely say that the child learns to understand others in intentional terms. An intuitive way out of the paradoxical situation in which the ToM-ists find themselves (with regard to SR-FBTs), and which the anti-ToM-ists have a hard time dealing with, also presents itself. Karmiloff-Smith (1992) has described what she calls a process of *representational redescription* that accounts for the way in which "children's representations become progressively more manipulable and flexible, for the emergence of conscious access to knowledge, and for children's theory building" (Karmiloff-Smith 1992, 17). During this multi-phase process the child turns "*implicit* information into *explicit* knowledge" (Karmiloff-Smith 1992, 16). She argues that there are three phases in the development of a skill, during which the format of the internal representations that the child has changes as well. Her model "argues for at least four levels at which knowledge is represented and re-represented", which she labeled "Implicit (I), Explicit-1 (E1), Explicit-2 (E2), and Explicit-3 (E3)" (Karmiloff-Smith 1992, 20). At the lowest, implicit level, "representations are in the form of procedures for analyzing and responding to stimuli in the external environment" and crucially: "information embedded in level-I representations is ...not available to other operators in the cognitive system" (Karmiloff-Smith 1992, 20). Only through the process of representational redescription can this procedural knowledge be made more ex-

plicit and thereby available for the child to linguistically reflect upon. Passing a SR-FBT requires only implicit, procedural knowledge whereas passing the ER-FBT "necessitates the E2/3 format" (Karmiloff-Smith 1992, 133).

Karmiloff-Smith's idea basically comes down to the intuitive notion that being able to perform skilfully does not necessarily mean that one is able to reflect (linguistically) on what one does. I can play 'The Entertainer' on the piano, but I would be hard-pressed to *tell* you how I do it (which keys I press, when I press them, etc). Likewise, as a child becomes skilled in picking up on functions that are performed by actors in its environment (and passing the SR-FBT), it does not necessarily have the ability to describe linguistically what it is doing. Only later (at around the age of four) does the child's knowledge reach the E2/3 level and does it become able to describe to itself and others what exactly it is doing. Passing a SR-FBT only involves recognizing affordances in our environment and functions that people around us perform, and does not depend on some very complex cognitive function like ascribing mental states. This does not mean that the child is not mindreading, as recognizing functions of people around us *is exactly what mindreading is.* The child has started to develop an intentional, mental understanding of those around it – even though it will learn to describe its environment in intentional terms only later.

Discussion

What all of this shows is that taking mindreading to be the ascription of mental states brings with it a lot of problems that can be avoided by taking a dynamical functionalist position with regard to mentality. It is not merely ontological issues that can be avoided, but problems in social cognition too. Dynamical functionalism satisfies both the ToM-istic intuition that we understand each other in mental terms, as well as the non-ToM-istic intuition that we do not ascribe mental states. It also opens the door to 'mechanistic' explanations of how we recognize mental functions, i.e. how we 'mindread'. The ToM-ists shied away from such explanations for fear of running

into conceptual problems with regard to the ontological status of mental states, and the non-ToM-ists – in their attempt to move away from mental state-ascription – discarded mentalistic or intentional explanations altogether, leaving their accounts wanting.

Another advantage of the dynamical functionalist perspective on mentality is that it offers a comfortable place for emotions. Feeling a certain emotion, just like thinking, desiring and believing, is a *mental function*. Whereas emotions are somewhat problematical to explain from a state-ascription based perspective on mindreading (do we ascribe 'an angry'?), mindreading as the recognition of functions readily embraces them as part of the mental. When someone is angry, he or she is simply performing one of many mental functions.

An important supporting argument for dynamical functionalism is that it connects with an interpretation of folk psychology that is more intuitive than the one that has become the standard in philosophy of mind. Slors and Macdonald (2008, 153) write that "our capacity to interpret the behaviour of others and ourselves in terms of beliefs and desires is assumed to give rise to a 'folk-psychological' understanding of one another. And without this kind of understanding of each other's behaviour, human social interaction is deemed impossible. How do we understand and anticipate each other's actions if not by gaining access to each other's minds, i.e. by knowing what the other believes, wants, thinks and feels?" (Slors and Macdonald 2008, 153). I believe such an understanding is indeed necessary, but that it can be achieved without having to ascribe mental states, and without us having to shy away from calling that understanding intentional or mental. Why would knowing what the other believes, wants, thinks, and feels have to involve knowing hidden internal *mental states*, that cause the other to believe, want, think and feel? Folk-psychological intuitions do not give rise to such shady internal states, but deal with the understanding of what people *do* and *experience*. Philosophical understanding of folk psychology is haunted by ontologically troublesome mental states, and I am more than willing to scare them off – free of charge.

References

Baillargeon, R., R. Scott, and H. Zijing (2010). False-belief understanding in infants. *Trends in Cognitive Science 14*, 110–118.

Baron-Cohen, S. (1995). *Mindblindness: An essay on autism and theory of mind*. MIT Press.

Baron-Cohen, S. (2001). Theory of mind in normal development and autism. *Prisme 34*, 174–183.

Cummins, R. (1975). Functional analysis. *The Journal of Philosophy 72*, 741–765.

