CHAPTER 9

COGNITIVE SCIENCE AND SOCIAL THEORY

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THE impact of cognitive science, social neuroscience, and research on cognitive development on social theory has been limited by a mismatch or disconnection between the ground-up, mechanism-driven perspectives developed in these areas and the top-down perspective of social science, which begins with descriptions of social phenomena that need explanation and looks for mechanisms that fit the apparent explanations. In this chapter we are concerned with the bottom-up approach. We discuss the implications for social theory of various competing cognitive science approaches, and reconsider some of the issues between them in light of their different implications for social phenomena.

The basic landscape of cognitive science can be summarized in the following manner. The original and core approach to modeling the mind in terms of the brain brought together a set of basic ideas, more or less organized around a common strategy: to identify the functional conditions necessary for the production of particular mental processes, and to reconstruct these as elements of a process that could be represented by flowcharts. These elements included reasoning understood as concept manipulation, memory, perception, motor skills, representation, pattern recognition, language, the ability to orient in space, and over time added such things as facial recognition—and, notably, the understanding of other minds, the understanding encoded in folk psychology, that is to say the ideas behind the ordinary way in which people speak and think about the beliefs and intentions of others.

There are two puzzling phenomena that have dominated the literature, and have tended to support the standard model: language and theory of mind. The considerations, however, are very indirect. Language proficiency and the capacity to think about others as thinking beings with thoughts distinct from and different from one's own both arrive at a certain, young, developmental point, and arrive, so to speak, all at once. They do not have the same slow incremental development that one would expect if they were like ordinary learning about the world through trial and error and empirical feedback.

In the case of ordinary learning, it would seem, intelligence would matter to the pace of what was learned; the data that were being given through life experiences varied and

would presumably produce variant outcomes, and the process would be slow and incremental. However, it seems that none of the features of ordinary learning matter much if at all: children learn language and come to speak and understand syntactically or in terms of linguistic rules "naturally" or without instruction, come to conform to these elaborate unconscious rules at a certain developmental stage and only at that stage, and exhibit remarkable uniformity, in contrast to the diversity of the results of ordinary learning. These facts lend themselves to the idea that there are pregiven modules, that is to say innate neural structures, common to all people that are activated at a particular developmental stage. We will have more to say about modularity shortly.

9.1 Boxology

Modules or innate structures are appealed to in order to explain not only the apparently odd way in which language use and theory of mind use appear developmentally but also their "fast" or automatic character. But the thing being explained requires its own specification, which is typically represented as a flowchart in which arrows are drawn between boxes representing components of these processes and the arrows representing (usually unspecified) causal and information-transforming processes. The boxes are functional units, parts of what is taken to be the minimal set of unitized processes that make up the cognitive conditions for the possibility of some phenomenon (Nichols and Stitch 2003:10).

The choice of the functional units reflects two constraints. First, there is experimental evidence from psychology about the phenomenon in question. One might have, for example, evidence of the specific details of the memory capacities of ants returning to a nest as revealed by experiments. Second, there are considerations of economy and simplicity. There should be no more boxes than are needed as "conditions for the possibility" to account for the total phenomenon. The "account" is functional, not physical. The point is to have boxes representing every necessary subprocess that figures into the capacity in question as the experimental evidence has defined it.

What is it that the boxes stand in for? There are of course inputs and outputs that are represented by arrows, and something that happens in the boxes. What happens, however, is a problem. The problem is this: in treating these depictions as explanations, we are in effect explaining brain processes by positing a little human-like operative, a homunculus, in the brain performing the relevant tasks in a manner similar to conscious explicit thought. There certainly are not such things. But the boxes help define the explanatory problem, and enable us to take an additional step: breaking the tasks down into a series of boxes that do not require full-fledged homunculi. Consider, for instance, Daniel Dennett's portrayal:

> without saying how it is to be accomplished (one says, in effect: put a little man in there to do the job). If we then look closer at the individual boxes we see that the

> function of each is accomplished by subdividing it via another flowchart into still smaller, more stupid homunculi. Eventually this nesting of boxes within boxes lands you with homunculi so stupid... that they can be, as one says, "replaced by a machine." One discharges fancy homunculi from one's scheme by organizing armies of such idiots to do the work. (Dennett 1978:123–4)

Less colorfully, "They try to explain mindreading (or some other complex cognitive capacity) by positing functionally characterized underlying mechanisms with capacities that are simpler than the capacity they are trying to explain" (Nichols and Stich 2003:11). In reducing a cognitive capacity to successively simpler underlying processes, the standard model's mechanism-driven perspective implies that combinatorial processes operating on representations play a primary role.

