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# *Two Problems of Intersubjectivity*

**Abstract:** *I propose a distinction between two closely related problems: the problem of social cognition and the problem of participatory sense-making. One problem focuses on how we understand others; the other problem focuses on how, with others, we make sense out of the world. Both understanding others and making sense out of the world involve social interaction. The importance of participatory sense-making is highlighted by reviewing some recent accounts of perception that are philosophically autistic — i.e., accounts that ignore the involvement of others in our perception of the world.*

**Key terms:** Intersubjectivity, social cognition, participatory sense-making, perception, philosophical autism.

The problem of social cognition goes by a variety of names in a variety of disciplines — the problem of other minds (in traditional philosophy of mind), intersubjectivity (in phenomenological philosophy), theory of mind (in psychology, recent philosophy of mind, and the cognitive sciences). There are at least two questions involved in this problem: How do we recognize others as conscious or minded agents/persons, *and* how do we understand their specific behaviours, actions, intentions, and mental states? Most recent work, especially in the cognitive neurosciences, focuses on the second question, and for purposes of this paper I'll do the same. In this form the problem of social cognition has been the focus of numerous empirical and theoretical studies across the disciplines, and there continue to be ongoing debates about best approaches to this problem. Rather than rehearse

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these debates in any detail, in this paper I will provide a brief outline of current thinking on social cognition in order to distinguish this problem from a second problem of intersubjectivity, which, following De Jaegher and Di Paolo (2007), I'll call the problem of participatory sense making. I'll also suggest that although these two problems are closely related, they should not be conflated. So my primary task here is to make the distinction between these two problems as clear as I can, and to show why the problem of participatory sense making is an important problem that needs more attention.

## Standard and Alternative Approaches to Social Cognition

The familiar story about social cognition is that there are two main contenders to be considered as possible solutions. Indeed, debates about these two approaches dominate the literature and seemingly leave little room for alternative theories. The two standard approaches are 'theory theory' (TT) and simulation theory (ST). According to TT, we use a theory about how people behave (folk psychology) to infer or 'mindread' (or mentalize) the beliefs, desires, intentions of others. This practice is sometimes considered to be explicit, a matter of conscious introspection, or implicit, something that we do so often that it becomes habitual. Theory theorists also disagree about whether our ability to mindread is acquired by means of experience (e.g., Gopnik & Meltzoff, 1997) or is the result of a modular development that comes online sometime around the age of four years when, as traditionally thought, children are able to pass false belief tasks. In contrast to TT, ST suggests that we have no need of a theory to understand others; rather, we have the capacity to put ourselves in the shoes of others and to employ our own mind as a model, with which we simulate — create 'as if' or pretend beliefs, desires, intentional states — and then project these mental states into the mind of the other person to explain or predict their behaviour. Again, simulation theorists can disagree about how much this is a conscious process, and how much it may be implicit. Most recently ST received a boost from the research on mirror neurons. It is now a common claim that the mirror resonance system constitutes an implicit simulation when we observe the actions of others by activating our own motor system in a way that matches the observed action (see e.g., Gallese, 2007; Goldman, 2006).[1]

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[1]  I've argued against the ST interpretation of the mirror system and in favour of an interpretation in terms of an enactive social perception (Gallagher, 2007a; 2008d). Sinigaglia (2009 — this issue) outlines a similar approach. To clarify one important issue in this discussion, the idea that motor expertise (the subject's own motor ability developed through

Perhaps the most significant development in recent years is how these two different approaches have been brought together in hybrid versions that combine theory and simulation approaches. Goldman, for example, who has been a strong proponent of ST, integrating both explicit and implicit (neural) versions, also makes room for theory (2006).

TT and ST, and their interpretations of the science, are based on three basic suppositions.

1.  Both of these approaches frame the problem in terms of the lack of access that we have to the other person's mental states. Since we cannot directly perceive the other's thoughts, feelings or intentions, we need some extra cognitive process (theorizing or simulating) that will allow us to infer what they are. This supposition defines the problem.

