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Scanning the lifeworld: Toward a critical neuroscience of action and interaction¹

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A recent report published in *Neuron*, a leading journal of neuroscience, by researchers at Japan's ATR Computational Neuroscience Laboratories (Miyawaki et al. 2008) has been the basis for the claim that "new brain analysis technology ... can reconstruct the images inside a person's mind and display them on a computer monitor."² This claim was followed by what is now a traditional optimistic prediction made in this case by a close colleague for the media: "These results are a breakthrough in terms of understanding brain activity. In as little as 10 years, advances in this field of research may make it possible to read a person's thoughts with some degree of accuracy" (Ibid). At best, however, the technology may allow a scientist to make inferences about whether a person may be experiencing one sample of a certain pre-delineated set of stimuli; and the claims made in the actual research paper were much more modest. The claims made in the media, even by one of the researchers themselves, go far beyond this.

The researchers suggest a future version of this technology could be applied in the fields of art and design — particularly if it becomes possible to quickly and accurately access images existing inside an artist's head. The technology might also lead to new treatments for conditions such as psychiatric disorders involving hallucinations, by providing doctors a direct window into the mind of the patient. ... In the future, it may also become possible to read feelings and complicated emotional states. (Ibid.)

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² Reported on the science blog, *Pink Tentacle* -- <http://www.pinktentacle.com/2008/12/scientists-extract-images-directly-from-brain/>

Similar kinds of claims have been made by others.³ Just these kinds of claims – claims that when added together with all the other claims made about what neuroscience is capable of showing about human experience, add up to a super claim that the richness of human experience, informed by emotion, memory, imagination and diverse perceptual encounters, etc., is entirely reducible to brain events, and that in principle there is a clean translation possible from measurable processes in the brain to the fullness of the meaningful, personal and interpersonal experience of the lifeworld – are the target of what seems to me a justifiable critique of neuroscience from the perspective of Frankfurt School critical theory. Thus, Axel Honneth has recently written:

Surrounding the current discussions concerning the results and social implications of brain research, it has often been remarked that the strictly physio-biological approach employed in this sphere betrays a reifying perspective. The argument goes that by presuming to explain human feelings and actions through the mere analysis of neuron firings in the brain, this approach abstracts from all our experience in the lifeworld, thereby treating humans as senseless automatons and thus ultimately as mere things.... [T]he fact that the neuro-physiological perspective apparently does not take humans' personal characteristics and perspectives into account is thus conceptualized as an instance of reification (Honneth 2008, p. 94)

While endorsing this critique of reification and reductionism, I want to suggest that the relationship between critical theory and cognitive neuroscience is a two way street.

- Critical theory can certainly take aim at the reifying and reductionistic tendencies of cognitive neuroscience (see, e.g., Choudhury, Nagel & Slaby 2009 and this volume)
- But also, cognitive neuroscience and cognitive science more generally may be able to tell us things about human behavior that that need to be accommodated by critical theory, or that can even support the aims of critical theory.

I want to pursue the second of these proposals in this chapter, but in doing so it will become clear that if cognitive neuroscience is to inform critical theory, it already needs to be a critical neuroscience, that is, a cognitive neuroscience that is non-reifying and non-reductionistic. In regard to this project I want to suggest two

³ Chris Frith, for example, in an interview with the present author, claims that we may someday be able to read mental states off of brain scans (see Frith and Gallagher 2002; also in Gallagher 2008d). Also Elger et al. (2004), declare that, “‘within the foreseeable future,’ it will be possible to explain and predict psychological processes such as sensations, emotions, thoughts, and decisions on the basis of physiochemical processes in the brain” (Habermas 2007, 14).

things. First, that a cognitive neuroscience informed by phenomenological insights about embodied, enactive and situated cognition can be non-reductionistic in a way that is not subject to the particular critique mentioned by Honneth. In other words, a phenomenologically informed neuroscience can be a critical neuroscience. And second, that cognitive neuroscientific studies of agency and social cognition, in particular, can reveal aspects of human relations important for improving the kind of actions and communicative practices that are championed by critical theory. I think there are clear but implicit connections between questions of social cognition and questions of agency, intention formation and free will, but I will not argue for these connections here. Instead I'll focus on the fact that for both agency and social cognition the relevant phenomena are not reducible to just brain processes, but involve larger pragmatic and social interactions in the lifeworld.

Agency and free will

There are a number of things to say about the kind of claims made in regard to fMRI reconstructions of mental images found in studies by Miyawaki and others. From a philosophical perspective it's not clear what neuroscientists mean by "images inside a person's mind" (and here Miyawaki is not alone in using this terminology, see, e.g., Damasio 1999). Many philosophers would consider this a return to an 18th-century epistemological vocabulary. But even current terminology is not settled or uncontentious. Neuroscientists, perhaps oblivious to ongoing philosophical debates about representationalism (see, e.g., Dreyfus 2002; Gallagher 2008e; Hutto 2008; Ramsey 2007; Rowlands 2006), often use terms like 'representation' without clearly defining what they mean. These are not just terminological squabbles; they register serious conceptual issues about just what one is imaging. There are also methodological considerations that should limit claims about what brain imaging actually shows. As Overgaard (2004) points out, brain imaging does not give us a direct snapshot of anything like an image in the mind. The brain imager does not see the brain state itself; she can only work with statistically massaged data based e.g., on BOLD (blood flow) signals; data that is manipulated in contrastive analyses which are never perfect. Neither are scientists able to access the subject's mental experience in any direct way; at best they are working with the subject's report or with interpretations of overt behavior. From this indirect view of the brain and mediated report on experience, conclusions about "images inside a person's mind" seem several steps removed (fig 1).

Debates within neuroscience on methodological questions about statistical analysis (e.g., Vol et al. 2009), about the use of overly general concepts to inform interpretations of brain-imaging studies (e.g., Legrand and Ruby 2009), as well as important issues regarding ecological validity in brain-imaging experiments certainly must be regarded as qualifications on any quick conclusions about what is being captured in the scanner. On any reading, however, it is clearly not the fully embodied and environmentally situated experience of an active agent in her lifeworld.

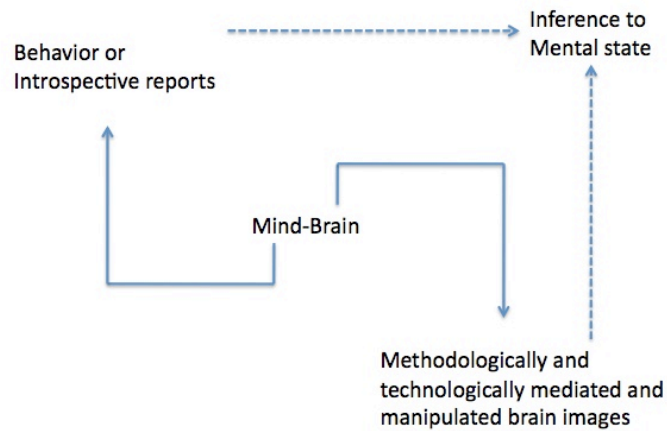


Figure 1

A good example of how experimental data can lead to serious confusions with moral and legal implications in the broader contexts of situated action can be seen in the use made of the Libet experiments to argue against the notion of free will. Psychologists and neuroscientists have argued that consciousness does not control behavior, that our sense of agency for action is retrospective and purely epiphenomenal, and, thus, that there is no such thing as free will.⁴ Part of the argument is based on the Libet experiments and on the idea that although we have a sense or feeling of freely deciding, in fact what we are going to do is already determined by brain processes. The focus of the Libet experiments, however, are on approximately 500 ms of neuronal processing, and the question is whether we can say that what counts as free will is contained in this very short time span. Here's a quick summary of the relevant experiment.