The temptation is to think of the thing that happens in the boxes in computational terms, and specifically in terms of rules. The inputs are conveniently thought of as things that are already in some sense representational, and the processes in the boxes as something that is done with the representations, which involves combining the representations and making them into something different, perhaps a different representation, or a command to a part of the body to act, or, in the case of perception taking raw inputs and turning them into a representation that can be stored as a memory or matched with a stored memory. Nichols and Stich put it this way:

> the representational account of cognition... maintains that beliefs, desires, and other propositional attitudes are relational states. To have a belief or a desire with a particular content is to have a representation token with that content stored in the functionally appropriate way in the mind. So, for example, to believe that Socrates was an Athenian is to have a representation token whose content is *Socrates was an Athenian* stored in one's "Belief Box," and to desire that it will be sunny tomorrow is to have a representation whose content is *It will be sunny tomorrow* stored in one's "Desire Box." (Nichols and Stich 2003:14–15; italics in the original)

They note, "Many advocates of the representational account of cognition also assume that the representation tokens subserving propositional attitudes are linguistic or quasi-linguistic in form" (Nichols and Stich 2003:15). Fodor makes the reasoning behind this explicit: what he calls "compositionality is at the heart of the productivity and systematicity of thought, but also because it determines the relation between thoughts and concepts. The key to the compositionality of thoughts is that they have concepts as theory constituents" (Fodor 2008:18), and further, "only something language-like can have a logical form" (Fodor 2008:18). It is difficult to see what the alternative is, given this construction of the problem. The bias toward thinking in terms of representations is overwhelming, in part because it is only representations that can be readily thought of as undergoing combinatorial processes.

"Readily thought of," however, implicitly means thought of in terms more or less familiar from folk psychology. The homunculus problem is simply an extreme case of imagining the inner workings of the mind in familiar human terms. The combinations

or representations in question are modeled on explicit reasoning, or explicit reasoning as formalized in computer programming. And this is a particular issue in relation to our understanding of other people. We seem to have implicit mindreading capacities, demonstrated by experiments, such as the famous false belief experiments to be discussed shortly. And these capacities seem to be the basis of social interaction: we could not easily imagine a social world without the employment of these capacities, routinely and as a part of every relationship between people.

We discursively reason about other minds in terms of notions like belief and motivation and this raises the question of whether the ToM (theory of mind) implied by the usage is true. One reason for thinking it is true, that is to say whether the mind really works in a way that has elements that more or less correspond to the concepts of folk psychology, like belief and desire, and therefore, the correct starting point both for accounts of the brain's role in mindreading and social explanation is the very fact of the ubiquity of the relevant concepts. So pervasive is the role of mindreading in our lives that Jerry Fodor has remarked that if the ordinary person's understanding of the mind should turn out to be seriously mistaken, it would be "the greatest intellectual catastrophe in the history of our species" (Fodor 1987:xii). But for our ToM, as depicted functionally in flowcharts and boxes, to be true, there needs to be something corresponding to its elements, or some of its elements, in the brain itself.

Modularity provides an answer to the question of what the boxes might correspond to. But modules explain at a different level of analysis: they are not physical features of the brain, but they are organizational features, with defined operational properties. Their major properties are defined differently by different users of the term, but among them is that they are fast, and they are highly specialized operations with simple outputs and are "informationally encapsulated" meaning that they operate on their own kind of informational inputs only, and their processes are mandatory. These may correspond to the functional units represented as boxes in flow charts—but they may not. There is no reason in principle for functionalists to think that any particular neural structure is necessary for the capacity. The reason for supposing that there are modules comes from other considerations: how the capacity appears in the course of child development, and the fact that they are "fast," which implies that they are products of evolution and are innate (Cosmides and Tooby 1994:86).