2.  Our normal everyday stance toward the other person is a third-person observational stance. According to most of the descriptions given in this literature, we observe the other person's behaviour as a starting point for mindreading (via theoretical inference or simulation), with the aim of explaining or predicting further behaviour.

3.  These mentalizing processes constitute our primary and pervasive way of understanding others.

In support of the latter supposition, for example, on the TT side, the psychologist Bertram Malle states: 'Theory of mind arguably underlies all conscious and unconscious cognition of human behaviour, thus resembling a system of Kantian categories of social perception — i.e., the concepts by which people grasp social reality' (2002, p. 267). And on the ST side, Alvin Goldman suggests that 'The strongest form of ST would say that all cases of (third-person) mentalization employ simulation. A moderate version would say, for example, that simulation is the *default* method of mentalization … I am attracted to the moderate version. … Simulation is the primitive, root form of interpersonal mentalization' (2002, pp. 7–8).

Among several alternatives to TT and ST, I have argued for what I call interaction theory (IT) (Gallagher, 2001; 2004; 2005; 2008a;

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prior experience) can enhance the mirror resonance process is often cited by simulation theorists as evidence that mirror resonance is indeed a simulation process. But the role of motor expertise can easily be interpreted in terms of a more specific set of sensory-motor capabilities informing enactive social perception. It's what makes the social perception enactive, rather than simulative. As Sinigaglia might want to say, mirror in action is mirror enaction.

2008b; 2008c; Gallagher & Zahavi, 2008). That IT is a genuine alternative to the standard approaches can be seen in the fact that it challenges the three basic assumptions just mentioned.

1.  IT rejects the Cartesian idea that other minds are hidden away and inaccessible, and it cites evidence, from phenomenology and developmental psychology, that we directly perceive the other person's intentions, emotions, and dispositions in their embodied behaviour. In most cases of everyday interaction no inference is necessary.
2.  Our normal everyday stance toward the other person is not third-person, detached observation; it is second-person interaction. We are not primarily spectators or observers of other people's actions; for the most part we are interacting with them on some project, or in some pre-defined relation.
3.  Our primary and pervasive way of understanding others does not involve mentalizing or mindreading; in fact, these are rare and specialized abilities that we develop only on the basis of a more embodied approach.

To be able to see clearly the distinction between the two problems of intersubjectivity that I am going to outline, it's necessary to summarize some of the more relevant aspects of IT. There are three components to IT, and I'll focus on the first two. Following termininology originating with Colwyn Trevarthen (1979; Trevarthen & Hubley, 1978) in his developmental studies, I'll refer to these as *primary* and *secondary intersubjectivity*. Primary intersubjectivity (which makes its appearance early in infancy, starting at birth) includes some basic sensory-motor capacities that motivate a complex interaction between the child and others. Secondary intersubjectivity (which begins to develop around 1 year of age) is based on the development of joint attention, and motivates contextual engagement, and acting with others. The third component of IT is narrative competency (which begins to develop around 2–4 years), and involves narrative practices that capture intersubjective interactions, motives, and reasons.

Primary intersubjectivity is expressed in an initial form in the phenomenon of neonate imitation (Meltzoff & Moore, 1977; also see Gallagher & Meltzoff, 1996). A newborn infant can pick out a human face from the crowd of objects in its environment, with sufficient detail that it can imitate the gesture it sees on that face. The infant's ability to track another person's eye direction (Baron-Cohen, 1995; Csibra & Gergely, 2006; Johnson *et al.*, 1998; Senju *et al.*, 2008) is an important capacity for understanding where they are looking and what

they might take as significant. In addition, infants are capable of discerning emotions and intentions in the postures, movements, facial expressions, gestures, vocal intonations, and actions of others (Hobson, 2005). Infants automatically attune to smiles and other facial gestures with an enactive, mimetic, response (Schilbach *et al.*, 2008). Human infants show a wide range of facial expressions, complex emotional, gestural, prosodic, and tactile face-to-face interaction patterns, absent or rare in non-human primates (Falk, 2004; Herrmann *et al.*, 2007). At 9–11 mos. they are able to see bodily movement as expressive of emotion, and as goal-directed intentional movement, and to perceive other persons as agents (Walker, 1982; Hobson, 1993; 2005; Senju *et al.*, 2006; Baldwin & Baird, 2001; Baird & Baldwin, 2001; Baldwin *et al.*, 2001).