Subjects wearing an array of surface electrodes to monitor brain activity are asked to flick their wrists whenever they want to (Libet et al. 1983). 50 ms before the movement there is activity in the motor nerves descending from motor cortex to your wrist. This is preceded by 500-800 ms of brain activity known as the readiness potential (RP). Subjects were asked to watch a clock and to say when, within this time frame, they decided (or felt the urge) to move their wrist. One might suppose the conscious decision would be made some time prior to the beginning of the brain activity responsible for the movement. Libet shows, however, that on average, 350 ms before one is conscious of

⁴ See, e.g., Prinz (2001); and Daniel Wegner (2002, 98): 'The unique human convenience of conscious thoughts that preview our actions gives us the privilege of feeling we willfully cause what we do. In fact, unconscious and inscrutable mechanisms create both conscious thought about action and the action, and also produce a sense of will we experience by perceiving the thought as the cause of the action. So, while our thoughts may have deep, important, and unconscious causal connections in our actions, the experience of conscious will arises from a process that interprets these connections, not from the connections themselves'.

deciding to move, one's brain is activated for the motor processes that will result in the movement.

Libet concludes that voluntary acts are "initiated by unconscious cerebral processes before conscious intention appears.... The initiation of the freely voluntary act appears to begin in the brain unconsciously, well before the person consciously knows he wants to act. Is there, then, any role for conscious will in the performance of a voluntary act?" (Libet 2000, p. 51). Although Wegner and others have considered Libet's results as evidence that free will is an illusion, Libet himself contends that we can still save free will – because there is still approximately 150 ms of brain activity left after we are conscious of our decision, and before we move we have time to consciously veto the movement.

I have argued elsewhere that Libet's experiment is about motor control mechanisms rather than free will, precisely because it focuses on control of bodily movement rather than engaged action in the world (Gallagher 2005; 2006). This, however, may be puzzling for philosophers since the standard understanding of agency and mental causation has been framed precisely in terms of control of bodily movement, at least since the time of Descartes. One need only compare Descartes' view to that of recent philosophers' statements about mental causation to see what the long-standing standard view is.

Now the action of the soul consists entirely in this, that simply by willing it makes the small [pineal] gland to which it is closely united move in the way requisite for producing the effect aimed at in the volition when we will to walk or to move the body in any manner, this volition causes the gland to impel the spirits toward the muscles which bring about this effect. ... Our volitions, in turn, are also of two kinds. Some actions of the soul terminate in the soul itself, ... other actions terminate in our body, as when from our merely willing to walk, it follows that our legs are moved and that we walk. (Descartes 1649, §§ xli, xliii,xv iii)

In the case of normal voluntary action, movements of the agent's body have amongst their causes intentional states of that agent which are 'about' just such movements. For instance, when I try to raise my arm and succeed in doing so, my arm goes up – and amongst the causes of its going up are such items as a desire of mine *that my arm should go up*. The intentional causes of physical events are always 'directed' upon the occurrence of just such events, at least where normal voluntary action is concerned." (Lowe 1999, 235-36).⁵

Neuroscientists follow this standard view. Haggard and Libet (2001), for example, frame the problem in the same way, referring to it as the traditional concept of free will: "how can a mental state (my conscious intention) initiate the

⁵ Raising one's hand is a favorite example in the philosophical literature. I note that Lowe is in good company; similar statements can be found in many contemporary philosophers – e.g., Frankfurt(1978), Searle (1984), Proust (2003).

neural events in the motor areas of the brain that lead to my body movement?" (p. 47).

Against this standard view, I suggest we think of the consciousness that pertains to action not as a consciousness of deciding to move one's body – indeed, as neuropsychology and phenomenology suggest, one's consciousness of normal bodily movement is minimal and recessive. For most intentional action when I decide to act, I do not first decide, for example, to locate my hand and then decide to move it in a specific way. We do not ordinarily think about flicking our wrists in the larger contexts of action. The processes that Libet studies are automatic body-schematic processes – processes that we are not normally aware of in the details of our movements. As Jeannerod and Pacherie (2004) explain, "both the experience of willing and the experience of acting are *what*-experiences and we are mostly unaware of the *how*-experiences of an action ... [That is] we do not experience willing specific muscle contractions, joint torques, or movement velocities ... our conscious access to our motor processes is thus extremely limited" (p. 121). Libet's experiments measure processes that pertain to the *how* of movement, and to a reflective consciousness of bodily movement that normally does not exist in situated action.

To be sure, complexities tied to embodied and situated action have not been carried over into neuroscientific experiments. But some experiments do start to point to a broader action arena, and they do so in a way that begins to show that the sense of agency is more complex than Libet or Wegner suggest. I'll discuss just one of several experiments (Farrer and Frith 2003; also see e.g., Chaminade and Decety 2002; Farrer et al. 2003) that begin with the phenomenological distinction between *sense of agency* (the experience of being the author of one's action) and *sense of ownership* (the experience that one's body is moving),⁶ and then attempt to identify the neural correlates of the sense of agency.

The experimental design in Farrer and Frith (2003) is as follows.

Subjects manipulated a joystick [to drive a colored circle moving on a screen to specific locations on the screen]. Sometimes the subject caused this movement [on the screen] and sometimes the experimenter. This paradigm allowed us to study the sense of agency without any confounding from the sense of ownership. To achieve this subjects were requested to execute an action during all the different experimental conditions. By doing so the effect related to the sense of ownership (I am performing an action [I am moving]) would be present in all conditions and would be canceled in the various contrasts (Farrer and Frith 2003, 597)

⁶ See Gallagher (2000) for this distinction. The sense of agency and the sense of ownership are difficult to distinguish in normal action, but they can easily be distinguished in involuntary movement or reflex. In the case of involuntary movement, for example, if someone is manipulating my body I have the experience of my body moving (a sense of ownership), but not the sense that I am the author of the movement (sense of agency).

Why does the sense of ownership remain constant while the sense of agency changes? The experimenters understand the sense of agency to be something more than an experience generated by motor control processes; rather, it is tied to the intentional aspects of the action, that is, to the perceptual monitoring of what I'm accomplishing in the world rather than to motor control. It's not about moving the joystick or moving one's body; it's about doing something on the computer screen. Results show that when subjects feel that someone else is controlling the action on the screen (no sense of agency), the right inferior parietal cortex is activated. In contrast, when they feel that they are controlling the action on the screen, the anterior insula is activated bilaterally.