Davidson, D. (1963). Actions, reasons and causes. *The Journal of Philosophy 60*(23), 685–700.

de Bruin, L., D. Strijbos, and M. Slors (2011). Early social cognition: Alternatives to implicit mindreading. *Review of Philosophy and Psychology 2*, 499–517.

deVries, W. (2011). Wilfrid Sellars. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Fall 2011 ed.).

Dretske, F. (1988). *Explaining Behavior - Reasons in a World of Causes*. The MIT Press.

Feigl, H. (1958). The 'mental' and the 'physical'. In *Minnesota Studies in the Philosophy of Science*, Volume II: Concepts, Theories, and the Mind-Body Problem. University of Minnesota Press.

Fodor, J. (1968). *Psychological Explanation*. New York: Random House.

Gallagher, S. (2001). The practice of mind: Theory, simulation or primary interaction? *Journal of Consciousness Studies 8*, 83–108.

Gallagher, S. (2004). Understanding interpersonal problems in autism: Interaction theory as an alternative to theory of mind. *Philosophy, Psychology and Psychiatry 11*(3), 199–217.

Gibson, J. J. (1979). *The Ecological Approach to Visual Perception*. Lawrence Erlbaum Associates.

Gordon, R. (2009). Folk-psychology as mental simulation. In *Stanford Encyclopedia of Philosophy*.

Haugeland, J. (1998). *Having Thought*. Harvard University Press.

Herschbach, M. (2008). False belief understanding and the phenomenological critics of folk-psychology. *Journal of Consciousness Studies 15*, 33–56.

Hutto, D. D. (2008). The narrative practice hypothesis: clarifications and implications. *Philosophical Explorations 11*, 175–192.

Hutto, D. D., M. Herschbach, and V. Southgate (2011). Social cognition: Mindreading and alternatives. *Review of Philosophy and Psychology 2*, 375–395.

Jackson, F. (1998). *From Metaphysics to Ethics – A Defence of Conceptual Analysis.* Oxford: Clarendon Press.

Karmiloff-Smith, A. (1992). *Beyond Modularity – A Developmental Perspective on Cognitive Science.* The MIT Press.

Kim, J. (2005). *Physicalism, or something near enough.* Princeton University Press.

Levin, J. (2010). Functionalism. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Summer 2010 ed.).

Lewis, D. (1972). Psychophysical and theoretical identifications. *Australasian Journal of Philosophy 50*(3), 249–258.

Millikan, R. G. (1989). In defense of proper functions. *Philosophy of Science 56*, 288–302.

Onishi, K. and R. Baillargeon (2005). Do 15-month-old infants understand false beliefs? *Science 308*, 255–258.

Perner, J. and T. Ruffman (2005). Infant's insight into the mind: How deep? *Science 308*, 214–216.

Place, U. (1956). Is consciousness a brain process? *British Journal of Psychology 47*(1), 44–50.

Putnam, H. (1975). Minds and machines. In *Mind, Language, and Reality*, pp. 362–385. Cambridge University Press. First published in Sidney Hook (ed.) *Dimensions of Mind* (New York, 1960).

Ravenscroft, I. (2004). Folk psychology as a theory. In *Stanford Encyclopedia of Philosophy*.

Ravenscroft, I. (2010). Folk psychology as a theory. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Fall 2010 edition ed.).

Ryle, G. (1949). *The Concept of Mind.* Hutchinson.

Schueler, G. (2003). *Reasons & Purposes; human rationality and the teleological explanation of action.* Oxford University Press.

Sehon, S. R. (1994). Teleology and the nature of mental states. *American Philosophical Quarterly 31*, 63–72.

Sellars, W. (1997). *Empiricism and the Philosophy of Mind.* Harvard University Press. First published in Feigl and Scriven (eds.) *Minnesota Studies in the Philosophy of Science, vol. 1* (Minneapolis, 1956).

Slors, M. (2012). The model-model of the theory-theory. *Inquiry 55*, 521–542.

Slors, M. and C. Macdonald (2008). Rethinking folk-psychology: alternatives to theories of mind. *Philosophical Explorations 11*, 153–161.

Smart, J. (1959). Sensations and brain processes. *Philosophical Review 68*, 141–156.

Southgate, V., A. Senju, and G. Csibra (2007). Action anticipation through attribution of false belief by 2-year-olds. *Psychological Science 18*, 587–592.

Spaulding, S. (2010). Embodied cognition and mindreading. *Mind and Language 25*, 119–140.

Stich, S. and I. Ravenscroft (1994). What *is* folk psychology? *Cognition 50*, 447–468.

Stone, T. and M. Davies (1996). The mental simulation debate: A progress report. In P. Carruthers and P. Smith (Eds.), *Theories of Theories of Mind*, pp. 119–137.

Strijbos, D. (2012). *In a public state of mind; the conceptual basis of folk psychology.* Ph. D. thesis, Radboud Universiteit Nijmegen.

Turing, A. (1950). Computing machinery and intelligence. *Mind 59*(236), 433–460.

Van Caspel, F. (2012a). State-functionalism and the Turing Trap. Unpublished paper.

Van Caspel, F. (2012b). Why mike turned off the tv; how teleological reasons can be true & a distinction between four types of reasons. Unpublished paper.

Wilson, G. (1989). *The Intentionality of Human Action.* Stanford University Press.

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