Infants, however, are not taking an observational stance; they are *interacting* with others. For example, infants vocalize and gesture in ways that are affectively and temporally 'tuned' to the vocalizations and gestures of the other person (Gopnik & Meltzoff, 1997, p. 131). The child smiles, the adult responds with a related expression, drawing forth a continued response from the child. The reciprocity in such mutual behaviour leads Reddy (2008) to call this a 'proto-conversation'. Such behaviour involves temporal synchronizations and desynchronizations. By the second month of life infants are sensitive to such reciprocity (the timing and turn-taking) while interacting with others and it provides a sense of shared experience or intersubjectivity (Rochat, 2001).

Importantly, primary intersubjectivity is not something that we leave behind as we mature. We continue to rely on our perceptual access to the other's affective expressions, the intonation of her voice, the posture and style of movement involved in her action, her gestures, and so on, to pick up information about what the other is feeling and what she intends. This has frequently been pointed out by phenomenologists such as Scheler (1954) and Merleau-Ponty (1962), but also by Wittgenstein.

> Look into someone else's face, and see the consciousness in it, and a particular shade of consciousness. You see on it, in it, joy, indifference, interest, excitement, torpor, and so on. … Do you look into yourself in order to recognize the fury in *his* face? (Wittgenstein, 1967, §229).

> In general I do not surmise fear in him — I *see* it. I do not feel that I am deducing the probable existence of something inside from something outside; rather it is as if the human face were in a way translucent and that I were seeing it not in reflected light but rather in its own (Wittgenstein, 1980, §170).

On average, around the age of one year, the advent of joint attention and the ability to share pragmatic and social contexts transitions into what Trevarthen calls secondary intersubjectivity. Of course movements, gestures, actions, and so forth, are never suspended in thin air — they are embodied; now, however, they come to be seen as embedded in the world. In secondary intersubjectivity the world begins to do some of the work as we try to understand others. The pragmatic and social situations within which we encounter others help us to make sense out of the other person. The things around us set the stage for carrying out certain actions. Children at 18 months are capable of recognizing uncompleted intentions of others because they know from the setting and the instruments at hand what the person is trying to accomplish (Meltzoff, 1995; Schilbach *et al.*, 2008; Woodward & Sommerville, 2000). Children also start to learn the significance of social roles as they are tied to specific environments (Schutz, 1967; Ratcliffe, 2007), and this helps them to make sense out of the other person's behaviour.

Secondary intersubjectivity gives us access to the others' intentions as they develop in the immediate environment, here and now. Around the age of two, and certainly as the child develops through the third and fourth years, they start to understand more complex actions and interactions as they are stretched out over longer time periods. Language acquisition and participation in communicative practices assists this extension of secondary intersubjective understanding, and helps to inform the development of narrative competency. Starting in a preliminary way around two years, and fostered by the stories that we read to children, narrative builds and expands on secondary intersubjectivity and starts to provide more subtle and sophisticated ways of framing the meaning of the other's intentions and actions (Gallagher & Hutto, 2008).

Here I'll mention two hypotheses in regard to narrative competency. The *implicit framing hypothesis* states that gaining narrative competency means that we start to implicitly make sense of our own and others' actions in narrative frameworks. Our perception and understanding of the behaviours of others come to be pre-reflectively shaped by narrative (Gallagher, 2006). The *narrative practice hypothesis* (Hutto, 2008a,b) states that narrative provides the concepts that are basic to folk psychological practice. If in fact we are capable of taking a mindreading stance — that is, if we come to require an explanation of the other's behaviour in terms of her mental states — something that may happen in relatively rare or puzzling cases, or in circumstances where we may be inclined or forced to take a

third-person perspective on others[2] — this is possible in part because we gain conceptual and generalizable knowledge of others through narrative practices. Our narratives can become, reflectively, folk-psychological narratives.

