Understanding Interpersonal Problems in Autism: *Interaction Theory as An Alternative to Theory of Mind*

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ABSTRACT: I argue that theory theory approaches to autism offer a wholly inadequate explanation of autistic symptoms because they offer a wholly inadequate account of the non-autistic understanding of others. As an alternative I outline *interaction theory,* which incorporates evidence from both developmental and phenomenological studies to show that humans are endowed with important capacities for intersubjective understanding from birth or early infancy. As part of a neurophenomenological analysis of autism, interaction theory offers an account of interpersonal problems that is fully consistent with the variety of social and nonsocial symptoms found in autism.

THEORY OF MIND, which includes explanations grouped under the heading "theory theory," is one of the most widely discussed approaches to explaining the cognitive and behavioral aspects of autism. Variations of theory theory have been defended, in whole or in part, by many of the major researchers in the field (e.g., Baron-Cohen 1995; Baron-Cohen, Leslie, and Frith 1985; Frith and Happé 1999). Proponents of this approach support their view by producing or citing what seems to be good scientific evidence for it, specifically the failure of autistic children to pass false-belief tests.

The theory theory version of theory of mind[1] contends that the normal and pervasive way in which we understand other persons depends on our implicit or explicit practice of mentalizing or mind-reading, in which we use a common sense or folk-psychological theory about how mental states (beliefs, desires, intentions) inform the behaviors of others. In this way we are able to explain or predict the other person's behavior or what they are thinking. This theory, or our ability to employ it, may be the product of an innate mechanism, or it may be acquired through early experience, but it initially manifests itself around the age of four years, and this is signaled by the ability of four-year-olds to pass false-belief tests. That is, on average, children of four years, but not children of less than four years, are able to distinguish between how things really are in the world and what other people may falsely believe about such things. It is thus clear that around this age we begin to recognize that other individ-

uals have their own sets of beliefs and intentions that inform their behavior, and that we are able to explain or predict their behavior based on these mental states. Significantly, however, autistic individuals fail false-belief tests even at mental ages significantly higher than four years. On this basis, it seems right to conclude that autistic individuals lack a theory of mind, and that this explains many of the behavioral symptoms of autism, especially their lack of social responsiveness and understanding. This is a bare bones and oversimplified version of the theory of mind account, but I think it captures its essential features.

Ignoring a variety of philosophical and empirical debates among the proponents of theory of mind,[2] it is generally acknowledged that there are some significant problems or limitations in this account of autism. These are what I call *internal* problems, in the sense that they are problems that appear when one accepts the general terms of the theory of mind account. For example, if theory of mind is to be an account that captures the definitive nature of autism, it is problematic that a significant percentage of autistic individuals are capable of passing false belief and other theory of mind tests. Happé (1995), for example, points out that the range of autistic children who pass such tests varies across different studies from 15 to 60 percent (Reed and Paterson [1990] and Prior, Dahlstrom, and Squires [1990], respectively). This suggests that some autistic subjects seemingly do possess a theory of mind. Another problem involves the fact that although the theory of mind approach is capable of addressing some of the major cognitive symptoms of autism, especially those involving social cognition and communication, it is unable to explain other symptoms, most of them nonsocial symptoms, characteristically found in many autistic individuals, namely, restricted range of interest, obsessive concern for sameness, preoccupation with objects or parts of objects, high cognitive ability for rote memory, echolalia, nonsemantic form perception, and a variety of sensory and motor behaviors such as oversensitivity to stimuli and repetitious and odd movements (see Happé 1995, 113ff).

Whatever the internal limitations of this approach to autism, it is also the case that theory theory, as an account of intersubjectivity or social cognition more generally, can be challenged at the level of its basic suppositions. I refer here not to the criticisms developed in the well-known alternative, known as simulation theory, which shares some of the same suppositions as theory of mind, but to a critique that has recently been developed on the basis of studies in both developmental psychology and phenomenology (e.g., Gallagher 2001; Hobson 2002; Hutto, 2004; Zahavi and Parnas 2003). Let me mention two of the suppositions made by proponents of theory theory (and shared by proponents of simulation theory).

Supposition 1 (the mentalistic supposition): The problem of intersubjectivity is precisely the problem of other minds. That is, the problem is to explain how we can access the minds of others. This is a problem of access because other minds are hidden away, closed in, behind the overt behavior that we can see. This is a mentalistic and clearly Cartesian supposition about the very nature of what we call the mind. The mind is conceived as an inner realm, in contrast to behavior, which is external and observable, and which borrows its intentionality from the mental states that control it. Both theory theory and simulation theory set the problem as one of gaining access to other minds, and their explanations of social cognition are framed in precisely these terms.

Supposition 2 (the supposition of universality): Our reliance on theory (or our reliance on simulation or some combination of theory and simulation) is close to universal. That is, this folk-psychological way of understanding and interacting with others is pervasive in our everyday life.

Supposition 1 is to be found, explicitly or implicitly, in almost every description of intersubjective interaction that proponents of theory of mind propose. A typical example is Happé's characterization: "to have a theory of mind is to be able to attribute independent mental states to self and others in order to explain and predict behavior." Autism, then, is "an impairment of the fundamental human ability to 'mind-read'" (1995, 38).

Supposition 2 is easily documented in the many strong claims made for universality by proponents of theory of mind. Baron-Cohen, for example, suggests that "it is hard for us to make sense of behavior in any other way than via the mentalistic (or 'intentional') framework. . . . 'attribution of mental states is to humans as echolocation is to the bat'. It is our natural way of understanding the social environment" (1995, 3–4, citing the work of Sperber). Currie and Sterelny write: "mind-reading and the capacity to negotiate the social world are not the same thing, but the former seems to be necessary for the latter. . . . our basic grip on the social world depends on our being able to see our fellows as motivated by beliefs and desires we sometimes share and sometimes do not" (2000, p. 145). Frith and Happé propose that mind-reading "appears to be a prerequisite for normal social interaction: in everyday life we make sense of each other's behaviour by appeal to a belief-desire psychology" (1999, 2). Wellman maintains that children at age four begin to "see people as living their lives within a world of mental content that determines how they behave in the world of real objects and acts," they construe "people's real-world actions as *inevitably* filtered through representations of the world rather than linked to the world directly" (1993, 31–2). Tooby and Cosmides argue that "humans everywhere interpret the behavior of others in . . . mentalistic terms because we all come equipped with a "theory of mind" module (ToMM) that is compelled to interpret others this way, with mentalistic terms as its natural language" (1995, xvii).[3]

The two suppositions taken together amount to the claims 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, and that our primary form of interacting with them is predicated on our attempts to explain or to predict their next move through a process of mentalizing.