One thing that seems important for the proper interpretation of these results is the phenomenological distinction between a feeling of agency for bodily action, generated in efferent processes, and the correlated perceptual intentionality of accomplishing something in the world. The experimenters do not keep this distinction as conceptually clear as they should, and when they attempt to explain why the anterior insula is involved in the sense of agency they focus on bodily movement and motor control. "[The sense of agency] occurs in the context of a body moving in time and space. ... There is evidence that both the inferior parietal lobe and the anterior insula are ... involved in the representation of body schema..." (p. 601) At the same time they point out that the anterior insula involves the integration of three kinds of self-specifying signals generated in self-movement:

- somatosensory signals (sensory feedback from bodily movement, e.g., proprioception)
- visual and auditory signals containing ecological information about movement, and
- corollary discharge associated with efferent motor commands that control movement.

Ecological information, of course, is tied to non-conscious or possibly pre-reflective monitoring of my relation to the environment, and this is certainly an important element in the sense of agency. It is likely, however, that in some cases even a more explicitly conscious perceptual monitoring is ongoing in action. Searle (1983) calls this "intention-in-action," and it is certainly one of the contributors to a full sense of agency, along with more deliberated intentions formed prior to the action (Gallagher, in press; Pacherie 2006; 2007).

The argument here is based on a complex phenomenological account of the sense of agency which depends not just on the efferent signals of motor control mechanisms, but on pre-reflective perceptual monitoring of what I am accomplishing in the world, as well as on reflective, prospective and retrospective, deliberations about means and ends. Beyond this relatively narrow phenomenology, however, beyond the brain-based and cognitive processes just mentioned, at the most relevant pragmatic level, embodied action is enacted in a world that is physical and social and that often reflects perceptual and affective saliences, as well as the effects of physical and social forces and affordances --

normative elements of the subject's social and cultural milieu. The sense of agency will accordingly be modulated by this larger context. Conceptions of agency, intention, and free will are best conceived in terms that integrate all of these aspects. What I freely decide to do is not about bodily movements -- it's about my pragmatic or socially defined actions. Intentions often get co-constituted in interactions with others -- indeed, some kind of intentions may not be reducible to processes that are contained exclusively within one individual. In this case, free will is a matter of degree -- it can be won or lost -- it can be enhanced or reduced -- by physical, social, economic, cultural factors -- including our own communicative and narrative practices.

The point I want to make here is that this kind of interchange between phenomenology and neuroscience points in the direction of a more complex picture involving not just brain processes "in the head," but certain physical and social aspects of the environment. Any adequate discussion of agency and free will needs to consider the longer time scale (certainly more than 500 ms) and wider contexts. In effect, even if we cannot "PET" or "fMRI" the lifeworld, as phenomenologists define it and critical theorists analyze it, the lifeworld, and what Habermas (2007) calls "the participant's involvement in shared lifeworld practices," need to be taken into consideration in the interpretation of experimental results. This, accordingly, would be a non-reductionist use of neuroscience.

Habermas sets the discourse of neuroscience and the discourse of responsible agency in opposition, and he contends that "the constellations of conditions that render actions intelligible and explainable differ in kind, conceptually, from the constellations of events linked by laws of nature" (2007, p. 17). In fact, however, we should not see these as completely distinct realms, even if we need different vocabularies to explain them. A breakdown at the level of neuronal processing is never *just* a brain event, since the brain is embodied and the body is embedded in an environment that is physical, social, cultural, and so forth. To say that I act the way I do because 300 ms before each bodily movement the brain engages in preparatory processes amounts to a completely inadequate explanation of intentional action; but neither can we claim to have the whole picture by pointing exclusively to conscious intention formation or the enabling and constraining factors involved in social structures. Non-neural factors have an effect on neural factors, and vice versa, since the system is brain-body-environment and is organized dynamically across time. Disruptions in any part of the system -- in the brain or even in those aspects that involve conscious deliberation and amounts of time in excess of 300 ms -- can lead to disruptions in action. If, as Habermas and many others suggest, the languages of neuroscience and freedom-responsibility are irreducible to each other, that should not be a problem since we have both languages and we can say more with both than we can with only one.

Theory of mind

To pursue the idea that a non-reductive neuroscience can contribute to critical theory, I want to show how a phenomenologically informed account of the

neuroscience of social cognition can reframe certain aspects of a critical theory of communicative action. This project is larger than I can outline here, but I will focus on one important controversy in social neuroscience and try to show the implications of a particular interpretation for critical theory.

Let me first set the stage of the large and current debate on social cognition. Theory of mind (ToM) is one way to name the standard theories that dominate this debate in philosophy of mind, psychology, and social neuroscience. Under this heading there are two main contenders. The first is theory theory (TT) – so called because it proposes that our understanding of others is based on a theory, namely, folk psychology, the general commonsense understanding that we have about human behavior. The idea defended by TT is that in understanding others, we use folk psychology to make inferences about their mental states (typically identified as propositional attitudes like belief and desire). Alternatively, simulation theory (ST) contends that we have something better than theory; we have direct access to our own mind and we are capable of using it as a model to simulate the mental states of others. We do this, explicitly (consciously) or implicitly, by introducing pretend mental states (pretend beliefs, pretend desires) into the mechanisms of our own minds, and then projecting the results to the minds of others. Alvin Goldman offers a concise 3-step formula for this procedure.

1. First, the attributor creates in herself pretend states intended to match those of the target. In other words, the attributor attempts to put herself in the target's "mental shoes."
2. The second step is to feed these initial pretend states [e.g., beliefs], into some mechanism of the attributor's own psychology ... and allow that mechanism to operate on the pretend states so as to generate one or more new states [e.g., decisions].
3. Third, the attributor assigns the output state to the target ... [e.g., we infer or project the decision to the other's mind] (Goldman, 2005, pp. 80-81).

Let me add two complications to this basic account. First, because it is left unexplained how we might accomplish the first step without already having the knowledge that ST is meant to explain, many theorists (including Goldman himself, 2006) now adopt a hybrid approach that combines TT and ST. Specifically, one appeals to folk psychology in order to understand what the other target's "mental shoes" look like. Second, theorists of ST have recently developed an implicit version of this approach that makes use of the neuroscience of mirror neurons. I'll return to this topic shortly.

Notably, both TT and ST share three basic assumptions.