Much more can be said, and has been said by numerous researchers, about primary intersubjectivity, secondary intersubjectivity, and narrative competence. Philosophers who are trying to work out a theory of social cognition clearly have to pay attention to the extraordinary work of the developmental psychologists, and owe them a great debt for the wealth of empirical data that they have provided. TT, ST and IT, however, all make some appeal to developmental studies, and it seems that the data are open to multiple interpretations, so that even the developmental psychologists have not found a consensus on this front.

## Participatory Sense Making

As may be expected, a number of criticisms of the IT alternative have been raised from the perspectives of TT and ST (see, e.g., Currie, 2008; Herschbach, 2008a; 2008b; also Goldman, 2007; Stitch, 2008). IT has also come under more friendly fire, however, specifically in commentary by Hanne De Jaegher and Ezequiel Di Paolo (2007; 2008; De Jaegher, 2009), and it is this criticism that I would like to discuss here.

De Jaegher & Di Paolo raise three objections to IT as I have outlined it. The first objection is that what IT says about interaction and the direct perception of the others' embodied emotions and intentions can too easily be appropriated by TT and ST. This is especially tied to the way that I characterize direct perception in the context of social cognition (Gallagher, 2008b). Much of what I say strikes De Jaegher (2009) as similar to what I criticize TT and ST for with respect to taking an observational stance. One could take my description of social perception as a description of observing others only if other aspects of my analysis, and specifically my criticism of the observational stance, were ignored. In the context of interaction theory, however, it should be clear that perceptual access to the other's movements, gestures,

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[2]   This is often the case in traditional false-belief tasks where the subject is explicitly requested to take an observational stance toward a third person (i.e., toward a person other than the subject herself or the experimenter, with whom the subject is in a second-person relation). It can also happen in cases where we suspect that others may not be telling the truth or may be hiding something from us. We may come to this suspicion, however, only on the basis of the capacities described under the headings of primary and secondary intersubjectivity, or, of course, on the basis of other relevant narratives.

facial expressions, etc., is in the context of and in the service of ongoing interaction. Social perception is enactive, or as Reddy puts it, perception 'is not merely observation. All perception is embedded in living and doing' (2008, p. 29).

I have no doubt, however, that such descriptions could be appropriated by TT or ST. Indeed, holding to a certain theory frequently determines the way that data is interpreted. Thus, despite the fact that much of the data that Meltzoff explicates in his developmental work can be cited as supporting certain ST approaches, or more clearly, I think, IT, Meltzoff himself argues for a TT interpretation (Gopnik & Meltzoff, 1998). Similarly, the ToM emphasis on mindreading leads Baron-Cohen (1995) to regard much of the developmental data about eye-tracking, intentionality detection, and shared attention as evidence of mere precurors to the main show of mindreading as demonstrated in false-belief tasks (also see Malle, 2002). Many of the defenders of TT and ST explicitly suggest that it's possible to appropriate various aspects of IT. Thus, for example, Currie (2008) suggests that the kinds of claims that IT makes about primary intersubjectivity would not be denied by the ST/TT folk. 'Indeed, all the one's I know about have insisted that there is a whole lot of stuff going on well before children acquire belief-desire psychology and which quite clearly counts as facilitating competent interaction with other people, and they have speculated on what the precursor states might be that underpin early intersubjective understanding, and make way for the development of later theorizing or simulation' (p. 212; similar claims are made by Goldman, 2007; and Stitch, 2008). I have to accept, then, that despite the clear differences in what I have identified as three basic suppositions (as outlined above and in other places, e.g., Gallagher, 2008a), TT and ST may nonetheless try to appropriate much of what is said by IT. Given this strategy, a defender of IT may be motivated, at the very least, to play the Trojan Horse option and hope that the appropriation will lead more to accommodation than assimilation.

A second objection raised by De Jaegher and Di Paolo is based on their more radical notion of interaction. That is, if IT champions interaction, it does not go far enough in its concept of interaction. The more radical notion turns out to be an emphasis on the detailed timing involved in interaction, and the idea that what emerges from interaction is not reducible to the individuals involved. Interaction has a certain autonomy that is not reducible to the capabilities of any one person. I certainly accept that this is the case, and if IT has not emphasized this sufficiently, it can certainly accept it as a friendly criticism.