Both phenomenology and scientific evidence from developmental psychology, however, question these basic suppositions and suggest that they are simply wrong (see below). The external challenge to the theory of mind account of autism, then, can be stated clearly: Deficits in theory of mind cannot explain autism because the theory of mind itself is not a good explanation of non-autistic intersubjective experience. If theory of mind does not offer a good or acceptable account of our everyday normal interaction with others, then the lack of a theory of mind does not offer a good or acceptable account of the problems involving social interaction in autism.

In the following section, I outline the case against theory of mind as an account of our everyday normal interaction with others. I then develop an alternative account, which I call *interaction theory,* based on phenomenological and developmental studies. In the concluding section I suggest that interaction theory can contribute to a better account of autism than theory of mind. This better account, however, will require additional considerations about sensory-motor deficits and problems with what Frith (1989) has called *central coherence.*

THE CASE AGAINST THEORY OF MIND

According to theory theory accounts, we take a theoretical stance to understand another person's mind, and then use that understanding to explain or predict the other person's behavior. Because we have no direct access to the other person's intentional states, we infer or postulate what their beliefs or desires are on the basis of a set of causal-explanatory laws. Taking the theoretical stance, theorizing about the other, is not necessarily conscious or explicit. It is likely that we learn to do it in a way that makes it habitual and transparent.

This account implies that the recognition of another person's beliefs, desires, or intentional states involves conceptual, declarative knowledge. Even if this recognition is implicit, it is informed by such knowledge. One might even go further and argue that this conceptual recognition, that is, to recognize a belief as a belief, involves an element of mentalistic abstraction. I require a concept of belief or desire in order to attribute such things to another person. Con-

cepts like *belief, desire,* and even *the mind* are abstract concepts developed in a second-order reflective stance in which I recognize my thoughts or those I postulate in the other to be propositional attitudes, classified as beliefs, desires, and so on. At least for some theory theorists it seems perfectly acceptable that the idea that I myself "have a mind" is already something of a theoretical postulate. What I take to be direct access to my own experience is itself the result of an abstract and theoretical attitude (see, for example, Carruthers and Smith 1996; Gopnik 1993; Frith and Happé 1999; for a philosophical statement of this see Churchland 1986, 305–10). If I say, for example, "It's good to see you at the beach," to comprehend that this experience is in fact a feeling, and that this feeling depends on the beliefs that I am actually seeing you and that this in fact is a beach, requires something like a reflective detachment from my phenomenal experience, and the positing of mental states as such. It requires a further postulation that such feelings and beliefs are located in a mind.

The phenomenologist who pays close attention to experience is likely to say that this explicit kind of metacognitive theorizing, although possible for the adult human, is not our everyday practice; this is not the way we think of ourselves or of others.[4] In a situation in which we converse with someone about a third person, for example, it seems possible to take a detached theoretical attitude toward the person under discussion. But this third-person attitude does not capture the dynamics of our ongoing interaction with our interlocutor. The conversation itself involves a second-person relationship, and in this relationship our interaction does not involve a detached or abstract observational stance, a third-person quest for causal explanation. Nor does it appear to involve a theoretical stance in which we take the other person's words as evidence for a mental state standing behind what he has just said. Our understanding of this second-person relationship is poorly described as involving the formulation of a theoretical hypothesis.

The defender of theory of mind, however, would point out that on most theory theory accounts, the claim is not that we explicitly go through such abstractive mentalizing procedures when we encounter someone, but that we somehow rely on an implicit use of these abstractions. As a result, the phenomenological criticisms miss the point. If the mentalizing process is an unconscious one, then what we experience, or seemingly experience, is not a good guide for what is really going on in such cases. Because phenomenology is in principle not able to say what is going on at an unconscious level, then it cannot rule out an implicit theory of mind. But proponents of an implicit theory of mind also make claims about what happens on the conscious level. They claim that our understanding of others is best characterized as an attempt to explain and predict the behaviors of others. This simply does not match up to what phenomenology tells us about our everyday interactions. When I am interacting with you in a second-person relationship—in conversation or while working together on a project, for instance—my experience is not one of acting as an observer, attempting to formulate an explanation or prediction of your behavior. Explaining and predicting are specialized and relatively rare modes of understanding others, and they involve, not interaction, but standing back in an observational attitude. For the most part, according to the phenomenological evidence, we are in interactive relations with others that involve modes of understanding that are pragmatic and evaluative. Our interaction is based on environmental and contextual factors, rather than mentalistic or conceptual, explanatory or predictive attitudes. Our encounters with others are not based on an implicit theorizing if such nonconscious procedures are cashed out phenomenologically as explaining or predicting on the basis of postulated mental states.[5]

This does not rule out the possibility that, when our everyday second-person interactions break down, or when I have problems understanding the other person, I may engage in a specialized theoretical approach that appeals to third-person explanation or prediction. But such specialized cognitive approaches do not characterize our primary or everyday encounters with others.

In addition, simply the ability to take a theoretical stance, and even to do so in an implicit

way, is not sufficient for understanding another person in any particular case. Particular cases require knowledge of specific contexts, and this depends on background knowledge, which is cultural, socially generated, and shaped by linguistic practices. This is something that we must already have for a good understanding of others. In other words, a theory theory account of understanding others requires several things: (1) the capacity for taking the theoretical stance (the ability to practice mentalizing), and (2) the background knowledge that informs our understanding. In addition, the background knowledge is not necessarily equivalent to (3) the theory itself, the folk psychology used to understand others. As Carruthers describes it, the theory consists of "general theoretical knowledge—that is the sort of non-content specific knowledge that might very plausibly be held to be innately given" (1996, 24). In contrast, background knowledge consists of content-specific pieces of information about the variety of contexts in which we act and interact with other humans. Without background knowledge, mentalizing would be simply an abstract guessing and not at all dependable.

Another way to put this is that if I have a theory of *x,* it is of no use to me unless I am able to recognize instances where it applies. To recognize instances of where it applies, however, involves a form of pretheoretical, practical, and very particularized knowledge. I cannot apply a theory of mind to brute behavioral appearances unless I already recognize these behaviors as intentional, purposeful, and as contextually meaningful. But this suggests that I already have some information about what is going on with the other person—I already have some understanding of the other person and their intentions.

We are led to ask, then, how we obtain the necessary background knowledge about others and about the various pragmatic contexts in which we encounter them. Because gaining this knowledge already involves some understanding of others, either we already have an innate theory of mind that enables this understanding, or we have some other pretheoretical, preconceptual access to others. The idea that we would need a theory of mind to gain the background knowl-

edge necessary to get a theory of mind does not necessarily involve a vicious circle, but it certainly does involve a serious hermeneutical circle, and it requires an explanation of how the process gets off the ground. This suggests, at the very least, that we should pay close attention to infant development.

