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The personal and the subpersonal in the theory of mind debate

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Abstract It is a widely accepted assumption within the philosophy of mind and psychology that our ability for complex social interaction is based on the mastery of a common folk psychology, that is to say that social cognition consists in reasoning about the mental states of others in order to predict and explain their behavior. This, in turn, requires the possession of mental-state concepts, such as the concepts belief and desire. In recent years, this standard conception of social cognition has been called into question by proponents of so-called 'direct-perception' approaches to social cognition (e.g., Gallagher 2001, 2005, 2007, 2012; Gallagher and Hutto 2008; Zahavi 2005, 2011) and by those who argue that the 'received view' implies a degree of computational complexity that is implausible (e.g., Bermúdez 2003; Apperly and Butterfill 2009). In response, it has been argued that these attacks on the classical view of social cognition have no bite at the subpersonal level of explanation, and that it is the latter which is at issue in the debate in question (e.g., Herschbach 2008; Spaulding 2010, 2015). In this paper, I critically examine this response by considering in more detail the distinction between personal and subpersonal level explanations. There are two main ways in which the distinction has been developed (Drayson 2014). I will argue that on either of these, the response proposed by defenders of the received view is unconvincing. This shows that the dispute between the standard conception and alternative approaches to mindreading is a dispute concerning personal-level explanations - what is at stake in the debate between proponents of the classical view of social cognition and their critics is how we, as persons, navigate our social world. I will conclude by proposing a pluralistic approach to social cognition, which is better able to do justice to the multi-faceted nature of our

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social interactions as well as being able to account for recent empirical findings regarding the social cognitive abilities of young infants.

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1 Introduction

According to what I will call the 'received view' in philosophy and psychology, what lies at the basis of our social interactions is the mastery of folk psychology. The term folk psychology stands for the practice of ascribing mental states – understood as propositional attitudes, such as beliefs and desires – to others for the purpose of predicting and explaining their behavior. This, in turn, requires the possession of the relevant mental state concepts. The claim is that it is the mastery of this practice (and hence the mastery of the concepts involved in this practice) that underwrites most if not all of our social interactions. The ascription of mental states to others is, on this view, a central, pervasively used capacity. There is considerable debate as to *how* we ascribe mental states, with the main contenders in this debate being the theory-theory and the simulation theory. Nonetheless, both theories aim to give an account of social cognition in terms of our ability to employ conceptual representations of the mental states of other in order to predict and explain their behavior.

The theory-theory (henceforth TT) assumes that the ability to predict and explain intentional behavior is underpinned by a theory concerning the way the mind functions (e.g., Leslie 1987; Gopnik and Meltzoff 1997). On this view, folk psychology consist in the application of a theory, that is, a set of rules that spell out the relation between different mental states as well as between mental states and behavior. These generally take the form of belief-desire explanations (that is, they explain or predict what x will do on the basis of what x believes and desires). In contrast to the TT, the simulation theory (henceforth ST) argues that rather than having a theory of how the mind works, we can simply rely on our own minds to predict and explain the behavior of others (e.g. Gordon 1986; Goldman 1989, 2006). According to this theory, the way we come to understand the mental states of others is by generating similar states in ourselves. So in order to anticipate, for example, how someone else will solve a certain problem, we imagine ourselves to be in the position of the other person and simulate how we ourselves would solve the problem. As mentioned above, despite this dispute with regard to the nature of our mindreading abilities, both TT and ST agree that social cognition does essentially consist in the ability to ascribe and reason about the mental states of others by using mental state concepts in order to predict and explain their behavior.[1] This view has also informed much of the empirical research in this area. Consequently, a large part of the relevant psychological experiments focus on

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[1] There is one caveat to this claim for there is a version of the simulation theory that allows for a form of simulation that does not require forming conceptual judgements attributing mental states to others (Gordon 1986).

determining when and how children acquire mental state concepts, in particular the concept of belief.

In recent years, the received view of social cognition has been attacked both on phenomenological grounds and on the grounds that infants are able to successfully engage in social interactions long before they possess mental state concepts (e.g., Gallagher 2001, 2005, 2007; Gallagher and Hutto 2008; Zahavi 2005).[2] Further, it has been argued that the received view renders social interaction unnecessarily and implausibly demanding with regard to the computational complexity that is required for conceptual mental state attributions (Bermúdez 2003; also see Apperly and Butterfill 2009). In response, it has been argued that while these attacks on the classical account of mindreading have purchase at the personal level, they have no bite at the subpersonal level of explanation, and that it is the latter that is at issue, as TT and ST are theories concerning the subpersonal processes that underly our social cognitive abilities (Herschbach 2008; Spaulding 2010, 2015).

In this paper I want to critically examine this defense of the classical view of social cognition. Much of its plausibility hangs on the way in which the distinction between personal and subpersonal level explanations is understood. Unfortunately, although this distinction is commonly found in the philosophical and psychological literature, it is used in rather different ways by different authors (Drayson 2014). Hence one of the aims of this paper is to clarify the implications for the debate at issue of two fundamentally different ways in which this distinction can be understood. My discussion will be specifically centered around the claim that social cognition involves the application of mental state *concepts* as a central and pervasively used capacity. My aim is to show that this is a crucial issue in the debate and one that has, so far, not been adequately brought into focus or addressed by proponents of the subpersonal defense. Moreover, I will aim to show that – contra Spaulding and Herschbach – this issue cannot be dismissed by an appeal to the subpersonal on either of its two main construals. I will end by sketching an alternative, pluralist, account of social cognition.