I am much more interested in the third objection, however. This may be best summarized by stating that IT has missed the significance of 'participatory sense making'. When De Jaegher and Di Paolo talk about participatory sense making, they refer to the fact that enactive '[e]xchanges with the world are inherently significant *for the cognizer and this is the definitional property of a cognitive system:* the creation and appreciation of meaning or *sense-making in short'* (Di Paolo, Rohde & De Jaegher, in press). As De Jaegher (2009) puts it, 'Sense-making is the active engagement of a cogniser with her environment'. Importantly, however, sense making happens not merely by means of an enactive, embodied movement, but also through coordinated interaction with others, and precisely this is participatory sense making (PSM).

De Jaegher & Di Paolo suggest that the concept of PSM is simply missing in the IT account of social cognition, and the account could be improved if it were reoriented to PSM. Their idea, then, is 'to reframe the problem of social cognition as that of how meaning is generated and transformed in the interplay between the unfolding interaction process and the individuals engaged in it' (2007, p. 485).

My response to this particular point is that PSM is a closely related, but different problem from the problem of social cognition, at least as the latter is understood in TT, ST and IT. That is, as De Jaegher & Di Paolo develop the concept of PSM, it is clear that they understand it to address the issue of how intersubjectivity enters into meaning constitution, and most generally the co-constitution of the world. The question that PSM addresses is: How do we, together, in a social process, constitute the meaning of the world? In contrast, the problem of social cognition is centered on the following question: How do we understand another person? Now I believe that these two problems are closely related. For example, one might think that the problem of PSM is the more general problem which includes social cognition since if we are trying to make sense out of the world, certainly we find other persons in the world, so making sense out of others must be part of PSM. Thus, De Jaegher and Di Paolo (2007) are interested in how aspects of the interaction affect the way interactors understand each other, e.g., in dialogue how emotional attributions are influenced by the temporal delay and are reciprocally constructed (pp. 497–8) — and they think of this as an example of PSM. But I think that in a more primary sense it goes the other way, that is, that our understanding of the world is shaped by our interactions with, and in our understanding of, other people. This latter sense is definitely emphasized by De

Jaegher and Di Paolo, and in some sense is the central meaning of the term 'participatory'.

Despite the close relationship between these two problems, I want to also insist on their difference. The difference is summarized in terms of their respective targets: in one case, the world (most generally), and in the other case, other agents or persons. I want to defend the idea that understanding another person is quite different from understanding a tool or an object, and indeed, that even perceiving another person is different from perceiving a tool or an object (Gallagher, 2008b). Making sense of the world together (in a social process) is not the same thing as making sense of another person within our interactive relationship, even if that interactive relationship is one of participatory sense making. One process may contribute to the other; but they are different processes. De Jaegher and Di Paolo characterize the process of PSM as involving interaction with others — specifically, the meaning of the world emerges through our interaction with others. In some sense, to the extent that intersubjective interaction is involved in both social cognition and PSM, we have two different questions that have a common core to their answer.

In most of what De Jaegher and Di Paolo say about PSM, the difference between these problems remains implicit, but there is a certain ordering, in the sense that participatory sense making for the most part seems to presuppose that I am capable of making sense of the other person in our interaction (this is clearest in De Jaegher & Di Paolo, 2007). Perhaps the closeness of these problems comes out in the conception of secondary intersubjectivity where our abilities to see and interact with others in our everyday dealings with the world — as we use objects, navigate situations, etc. — help us to understand their intentions, feelings, attitudes, dispositions and so on. We can think of the capacities gained in secondary intersubjectivity as contributing to how we can make sense of the world together.

### Philosophical Autism

I think I can make the distinction between the problems of social cognition and PSM clearer by considering what happens if theorists ignore the phenomenon of PSM. At the same time this will point to the importance of this concept. To do this I'll focus on some recent accounts of perception that ignore the problem of PSM. I suggest that precisely because they do ignore PSM, these accounts remain philosophically autistic (for some of this analysis see Gallagher, 2008c). An account of perception or cognition is philosophically autistic if it

ignores the effects social interaction has on perception or cognition. I'll focus on two recently published works.