Thinking of the mind as modular thus solves certain crucial problems about speed, the speed needed to perform complex cognitive tasks, and also enables us to think about these dedicated components as both complex and simple at the same time: complex in that they perform complex calculations quickly; simple in that as components of a process they can be treated as simple mechanical devices.

On the surface, this solution works. But it presents a picture of the human mind that is difficult to reconcile with some aspects of social science knowledge, while fitting in a rough way with others, and, as it turns out, difficult to reconcile with the physical properties of the brain and neural processes. We know, for example, that affect or emotion plays a significant role in reasoning, but it is difficult to see how this role can be modeled as computation. The issues, as they relate to social science in particular, are exemplified

by the idea of ToM, though many of the same issues arise in connection with language, which has its own "folk" grammatical ideas, which vary by culture even more dramatically than folk psychologies do. We also know that there are mechanisms, such as mirror neurons, that operate in ways that do not correspond to the mental operations allowed for in folk psychology. Theory of mind is the "social" topic that fits the standard computational model most closely. It is "social" because complex human social interaction involves assessing the beliefs and motives of other people. If the condition for the possibility of doing this is possessing a "theory"—implicit in the narratives of action in terms of which people understand and explain one another—then this theory has a foundational role in accounting for social action. A long tradition of social phenomenology engaged with the presuppositions of understanding other minds reasoned in the same way (Schutz 1932/1967). This fits, though imperfectly, into the biexperimental results involving "false belief" that impressed a generation of researchers and spawned a large literature.

The findings were this: only at about four years of age could children correctly answer questions about where someone would look for an object if it had been moved from its original place without their knowledge. This was interpreted as meaning that children developed a ToM only after four, or to put it in modularity terms, activated their ToM module only at this age. The modularity interpretation was understood to fit the experimental results perfectly, in part because it was also claimed, based on a small cross-cultural sample, that all humans developed the same ToM. Learning and difference was therefore beside the point—nothing was learned; something was activated that was already there, universally. The conclusion was that an infant does not have a ToM yet, but an inbuilt capacity to have one that gets activated at a certain age, and which, once activated, allows them to solve particular problems that they could not solve before it was activated. There is, however, no account of how this activation happens. Indeed, the modularity hypothesis refers such questions to evolutionary explanations, on the grounds that only evolution could produce such complex capacities.

But these claims need to come with a warning. We do not have an argument other than plausibility and the lack of alternatives for believing in the results of boxology, or in modules. There is a sense in which this is simply a sign of our limitations and the limitations of folk psychology: without it, we cannot make sense of the actual processes of thought, because folk psychology is *how* we make sense of thought, indeed, how we define it. How any of this works in the brain is unknown, and indeed there is a substantial explanatory gap between what we would like to explain (thought, actual speech, consciousness, and the qualities of human experience) and the neuroscience mechanisms we have an understanding of (Horgan 1999).

This is not to say that there is no empirical basis for these claims. As noted earlier, these accounts are constrained by experimental results in psychology: if there is a demonstrated capacity, such as the homing capacity of an ant and its capacity for self-correcting spatial orientation, a functionalist model of this capacity must include the necessary subroutines. There is, however, a physical side to the reasoning. Ideally, the boxes, which represent modularized capacities, should correspond to *something* in

the brain. The brain is a variegated organ, which has been mapped into different regions that are known, especially as a result of lesion or cognitive deficit studies, to be associated with particular activities or competencies. Ideally, a box should correspond to a cluster of neurons that activate in the appropriate point in the sequence of the boxed processes. Because at least some cognitive processes can be replicated in conditions in which brain activity can be measured, such as fMRI machines, it is technically possible to determine where and in what order brain activity occurs—up to a certain resolution. It is a bonus for boxology if these capacities can be localized in the brain, and the fact that many capacities, such as phoneme recognition, can be localized, serves as a general warrant for the strategy of boxology.

Boxology arguments depend very heavily on considerations of plausibility. Localizing enhances plausibility. But the two are logically distinct: "Positing a 'box' which represents a functionally characterized processing mechanism or a functionally characterized set of mental states does not commit a theorist to the claim that the mechanism or the states are spatially localized in the brain, any more than drawing a box in a flow chart for a computer program commits one to the claim that the operation that the box represents is spatially localized in the computer" (Nichols and Stich 2003:11). This is an important point for what follows. Nevertheless, this bonus, when it can be obtained, for example by localizing certain kinds of thoughts or mental processes, plays an important role.