- **Mentalistic supposition:** we understand others to be other minds that are inaccessible. Mindreading involves an attempt to *explain* or *predict* their behavior on the basis of their mental states -- the beliefs or desires they have, or as John Flavell recently put it, "the inner world inhabited by

- beliefs, desires, emotions, thoughts, perceptions, intentions and other mental states” (2004, 274).
- **Spectatorial supposition:** For the most part we are observers who take a 3rd-person stance toward others. Descriptions in TT or ST picture the subject as standing back observing the actions of others and trying to interpret them from that stance.⁷
 - **Universal supposition:** Mindreading is our primary and pervasive way of understanding others (starting sometime around the age of 3 or 4 years, based on data from traditional false-belief tests).⁸

Two things are clear from this set of suppositions. First, whatever our ordinary, usual way of understanding others actually is, it must enter into and constrain our communicative practices. Second, if our ordinary, usual way of understanding others is best described by either TT or ST, or by some hybrid version, then there are already some issues of concern to critical theorists. Honneth, following a long tradition in critical theory, objects to reifying practices that involve “detached observation” of one subject by another. Yet, if ToM genuinely captures our

⁷ Carruthers recently denied that TT requires the spectatorial supposition. Responding to my criticisms of TT, he writes: “In particular, it is simply false that theory-theorists must (or do) assume that mentalizing usually involves the adoption of a third-person, detached and observational, perspective on other people. On the contrary, theory theorists have always emphasized that the primary use of mindreading is in interaction with others (which Gallagher calls “second-personal”)” (2009, p. 166-167). Really? In almost every major account of TT the description is cast in terms of the mindreader observing the other and making inferences from that stance. One finds this consistently to be the case, for example, not only in the discussion of, but in the design of the false-belief tests that are pervasively cited in the ToM literature. In standard false-belief tasks, the subject is always called upon to “explain” or predict the action of another person with whom they are *not* interacting; and in contrast with the observational stance that is studied in these experiments, there is no comment on the subject’s usually smooth second-person interactions with the experimenter.

⁸ I have a large collection of statements endorsing this universal (or at least close to universal) supposition. Here are just a few.

[...] 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. (Currie and Sterelny (2000: 145).

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. (Goldman 2002: 7-8)

Human beings are inveterate mindreaders. We routinely (and for the most part unconsciously) represent the mental states to (sic) the people around us We attribute to them perceptions, feelings, goals, intentions, knowledge, and beliefs, and we form our expectations accordingly. While it isn’t the case that all forms of social interaction require mindreading ... it is quite certain that without it, human social life would be very different indeed. (Carruthers 2009, 121).

natural capacities for social cognition, taking a detached, third-person, observational stance may be unavoidable.

Here the subject is no longer empathetically engaged in interaction with its surroundings but is instead placed in the perspective of a neutral observer, psychically and existentially untouched by its surroundings. The concept of “contemplation” [observation] thus indicates not so much an attitude of theoretical immersion or concentration as it does a stance of indulgent, passive observation... (Honneth 2008, 98-99)

Likewise, ST throws up some important problems from the perspective of critical theory. One criticism, targeting an earlier version of ST (the argument from inference by analogy) was voiced by both Max Scheler (1923/1954) and Gilbert Ryle (1949). According to the latter, for example, “the observed appearances and actions of people differ very markedly, so the imputation to them of inner processes closely matching [one's own or] one another would be actually contrary to the evidence” (Ryle 1949, p. 54). In other words, people are diverse and it is somewhat presumptuous to reduce this diversity to something that can be easily modeled by one's own first-person experience, as ST would suggest. In a broader view this is an important point for critical theory, and I'll return to this later.

Before we leave these standard accounts, we need to say something about the recent development of neural ST. Neural ST conceives of simulation as a subpersonal process. This is an approach that has gained more ground in recent years by appealing to neuroscientific evidence involving subpersonal activation of the mirror (neuron) system.⁹ Mirror neurons (MNs) in the pre-motor cortex, including Broca's area, are said to be activated both when the subject engages in specific instrumental actions and when the subject sees someone else engage in those actions (Rizzolatti et al., 1996, 2000). In broad terms, one's motor system resonates when one encounters another person. The claim made by ST is that these subpersonal mechanisms constitute a simulation of the other's intentions. Thus Gallese contends that “when we observe actions performed by other individuals our motor system ‘resonates’ along with that of the observed agent . . . action understanding heavily relies on a neural mechanism that matches [simulates], in the same neuronal substrate, the observed behaviour with the one [the observer could execute] . . . ” (2001, pp. 38-39; see Gallese & Goldman 1998). The hypothesis is just this: understanding others is achieved by simulating the other's action “with the help of a motor equivalence between what the others do and what the observer does” (2001, 39). This is a subpersonal process

⁹ E.g., Fadiga, Fogassi, Pavesi, & Rizzolatti (1995); Rizzolatti, Fogassi, & Gallese (2000); Rizzolatti, Fadiga, Gallese, & Fogassi (1996). I leave aside the recent criticisms that raise questions about the existence of MNs in humans (see, e.g., Dinstein et al. 2008; Hickok 2009). This is clearly an empirical question with implications for ST. But even if we assume that there are MNs in the human brain, the more philosophical question is whether they can be considered what Oberman and Ramachandran (2008) call ‘simulator neurons’.

generated by “automatic, implicit, and nonreflexive simulation mechanisms . . .” (Gallese 2005, p. 117).

Neural ST understood in these or in similar terms has been the growing consensus. Indeed, use of the term ‘simulation’ has become the standard way of referring to mirror system activation. Thus, for example, Marc Jeannerod and Elizabeth Pacherie write:

As far as the understanding of action is concerned, we regard simulation as the default procedure.... We also believe that simulation is the root form of interpersonal mentalization and that it is best conceived as a hybrid of explicit and implicit processes, with subpersonal neural simulation serving as a basis for explicit mental simulation (Jeannerod and Pacherie 2004, p. 129).

Goldman (2006) now distinguishes between simulation as high-level mind-reading and simulation as low-level mind-reading where the latter is “simple, primitive, automatic, and largely below the level of consciousness” (p. 113), the prototype for which is “the mirroring type of simulation process” (p. 147). That MN activation is a simulation not only of the goal of the observed action but of the intention of the acting individual, and therefore a form of mindreading, is suggested by research that shows MNs discriminate identical movements according to the intentional action and the simple pragmatic contexts in which these movements are embedded (Fogassi et al. 2005; Iacoboni et al. 2005; Kaplan and Iacoboni 2007).¹⁰

An alternative theory

For present purposes I want to focus on some important criticisms of neural ST, but before I do that let me outline an alternative theory that emphasizes embodied interaction.¹¹ Interaction theory (IT) offers an alternative account of social cognition that opposes the three basic suppositions made in ToM approaches. In opposition to the *mentalistic supposition* which treats the other as a Cartesian mind that is hidden away, IT maintains that we have a direct perceptual access to the other’s intentions and emotions via their embodied actions, movements, gestures, facial expressions, etc. In opposition to the *spectatorial supposition* that takes third-person observation to be our normal stance toward others, IT holds that in our everyday encounters with each other we are primarily interacting in second-person relations where the task is not explanation but understanding and pragmatic doing. And in opposition to the *universal supposition* IT holds that there are many kinds of human relations, but interaction rather than mindreading

¹⁰ Neural simulation has also been offered as an explanation of how we grasp emotions and pain in others (Avenanti and Aglioti 2006; Minio-Paluello, Avenanti and Aglioti 2007; Gallese, Eagle, Migone 2007). The idea that “simulator neurons” are responsible for understanding actions, thoughts, and emotions is taken up by Oberman and Ramachandran (2007; 2008) who amass evidence that the MN system as an internal simulation mechanism is dysfunctional in cases of autism.