Before I present the arguments against the received view on social cognition, let me briefly explain the notion of concepts that is at play in this discussion. I take it that what makes concepts philosophically interesting is that they make intelligible the systematicity, productivity, flexibility and rationality of human thought. The basic idea is that human thought is systematic, productive, flexible and rational because it is composed of concepts that can be systematically decomposed and recombined to form an unlimited number of thoughts and that license rational inferences between thoughts. This is also sometimes put by saying that concepts are subject to what Evans (1982) calls the "Generality Constraint": "...if a subject can be credited with the thought that *a* is *F*, then he

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[2] At the time when most of these criticisms were developed, this was typically taken to be the case at about 4–5 years of age, when children are able to pass verbal "false-belief" tasks. However, since then, evidence based on nonverbal mindreading tasks has been put forward that challenges the age at which mental state concepts are acquired (see Onishi and Baillargeon 2010 for a review). The authors of these studies generally interpret them as evidence of mental state concept possession years earlier, and even before the acquisition of language. Hence, the age at which children acquire mental state concepts is currently disputed. We will discuss this issue in more detail further below.

must have the conceptual resources for entertaining the thought that *a* is *G*, for every property of being *G* of which he has a conception."(1982, p. 104) Conceptual content is also thought to enable a subject to extend their thoughts on a matter beyond the current context. In other words, conceptual thought is stimulus-independent (Camp 2009), or detachable from the present context (Hopp 2011). So conceptual thought is highly systematic and flexible, enabling us to form thoughts from an unlimited number of domains. On the other hand, to the extent that an organism shows flexible, intentional behavior that does nonetheless not fulfill the criteria for fully generalizable, conceptual thought, it makes sense to attribute nonconceptual representations to this organism. As I have argued elsewhere (Musholt 2015, ch. 2), these are plausibly characterized as a form of procedural representation, or in terms of "know-how".

2 Arguments against the received view on social cognition

Three main arguments have recently been put forward against the view that social cognition relies on the explicit attribution of mental states (i.e., on the employment of mental state concepts). First, phenomenologically oriented authors have argued that it is phenomenologically implausible that in many of our day-to-day social interactions we attribute mental states to others in order to predict and explain their behavior. Second, they point to the fact that infants are able to successfully navigate the social world long before they possess mental state concepts. Although this argument was initially presented in order to bolster the phenomenological criticism, I think that it will be more fruitful to discuss these as two separate arguments in what follows. Third, it has been argued that the attribution of mental states to others for the purposes of predicting and explaining behavior is computationally very demanding, and hence it is implausible that this is at the heart of many of our fast and efficient social interactions. I will present these three arguments in turn.

2.1 The argument from phenomenology

According to some authors, phenomenology tells us that we rarely (if ever) engage in either theorizing or simulation in order to predict and explain the mental states of others (see, e.g., De Jaegher and Di Paolo 2007; Fuchs 2013; Gallagher 2001, 2005, 2007, 2012; Gallagher and Hutto 2008; Hutto 2008; Ratcliffe 2006; Zahavi 2005, 2011). Not only do prediction and explanation imply a detached third-personal perspective on the actions of others, when in fact we are often engaged in a specifically second-personal interaction with them, but we are also often able to "directly perceive" their emotions, intentions, and so on, without having to simulate or theorize about them. As Gallagher and others characterize them, TT and ST suppose that we don't have direct access to the mental states of others, and that social cognition relies on a process of inference by which we either ascribe the invisible mental states to others via a process of subsuming their behavior under general rules, or by simulating their decision-making processes. In contrast, phenomenologists argue that the minds of others are directly and visibly expressed through their behavior. Accordingly, we have a direct, unmediated access to the minds of others; and we can engage with others in a skillful manner prior to and

independent of the ability to engage in conceptually mediated propositional attitude ascriptions.[3] On this view, the received view disregards "the way in which the life of the mind of others is visible in their expressive behavior and meaningful action" (Zahavi 2005, p. 222).[4] The alternative view is often called "Interaction Theory", and I will use this label (IT) in the following.

2.2 The argument from developmental psychology

In addition to phenomenological evidence, proponents of IT point out that infants are able to engage in social interactions long before they possess mental state concepts. The early types of social interaction that proponents of IT appeal to in favor of their theory can be subsumed under what Trevarthen (1979) has termed "primary and secondary intersubjectivity". For instance, shortly after birth, infants are already able to imitate the facial expression of others (Meltzoff and Moore 1977). This suggests that they possess a primitive body schema that allows them to match the visual information about the movements of others with proprioceptive information regarding the movement of their own bodies into a common framework. Moreover, six to eight-week-old infants will detect and react negatively to interactions that are "out of tune". For instance, in one experiment infants were placed in a room separate from their caregiver to which they were connected via double closed-circuit video. The first minute of the infant's interaction with their caregiver was videotaped, and the tape was subsequently replayed to the infant. While infants are happily engaged in interaction as long as the video presentation is "live", they become distressed during the replay phase, when their actions and the reaction of their caregivers are no longer matched (Neisser 1993; also see Nagy 2008). Thus, they seem to be implicitly and automatically "tuned in" to the movements and expressions of others from very early onwards. From the age of nine months onwards, infants begin to engage in so-called "triadic interactions", such as those requiring shared attention or social referencing. For instance, they are able to follow the eye-gaze or pointed finger of another and often look back and forth from the other's face to the attended object to make sure that both partners do in fact attend to the same object (Tomasello et al. 2005). Moreover, in challenging situations infants will look to their caregiver and check for their emotional reaction in order to regulate their own reactions to the situation (Feinman 1982; Klinnert et al. 1983; Striano and Rochat 2000). From their second year onwards, infants are able to take the perspective of another and differentiate it from their own (Moll and Tomasello 2006). However, it has long been held that it is only from the age of four years onwards that children acquire the concept of a mental state as a subjective, perspectival propositional attitude that can misrepresent and that stands in certain relations to other mental states and to behavior, as demonstrated by "false-belief" and level II perspective-taking tasks (for reviews see Perner and Roessler 2012; Wellman et al. 2001). Thus, there seems to be a range of

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[3] It is not entirely clear how the 'direct perception' of mental states is to be understood. As I will explain below, we might take this to mean that we have a nonconceptual, non-inferential understanding of the mental states of others.Also see Michael and DeBruin (2015) for a detailed discussion of the notion of social perception.