The first is a book by Samuel Todes entitled *Body and World* (2001). Todes argues, influenced by the phenomenological tradition, that it is not possible to provide an account of our cognitive experience of the world without an account of the body's role in that experience. He sets out to show how we perceive objects, and how that experience is shaped by the body's capacity for movement through the physical environment. His descriptions are enriched with examples from sports, dance and ordinary motor responses like turning. His primary aim is to provide a phenomenological account of object-perception — and he explicitly sets aside questions about social cognition, or person-perception, which, he admits, is likely a different kind of experience: 'the way I know *persons* differs from the way I know *objects*' (p. 2).

> All issues in the social philosophy of the human body, all issues concerning our body's role in our knowledge of persons, are carefully avoided. … for the purposes of this study of the human body as the *material* subject of the world, our experience is simplified by disregarding our experience of other human beings. … Throughout this book I assume that this question is answerable, without giving the answer or claiming to do so (2001, p. 2).

One might think that's 'fair enough'. But Todes goes further: he assumes that object-perception can be analysed without introducing any considerations about our interaction with others. On Todes' strategy, we would come to understand the fullness and complexity of human experience by first understanding how an isolated body, moving alone in the world, perceives non-living objects, and then adding to this an analysis of how others enter into the picture. The phenomenal dimension of social interaction that characterizes human existence at least from birth, on his view, has nothing to do with the way we perceive objects.

The problem here is not the bracketing of the problem of social cognition — which may indeed be fair enough since an analysis of object-perception may not require an account of social cognition; rather, the problem is the bracketing of participatory sense making — and by bracketing this latter problem I suggest that Todes' account of object-perception is philosophically autistic. The concept of PSM actually provides a good definition of philosophical autism. An account of how we perceive or interpret the world is philosophically autistic if it ignores the contribution of PSM.

Accounts of action can also be philosophically autistic if they ignore PSM. In this regard we can note in brief that Hubert Dreyfus was influenced by Todes, as he explains in his introduction to *Body and World*, and we can see a similar philosophical autism in Dreyfus' influential analysis of expert action. For Dreyfus (Dreyfus & Dreyfus, 1986), expertise is an instance of embodied human performance — on a continuum with basic lifeworld practices. But in his account of expertise, social and cultural contexts play no part. Selinger and Crease (2002) summarize:

> From Dreyfus's perspective, one develops the affective comportment and intuitive capacity of an expert solely by immersion into a practice; the skill-acquiring body is assumed to be able, in principle at least, to become the locus of intuition without influence by [social] forces external to the practice in which one is apprenticed (Selinger & Crease, 2002, pp. 260–1).

This kind of account, which leaves out relevant social factors that involve biography, gender, race or age, however, simply doesn't hold up (Collins, 2004; Gallagher, 2007b; more generally see Young, 1990; Sheets-Johnstone, 2000). Although Dreyfus's account of acquiring expertise does mention apprenticeship, he fails to provide any details about how we learn from others. It almost seems that we are on our own when it comes to learning, and there is no mention of those social processes that we normally would consider important to learning — imitation, communication, working together, narratives, etc.

In the present context, perhaps the most interesting and relevant case of philosophical autism can be found in Alva Noë's (2004) detailed account of enactive perception. This is interesting and relevant precisely because De Jaegher and Di Paolo frame their account of PSM as an enactive account of social cognition. At least on this one issue we can see some important differences in enactive theories.