The standard model's evidential appeal to plausibility, however, is troublesome given other considerations that undermine its plausibility. The modular account depends very heavily on its being universal, on everyone having the same module to activate, and on the modules being primordial products of evolution, and thus freed from any requirement to make sense of how they are acquired, which would be the case if they varied culturally. The claim is made that ToM is robust at least across several modern cultures. But although the basics of ToM, such as recognition of goal directedness, do seem universal, ToM terms are not universal. Epistemic language varies widely, and even the distinction between true and false belief does not appear in some languages (Needham 1972). Some cultures regard talk about another person's beliefs and mental contents as deeply inappropriate and treat their minds as opaque (Robbins and Rumsey 2008; Robbins 2008; Schiefflin 2008). And there are a number of other variations in explicit ToM talk between cultures.

What are the implications for social theory of the standard model? They are familiar from Hobbes, rational choice theory, and analytic sociology, for the most part, but the image of the human is arrived at in a somewhat different way, with somewhat different elements. What is common to all of these social theoretical conceptions is an image of man as a kind of calculator whose calculations and the actions that are produced by them are explained by their desires and beliefs. Differences in desires and beliefs explain differences in action. Cultural differences are the product of differences in desires and beliefs. Differences in desires and beliefs are understood as the product of data—of what is fed into the calculating mind. Other people have no special status, other than as sources of this data, objects of desires and fears, and as obstacles to action. But people also have a ToM and can make inferences about the beliefs and desires of others,

and this is at the core of the mutual calculations that make up social action and determine institutional arrangements.

The model extends and relies on folk psychology, the folk psychology of belief and desire. The tyranny of this model over social theory results from the implication that social relations are structured by beliefs, desires, and the actions they produce, and by the rational choices that are implied by the combinations of beliefs and desires. Obviously to some extent they are, and there are some contexts in which this form of explanation is sufficient. But other contexts are by definition impervious to this form: those involving the tacit, embodiment, and the frames in which beliefs become intelligible, and the causes of desire. Norms, to the extent that they are not explicit and encapsulated in beliefs, and are tacit, are excluded. And consequently much of what we would call culture—that which operates at the level of perceptual structuring—is also excluded.

However, the standard computational model of the mind is quite elastic: it can be expanded to account for any functional capacity. One could, for example, take something described in symbolic interactionist terms, such as significant gesturing, redescribe it in functional capacity terms, and then break it down into the modular components necessary for the exercise of this capacity. Or one might enhance this model by giving a functional account of joint action or collective action and positing the necessary modules for these capacities. Or one can take a Parsonsian account of norms, and endow the mind with a functional capacity for norm-detection and responsiveness to norms that fits with this account of norms. In this sense, the computationalist model of mind does not come into direct conflict with the various conventional accounts of "the social," and indeed fits them very well.

Indeed, the sheer elasticity of the standard model thus seems to make it impervious to empirical refutation, and potentially consistent with any possible social theory. But the alternatives to the standard model lead in some different directions, and point to some important limitations to the strategy of positing modules that is central to its explanations. More importantly, they point to alternative explanations that do not rely on fixed evolutionary cognitive structures and are potentially better at accounting for diversity and change. The limitations of the standard model may be seen, however, in connection with the distinction between slow and fast thinking made famous by Daniel Kahneman (2011). The basic idea behind this distinction is this: we normally function by thinking by way of short-cuts or heuristics that are not part of our conscious thinking or inferential process, and which have some biases when compared to pure rational choice or to the results we might obtain by slow, explicit thinking, which would allow us to articulate reasons and inferences and reflect on them.

The relevance of the distinction between fast and slow is this: the standard way to explain the existence of modules is to claim that they are the product of long evolutionary processes and that the functional origins are lost in deep time. The problem with the account is this: if we explain fast thinking by the existence of modules, and slow thinking—the kind we can reconstruct or articulate explicitly—by training and linguistic competence, which is language-specific, we are faced with a conundrum about the

things that seem also to fall into the category of fast and difficult to articulate thinking but which are *not* the product of evolution.