[4] Notice that more recently, proponents of TT and ST have argued that this in fact mischaracterizes their view and have put forward interpretations of TT and ST that are compatible with a direct, perception-like access to the minds of others, as an anonymous referee helpfully pointed out to me. For a detailed debate of the social perception thesis, see Michael and DeBruin (2015).

social behaviors that can be displayed in the absence of the possession of mental state concepts.

Importantly, the crucial claim that is being made is that the social cognitive abilities that underwrite these primary and secondary forms of intersubjectivity are not just at play when it comes to the behavior of infants. Rather, they are thought to still play an important role in the social interactions of adults. This is important because a claim that would be restricted to the development of social cognitive abilities would be fully compatible with both TT and ST. After all, proponents of the traditional view of social cognition are more than prepared to accept that social cognitive abilities develop over time and can argue that the early social cognitive abilities that I have just described are simply precursors to a fully developed theory of mind. Thus, the claim cannot just be that infants can rely on cognitive mechanisms that enable them to interact with others long before they develop mental state concepts. Rather, the claim must be that these very same mechanisms are still at play in adult human social interactions (cf. Spaulding 2010). Since many social interactions can evidently be explained without recourse to the possession of mental state concepts, and since phenomenological introspection tells us that we rarely ascribe mental states to others when we interact with them, there is reason to believe, so the argument goes, that the same mechanisms that enable the social interaction of infants also provide the basis for many adult interactions. Notice also that the claim is not that adults never engage in the explicit ascription of mental states to others – for evidently we are able to do so – but rather that the ascription of mental states to others for the purposes of predicting and explaining their behavior constitutes a much smaller part of our repertoire for social interaction than is assumed by the received view.

Two potential objections are worth raising, before I turn to the third argument, which will be followed by a discussion of the subpersonal defense in Section 3.[5] First, it might be argued that some of the evidence in favor of primary and secondary intersubjectivity can be interpreted as requiring mental state concepts, after all. For example, tracking others' attentional states and emotions may involve the possession of concepts of attention and emotion. Indeed, it is common to say that the concept of (a false) belief is one of the last to emerge developmentally, so it is entirely compatible with the received view to say that primary and second intersubjectivity develop and continue into adulthood using mental state concepts other than belief. In fact, the development of and relation between different mental state concepts is an important issue, and one that seems to me to be insufficiently addressed in current philosophical discussions, which tend to center on the concept of belief.[6] However, if we remind ourselves of the way in which the notion of concepts was introduced at the beginning of this paper, it becomes clear that this is not a convincing proposal. We said earlier that concept possession is attributed to a thinker just in case the thinker displays an ability for systematic, flexible and productive thought, that is, thought that is stimulus-independent and enables the thinker to engage in inferential judgments licensed by the concepts in question. However, both the dyadic interactions that constitute primary intersubjectivity and the triadic interactions characteristic of secondary intersubjectivity seem to be stimulus-dependent and situation-specific. Moreover, the ability to track another's attentional or emotional state does not require an understanding of the relation between

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[5] I am grateful to an anonymous referee for raising these points.
[6] Though note current discussions on the relation between the concepts of knowledge and belief (Nagel 2013).

different mental states, nor even an ability to differentiate between one's own mental state and that of another. During episodes of shared attention, there is a matching of first- and third-person information, in the sense that infants perceive the gaze orientation of the other while simultaneously experiencing proprioceptive feedback from their own head or eye movements and seeing the object of shared attention (Barresi and Moore 1996). Likewise, in the case of social referencing, the infant sees another's emotional expression and adopts a corresponding emotional attitude. So shared intentionality enables the integration of third-person information about another's appearance or behavior with first-person information about one's own intentional relations. Nonetheless, infants understand the intentional relations associated with these types of social interaction only to the extend that they actually engage in episodes of shared intentionality, and this engagement does not require an explicit differentiation between first- and third-personal sources of information (cf. Barresi and Moore 1996). That is, in order for shared intentionality to occur, it is sufficient that intentional relations are in fact shared; the child does not have to explicitly represent their own mental states as being distinct from those of others. So I suggest that instead, the abilities displayed in instances of primary and secondary intersubjectivity are more plausibly interpreted in terms of nonconceptual, procedural representations, or "knowing-how" (e.g. knowing how to attract the attention of another, or knowing how to employ another's emotional state for self-regulation). (For more detail see Section 4; also see Musholt 2015, ch. 6.)

Second, the claim that children acquire the concept of (false) belief only after the age of four has become disputed in recent years. In particular, experimental results involving nonverbal tasks have been interpreted as offering evidence of possession of the concept of (false) belief in children much younger than four years old (for reviews see Kovács et al. 2010; Baillargeon et al. 2010), as indicated by their sensitivity to another's false belief in their looking time (Onishi and Baillargeon 2005), anticipatory looking (Southgate et al. 2007), or their spontaneous helping behavior (Buttelmann et al. 2009; Knudsen and Liszkowski 2012). However, there are good reasons to resist such interpretations. Possession of the concept of a propositional attitude, such as belief, involves an appreciation of the intentionality and intensionality of mental representations, their complex relations to other mental states as well as to behavior, the possibility of misrepresentation and the ability to attribute propositional attitudes to different holders of such attitudes. Put differently, possession of mental state concepts (in the sense of propositional attitudes) requires an understanding on the part of the subject that others represent the world from their own perspective, that is, under particular descriptions and in ways that are potentially different from how it is represented by oneself (including ways that can be false). However, the findings reported in the studies referenced above do not demonstrate the ability to reason about mental states in this sense. Rather, the ability to pass nonverbal false-belief tasks can instead be interpreted as demonstrating a (nonconceptual) understanding of certain aspects of behavior that can function as proxies for propositional attitudes proper, such as perceptual registration or encountering situations (e.g., 'an agent will search for an object where they have last encountered it'; for more detail see Apperly and Butterfill 2009; Butterfill and Apperly 2013; Rakoczy 2012). That is to say these results do not show that infants at this age possess propositional attitude concepts. This view is further supported by recent findings that two-year-olds, in contrast to four-year-olds, are unable to understand the aspectuality (and hence intensionality) of mental representations, which

confirms that they do not yet possess the conceptual abilities characteristic of propositional attitude psychology (Rakoczy 2015). So while the behavior displayed by the infants in nonverbal mindreading tasks might go beyond a mere behavior-reading (contra skeptics such as Perner and Ruffman 2005), there are good reasons to think that it does not yet amount to a conceptual ability to ascribe propositional attitudes.[7]