Proponents of theory of mind do appeal to developmental psychology,[6] and specifically to false-belief tests, for support. Importantly, these are the same tests that many autistic subjects fail to pass, and it is primarily on this basis that the theory of mind account of autism is developed. In the standard false-belief task, a subject is asked about the thoughts and actions of another person (or sometimes a puppet or character in a story) who lacks certain information that the subject has. In a simple example, the subject learns that a clearly marked candy box actually contains pencils. She is then asked what someone else, who has not seen the pencils, will say is in the box when they see it. Four-year-olds generally answer correctly that the other person will think that there are candies in the box. Three-year-olds, as well as autistic subjects with higher mental ages, are unable to see that the other person may falsely believe that there are candies in the box and they tend to answer that the other person will say there are pencils in the box. False-belief tests can be made more or less complicated (see, e.g., Perner, Leekam, and Wimmer, 1987).

These kinds of experiments are often cited as evidence for the development of a theory of mind at around four years of age, and a lack of that development in autistic children (see, e.g., Baron-Cohen, Leslie, and Frith 1985). Does the false-belief paradigm capture everything there is to say about children's abilities to understand others, or does it even capture the most important things? Stich and Nichols (1992, 62) suggest that "the explanation of the data offered by the experimenters is one that presupposes the correctness of the theory-theory." One could further suggest that the kinds of questions that are asked, and the kinds of answers that are sought in these experiments, are framed by theory of mind's contention that explanation and prediction are the

primary ways of interpreting other people. Furthermore, Bloom and German (2000), who generally support a theory approach, suggest that the false-belief test is "an ingenious, but very difficult task that taps [only] one aspect of people's understanding of the minds of others" (B30).

The fact that these experiments are designed to test one aspect of how people understand the minds of others is both their strength and their weakness. The experiments clearly show that something new happens at age four. Moreover, what happens is consistent with certain assumptions of theory of mind explanations. The experiments are designed to test whether children at certain ages have acquired an ability to explain or predict the behavior of others. As I have suggested, however, explaining and predicting are very specialized cognitive abilities that put us in an observational mode and do not capture the fuller picture of how we understand other people.

False-belief tasks are thus extremely limited in terms of trying to capture the nature of intersubjective understanding. One reason for this is that subjects are asked to predict the behavior of others with whom they are not interacting. The subject is installed in the role of third-person observer, and in this role the child is asked to predict what the other person will do. The fact that what is tested is ability for third-person observation suggests that the results of these experiments may not be applicable to second-person (I–you) interaction, which is arguably the primary and ordinary way of encountering the other person. It is interesting to note that during these tests, the three-year-old subject does not seem to have any difficulty understanding the experimenter or what the experimenter wants. That is, the three-year old seems not to have any trouble with the kind of understanding that is important in second-person interaction, even as she does have difficulty with the specialized kind of cognition needed for grasping false belief. It is not at all clear that third-person observation best captures our ability to interact with and understand another person directly in our ordinary and everyday second-person relationships.

It is also the case that most false-belief experiments are designed to test a conscious, metarep-resentational process. Subjects are asked, not only to explain or predict something about the other person, from a third-person perspective, but they are asked to perform these tasks consciously and in a reflective manner. Yet it is often the claim by the proponents of theory of mind who cite these experiments that theory of mind mechanisms are subpersonal and implicit, operating below the level of consciousness. In effect, the experimental design simply does not support the claim that is being made, and indeed does not even address the issue of how such mechanisms function nonconsciously.

Interaction Theory

What I call *interaction theory* proposes that more primary forms of intersubjective understanding develop much earlier than the age of three, and in some aspects may be innate. In the context of developmental psychology, this approach takes its point of departure from Trevarthan's notions of primary and secondary intersubjectivity (Trevarthen 1979). My intent here is not to cite all of the developmental evidence that supports this approach, although I briefly summarize it; rather, I want to suggest that there is good phenomenological evidence to support it as well.

Primary Intersubjectivity

By *primary intersubjectivity,* we mean the innate or early developing capacity to interact with others manifested at the level of perceptual experience—we see or more generally perceive in the other person's bodily movements, facial gestures, eye direction, and so on, what they intend and what they feel. On this view, in second-person interactions, the mind of the other is not entirely hidden or private, but is given and manifest in the other person's embodied comportment.[7] The basis for human interaction and for understanding others can be found already at work in early infancy in certain embodied practices that are emotional, sensory-motor, perceptual, and non-conceptual. Interaction theory contends that these embodied practices constitute our primary access for understanding others, and continue to

do so even after we attain theory of mind abilities. In most of our ordinary and everyday intersubjective situations we have a direct, perception-based understanding of another person's intentions because their intentions are explicitly expressed in their embodied actions. This kind of primary understanding does not require us to postulate some belief or desire that is hidden away in the other person's mind. To put it most bluntly, the mind conceived as a set of propositional attitudes simply does not come into it. What we might reflectively or abstractly call their belief or desire or mental state is expressed directly in their behavior. This is not to deny that the other person has phenomenal experience. Indeed, their behaviors inform us that they intend and feel in ways that are not exactly the same but not entirely different from the way we experience things.

In brief, the developmental evidence for primary intersubjectivity suggests that pretheoretical (nonconceptual) sensory-motor capabilities for understanding others already exist in very young children. Infants already have a sense from their own proprioception and movement of what it means to be an experiencing subject-agent. They can sense that certain kinds of entities (but not others) in the environment are indeed subject-agents like themselves; and that in some way these entities are similar to and in other ways different from themselves. This sense is implicit, at least in a primitive way, in the behavior of the newborn. Infants from birth are capable of perceiving and imitating facial gestures presented by another (Meltzoff and Moore 1977, 1994). This interaction depends not only on a distinction between self and non-self, and a proprioceptive sense of one's own body, but on the recognition that the other is in fact of the same sort as oneself (Bermúdez 1996; Gallagher and Meltzoff 1996). Infants are able to distinguish between inanimate objects and people (agents). They can respond in a distinctive way to human faces, that is, in a way that they do not respond to other objects (Legerstee 1991; Johnson 2000; Johnson et al. 1998).

Infants do not accomplish this feat by means of applying a theory. Rather, the evidence suggests that from birth the action of the infant and the perceived action of the other person are coded in the same language, a cross-modal sensory-motor system that is directly attuned to the actions and gestures of other humans (Meltzoff and Moore 1994; Gallagher and Meltzoff 1996). Accordingly, we can say that there is a common bodily intentionality that is shared across the perceiving subject and the perceived other. As Husserl suggested as early as 1907, and as recent research on mirror neurons confirms, our perception of the other person induces a sensory-motor process that reverberates kinetically and kinesthetically with their intentions (Husserl 1973; see Gallagher 1986, in press-c; Petit 1999).[8] As Gopnik and Meltzoff put it, "we innately map the visually perceived motions of others onto our own kinesthetic sensations" (1997, 129).