Noë offers detailed discussions of vision, causation, content, consciousness and qualia, perceptual perspective, constancy and presence, as well as critiques of computational theories of cognition and sense-data theories. He presents an excellent account of the embodied dimension of enactive perception. And yet the world in which we act and perceive, although full of *things*, seems, in his account, underpopulated by other people. There is a lot of the first-person embodied perspective engaged in a variety of pragmatic and epistemic pursuits — but no second-person perspective. Thus, throughout Noë's analysis, we find elements like central nervous systems, sensory organs, skin, muscles, limbs, movements, actions, physical and pragmatic

situations to deal with — his account is entirely embodied, emphatically embedded, and exhaustively enactive. The point, however, is not that he fails to offer an account of social cognition — like Todes this is simply not his project. Rather, the point is that there is no consideration given to the role that others (and our social or intersubjective interactions with them) may play in the shaping of perceptual processes.

For Noë, 'the key to [the enactive theory] is the idea that perception depends on the possession and exercise of a certain kind of practical knowledge' (2004, p. 33). The mind is 'shaped by a complicated hierarchy of practical skills' (p. 31). If we ask, *how do we get this practical know-how*, his answer is not unlike the answer provided by Todes and Dreyfus — embodied practice and action. Consider, however, that we might actually get it from others — imitating their actions, interacting with them, communicating with them, entering into intercorporeal resonance processes — and doing this even before we know what we are doing — from birth onwards. For Todes, Dreyfus and Noë, fully embodied individual perceivers and practitioners seemingly move about the world without meeting up with others, and nothing about others seems to significantly count in their analyses of embodied, enactive perceptions and expert actions.

## The Importance of Participatory Sense Making

Both phenomenology and empirical science suggest something different. Perhaps Jean-Paul Sartre offers the most dramatic description of the significance of others for the constitution of world meaning. He gives a nice example of sitting alone in an empty park, enjoying the ambiance, when someone else walks into the park.

> Suddenly an object has appeared which has stolen the world from me. Everything [remains] in place; everything still exists for me; but everything is traversed by an invisible flight and fixed in the direction of a new object. The appearance of the Other in the world corresponds therefore to a fixed sliding of the whole universe, to a decentralization of the world which undermines the centralization which I am simultaneously effecting (Sartre, 1969, p. 255).

This may be a little too dramatic, but Sartre is trying to capture the ontological significance of the presence of others. This is not Sartre's famous 'peeping Tom' example, where someone is caught looking through a keyhole and as a result is objectified and experiences shame. The latter is clearly a case of social cognition and emphasizes the importance of the gaze of the other. As Rochat (2004, p. 259) puts

it, 'infants develop in a world inhabited by the gazes of others staring at them'. The park example is not this; rather it's the problem of participatory sense making in perhaps its most basic form.

Sartre's intuition here is confirmed by recent science which shows that our attention to objects changes when others are present — even if it is not explicitly guided by others. The way that others look at objects, for example, or the way that we encounter objects in joint attention, influences the perception of objects in regard to motor action, significance and emotional salience (see Becchio *et al.*, 2008 for a good review of this literature). Let me point to three instances of such phenomena which lend support to the idea that PSM plays an important role in how we attend and react to the world: action priming; object evaluation; and an intersubjective Simon effect. I'll conclude with a brief word about shared attention.

*Action priming.* It's a familiar fact now, from the mirror neuron literature, that when we see someone reach for an object our own motor system is activated. But it is also the case that if we simply see them gaze at an object, motor-related areas of the brain — dorsal premotor cortex, the inferior frontal gyrus, the inferior parietal cortex, the superior temporal sulcus — are activated. Others prime our system for action with objects (Friesen *et al.*, 2005; Pierno *et al.*, 2006; 2008).

*Object evaluation.* Subjects presented with a face looking towards (or away from) an object evaluate the object as more (or less) likeable than those objects that don't receive attention from others. When an emotional expression is added to the face one get's a stronger effect (Bayliss *et al.*, 2006; 2007). Social referencing, where the effect of this kind of emotional communication is clear, occurs early in infancy (Klinnert *et al.*, 1983). Infants have a propensity to glance at their care-givers when faced with an ambiguous situation and to respond behaviourally toward a perceived object or event on the basis of emotional signals. This suggests that our perception of objects is shaped not simply by pragmatic or enactive possibilities, but also by a certain intersubjective saliency that derives from the behaviour and emotional attitude of others toward such objects. It is also the case that if we see another person act with ease (or with difficulty) toward an object, this will also influence our feelings about the object (Hayes *et al.*, 2007).