What might this category include? The list would involve, as suggested above, everything that is tacit and embodied, which would include such things as habitus, practices, and the kinds of skills that chess masters and other experts have, of acting, thinking, or performing at a high level of proficiency without thinking of rules. It would also include what are sometimes called reactive attitudes (Strawson 1962/2003), the immediate feelings that are generated in response to an offending act, a wrong, and so forth. Such things as our immediate negative response to the appearance of free-riding, for example, a topic much discussed in the neuroeconomics literature, would also fall into this category.

9.2 The Cognitive Science Alternatives

There has been no shortage of critiques of cognitive science's dominant computationalist paradigm. In an attempt to clarify and elucidate this motley landscape, Richard Menary (2010) refers to the 4Es of cognition: the embedded, embodied, extended, and enactive movements. These movements form the rhetorical center of challenges to computationalism, though it is worth stressing that there are numerous theoretical frameworks—not all of which begin with the letter E—that overlap, cross-cut, or even fall outside the range of the 4Es. Missing from Menary's list, for instance, is the ecological approach based on Gibsonian psychology and Mark Bickhard's (2009a, 2009b, 2010, 2011, n.d.) interactivism. One of the chief obstacles to developing the social aspects of the 4Es, as suggested by this preliminary glance, is the heterogeneity of the literature.

With that said, there are substantive convergences among the 4E movements. Most basic among these is that all of 4E theory finds the computationalist paradigm's treatment of the individual–environment relationship to be woefully inadequate. When put in positive terms, the critique suggests as an alternative a focus on what is called embeddedness or situatedness. A second point of convergence among the contender theories is the methodological significance of dynamical systems theory for modeling embeddedness.

Dynamical systems theory is a mathematical framework for modeling complex systems. Complex systems change over time, possess interacting components that exhibit emergent behavior, and, as collectively implied by these two traits, the system's emergent behavior does not result from a controlling component agent (Chemero and Richardson 2014:116). Unlike component-dominant systems—where the function of components can be identified in isolation from each other—the behavior of interaction-dominant systems is "the result of interactions between system components, agents, and situational factors, with these intercomponent or interagent interactions altering the dynamics of the component elements, situational factors, and agents themselves" (118). The individual–environment relationship is thus the most important frame of analysis

because agents and the function of their components cannot be understood in abstraction from particular interactive contexts. Embeddedness and dynamical systems theory serve as the most general framework for the 4E movements. Given this general framework, we turn now to the many competing conceptions of embodiment developed therein.

Embodiment is also central theme of the 4E movement, and comes in weak and strong forms. The ecological movement of Gibsonian psychology presents a strong form and, according to Michaels and Palatinus (2014), places general constraints on any account of embodiment. It is important to note that some theorists use "ecology" interchangeably with "embeddedness," which is consistent with Michaels and Palatinus's claim to generality. The key concept of Gibsonian psychology—what makes it appealing to dynamical modeling and, for others, the general framework for embodiment—is its theory of affordances. Gibson (1977) describes affordances as "what it [the environment] offers the animal, what it provides or furnishes, either for good or ill" (127). Donald A. Norman added the notion that affordances are products of human perception, in the sense that the environment affords only that which is perceived as a use (1988/2013). Norman further distinguished real and perceived affordances (1999). This led to the view that perceived affordances are not properties of the environment or of the organism; rather, they are objective features or *relata* between the environment and the organism. Organisms directly respond to perceived affordances rather than mind-independent features of an objective environment: the world we live in is a world of perceived affordances, affordances for us, rather than a world of inherent properties. This intrinsic link between perception and embodiment departs significantly from the standard model, implying a nonrepresentational account of cognition. In the next section, we examine affordances in a broader light, focusing on the environment–individual relationship rather than the associated antirepresentationalism.

Although antirepresentationalism is a common position within the 4E literature, a strong conception of embodiment does not necessarily eliminate representations from primitive forms of perception. Pursuing this line of enquiry, however, does require a radically different concept to substitute for the work done by representation. Bickhard's interactivism advances such an account: the lesson to be learned from Gibsonian affordances, on this view, is not that organisms directly perceive information in their environment—thereby eliminating representations from primitive forms of perception—but rather that representational content in its most primitive form is an organism's anticipation of environmental interactions, which is indexed to an organism's internal bodily states (Bickhard and Richie 1983; Bickhard 2009a).