Primary intersubjectivity can be specified in more detail. Although these aspects of infant behavior are sometimes considered to be precursors of theory of mind (Baron-Cohen 1995, 55; Gopnik and Meltzoff 1997, 131), they support a more immediate, less theoretical (nonmentalistic) mode of interaction. One such ability involves what Baron-Cohen (1995) calls the *intentionality detector* (ID). He considers this to be an innate capability that allows the infant to read "mental states in behavior" (1995, 32). The ID allows the infant to interpret, perceptually and nonmentalistically, rather than theoretically, the bodily movement of others as goal-directed intentional movement. Infants at ten to eleven months of age are able to parse some kinds of continuous action according to intentional boundaries (Baird and Baldwin 2001; Baldwin and Baird 2001; Baldwin, Baird, Saylor, and Clark 2001). In effect, the infant is capable of perceiving other persons as intentional agents. This perceptual ability is, as Scholl and Tremoulet suggest, "fast, automatic, irresistible and highly stimulus-driven" (2000, 299). This suggests that another person's intentional state is simply and in the first place their action or the dynamic comportment of their body.

Another aspect of primary intersubjectivity involves following the eyes of the other person, which is an ability bestowed early in infancy by a

mechanism that Baron-Cohen calls the *eye-direction detector* (EDD). EDD allows the infant to follow the gaze of the other person. The infant is able to see that the other person is looking in a certain direction, and to sense what the other person sees (which is sometimes the infant herself), in a way that throws the intention of the other person into relief.

In addition to the eyes, it is likely that the infant perceives various movements of the head, the mouth, the hands, and more general body movements as meaningful, goal-directed movements. Such perceptions give the infant a non-mentalistic (pretheoretical) understanding of the intentions and dispositions of other persons (Allison, Puce, and McCarthy 2000), and they are operative by the end of the first year (Baldwin 1993; Johnson 2000; Johnson et al. 1998). In seeing the actions and expressive movements of the other person, one already perceives their meaning; no inference to a hidden set of mental states (beliefs, desires, etc.) is necessary.

Highlighting the interactive nature of the infant's relations with others in precisely these primary sensory-motor understandings, and discounting the idea that the infant is simply a passive spectator trying to figure out what is going on, there is also good evidence for affective and temporal coordination between the gestures and expressions of the infant and those of the other person. Infants "vocalize and gesture in a way that seems [affectively and temporally] 'tuned' to the vocalizations and gestures of the other person" (Gopnik and Meltzoff 1997, 131). Infants are able to detect correspondences between visual and auditory information that specify the expression of emotions as early as five to seven months of age (Walker 1982; also, Hobson 1993, 2002). In this regard, too, primary intersubjectivity is based on something that is cognitively closer to the perception of embodied comportment, rather than to a theoretical inference about emotional states.

It is, of course, impossible to ask the infant to provide phenomenological descriptions of primary intersubjectivity. Yet phenomenologists have described something that seems to correspond to what is indicated by the behavioral measures of developmental psychology. We find such descriptions precisely in the analysis of a basic intersubjectivity found in our normal everyday adult relations. Max Scheler, for example, describes our primary understanding of another person in terms of a perceptual ability.

> For we certainly believe ourselves to be directly acquainted with another person's joy in his laughter, with his sorrow and pain in his tears, with his shame in his blushing, with his entreaty in his outstretched hands . . . And with the tenor of this thoughts in the sound of his words. If anyone tells me that this is not 'perception', for it cannot be so, in view of the fact that a perception is simply a 'complex of physical sensations . . . I would beg him to turn aside from such questionable theories and address himself to the phenomenological facts. (Scheler 1954, 260–61)

On this phenomenological evidence, Scheler argues against the idea that any sort of inference is involved in our immediate sense of what the other person is experiencing. He presents this view in opposition to the argument of "inference from analogy," an early version of simulation theory (see Gordon and Cruz 2003), according to which we observe the physical appearance and behavior (expressive movements and gestures, etc.) of others, and then infer mental experiences, based on an analogy with what we know of our own mental experiences and behaviors. Specifically, Scheler argues (1) that the notion of inference is overly cognitive, given that infants, and perhaps some animals, may be capable of understanding intentions.[9] (2) The body of the other is experienced differently from our own body (starting with different sense modalities, vision versus proprioception).[10] (3) The argument from analogy assumes that there is no direct access to the other person's mind. It is this last objection that Scheler develops in his description of our perception-based understanding of others.

If we supplement Scheler's phenomenology with the evidence from developmental psychology, we have a strong case for the importance of the sensory-motor, perceptual processes of primary intersubjectivity in providing a primary understanding of others which we can carry forward into our everyday interactions. That is, as Scheler suggests, the capacities of primary inter-

subjectivity do not disappear in later life; they are not replaced by later-developed strategies for understanding others. Yet, we also have to say that primary intersubjectivity does not fully explain everything about our intersubjective interactions. Certain developmental aspects of our intersubjective abilities seem to involve more than just the perceptual, sensory-motor capacities of this early experience. We do not leave the capabilities of primary intersubjectivity behind, but we also do not simply stay at the primary level of intersubjectivity. Our interactions become nuanced and more sophisticated in an embodied and enactive fashion—in a way that prepares us for the Cartesian specialization of the four-year-old, but does not limit us to a mentalistic understanding of others.

SECONDARY INTERSUBJECTIVITY

Trevarthan shows that around the age of 1 year, infants go beyond the person-to-person immediacy of primary intersubjectivity, and enter into contexts of shared attention—shared situations—in which they learn what things mean and what they are for (see Trevarthan and Hubley 1978). Peter Hobson nicely summarizes this notion of secondary intersubjectivity.

The defining feature of secondary intersubjectivity is that an object or event can become a focus *between* people. Objects and events can be communicated about. . . . the infant's interactions with another person begin to have reference to the things that surround them. (Hobson 2002, 62)

Children do not simply observe others; they are not passive observers. Rather they interact with others, and in doing so they develop further capabilities in the contexts of those interactions. If the mechanisms of primary intersubjectivity like the detection of intentions, and of eye direction, are sufficient to enable the child to recognize dyadic relations between the other and the self, or between the other and the world, something more is added to this in secondary intersubjectivity. Baron-Cohen terms it the *shared attention mechanism* (SAM). A young child not only understands that another person wants food or intends to open the door, that the other can see him (the child) or is looking at the door, but

he now begins to share interactions directed at objects in the world. Behavior representative of joint attention begins to develop around nine to fourteen months of age. The child alternates between monitoring the gaze of the other and what the other is gazing at, checking to verify that they are continuing to look at the same thing. The child also learns to point around this same time. Phillips, Baron-Cohen, and Rutter (1992) show that infants between nine and eighteen months of age look to the eyes of the other person to help interpret the meaning of an ambiguous event.