2.3 The argument from computational complexity

The third objection to the received view on social cognition argues that the explicit attribution of mental states to others for the purposes of predicting and explaining their behavior is computationally very demanding, and thus implausible in light of the fact that many of our social interactions rely on very fast and efficient cognitive processing (Bermúdez 2003; also see Apperly and Butterfill 2009). The general reasoning behind this concern is based on the fact that conceptual thought, while allowing for a huge amount of flexibility, places large demands on the cognitive system. As we have seen in the introduction, concepts are at the heart of the flexibility and systematicity of human reasoning, for they enable the systematic decomposition and recombination of thoughts, thus allowing humans to form an indefinite number of thoughts. However, the very flexibility of conceptual thought also makes it computationally rather demanding. This is because, given that conceptual thought is general and context-independent, it can draw relevant information from virtually any domain. Fodor (1983) calls this "isotropy", referring to the epistemic interconnectedness of beliefs. This leads to the problem of how to determine which factors are relevant in any given situation. More specifically, when it comes to social cognition, the problem consists in determining the factors that are relevant to the ascription of a particular mental state and to predicting or explaining an action in a given situation. For the TT, the problem consists in determining the relevant factors that one is to take into account in a given situation in order to ascribe mental states with specific propositional content to others, and in order to figure out which of the rules that are part of our folk-psychological theory apply in the given situation. As Bermúdez (2003) puts it:

> "[I]t is no easy matter to attribute beliefs and desires and then to work either backwards from those beliefs and desires to an explanation or forwards to a prediction. The point is perhaps easiest to see with respect to the theory-theory. To apply folk psychological explanation is to subsume observable behavior and utterances under general principles linking observable behavior to mental states, mental states to other mental states and mental states to behavior. As many authors have stressed, the application of these principles requires identifying,

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[7] An alternative way to look at these findings (which was put forward by a referee for this journal) is that while children younger than four years old do not yet possess concepts of mental states as propositional attitudes they might have simpler concepts that are still genuinely representations of mental states. Indeed, although they have tended to receive less philosophical attention, there are mental states that are arguably best characterized as being non-propositional, though it's not clear that these are simpler (see Grzankowski 2013). However, the question at issue in the studies cited here was whether children possess the concept of belief, which is a propositional attitude. Moreover, the received view as it has been laid out implies an understanding of propositional attitude psychology. Thus, insofar as children younger than four seem to lack this, they do not seem to engage in mindreading as it is being construed on the received view.

among a range of possible principles that might apply, the ones that are the most salient in a given situation. It requires identifying whether the appropriate background conditions hold, or whether there are countervailing factors in play. It requires thinking through the implications of the principles one chooses to apply in order to extrapolate their explanatory/predictive consequences." (pp. 31-32).

The more details we need to take into account about a predictee's cognitive circumstances, the more computationally demanding the operation will be. This seems especially problematic when we are confronted with multiple-agent interactions rather than simple one-to-one situations.

While it has been argued that ST does not face this "frame problem" (Heal 1996), it is not clear that ST really is better off. Even if we assume that we can simply use our own mind as a model of the minds of others, one would "still need to plug into the decision-making processes an appropriate set of inputs for all the other participants and then run simultaneous simulations for all of them" (Bermúdez 2003, p. 34). That is, in order to get the simulation process off the ground, we need to determine the relevant mental states that we can use as input into the simulation process and, again, these can potentially draw from any domain.[8]

Notice that the worry remains, even if the frame problem can be solved in principle. For even if there was a way of solving the relevance problem in principle, the "combinatorial explosion" of tracking multiple agents with different mental states would be enormous (cf. Bermúdez 2003, p.34).[9]

Thus, as an alternative to the received view, Bermúdez suggests that in many situations we can rely on simple scripts, heuristics (such as "tit-for-tat" strategies), or knowledge about social roles to engage in interactions without having to attribute mental states to others. For example, in order to engage in a successful transaction with a cashier in a supermarket, I don't need to attribute any propositional attitudes to the cashier. It is sufficient that I know that my role as a customer involves handing over money, and the role of the cashier is to take the money, give back change and hand over the product. A similar view has recently been put forward by Andrews (2012). Andrews also points out that in many situations, we can simply predict the behavior of others based on our knowledge of their past behaviors, without needing to attribute mental states. On her view, the need for behavioral explanations on the basis of the ascription of mental states would arise only in specific circumstances, namely those in which the behavior in question falls outside the norm. In line with this, Maibom (2007) has suggested that we should think of social cognition in terms of social models. On her view, these models represent social structures in terms of their overall purpose and in terms of the roles played by different agents. This is thought to enable us to engage in

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[8] Notice that simulation theorists are ambiguous as to whether the assumed projection into the situation of another requires a specification of the others' mental state, or whether we simply adopt their perceptual perspective. However, as Bermúdez (2003) has pointed out, adopting someone's perceptual perspective is of limited use with regard to a prediction of their behaviour. In order to know how their perceptual states will affect their behaviour, we need to know how they relate to other mental states. Thus, at least some attitudes need to be attributed in order to get the simulation process started.