¹¹ I’ve outlined the phenomenological critique of TT and ST in other places (Gallagher 2001; 2004; 2005; 2007a; 2008a,b).

characterizes most of our encounters, while the use of theory or simulation for this purpose is a relatively rare occurrence.

IT points to three broad kinds of capacities for understanding others. The first consists of a set of sensory-motor capacities included under the concept of *primary intersubjectivity*, a term originating with Colwyn Trevarthen (1979) working in developmental psychology. These basic sensory-motor capacities, some of which are found in infants from birth, are geared to interaction with others. They include the capacity for neonate and very early imitation (Meltzoff and Moore 1977; 1994; Gallagher and Meltzoff 1996). Young infants are also able to parse the surrounding environment into those entities that perform human actions and those that do not (Meltzoff and Brooks 2001; Johnson 2000; Johnson et al. 1998; Legerstee 1991). For the infant, the other person's body presents opportunities for action and expressive behavior – opportunities that it can pursue through imitation. There is, in this case, a common bodily intentionality that is shared by infant and caregiver. In addition, the ability to detect correspondences between visual and auditory information that specify the expression of emotions starts as early as 5 to 7 months (Walker, 1982; also, Hobson, 1993; 2002), and at 9 months, the ability to follow the other person's eye gaze (Senju, Johnson and Csibra 2007). Such perceptual abilities serve affective coordination between the gestures and expressions of the infant and those of caregivers with whom they interact. Infants "vocalize and gesture in a way that seems 'tuned' [affectively and temporally] to the vocalizations and gestures of the other person" (Gopnik and Meltzoff 1997, 131). Infants, then, are not simply observing others; they are interacting with them from the very beginning.

In primary intersubjectivity, then, our preliminary access to others is based on these innate or early developing capacities manifested at the level of perceptual experience -- we *see*, in the other person's bodily movements, facial expressions, gestures, eye direction, etc. what they intend and what they feel, and we react to them. Infants as young as 6 months perceive grasping as goal directed; infants at 10-11 months are able to parse some kinds of continuous action according to intentional boundaries (Baldwin and Baird 2001; Baird and Baldwin 2001; Woodward, & Sommerville 2000). By the end of the first year of life, infants have a non-mentalistic, perceptually-based embodied understanding of the intentions and dispositions of other persons (Allison, Puce, and McCarthy 2000; Baldwin, 1993; Johnson 2000; Johnson et al. 1998).

These primary capacities do not disappear with maturity; they become more nuanced. Thus Scheler, Wittgenstein, and others have described the everyday phenomenology of perceiving others as a direct perception of their feelings and intentions.

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 his thoughts in the sound of his words. (Scheler 1954, 260–61).

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)

As we'll see, the best way to characterize this ability to see meaning in the other person's actions and expressions is to say that social perception is enactive – that is, that it is geared to interaction with others..

A second set of capacities belongs to what Trevarthen calls secondary intersubjectivity (Trevarthen and Hubley 1978). Expressions, intonations, gestures, and movements, along with the bodies that manifest them, do not float freely in thin air; we find them situated in the world, and infants soon start to notice how others interact with things in the environment. In such interactions 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. Around the age of 1 year, the infant thus goes beyond person-to-person immediacy and enters contexts of joint attention (Phillips, Baron-Cohen, and Rutter 1992)¹² -- shared situations – the pragmatic and social situations in the everyday lifeworld where we learn what things mean and what they are for. The child can understand that the other person *wants* food or *intends* to open the door; that the other can *see* him (the child) or is *looking at* the door. They begin to see that another's movements and expressions often depend on meaningful and pragmatic contexts and are mediated by the surrounding world.

There are two aspects involved in secondary intersubjectivity that are important to distinguish (see Gallagher 2009). The first is the social cognitive aspect. As we interact with others we learn their intentions and we gain understanding of them through their behavior towards us and towards the things in the surrounding world, and through the richly pragmatic and social contexts of such interactions. The second aspect is what DeJaegher and DiPaolo (2007) call 'participatory sense making'. As we interact with others we not only gain an understanding of them, we gain an understanding of the world that we share with them. Our attention to objects in the world around us changes when others are present – even if our attention is not explicitly guided by others (Becchio et al 2008). Empirical studies show that when we see another person's face simply looking towards or away from an object we evaluate the object looked at as more valuable than the object not looked at. An emotional expression on the face results in a stronger effect (Bayliss et al. 2006; 2007). Brain imaging studies show that what we see other people do primes our system for action with objects. Motor-

¹² Reddy (2008) summarizes recent evidence that suggests joint attention is likely present around 9 months, and is pre-figured in behavior even earlier.

related areas of the brain -- dorsal premotor cortex, the inferior frontal gyrus, the inferior parietal cortex, the superior temporal sulcus – are activated not only when we see someone reach for an object, but simply if we see them gaze at an object (Friesen et al. 2005; Pierno et al. 2006; 2008). Thus, objects surrounding us take on meaning within the context of our shared projects. We begin to make sense out of the world through our participation with others in pragmatic contexts, and the shared lifeworld starts to open up precisely in such participation.

The actions of others are always framed in pragmatic and socially defined contexts. It follows that there is not one uniform way in which we relate to others, but that our relations are mediated through the various pragmatic (and ultimately, institutional) circumstances of our encounters. In understanding others, then, the world itself does some of the work – sometimes the actual physical situation, or location; sometimes the institutional setting and the various social roles played by individuals. We come to understand how things work and how contexts can inform the emotions, intentions, and thoughts of others. In this very real sense, a complete explanation of social cognition is not possible simply in terms of neuronal processes; since it clearly involves others in extra-neural contexts and worldly events, it is not reducible to the worldless realm of brain events. The lifeworld cannot be reduced to appropriate scanner size.

A third set of capacities are required to account for the more nuanced and sophisticated understandings we attain as adults. These are communicative and narrative competencies that allow us to fill in and properly frame the interactive contexts that help to make sense out of people's actions (Gallagher and Hutto 2007; Hutto 2008). If IT helps us to see how a phenomenologically informed cognitive science avoids the reductionist aspects of cognitive neuroscience, as well as the reifying approaches to social cognition found in ToM, capacities involved in communicative and narrative competency suggest how IT can offer something more positive to the kind of critical theory that develops around the concept of communicative practice. There is much more to say, especially in regard to narrative competency but for purposes of this chapter I will focus my remarks on the issue of communication. First, however, let's reconsider the neuroscience.

Neural simulation or enactive perception?

At the neuronal level the mirror neuron (MN) system may (or may not¹³) underlie some of the capacities of primary intersubjectivity. For that reason it might seem that the idea of an implicit neural simulation would help to support interaction theory, or that IT is just a version of ST. There are, however, several things wrong with thinking of MN activation as a simulation process (see Gallagher 2007; 2008c). First, the meaning of the term 'simulation' as defined by ST involves two essential aspects that are simply missing in the activation of

¹³ As we noted before, there are still disagreements about whether there is good scientific evidence for MNs in humans (see, e.g., Dinstein et al. 2008); but if there are MNs in humans, there are still debates about whether they have anything to do with social cognition (see Hickok 2009).