Eighteen-month-old children can comprehend what another person intends to do. They are able to reenact to completion the goal-directed behavior that an observed subject does not complete. The child, seeing an adult who tries to manipulate a toy in the right way and who appears frustrated about being unable to do so, quite readily picks up the toy and shows the adult how to do it (Meltzoff 1995; Meltzoff and Brooks 2001). Quite obviously this understanding depends on shared attention and the pragmatic context. Just as we understand our own actions on the highest pragmatic level possible (see, e.g., Jeannerod 1997; Gallagher and Marcel 1999), we understand the actions of others in the same way. That is, we understand actions at the most relevant pragmatic, (intentional, goal-oriented) level, ignoring possible subpersonal or lower-level descriptions, and also ignoring ideational or mentalistic interpretations. We do not need to make an inference to what the other person is intending, starting by observing the movements of her hands on the toy, and moving thence to the level of desires and beliefs. Just as when we are asked "What are you doing?" we never respond "I'm acting on a belief that I am thirsty," so, in such pragmatic circumstances, we do not look beyond the actions of others to try to find the beliefs that motivate them. Indeed, the very question in many contexts is unnecessary: if I see you reach for a glass and a bottle of water, I know what your intentions are as much from the glass and bottle of water as from your reach. We interpret the actions of others in terms of their goals and intentions set in contextualized situations, rather than abstractly in terms of either their muscular performance or their beliefs.

So again, the evidence indicates that well before the development of a theory of mind mechanism, the child looks to the body and the expressive movement of the other to discern the intention of the person or to find the meaning of some object. In this kind of second-person interaction two-year-olds are even capable of recognizing pretend behavior, for example, the mother pretending the banana is a telephone (Leslie 1994).

What characterizes this kind of interaction phenomenologically is made clear by another early phenomenologist, Aron Gurwitsch (1978). Following Scheler in his critique of the argument from analogy, Gurwitsch challenges the idea that the problem should be defined as access to a hidden mind, and in his criticism of the argument from analogy he offers objections that would also target theory of mind.

According to Gurwitsch, we have a basic, first-order "conviction" that we directly experience the other's intentional states: "no theoretical or other sort of consideration is even required to arrive at or confirm this 'conviction'" (1978, 3). Following Heidegger's phenomenological analysis of the primacy of our pragmatic, circumspective engagement with the surrounding environment, and our encounters with others in the larger action contexts of human existence (Heidegger 1968), Gurwitsch claims that "our *originary* encounter with other human beings does not place us as cognizing subjects over against an object to be cognized (namely, other people)" (1978, 35). Rather, we encounter other human persons directly as human persons with intentions. But we never do that in the abstract, removed from all practical contexts. Our understanding of the other's expressive movements depends on their involvement in meaningful instrumental/pragmatic contexts. Thus, according to Gurwitsch, the meaningful encounter with others is not only embodied, but contextually embedded and pragmatic. "Prior to all specific cognition, and independent of it, we are concerned with other people in our 'natural living' of daily life" (1978, 35)—in the pragmatic contexts of life.

The other belongs to the specific situation, determined by it and, on his side, also determining it, so that our comportment toward the other is codetermined by our entire situational comportment. (1978, 36).

Gurwitsch takes pains to avoid a cognitive account of intersubjectivity. Indeed, he argues, the task is not to identify special cognitive acts that have special empathic insight—the explanation is not to be found in some "magical psychical mechanism." Like Scheler, Gurwitsch wants to say we do have direct access to something about the other person that allows intersubjective understanding. But unlike Scheler, this direct access is not a matter of the primary intersubjective perception of expressive movements (gestures, facial expressions, movements) of others. Rather, his emphasis on contexts and shared interaction correlates well with the idea of secondary intersubjectivity. Pragmatic involvement rather than cognitive confrontation, or even direct perception, is the primary basis for intersubjective understanding.

Gurwitsch's account is not inconsistent with Perner's (1991) emphasis on the situation. According to Perner, who attributes to young children what he calls *situation theory,* three-year-olds, prior to attaining a theory of mind, employ some aspect of the environment plus some understanding of desire, but are unable to comprehend the concept of the other's belief. On the phenomenological view, however, we should say that the environment, the situation, or the pragmatic context is not something that the child, or the adult, objectively confronts as an outside observer. The notion of situation should be understood to include the experiencing subject who is at the same time an agent of intentional actions. Our interactive involvement in a situation is not as third-person observers developing a situation theory, as if we were not part of the situation ourselves.

Putting Primary and Secondary Intersubjectivity Together

Gurwitsch's account suggests a displacement of primary intersubjectivity by secondary intersubjectivity, and he is led to an entirely pragmatic or instrumental account of intersubjectivity: we understand others only in the contextualized,

pragmatic interactions that define their social roles. In effect, construing social relations totally in terms of pragmatic or instrumental interactions, Gurwitsch ignores the capacities that define primary intersubjectivity. On the interactive view that I want to develop here, however, the contextualized understanding of others described by Gurwitsch does not displace the primary intersubjective perceptual capacity for understanding others—it builds upon it.

The phenomenology of intersubjectivity cannot be mapped out purely in terms of instrumentally contextualized interaction. Granted that intersubjectivity is not primarily cognitive, the noetic aspects of the perception of another person are not equivalent to the noetic aspects of object perception (perception for object recognition) or perception for pragmatic/instrumental action.[11] To argue for the primacy of the pragmatic over our cognition of objects per se, Gurwitsch cites Gelb and Goldstein's (1920) distinction between the concrete and categorial attitude, showing the primacy of the concrete (pragmatic), for example, in cases of apraxia. Gurwitsch's analysis along this line, however, should be supplemented by more recent studies that show the primacy of certain sensory-motor processes for social interaction over those for both pragmatically concrete and categorial behavior. Marcel, for example, has shown that social interaction has a significant effect on apraxic-like pathologies, over and above both pragmatic (instrumentally contextualized) and abstract (minimally contextualized) behavior (Marcel 1992; Gallagher and Marcel 1999). In addition, studies of proficient gesture in a deafferented subject who has profound difficulties with instrumental movement, show that socially expressive/communicative movement (gesture) is not a form of instrumental movement (Cole, Gallagher, and McNeill 2001; Gallagher, Cole, and McNeill 2001). These studies of apraxia and of gesture, then, suggest that there are sensory-motor aspects of our behavior that are socially primary and irreducible to pragmatic action. On the basis of this kind of evidence, I have argued that, contra Gurwitsch, social interaction, intersubjectivity, and the perception of others are not explainable in terms of

interactions and understandings based purely on pragmatically contextualized encounters (Gallagher, in press-b). Socially contextualized behavior is irreducible to either pragmatically contextualized or abstractly noncontextualized behavior.