[9] Accordingly, Bermúdez sees his worry regarding the computional complexitiy as being ultimately orthogonal to the frame problem.

social interactions without having to think about what agents think or want. Not only are these proposals thought to avoid the computational complexity objection, but, according to Andrews and Maibom, they are also thought to provide us with a more nuanced and accurate picture of the social cognitive abilities of humans and animals.

3 The subpersonal defense

In defense of the 'received view' on social cognition it has recently been argued that the objections presented above neglect the distinction between personal and subpersonal level processes. Both Herschbach (2008) and Spaulding (2010, 2015) argue that while the arguments put forward by critics against the received view have purchase at the personal level, they do not rule out TT and ST as *subpersonal* level accounts of social cognition.

First, with respect to the argument from phenomenology, Herschbach (2008) argues that while "phenomenological evidence is important in providing adequate personal level accounts, it alone is insufficient to rule out subpersonal theorizing as enabling social perception". Similarly, Spaulding claims that "the debate in mindreading between the Theory Theory and the Simulation Theory is a debate about the architecture and sub-personal processes responsible for social cognition. Neither account is committed to any view on what phenomenology tells us is going on in our ordinary interactions." (Spaulding 2010, p. 131) In fact, according to Spaulding, proponents of TT and ST might even argue that it is no wonder (and no objection) that at the personal level it does not seem to us as though we are engaging in simulation or theorizing when we interact with others and try to make sense of their behavior. It is precisely because our theory of mind or our simulation system, respectively, are located at the subpersonal level that it seems to us as at the personal, phenomenological level as though "our interactions are the result of immediate, non-mentalistic understanding" (ibd.).[10] Put briefly, phenomenological arguments are simply irrelevant to theories of social cognition that make claims about the subpersonal level. In a more recent paper Spaulding provides additional objections against the argument from phenomenology by claiming that phenomenological evidence is incapable of playing a substantial methodological role in this debate as it it neither novel, nor reliable, nor able to confirm or disconfirm the hypotheses in question (Spaulding 2015).

Second, with respect to the objection from developmental psychology, one might wonder whether a further interpretation of the empirical evidence with respect to the mindreading abilities of young infants presented in the previous section that so far has not been considered should not appeal to the subpersonal level as well. Why shouldn't we say that infants who are able to pass nonverbal (but not verbal) false-belief and perspective-taking tasks are genuinely engaging in mindreading, (i.e., are engaging in conceptual propositional attitude ascription), but that the mindreading is occurring subpersonally? In fact, isn't this just another way of saying that the mindreading in

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[10] Hence, on this view, TT and ST don't have to be thought of as being incompatible with the ability to "directly perceive" the mental states of others. Notice that Spaulding's useage of the term "non-mentalistic" is potentially confusing here. Standardly, this term is used behavioristically, referring to cognitive abilities that do not involve the representation or tracking of mental states (as a referee helpfully pointed out to me). This doesn't seem to be the way Spaulding uses the term, though.

question is occurring implicitly, which is how these early social cognitive abilities are often described?[11]

Third, the distinction between the personal and the personal level is also taken to be relevant to the argument from computational complexity. Spaulding (2010, 2015) argues that at the subpersonal level, many processes are computationally complex. Take the visual system: as Spaulding points out, the computational story for vision is very complicated indeed, involving, for example, photo-transduction in retinal cells, or the algorithmic transformation of retinal input into a format usable for the construction of three-dimensional representations. This in turn involves the detection of light, intensity values, reflectance changes of surfaces, or the shape and orientation of objects, and all of this in a constantly changing visual field (cf. Spaulding 2010, p. 135). Nonetheless, at the personal level, vision is an immediate, fast and easy process. Hence, Spaulding claims, computational complexity is simply not an issue at the subpersonal level.

In what follows, I will examine whether this appeal to the subpersonal level works. Although commonly referred to in the literature, the distinction between the personal and subpersonal is all but clear as it tends to be construed quite differently by different authors. Accordingly, my aim in the following is in part to see what work the distinction can do under different construals and to make explicit the commitments associated with different ways of construing the notion. The hope is that this might add some clarity to the discussion. While it has already been argued that the notion of a theory cannot be attributed to the subpersonal level (Gallagher 2005; Zahavi 2005) and that, likewise, the notion of simulation is a personal level notion (Gallagher 2007), I will not consider these arguments here (for a critical discussion see Herschbach 2008).[12] Likewise, my focus is not going to be on the methodological weight that can or cannot be carried by arguments from introspection, as discussed by Spaulding (2015). Rather, the arguments I am going to discuss will focus on the objection from developmental evidence and from computational complexity and will be specifically centered around the claim that social cognition involves the application of mental state *concepts* as a central and pervasively used capacity. My aim is to show that this is a crucial issue in the debate and one that has, so far, not been adequately brought into focus or addressed by proponents of the subpersonal defense. Moreover, I will aim to show that – contra Spaulding and Herschbach – this issue cannot be dismissed by an appeal to the subpersonal on either of its two main construals.[13]

4 Assessing the role of the subpersonal in the ToM debate

In order to see whether the subpersonal defense works, it is useful to consider first in more detail what the distinction between the personal and the subpersonal amounts to.

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[11] This way of framing the issue was suggested to me by an anonymous referee.

[12] Also see Spaulding (2015) who admits that while the terms "prediction" and "explanation" might be considered to be personal-level terms (in the sense of involving conscious reflection), "anticipation" and "interpretation" can occur subconsciously. For this as well as for other reasons, she claims that the latter are more appropriate terms.

[13] Notice that while Herschbach is not explicitly concerned with the role of concept possession in social cognition, Spaulding's explicit aim in her 2010 paper is to defend the received view of social cognition (understood as involving conceptual mental state attributions) against views involving pre-theoretical, non-conceptual forms of intersubjectivity.