MNs. According to that definition simulation (1) involves pretense and (2) has an instrumental character.

For example, in Goldman's explanation: simulation involves "pretend states" where, by pretend state he means "some sort of surrogate state, which is *deliberately adopted* for the sake of the attributor's task ... In simulating practical reasoning, the attributor *feeds* pretend desires and beliefs into her own practical reasoning system" (2002, 7; see Adams 2001; Bernier 2002). The aspect of pretense is part of what distinguishes simulation from a TT model or a simple practice of reasoning (see Fisher 2006). The claim for pretense is found even in subpersonal accounts: as Gallese puts it, "our motor system becomes active *as if* we were executing that very same action that we are observing" (2001: 37). Likewise for Gordon (2005: 96) the neurons that respond when I see your intentional action, respond "*as if* I were carrying out the behavior ..."

Despite these claims, it is difficult to see how pretense can be involved at the sub-personal level, in the neuronal processes themselves. Activation of MNs *per se* cannot represent or register pretense in the way required by ST since MNs are "neutral" in regard to the agent (Gallese 2005; Hurley 2005; Jeannerod and Pacherie 2004); that is, they are activated both when I engage in intentional action and when I see you engage in intentional action. Accordingly, in MN activation there is no first- or third-person specification, in which case, it is not possible for them to register *my* intentions as pretending to be *your* intentions. There can be no "as if" of the sort required by ST because there is no 'I' or 'you' represented.

With respect to characterizing simulation as instrumental, it is often described as a mechanism or model that we manipulate or control in order to understand something to which we do not have access (see Goldman's description above). Gordon locates instrumental control at the neuronal level by suggesting that on the "cognitive-scientific" model, "one's own behavior control system is employed as a *manipulable model* of other such systems. (This is not to say that the "person" who is simulating is the model; rather, only that *one's brain can be manipulated to model other persons*") (2004, 1).

In this regard, however, if simulation is characterized as a process that I (or my brain) instrumentally use(s), manipulate(s), or control(s), then the implicit processes of motor resonance are not good examples of simulation. Certainly, at the personal level, we do not manipulate or control the activated brain areas -- in fact, we have no instrumental access to neuronal activation. *Pace* Gordon, it's not clear where anything like manipulation comes into play. Indeed, in precisely the intersubjective circumstances that we are considering, these neuronal systems do not take the initiative; they do not activate themselves. Rather, they are automatically activated by the other person's action. The other person *has an effect on us* and *elicits* this activation. It is not us (or our brain) manipulating anything; it's the other who does something to us via a perceptual elicitation.

Perhaps, however, this objection targets a step-wise version of ST that is not favoured by neural simulationists.¹⁴ Indeed, anticipating objections about the

¹⁴ Hutto (in press) suggests that this kind of objection targets the wrong concept of simulation; and Gordon suggests that "there is no conflict between the simulation theory, once it is freed from certain constraints carried over from theory theory, and Gallagher's view that our primary and

involvement of pretence and instrumentality, Goldman (2006; Goldman & Sripada 2005) argues that the instrumental and pretense conditions are not necessary conditions for simulation, and that simulation involves something more minimal.

[...] We do not regard the creation of pretend states, or the deployment of cognitive equipment to process such states, as essential to the generic idea of simulation. The general idea of simulation is that the simulating process should be similar, in relevant respects, to the simulated process. Applied to mindreading, a minimally necessary condition is that the state ascribed to the target is ascribed as a result of the attributor's instantiating, undergoing, or experiencing, that very state. In the case of successful simulation, the experienced state matches that of the target. This minimal condition for simulation is satisfied [in the neural model] (Goldman and Sripada 2005, 208).

Rizzolatti and Sinigaglia (2008; Sinigaglia 2009; Flanagan and Johansson 2003) also favor what they term the Direct Matching Hypothesis (DMH). There are a number of things we could say in response to this tactic (see Gallagher 2008c). Here let me just note that against this view, the minimal condition of matching cannot be the pervasive or default way of attaining an understanding of others. If simulation were the default mode of social cognition, and as automatic as mirror neurons firing, then it would seem that we would automatically go into the mental or motor state of the other person whenever we properly see their action, and we would not be able to attribute to ourselves a state different from the other person's mental or action state. But we do this all the time. Seeing you angry doesn't automatically make me angry – indeed, it may make me afraid. There are many cases of encountering others in which we simply do not adopt, or find ourselves in a matching state. When I see you trip and start to fall, I do not simulate your movement; I do not find myself starting to fall; rather I find myself trying to reach out to catch you – so my motor system is clearly in a different state from yours. Furthermore, consider the difficulties involved if we were interacting with more than one person, especially if in such interpersonal interactions the actions and intentions of each person are affected by the actions and intentions of the others (see Morton 1995).

In this regard a study by Catmur, Walsh, & Heyes, (2007) demonstrates that learning can work against matching. The experimenters trained subjects to move their fingers in a manner incongruent with an observed hand, for example, moving the little finger when they observed movement of the index finger. After training, MEPs were greater in the little finger when index finger movement was observed. “The important implication of this result is that study participants who exhibited incongruent MEP responses presumably did not mistake the perception of index finger movement for little finger movement...” (Hickok 2009, 1236). That is, the

pervasive way of engaging with others rests on ‘direct’, non-mentalizing perception of the ‘meanings’ of others’ facial expressions, gestures, and intentional actions” (Gordon 2008, p. 219).

lack of matching in the motor system does not preempt some kind of recognition of what the other person is doing.

The phenomenology and behavioural logic of these examples are supported by the details of the scientific data on MNs. MN activation in monkeys does not always involve a precise match between motor system execution and observed action. Conservatively, between 21 and 45% of neurons identified as mirror neurons are sensitive to multiple types of action; of those activated by a single type of observed action, that action is not necessarily the same action defined by the motor properties of the neuron. Further, approximately 60% of mirror neurons are “broadly congruent,” which means there may be some relation between the observed action(s) and their associated executed action, but not an exact match. Only about one-third of mirror neurons show a one-to-one congruence (Csibra (2005)).¹⁵ It’s likely that broadly congruent MN activation is preparation for a responsive complementary action rather than a matching action (Newman-Norlund et al. 2007, 55). In that case MN activation could not constitute a simulation even in the minimal sense.

In denying that MN activation is a form of simulation, I am not denying the possibility that MNs may be involved in our interactions with others, possibly contributing to our ability to understand others or to keep track of ongoing intersubjective relations. There is some evidence that the mirror system is involved when we perceive not only the other person’s action, but when we perceive the other person being touched (Blakemore et al. 2005), when we perceive their emotional states (Jabbi, Swart, and Keysers 2007), facial expressions (van der Gaag, Minderra and Keysers 2007), and emotional bodily movements (Pichon, de Gelder and Grézes 2008a&b). In contrast to thinking of MNs as part of a simulation process, over and above perceptual processes, a more parsimonious interpretation of MN activation, consistent with IT, is possible. The line between neuronal activation in the visual system and neuronal activation of the mirror system is not a line that we should draw between perception and simulation. Rather, mirror resonance processes can be considered part of the neuronal processes that underlie the kind of direct, enactive *perception* found in primary intersubjectivity.