*Intersubjective Simon effect.* In a traditional stimulus-response task, participants respond to different colours, pressing the button with their left hand when they see the colour blue flashed in front of them, and pressing a different button with their right hand when they see red. They are asked to ignore the location of the colour (which might be flashed on the right or the left of their visual field). It turns

out that incongruence between the location (L or R) and response mode (L hand or R hand), results in increases in reaction times (Simon, 1969). In other words, it will take you slightly longer to press the button with your right hand if you see the relevant colour on the left side of your visual field.

As you might expect, when a subject is asked to respond to just one colour with one hand, there is no conflict and no effect on reaction times regardless of where the colour is flashed. When, however, the subject is given exactly the same task (one colour, one hand) but is seated next to another person responding in a similar manner to a different colour — each acting as if one of the fingers in Simon's experiment — reaction times increased (Sebanz *et al.*, 2006).

These three examples suggest at least that the presence of others calls forth a basic and implicit interaction that shapes the way that we regard the world around us. But this should be no surprise if we think of how the phenomenon of joint attention shapes the way attention works. Evidence from developmental studies of joint attention show that we gain access to a meaningful world through our interactions with others. The other person's gaze, alternating between infant and the world, guides the infant's attention. Even an infant at 8 months follows the direction of gaze behind a barrier — it understands that the agent is seeing something that it does not see (Csibra & Volein, 2008; Frischen *et al.*, 2007). We learn to see things, and to see them as significant in practices of shared attention. In addition, our perception of things often involves an emotional dimension which can derive from a shared feeling as we interact with others and share their attention to specific objects.

Shared attention, as it characterizes secondary intersubjectivity, is that process where interacting with others becomes an interaction with the world — where understanding others throws light upon the world in participatory sense making, and understanding the world throws light upon others as we see them act and as we interact with them in that world. This is where answers to the two problems come together in a mutual process. These two problems, however, should not be conflated, even if they are closely related in just this way.

One might ask how far back we can push PSM? Might PSM also be involved in primary intersubjective processes, and might we say that PSM already characterizes the infant's relations with others from the very beginning? No doubt more research is necessary to answer this question. What we can say, however, is that the emergence of joint attention and secondary intersubjectivity plays an essential role in participatory sense making.

Going forward, we can also say that participatory sense making is obviously not limited to the perceptual and immediate interactive processes described here. More nuanced social and communicative practices enrich the social and pragmatic contexts of secondary intersubjectivity. As we mature, narrative practices clearly enhance PSM.[3] In narratives, the world around us takes on meanings that are not reducible to purely physical environments or merely instrumental settings. Indeed, through narratives and in many cases through specific technologies, we are able to live in socially constituted multiple realities (Schutz, 1974) — think here about literary and theatrical productions, but also film, television, video games and virtual simulations — and we extend our cognitive accomplishments into cultural institutions, some of which liberate us, and some of which enslave us (Gallagher & Crisafi, 2009). For the most part, to the extent that these remain participatory (and here this term can take on a political significance) there is both good and bad to be found in such productions. In contrast, when sense making ceases to be participatory, as in the extremes of autism or delusional experience (Gallagher, 2009), we often categorize it in medical terms by calling it pathological. Such categorizations, of course, are themselves instances of participatory sense making, as are all theoretical and scientific practices.

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[3] This is certainly not a novel idea (see Bruner, 1990; Fiske, 1993). In some discussions of sense making the term 'social cognition' is taken to have a wider meaning than the idea of understanding others (theory of mind, or intersubjective interaction). It means something more like a socially constructed cognition, and in that sense it includes participatory sense making as we use that phrase here. Likewise, the term simulation might mean different things outside of ST. Thus, for example, Fiske, in her review article, 'Social cognition and social perception' writes about 'using stories and simulations to make meaning' (pp. 170 ff.). What she means, in the terminology employed in the present paper, is 'using true and fictional narratives in sense making'.

(http://www.esf.org/activities/eurocores/ programmes/cncc/pro-
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