The distinction was first introduced by Dennett (1969) as a distinction between different levels of (psychological) explanation. According to Drayson (2014), Dennett's distinction was originally intended to lend support to the then emerging disciplines of the cognitive sciences, who used psychological vocabulary (i.e. referred to internal representations) to describe the capacities of cognitive sub-systems. As such, it was initially silent with respect to metaphysical claims about the relation between these levels and the entities they refer to. As Drayson nicely lays out, the distinction was subsequently developed in two main ways.[14] On the one hand, some philosophers mapped the distinction onto Sellars' (1956) distinction between the "space of reasons" and the "space of causes". On their view, personal level explanations essentially aim to make intelligible the behavior of a person by providing the reasons the person might have in light of their mental states for acting in the way that they do (e.g. McDowell 1994; Hornsby 2000). Thus, we appeal to a person's beliefs, desires, perceptions and emotions (e.g., the desire for chocolate and the belief that chocolate is in the drawer) to explain their action (e.g., the opening of the drawer). In contrast, the subpersonal explanations of the cognitive sciences are located in the "space of causes". Thus, the distinction becomes a distinction between two very different – and autonomous – types of explanation: normative on the one hand, and descriptive on the other. On this view, the distinction is not a whole/part distinction, but rather a distinction between different perspectives one can take on a subject: one which sees the subject essentially as a rational agent, whose thoughts and actions are constrained by the norms of rationality, and another which sees the subject essentially as a physiological organism, whose behavior is subject to the laws of nature.

If we take this conception of the distinction and combine it with the notion of concepts outlined in the introduction, it turns out that the subpersonal defense does not work. As we saw earlier, concept possession is ascribed to a thinker in order to explain their ability for flexible, systematic, rational and productive thought. One way of spelling this out is by saying that in order to possess a concept, a thinker must be disposed to apply the concept in appropriate circumstances (that is, they must be sensitive to the rational basis for applying the concept), they must be disposed to draw certain inferences involving the concept in question (that is, they must find 'primitively compelling' certain judgements); and they must be willing to revise judgments involving this concept when faced with counter-evidence (Peacocke 1992). That is to say that there seems to be a constitutive relation between concept possession and the ability to make judgments that are sensitive to reasons (Bermúdez 2007). For example, in order to possess the concept of 'belief' I need to know that beliefs can stand in various complex relations to other mental states, that they can misrepresent, and that different subjects can hold different beliefs. While this knowledge might be tacit, it must nonetheless be the case that a thinker who possesses the concept of belief is able to make judgments and engage in inferential reasoning processes that demonstrate the tacit knowledge of these relations.

However, an appeal to reasons is precisely what distinguishes personal-level from subpersonal-level explanations, according to authors like McDowell and Hornsby. On their view, in personal-level explanations we can make intelligible the behavior of a person by appealing to their reasons for acting. In contrast, at the subpersonal level, we

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[14] I am grateful to an anonymous referee for pointing me towards Drayson's paper.

are concerned with the physiological processes that make possible (or enable) this behavior. Thus, a subpersonal process doesn't judge, though it might enable judgments being made by the person. Now, if concept possession is constitutively connected to the ability to make judgments and respond to reasons, and if the latter is an ability that can only figure in personal-level explanations, then concept possession is a personal-level phenomenon (cf. Bermúdez 2007). Accordingly, TT and ST – insofar as they assume that social cognition consists essentially in the possession and application of mental state *concepts* – cannot be purely subpersonal level accounts of social cognition. In other words, insofar as the received view of social cognition claims that subjects are routinely engaging conceptual abilities to ascribe mental states to others for the purposes of prediction and explanation, the subpersonal defense is inconsistent with this construal of the subpersonal level.[15]

So according to this understanding of the personal/subpersonal level distinction, the most a defender of the claim that TT and ST are subpersonal level accounts can say is that TT and ST provide us with – competing – subpersonal level explanations of what kind of brain processes *enable* mindreading.[16] But such a claim is very different from saying that belief-desire reasoning itself (which would involve the application of the relevant concepts) takes place at the subpersonal level.

However, I stated earlier that there exists an alternative construal of the distinction between the personal and the subpersonal, which does not place the notion of rationality at its heart. Spaulding and Herschbach would likely want to subscribe to this alternative, rather than to the view just outlined (this also seems to be suggested by Herschbach 2012). On this second construal, subpersonal level explanations operate by identifying subsystems within the agent and by positing functional states within these subsystems that correspond to psychological states (such as beliefs and desires) at the personal level (Drayson 2014). On this view, the distinction amounts to a whole/part distinction. Importantly, as we go further down the line of subsystems into sub-subsystems and so on, we are increasingly concerned with functional states that do not correspond directly to any personal level state. Following Stich (1978), these are often called subdoxastic states, in distinction to doxastic states, such as beliefs. The latter "form a consciously accessible, inferentially integrated cognitive subsystem" (Stich 1978, pp. 508–509). In contrast, "[s]ubdoxastic states occur in a variety of separate, special purpose cognitive subsystems" (ibd.), which are inferentially isolated. That is, the information processed in these subsystems is not consciously accessible to us. As Drayson (2014) points out, among proponents of a

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[15] This is not to say that subpersonal level processes cannot be genuinely representational. To the contrary, it has been argued that it is one of the attractions of the notion of *non*conceptual content that it enables us to do justice to explanations in the cognitive sciences that attribute (nonconceptual) representational content to subpersonal level processes while at the same time capturing the intuition that the realm of reasons (and hence of conceptual representations) is limited to persons (Bermúdez 2007). Notice, however, that McDowell (1994) denies that there is genuine content at the subpersonal level.