The idea of an enactive social perception is consistent with the basic idea of enactive perception (Varela, Thompson, and Rosch 1991), where the act of perception is defined not simply as a sensory activation but includes motor components. Perception is primarily *for action*. In the case of intersubjectivity, perception is *for interaction*. The corresponding phenomenology is this: in most cases, when I see the other's action or gesture or emotional expression, I *directly perceive* the meaning in the action or gesture or expression. I see the joy or I see the anger, I see what they must feel, or I see the intention in the face or in the posture or in the gesture or action of the other. I see it. I don't have to simulate it;

¹⁵ A recent study by van Schie et al. (2008) does find matching (of same-action-related neurons to observed action) in the automatic initial time frame of congruent MN activation (taking place less than 100 ms after activation of visual cortex). But this study also shows that this initial matching does not register any of the important specifics of the action in relation to goal or intention, correctness or incorrectness, or any other parameters that are important for social cognition.

and I see is as something *I can* respond to – I see is as “responsible to.” This kind of perception depends, of course, not just on MNs, but on a complex of subpersonal neuronal processes that include activation of sensory areas (e.g., visual cortex), association areas, as well as motor areas. These articulated neuronal processes that may include activation of MNs contribute as part of the neural correlates of a non-articulated immediate perception of the other person's intentional actions, rather than a distinct process of simulating their intentions. If mirror activation is involved, on this interpretation it is not the initiation of simulation; it's part of an enactive intersubjective perception of what the other is doing. That is, I see the other's action as something I can respond to. Action perception in the interactive context is action priming -- I perceive the action of the other as a social affordance.

Implications for critical theory

Questions of free will and responsibility are directly linked to questions about intersubjectivity, since responsibility may be conceived of as answerability to others. Responsibility is something that we attribute to others; and we also accept attribution of responsibility from others. That I am responsible for my action suggests that I should be able to give (to others, or to myself as another) reasons for acting the way I did where such reasons go beyond a list of mechanical causes.

Habermas draws a strict line between reasons, which he characterizes as “arguments that express positions persons take on validity claims,” and causes, such as unconscious brain states. When reasons are assimilated to causes, as in the neuroscientific claim that free will is an illusion, scientific understanding itself, which depends on the evaluation of reasons and arguments, is undermined. Whether a strict line between reasons and causes, or between the two respective language games, can hold, it certainly seems right to suggest that in doing science scientists, who themselves are not just brains, engage in the evaluation of reasons and arguments about what they should do (how they should act) to maintain the validity of their experimental procedures, for example.¹⁶ It is also clear that their actions are or presuppose intersubjective interactions with others.

Habermas's own characterization of intersubjectivity, however, reflects an emphasis on propositional communication, described in terms of pragmatic speech acts.

Thoughts, intentions, and experiences can be attributed only to persons, who themselves can develop as persons only in contexts of social interaction. It is in the course of their ontogenesis that children first learn to take up the pragmatic roles of speaker, hearer, and observer and relate to oneself in the corresponding ways....

¹⁶ I think Searle (2007) misses the point when he argues against Habermas that it is perfectly legitimate for scientists to take their own free will as a presupposition which their investigation in the end shows to be false. The issue is not about an inconsistency within the methodological boundaries of a particular experiment, but about the ability to do science in the first place. The situation is more like the scientist presupposing that he has a right arm, and by investigation demonstrating that to be false, but doing so only by using his right arm.

[T]he intersubjective constitution of a mind that is intentionally oriented towards the world, communicates via propositional contents, and is responsive to rules and standards of validity (2007, 24-25).

Habermas suggests that there is a logical gap between the other's mind and her behavior. At the same time he emphasizes the priority of second-person interaction over experiential aspects of mind – which have too little propositional content and are seemingly inaccessible.

That explains why the intentionalist predicates with which a vocabulary must be equipped (if it is to be suitable for describing persons and their utterances) can be learned only performatively, through being practiced by agents who relate to each other in interaction as second persons. (2007, 35).

Trevarthen settled on his terminology of primary and secondary *intersubjectivity* after finding the concept of intersubjectivity developed in Habermas's writings on critical theory (personal communication). In Habermas, however, all of the important action, the "action oriented toward reaching understanding" is to be found in communicative practices. Habermas links the developmental psychology of Piaget and Kohlberg to his discussion of communicative action, but in this respect the earliest experiences of the infant have little or nothing to do with such action (see Habermas 1990). He comes at the developmental questions from a perspective already informed by social theory and his interest in moral development, and perhaps for this reason he misses the importance of the embodied and enactive aspects of non-verbal interaction.¹⁷ For him, coordination of action is the result of reflective processes, but, from the perspective of IT, such processes are always informed by pre-reflective intersubjective experiences, about which Habermas has little to say. Indeed, in these primary and secondary intersubjective experiences the lifeworld, understood as a background to communicative action (Habermas 1990, 135), is established. Habermas's starting point is too late in developmental terms to give an account of how the lifeworld – the shared world in which we interact – comes to be the established background. Building on work by Selman (1980) and Flavell (1968), the interaction he describes is something of a hybrid of ST and TT, framed in terms of inferring the intentions of others through the rational adoption of different perspectives (1990, 142ff).

As indicated above, whatever our usual ways of understanding others actually are, whether or not these capacities for social cognition are innate or early developing, or relatively late developing, they must enter into and constrain, as well as enable our communicative practices. If TT or ST best describe social cognition, we would end up with a communicative practice in which the second-

¹⁷ We could say of Habermas what Merleau-Ponty says of Piaget: "Piaget ... eliminates from adult language all that is self-expressive and all that calls to others." (Merleau-Ponty, CPP, FP 50, word, 68)

person participatory perspective is waylaid since, for TT especially, our relations to others are characterized in terms of the 3rd-person observational perspective, and for ST, interaction is framed in terms of 1st-person mechanisms, something, as we noted, that raises questions about the nature of diversity. Neither of these standard accounts provides an explanation of what Bruner and Kalmar (1998) have called the “massively hermeneutic” background, i.e., the lifeworld, which forms a necessary backdrop for communicative processes. At best, they appeal to an already formulated folk psychology as the *de jure* theory, or as an *ad hoc* primer that lets simulation take the first step into someone else’s shoes.