The interaction theory of intersubjectivity, then, includes two important and related, but nonetheless distinct, elements:

- *Primary intersubjectivity:* embodied, sensory-motor (emotion-informed) capabilities that enable us to perceive the intentions of others (from birth onward), and
- *Secondary intersubjectivity:* embodied, perceptual, and action capabilities that enable us to understand others in the pragmatically contextualized situations of everyday life (from twelve to eighteen months of age onward).

On this view, the theory of mind is, at best, a set of specialized cognitive abilities that allow us to mentalize on rare Cartesian occasions (from four years onward).

A NEUROPHENOMENOLOGICAL ACCOUNT OF AUTISM

Can we develop, from the perspective of interaction theory, an alternative account, and a more adequate explanation of autism than that found in theory of mind accounts? I want to set out the positive response to this question here. There is good evidence that long before we see in autistic subjects problems in mentalizing as it is defined in theory of mind, we see problems that affect the more basic intersubjective interaction characterized in primary and secondary intersubjectivity. In addition, however, we can acknowledge the limitations of any theory that focuses exclusively on the social problems in autism given the array of other symptoms that go beyond such problems—as mentioned: the restricted range of interest, obsessive concern for sameness, preoccupation with objects or parts of objects, high cognitive ability for rote memory, nonsemantic form perception, echolalia, and a variety of sensory and motor behaviors such as oversensitivity to stimuli, and repetitious and odd movements. To the extent that these nonsocial symptoms of

autism show the limits of theory of mind accounts, they also show the limits of interaction theory, or any theory that focuses on just the social aspects, to explain all there is to explain in autism. We need to face up to this fact by developing an account of the social symptoms that is not inconsistent with a broader account that would explain the nonsocial symptoms. At the same time, in applying interaction theory to autism, we need to ascertain whether the problems that involve intersubjective interaction and understanding are problems best defined at the level of primary intersubjectivity, secondary intersubjectivity, or some combination of these.

In the following, then, I want to map out a general account that is coherent across all significant levels of analysis: neurological, sensory-motor, phenomenological, behavioral, and cognitive. On this neurophenomenological account, the problem of specialized cognitive functions related to theory of mind appears at the end of a long line of effects that are more basic and that are generated in neurological disruptions that affect sensory-motor processes. In turn, these sensory-motor problems infect the development of social interaction and understanding at the level of primary intersubjectivity. Further along this line of development, the problems of primary intersubjectivity combine with certain cognitive deficits to disrupt secondary intersubjectivity, which, in turn, contribute to problems with social cognition and theory of mind.

A good starting point for a neurophenomenological account is at the neurologic level. Here, however, although the picture is beginning to clear, there is still no consensus about what happens in the brain of the autistic subject. Recent research on apoptosis (the natural pruning of the excess of neuronal cells with which we are born) suggests that the normal timing of this process is disrupted in the autistic brain (see, for example, Courchesne, Carper, and Akshoomoff 2003; Fatemi and Halt 2001; Fatemi, Halt, Stary, Realmuto, and Jalali-Mousavi 2001; Margolis, Chuang, and Post 1994). If that is the case, it is likely that many and diverse neurological problems affecting many different parts of the brain, and different kinds of dynamic processing in the brain,

could result. It would not be surprising then to find abnormalities in the neuronal processes that underlie face recognition (the fusiform gyrus [Pierce, Muller, Ambrose, Allen, and Courchesne 2001]), emotional perception (amygdala and limbic system [Bachevalier 2000; Bauman and Kemper 1994]), and many other sensory, motor, and cognitive problems that can result from a variety of brain abnormalities. Because the neurologic picture remains unclear, however, we need to look to behavioral indicators to find the first clues about autism.

Sensory-Motor Problems

It has been demonstrated that a variety of basic sensory-motor problems exist in autistic children between ages three and ten years (see Damasio and Maurer 1978; Vilensky, Damasio, and Maurer 1981) and even before that, in infants who are later diagnosed as autistic. Teitelbaum, Teitelbaum, Nye, Fryman, and Maurer (1998) studied videos of infants who were diagnosed as autistic around age three years. Movement disturbances were observed in all of the infants as early as age four to six months, and in some from birth. These include problems in lying, righting, sitting, crawling, and walking, as well as abnormal mouth shapes. They involve delayed development, as well as abnormal motor patterns, for example, asymmetries or unusual sequencing in crawling and walking.

Just these kinds of sensory-motor processes have been shown to be important in explaining some basic aspects of social cognition. There is good evidence that a subject's understanding of another person's actions and intentions depends to some extent on a mirrored reverberation in the subject's own motor system. When I observe someone else performing a certain action, or imagine myself doing that action, the neuronal patterns that are activated in my premotor cortex, supplemental motor area (SMA), and other brain areas are in large part the same neuronal patterns that are activated when I perform action myself. The neurology of "shared representations" for intersubjective perception (Georgieff and Jeannerod 1998), then, suggests that problems with our own motor or body-schematic

system could significantly interfere with our capacities for understanding others. Accordingly, it is possible that developmental problems involving sensory-motor processes may have an effect on the capabilities that make up primary intersubjectivity, and therefore the autistic child's ability to understand the actions and intentions of others.[12]

Importantly, however, the disrupted development of these sensory-motor processes may contribute not only to deficiencies in primary intersubjectivity, but are likely to offer some explanation of the other sensory-motor symptoms of autism: oversensitivity to stimuli, repetitious and odd movements, and possibly, echolalia.

PROBLEMS WITH CENTRAL COHERENCE

Uta Frith (1989) and Francesca Happé (1995) have developed a proposal meant to supplement the theory of mind approach, since the latter leaves many symptoms unexplained. Frith (1989) suggested that autism involves an imbalance in the integration of information, and specifically in integrating parts and wholes. She refers to this as a problem with central coherence. Perception and understanding are normally shaped by Gestalt principles. In autism these Gestalt principles seem to break down. Happé emphasizes the idea that autistic cognition focuses on parts rather than on the broader contexts that provide meaning for the parts. Autistic subjects thus have difficulty seeing things in their context; they treat them as noncontextualized, in an impoverished categorial (Goldstein) or abstract way. Happé cites a clinical example.

A clinician testing a bright autistic boy presented him with a toy bed, and asked the child to name the parts. The child correctly labeled the bed, mattress and quilt. The clinician then pointed to the pillow and asked, "And what is this?" The boy replied, "It's a piece of ravioli." (Happé 1995, 117).

Indeed, the pillow did look like a piece of ravioli, out of context, but ordinarily one would see it as a pillow in the context of the bed.