[16] For instance, it could be claimed that ST requires something like the mirror neuron network whereas TT does not. However, this is rather controversial; for a recent critical discussion of the claim that mirror neurons are evidence for ST, see Spaulding (2012). Alternatively, the difference between TT and ST might be seen in the fact that TT posits the existence of an abstract set of laws – which might, in turn, presuppose a GOFAI architecture –, while ST could be based on statistical patterns or heuristics – which might, in turn, be compatible with connectionist approaches to cognition (cf. Herschbach 2008).

functionalist view of the distinction between personal and subpersonal states, the distinction has come to be used ambiguously: sometimes it is equated with the distinction between doxastic and subdoxastic states, whereas at other times, subpersonal level explanations can also refer to states that correspond to everyday mental states like belief.

Now, if we take subpersonal level states to refer to subdoxastic states only, then again the claim that conceptual mindreading occurs at the subpersonal level becomes incoherent, since mindreading entails the involvement of doxastic states. On the other hand, if we allow that doxastic states can be part of subpersonal level explanations, it would be possible to speak of mindreading at the subpersonal level, as Spaulding and Herschbach seem to want to do. Indeed, in Spaulding's account, the distinction between the personal and the subpersonal seems to be more or less equivalent to the distinction between conscious and unconscious processing, and she certainly does not seem to want to restrict talk of subpersonal states to subdoxastic states only.

Nonetheless, even so, an appeal to the subpersonal cannot avoid the argument from computational complexity. For, as we have seen above, the involvement of concepts is precisely what makes explicit mental state attributions so cognitively demanding. Concepts are posited as those components of thought that make intelligible the systematicity, productivity and flexibility of human thought. As such, conceptual thinking necessarily imposes high computational demands on the cognitive system and this would be true even if it occurs at the subersonal level (i.e. subconsciously). Moreover, not only does the flexibility of conceptual thought in general pose high demands on the cognitive system, but the ability to ascribe a particular propositional attitude (from a potentially unlimited range of such attitudes) to another, and the ability to keep that propositional attitude separate from one's own beliefs (and the beliefs of others parties in the case of multi-agent interactions) arguably also pose specific computational demands on a thinker. So any theory according to which social cognition is thought to essentially consist in the attribution of propositional attitudes for the purposes of predicting and explaining behaviour will face just these problems, thus calling into question whether such a practice could really be at the basis of most of our often fast and efficient social interactions. Spaulding's appeal to other complex information processing systems, such as the visual system, at the subpersonal level does not help to alleviate this concern, for we would precisely not ascribe conceptual thinking to the visual system. After all, the visual system does not engage in domain general information processing. Rather, the visual system is a highly compartmentalized or modular system, which means that its information processing mechanisms can only draw from a very particular and highly specified domain. Accordingly, insofar as its states are inferentially isolated, they can only involve nonconceptual representational content (Bermúdez 2007). Indeed, visual processing is one of the prime examples of a subpersonal level explanation involving *subdoxastic* states (cf. Drayson 2014).

A potential reply to this objection might be that concepts do not necessarily have to be characterized by their inferential integration. On a different view of concepts, concept-based mindreading arguably does not require fully-domain-general

information processing. For instance, if the content of a concept is determined by its reference, then a concept may have a limited inferential role but still genuinely be a concept of a mental state.[17] However, I take it that such a conception of concepts would loose much of what makes the ascription of conceptual abilities explanatorily fruitful in terms of accounting for the flexibility, systematicity and productivity of human thought. It would also blur the distinction between conceptual and nonconceptual representations. Yet it is unclear to me why we should give up on this distinction; indeed it seems to me that we need this distinction in order to be able to do justice to the different levels of complexity and flexibility that we find in cognition (see Section 5 and Musholt 2015, ch. 2 for a more detailed discussion). What's more, weakening the notion of concepts in this manner in fact threatens to collapse the received view and the view put forward by proponents of IT. For it is now no longer obvious how a conceptual representation of a mental state is to be distinguished from a nonconceptual mental-state-like representation. So if this is the notion of concepts employed by defenders of the received view, then it is not obvious that there are really substantial differences between the received and alternative views of social cognition.

Finally, even if the objection from computational complexity could be countered without weakening the notion of concepts at play, one might ask what is gained by claiming that – contrary to what proponents of IT argue – the social cognitive abilities shown by infants involve conceptual mental-state attributions, albeit at a subpersonal (unconscious) level. After all, the point of the arguments in Section 2 was that there are a number of social cognitive abilities that do not seem to rely on judgments involving mental state concepts. Put differently, the claim was that the social behavior in question can be explained without reference to conceptual mental state attributions. As such explanations would seem to be more parsimonious than those who do refer to conceptual mindreading capacities, it is unclear why we should posit the latter instead.

To sum up, I take it that what is at issue in the debate between proponents and critics of the received view is whether or not social cognition is primarily a matter of engaging in the conceptual attribution of propositional attitudes to others. Both TT and ST (their differences notwithstanding) claim that it is. Proponents of IT claim that it is not. This issue cannot be resolved by appealing to the subpersonal processes involved in social cognition (though the specific dispute between TT and ST might well be read as a dispute concerning the subpersonal level). For on one construal of the personal/subpersonal distinction conceptual abilities cannot even be meaningfully attributed to the subpersonal level, and on either construal, the argument from computational complexity speaks against such an attribution. Moreover, there are good explanations of the social interactions that those who call into question the received view point towards that do not assume possession of mental state concepts on the part of the agents involved. For reasons of parsimony, these should be preferred.

5 An alternative account of social cognition

So what are the conclusions to be drawn from the arguments above? I propose that we should conclude that there is a wide range of social interactions that do not rely on

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[17] I am grateful to an anonymous referee for raising this objection.

conceptual mindreading abilities, but that rather involve nonconceptual ways of representing mental-state-like states in others.