More importantly, when one ignores the various capacities for interaction found in primary intersubjectivity, communicative practices can only be conceived of as a collection of speech acts motivated by a formal *a priori* trust that speakers want to be understood – a formal-pragmatic conception of interaction in which one has to argue for the idea that illocutionary force is not just something extra added on to expressed propositions (Habermas 1987; 2000).¹⁸ In contrast, if one starts with the idea of communicative practices as a continuation of the enactive sensory-motor performances of primary intersubjectivity, communication is already *for action*. That is, we would not have to undertake a demonstration of “how communicative acts – that is, speech acts or equivalent non-verbal expressions – take on the function of coordinating action and make their contribution to building up interactions” (Habermas 1987, p. 278). Rather, we would clearly see that speech acts emerge with just this function in already established interactions. The task would be to show how such communicative speech acts transform actions that are already non-propositionally, non-verbally, communicative.

In other words, with a detailed account of primary and secondary intersubjectivity – a set of capacities and practices that characterize not only young infants, but continue to characterize relations with others in maturity, albeit transformed in communicative and narrative practices – we already have an enactive account of interaction, a form of (pre-verbal) communication, and already the basis for the opening up of the intersubjective, experiential lifeworld in participatory sense-making. An analysis of communicative practice at the level of speech acts doesn’t get off the ground without this more basic framework.

Moreover, an important part of this detailed account is neuroscientific, at least it is if we want the well-rounded story, and if we don’t want to appeal to a concept of the lifeworld as a representational (or simulated) illusion. Getting the story right, even at the level of brain processes, seems important with respect to just this point of understanding what the lifeworld is – namely, a landscape for action and interaction rather than a place for the meeting of minds.¹⁹ Intentional actions are already underway, at a pre-reflective level constrained and enabled by sensory-motor processes, as well as by social, cultural, and institutional forces,

¹⁸ Habermas clearly puts the emphasis on speech acts. “If we were not in a position to refer to the model of speech, we could not even begin to analyze what it means for two subjects to come to an understanding with one another” (2000, 120).

¹⁹ For the distinction between the landscape of action and the mentalistic – folk psychological – concept of the landscape of consciousness, see Bruner (1986).

before we can turn them to account by means of reflective intention formation. Deliberative speech acts are already shaped by implicit communicative processes of interaction and participatory sense making that have woven together the shared lifeworld which makes those more explicit acts possible.

In this regard, Honneth's recent work may be more promising, for he does include reference to concepts of primary and secondary intersubjectivity. Honneth, reviewing the developmental studies of Mead and Piaget, which emphasize perspective taking, rightfully criticizes their lack of inclusion of an emotional dimension. He turns to, among others, Peter Hobson and Michael Tomasello for clarification on the importance of emotion in developing communicative abilities.

The starting point of these investigations consists in the same transition from primary to secondary intersubjectivity that the cognitivist approaches also have in mind. These theories suggest that at the age of nine months a child makes several notable advances in its interactive behavior. It acquires the ability to point out objects to its attachment figure by means of protodeclarative gestures and then to view these objects with this person. It can further make its attitude toward meaningful objects dependent upon the expressive behavior with which this other person reacts to these objects. And, finally, the child appears, in doing what G. H. Mead calls "playing," gradually to grasp the fact that familiar meanings can be uncoupled from their original objects and transferred to *other* objects, whose new borrowed function can then be creatively dealt with. (Honneth 2008, 116).

Although Honneth emphasizes the importance of joint attention and emotional attachment as an essential aspect of this development, he leaves aside the full complement of what Buckner et al. (2009) have called the "swarm" of interactive capacities found in primary intersubjectivity. Interaction theory, integrating the rich set of capacities of primary and secondary intersubjectivity (as well as narrative competency), presents a fuller picture of what constitutes intersubjective interaction than that acknowledged by Habermas or yet by Honneth. In specific regard to the question of communicative behavior, we should not stop short of considering the contribution of early interaction capabilities, or the questions that concern the neuroscientific understanding of these capabilities.

If most of the actions that are the concern of critical theory are more contextually complex than the typical dyadic relationship that developmental psychology addresses, the question still remains, can we not, at least to some limited degree, use principles that pertain to dyadic and small group interactions to understand the larger and more complex events that involve not only people, but institutions, technologies and cultural practices?²⁰ One such principle may be

²⁰ On a related issue Joel Anderson, who translated Habermas's essay on free will, makes a suggestion that has recently been explored, independently, in Gallagher and Crisafi (2009) and Crisafi and Gallagher (2009), namely, that these kinds of institutions might be considered from the perspective of the extended mind hypothesis. "The notion of 'objective mind' (which stems from

that interaction always adds up to more than what each individual brings to the encounter. Interaction itself generates meaning irreducible to any or all of what the participants intended (see De Jaegher and Di Paolo 2007). This relates directly to the concept of participatory sense making in which meaning emerges from the interaction itself. This is certainly consistent with the view of critical theory, that to limit analysis to what individuals intend (or to what is happening in one brain) would be to ignore some very real and powerful aspects of interaction that may be productive or counterproductive to communicative practices.

Likewise, the importance that IT places on pragmatic and social contexts is clearly relevant to the aims of critical theory. What makes Habermas's concept of the ideal speech situation ideal (if not idealistic) is precisely that it tries to strip away contextual differences (differences in individual backgrounds, for example)²¹ -- differences that actually make a difference in communicative practices. IT would side with the hermeneutical claim that real communicative situations are always biased by differences. The only way to deal with such differences is through continued interaction, and in ways that recognize the differences. Understanding others is not a matter of simulating or matching our experience to theirs. Rather, it involves understanding why such simulation, or the presumption of simulation, may blind us to diversity, and may lead to distorted communicative practices.

On standard ToM accounts the problem is often posed as follows: “To understand interactive minds we have to understand how thoughts, feelings, intentions, and beliefs can be transmitted from one mind to the other” (Singer, Wolpert and Frith 2004, xvii). But mental states do not fly through thin air between minds; nor are they simply replicated in matching brains. Rather, human feelings, intentions, thoughts and beliefs are deeply embedded in backgrounds and contexts, in embodied social interactions and communicative practices in the everyday lifeworld, and all of these phenomena are characterized by a great many differences that need to be recognized and acknowledged.

Hegel, where it is often translated as ‘objective spirit’) is used to refer to social institutions, customs, shared practices, science, culture, language, and so on—those entirely real parts of the human world that are neither held within one individual’s mind nor physically instantiated independently from humans. In this sense, then, recent discussions within philosophy of mind and cognitive science regarding ‘situated cognition’ or the ‘extended mind’ are also about the ‘objective mind’” (Translators footnote 5, in Habermas 2007, 42-43).

²¹ For what is sometimes referred to as a hermeneutics of suspicion, Habermas puts a great deal of trust in reason: “Whoever enters into discussion with the serious intention of being convinced of something through dialogue ... has to presume ... that the participants allow their ‘yes’ or ‘no’ to be determined solely by the force of the better argument” (1996, 367). Certainly this needs to be qualified by the particular differences of the participants – differences that can be communicated by narrative means. See Harrist and Gelfand (2005) for a more detailed analysis of this approach. As they point out, “Non-narrative theoretical accounts necessarily emphasize the bias built into the theoretical model Narrative accounts, on the other hand are flexible enough to allow emphasis on any given factor at any given moment” (238).

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