This problem of central coherence permeates autistic cognition and can generate a variety of symptoms and test results, including what might be regarded as positive effects (unusual talents for remembering word strings or unrelated items, echoing nonsense, sorting faces by accessories, recognizing faces upside down) and negative effects (unusual weakness for remembering sentences and related items, sorting faces by emotion, recognizing upright faces). Problems with central coherence also affect perceptual experience. In contrast to normal test subjects, for example, autistic children are better able to find embedded figures in complex backgrounds—for them, the background context does not interfere with their search abilities, as it does for non-autistic subjects.

If we characterize these Gestalt problems of central coherence to be problems that involve understanding context, then it is clear that such problems may interfere with the capabilities that make up secondary intersubjectivity—intersubjective capabilities that depend on understanding others and interacting with them in contexts—contexts that are pragmatic, but also social. Seeing another person move in a certain way could mean many different things if it is done outside of any particular context. If, for example, you see my right arm, with open hand, drop through the air, but nothing else that would provide the context for what it means, then it could mean many different things. It might be part of a gesture that means *hello* or *goodbye*; it might mean *get out of here*; it might be that I intend to make an important point by bringing my hand down hard on the desk in front of me. Without the context, my intention is simply not clear to anyone who would be watching me, or trying to interact with me.

Problems with central coherence can contribute to the explanation of other nonsocial problems as well. Specifically, we would expect someone with a central coherence problem to manifest certain nonsocial symptoms found in autistic subjects: restricted range of interest, obsessive concern for sameness, preoccupation with objects or parts of objects, high cognitive ability for rote memory, and nonsemantic form perception.

If we were to remain with a theory of mind approach, we might suggest that there may be a connection between central coherence and metarepresentation, so that a deficit that affects

central coherence may affect the capacity for metarepresentation, which is seemingly important for attaining a theory of mind. Happé notes, however, that one can find weakness in central coherence even in autistic subjects who pass theory of mind tasks. She points out that this loosens the tie between central coherence and theory of mind.

The finding that weak central coherence appears to characterize autistic people at all levels of theory of mind ability goes against Frith's (1998) original suggestion that a weakness in central coherence could by itself account for mentalizing impairments. At present, all the evidence suggests that we should retain the idea of a modular and specific mentalizing deficit in our causal explanation [of autism]. (Happé 1995, 124; also Frith and Happé 1994)

To see the difference between a theory of mind approach, supplemented with these considerations of central coherence, and a fuller account that includes interaction theory, we can compare two diagrams (Figures 1 and 2). Whether we stay with the idea that problems of central coherence may interfere with the functioning of metarepresentation, or follow what Happé terms the "exciting suggestion" that there are two possible cognitive deficits that underlie autism, these approaches still ignore the evidence for other more basic and noncognitive problems. If, instead, we consider the effects that both sensory-motor problems and problems of central coherence may have on primary and secondary intersubjectivity, as well as their connections to the nonsocial symptoms, we could develop a fuller theory as represented in Figure 2.

Here we see that sensory-motor problems may lead to symptoms that are social (in primary intersubjectivity) and nonsocial. Problems with central coherence may also lead to both symptoms that are social (including problems in both primary and secondary subjectivity) and nonsocial. We may also ask whether there is any connection between sensory-motor problems and the problems with central coherence. There are good reasons to think that body-schematic processes are closely related to perceptual and cognitive abilities (see, Gallagher in press-a; Johnson 1987), but the precise nature of the autistic sensory-

motor problems needs to studied further before any clear answer can be given in regard to their relations to either central coherence or primary intersubjectivity.

The status of theory of mind in this account of autism is left open. There is good reason to think that in contrast to an autistic deficiency in theory of mind, as argued by theory of mind proponents, high-functioning autistic individuals may actually employ theorizing strategies as a way to compensate for the loss in the capacities of primary and secondary intersubjectivity. If they are not able to perceive the intentions or emotions in the other person's bodily comportment, they may resort to a purely intellectual mentalizing to develop hypotheses about what motivates others to do what they do. Pursuing this suggestion, Zahavi and Parnas (2003) cite accounts of strategies used by high-functioning autistic individuals. A high-functioning autistic person like Temple Grandin, for example, uses a variety of strategies to make up for a loss of a natural intersubjectivity. She reads about people, and observes them, in an attempt to arrive at the various principles that would explain and predict their actions in what she describes as "a strictly logical process." As Zahavi and Parnas suggest, "Grandin's compensatory way of understanding others perfectly resembles how *normal* intersubjective understanding is portrayed by the proponents of the theory-theory" (67–8). She decodes emotional behavior. As Oliver Sacks explains, she lacks an "implicit knowledge of social conventions and codes."

This implicit knowledge, which every normal person accumulates and generates throughout life on the basis of experience and encounters with others, Temple seems to be largely devoid of. Lacking it, she has instead to "compute" others' intentions and states of mind, to try to make algorithmic, explicit, what for the rest of us is second nature. (Sacks 1995, 258)[13]