Nonconceptual content is content that can be ascribed to a thinker without thereby attributing to the thinker the concepts required to specify the content in question. Recall that conceptual thought is highly systematic and context independent, enabling us to form thoughts from an unlimited number of domains. Thus, one might say that conceptual thought lies at one end of the cognitive spectrum. On the other end of this spectrum lie simple stimulus-response behaviors, such as reflexes. These are very fast and computationally less demanding, but they are also very inflexible and thus limited. Now, it becomes explanatory useful to ascribe nonconceptual representations in addition to conceptual ones, once we recognize that there is some middle ground to be spelled out in between simple stimulus-response mechanisms and systematic, flexible deliberation (cf. Hurley 2006). This is the case in situations where the behavior of an organism cannot be explained in terms of invariant relations between sensory input and behavioral output, but where we would nonetheless be reluctant to ascribe conceptual abilities, due to a lack of full generalizability and cognitive integration of the underlying representations. That is to say that to the extend that an organism shows flexible, intentional behavior that does nonetheless not fulfill the criteria for fully generalizable, conceptual thought, it makes sense to attribute nonconceptual representations to this organism. In other words, given that we can distinguish different levels of flexibility and generality in cognition, it makes sense to make room for nonconceptual representations.

Now, we have seen in Section 2 that there are a variety of social cognitive abilities in early infanthood that do not seem to rely on the possession of mental state concepts. As argued earlier, conceptual reasoning about mental states implies an appreciation of the intentionality and intensionality of these states (i.e. of the different ways in which things can be represented by subjects), their complex relations to other mental states as well as to behavior, the possibility of misrepresentation and the ability to attribute propositional attitudes to different holders of such attitudes. The social cognitive abilities found in infants do not demonstrate the ability to reason about mental states in this sense. Moreover, both the dyadic interactions that constitute primary intersubjectivity and the triadic interactions characteristic of secondary intersubjectivity are stimulus-dependent and situation-specific. Thus, they should be interpreted as forms of nonconceptual mentalizing. This would do justice to the phenomenology while also explaining how social cognition can – in many cases – be fast and efficient. For the fact that nonconceptual representations are not domain general and context independent in the way conceptual representation are makes them fast and efficient, though it also implies that they are less flexible than conceptual representations. Accordingly, I suggest that many of our social interactions rely on such nonconceptual, domain-specific representations. It might only be through the acquisition of a natural language that these are redescribed into domain-general, conceptual thought. That is, it might be the learning of words that enables the mental conjunction of representations from different domains, hence overcoming the domain specificity of the original representations (cf. Spelke 2003). This is also consistent with the finding that language ability is correlated with and predictive of performance in verbal mindreading tasks (Astington and Jenkins 1999; Milligan et al. 2007; Slade and Ruffman 2005).

But notice, again, that the claim is not what with the acquisition of language, nonconceptual mental-state-like representations disappear. Rather, the idea is that these are in play in much of our adult social interactions as well. In fact, this might account for recent evidence of an automatic, efficient, and subconsciously operating mentalizing system in adults (e.g., Cohen and German 2009; Samson et al. 2010; Schneider et al. 2012; Schneider et al. 2014). Notice also that the arguments presented here do not imply that explicit mindreading in the sense of conceptual propositional attitude applications can never be involved in social cognition. Rather, they suggest that, contrary to the received view, this not our primary and most pervasive way of interacting with and understanding others.

The view suggested here is compatible with the proposal made by Apperly and Butterfill (2009) and Butterfill and Apperly (2013) that humans possess a dual system for tracking beliefs and belief-like states. On this view, some social cognitive abilities involve flexible processes, which are conceptually mediated and dependent on language (System 2), while both infants' precocious abilities as well as some abilities found in adults rely on a distinct set of nonconceptual, automatic and cognitively efficient (but less flexible) processes (System 1). The cognitively efficient system is essential for fast and efficient on-line social interaction, while the cognitively flexible system allows us to engage in explicit reasoning about the causes and justifications of mental states and actions, such as when we participate in gossip or when a jury tries to come to a verdict in a criminal trial.[18] That said, the two-systems approach also raises questions with respect to the relation between the two systems, and it might be more accurate to think of the broad spectrum of social cognitive abilities in terms of multiple levels of representation, with varying degrees of explicitness (i.e. varying degrees of structure), as I suggest elsewhere (see Musholt 2015, ch. 5 & 6). Such a multi-level approach would allow us to interpret infant mindreading abilities in terms of internal representations with some degree of structure (as argued by Carruthers 2013) while withholding the claim that they must be fully conceptual. There is certainly more to be said about what nonconceptual mindreading could be like, and how exactly it relates to conceptual mindreading. Matters here will be complicated by fact that it seems reasonable to assume that the acquisition of concepts in general and of mental state concepts in particular can proceed in degrees, which means that there might not always be clear boundaries between nonconceptual and conceptual forms of mindreading. Moreover, it would be interesting to examine in more detail whether the notion of nonconceptual mindreading that I have put forward here is really compatible with the view offered by phenomenologists. However, it would go beyond the scope (and reasonable word limit) of this paper to pursue these questions in more detail.

In addition, it seems very plausible that a large range of social behaviors is underwritten by simple heuristics, knowledge about social roles, and knowledge about a person's character and past behavior, as suggested by Bermúdez (2003), Maibom (2007), and Andrews (2012). [19] Thus, I think that we should ultimately opt for a pluralistic approach to social cognition. I take it that to what extent and in what kind

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[18] Carruthers (2013) suggests that rather than thinking of two independent systems for mindreading, we should assume the existence of a core mindreading system (as one of a set of systems subsumed under System 1) and to think of System 2 as a general purpose system.

[19] Also see Newen (2015) for an account of social cognition that encompasses multiple epistemic strategies for understanding others based on the background information available to us.

of situations different mechanisms for social cognition – including nonconceptual forms of mentalising, conceptual mental-state reasoning and heuristics/social role/person-specific knowledge – are at play is an interesting question for future research.[20]

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[20] See Fiebich and Coltheart (2015) for a promising proposal with respect to this question.

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