Perhaps, however, as I have argued here, it is something more basic than a *second* nature, to the extent that primary intersubjectivity may come along for most of us as part of our innate genetic endowment as humans.
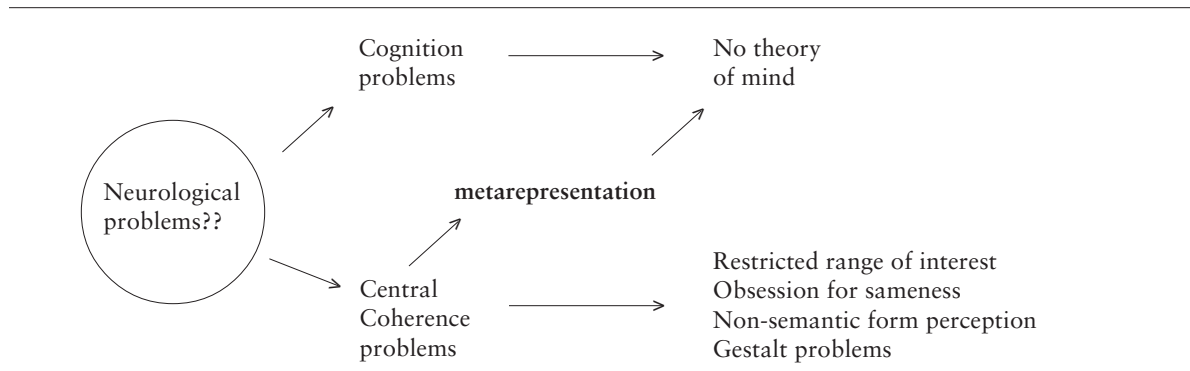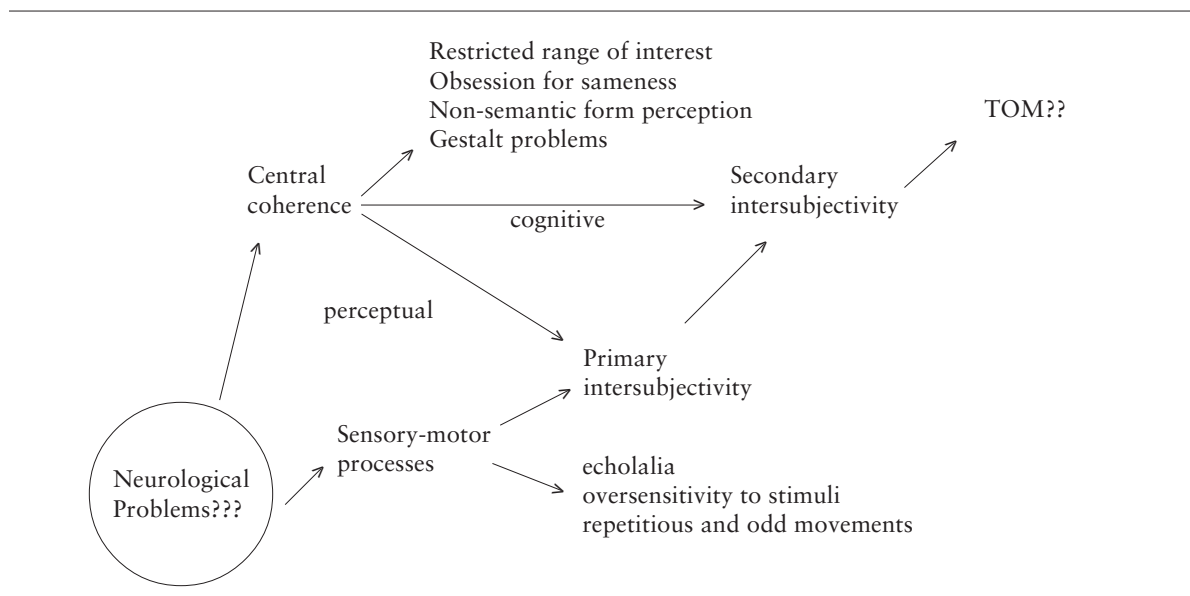
FIGURE 1. THEORY THEORY ACCOUNTS OF AUTISM.

FIGURE 2. A NEUROPHENOMENOLOGICAL ACCOUNT OF AUTISM.

NOTES

1. The other main theory of mind approach is simulation theory. In this paper, I focus on those explanations that enlist some version of theory theory because they are the ones that have been most discussed in the autism literature. For simplicity, I treat the terms *theory theory* and *theory of mind* as equivalent. For a phenomenological critique of simulation theory, see Gallagher (in press-c).

2. In the above description a number of these disagreements are indicated by the several appearances of the word *or*. For our purposes, we do not need to discuss different versions of theory of mind.

3. Strong claims like these can be found in too many places to list, but several others are worth noting. Leslie defines ToMM as a specialized component of social intelligence, but claims that it is necessarily involved "whenever an agent's behavior is attended to," for example, "in conversations and other real-time social interactions" (2000, 1236). Scholl and Leslie introduce their view as follows: "the currency of our mental lives consists largely of propositional attitudes, even when we are interpreting the behaviours of others" (1999, 131). Paul Churchland states that intentional psychology currently "embodies our baseline

understanding of the cognitive, affective, and purposive nature of people" (1998, 3). I thank Matthew Ratcliff for several of these citations.

4. In this regard, simulation theorists are in agreement. They contend that we do not represent, explicitly or implicitly, the sorts of rules (causal-explanatory laws) that summarize what we know of human situations and operate as the bases for a theoretical understanding of the other person (Goldman 1989).

5. As Richard Gipps has pointed out (personal correspondence), it is not clear what could warrant ascribing nonconscious or implicit theorizing to someone. On the one hand, we cannot simply appeal to the subject's behavior, because it is this behavior that the nonconscious theorizing has been posited to explain. On the other hand, it is hard to see what legitimation would be available for describing subpersonal neurologic occurrences as theorizing, because the prerequisite everyday intentional context for coherent talk of theorizing is absent on the subpersonal level.

6. Baron-Cohen (1995) and Gopnik and Meltzoff (1997) are good examples. As we see in the next section, however, much of the evidence they cite can be better interpreted to serve interaction theory (and sometimes simulation theory) rather than theory theory.

7. This is not to deny that there is some private aspect to mental experience. The possibility of deception attests to the fact that we do not always have complete access to the other person's mind. The argument here is simply that we do not appeal to a hidden mind when we interact with others in this primary way.

8. This insight was much developed by Merleau-Ponty who wrote that "between this phenomenal body of mine and that of another as I see it from the outside, there exists an internal relation which causes the other to appear as the completion of the system" (1962, 352). Gallese (2003) has been developing the implications of the mirror neuron research for these kinds of questions, although he takes the simulationist position.

9. Good evidence for eighteen-month-olds understanding intentions is given by Meltzoff (1995). The question of whether animals have a theory of mind or are capable of empathy is still debated. See, for example, Gallup (1998), Povinelli (1998), Premack (1988), and Premack and Woodruff (1978).

10. This objection has been made frequently in the phenomenological literature. I think it is now questionable, at least to the extent that, as mentioned, perception is intermodal from birth.

11. Here it is interesting to note certain correspondences in the neuropsychological analysis of dorsal versus ventral visual systems worked out by Milner and Goodale (1995), that is, the neurologic basis for the distinction between vision for motor control and action and vision for object recognition, respectively,

and the Heideggerian analysis of *Zuhandenheit* and *Vorhandenheit* that Gurwitsch uses in his account.

12. Much more work is needed in this regard. An easy objection to this idea is that there are many individuals with severe sensory-motor problems who do not show autistic symptoms in regard to social development. We could imagine, however, that some specific, early developed sensory-motor problems may interfere with capacities to interact with others, while other sensory-motor problems may not. So it would be important to find out more about the nature of these problems—more, at least, than the study of videotapes may reveal.

13. Another high-functioning autistic person, Jared Blackburn, puts it this way: "Those Autistic people who are very intelligent may learn to model other people in a more analytical way, however, as part of adapting to society. For those who are skilled in this, it may become very accurate, and make a few Autistic people seem to have exceptional insight into people. However, even for them there is a social disability, because this accuracy is at a great cost in terms of speed and efficiency, and is maybe virtually useless in practical situations (which involve "real-time" interaction and fast interpretation and response). Thus, given time I may be able to analyze someone in various ways, and seem to get good results, but may not pick-up on certain aspects of an interaction until I am obsessing over it hours or days later. So in practical situations, I have impaired social cognition, with problematic results, while I may seem to have good insights into people at other times. (Blackburn, Gottschewski, George, and Niki 2000).

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