Enactivism—the most influential account of strong embodiment—has been largely interpreted as antirepresentationalist. This is clearest with Daniel Hutto and Erik Myin's (2013) radical enactive cognition hypothesis, whose primary goal is to eliminate any notion of representations at the level of basic cognition. But even within the enactive movement there has been a great deal of theoretical diversity. The radical enactive cognition hypothesis is aligned with the sensorimotor contingency theory (O'Regan and Noë 2001), which is only one of two major strands of enactivism (Torrance 2006). In contrast to the sensorimotor contingency theory's central tenet—namely, that bodily

movement constitutes cognition of the world—the strand of enactivism associated with Varela, Rosch, and Thompson (1991) begins with a more general perspective on cognitive agency and perception, which allows for a wider range of positions. The Varela-inspired strand asserts the primacy of processes—treating organisms, cognition, and, ultimately, social interaction as all different types of emergent processes rather than substances with objective physical properties. One development from these ideas is De Jaegher, Di Paolo, and Gallagher's concept of participatory sense-making—an enactivist account of social interaction (De Jaegher 2009; De Jaegher et al. 2010).

The movement that has gained most attention from theorists outside of cognitive science, including social science, is the idea of the extended mind. According to theories of extended cognition, there has been a general evolutionary trend of organisms becoming more efficient cognizers via offloading burdensome tasks onto the environment. Clark (2008) refers to this general type of activity as "scaffolding" one's environment. Organisms who offload thereby figure out how to do more within relatively stable biological constraints and, as a result, have a better chance of survival. Clark (1993) previously dubbed this adaptationist sketch the "007 principle": organisms tend to know only as much as they need to. But adaptationism arguably comes at a dear price. One concern—seen previously in connection with the standard model's modules—is that the adaptationism burdens extended theories of cognition with just-so evolutionary histories. But in contrast to special purpose modular mechanisms, Clark is at pains to characterize the evolutionary trajectory implied by extended theories as one of ever increasing plasticity (e.g., Clark 2001). Another concern is highlighted by phenomenologically informed accounts of *social* interaction. The concern is as follows: adaptationism is *anti*social, reducing all intersubjective relationships to forms of exploitative resource maximization. Other people—like an individual's own body—are reduced to being "operating profiles" within larger functional processes.

Despite these concerns the extended movement has been the most popular of the 4Es among social scientists, in particular social scientists working with representationalist models of cognition (e.g., Harrison and Ross [2010] on neuroeconomics). This is in large part because the extended movement retains major aspects of the standard model: there are representations at the basic level of cognition and, more importantly, all cognition is computation. What the dominant paradigm fails to appreciate, on this view, is simply the pervasive offloading of representations onto the environment, a process occurring on both evolutionary and ontogenetic timescales. Given the commonalities between the standard model and extended theories of cognition and the latter's popularity, it is worth questioning whether the 4Es offer any novel insights for social theory.

9.3 Reconstructing Social Theory

How do these movements bear on social theory? The term "extended mind" suggests something more radical than it might appear. Clark's key example is innocuous enough:

> There is a documented case (from the University of California's Institute for Nonlinear Science) of a California spiny lobster, one of whose neurons was deliberately damaged and replaced by a silicon circuit that restored the original functionality: in this case, the control of rhythmic chewing.... now imagine a case in which a person (call her Diva) suffers minor brain damage and loses the ability to perform a simple task of arithmetic division using only her neural resources. An external silicon circuit is added that restores the previous functionality. Diva can now divide just as before, only some small part of the work is distributed across the brain and the silicon circuit: a genuinely mental process (division) is supported by a hybrid bio-technological system. That alone, if you accept it, establishes the key principle of Supersizing the Mind. (Clark 2009)

The key principle, in short, is the substitutability of some other means for a mental or at least partly mental process.

In the literature the total process is called an algorithm, and a procedure or object that produces the same result is said to be the same algorithm. The term "same," here, and the designation of the functional process represented by the "algorithm" itself are not well defined, and the results are different depending on how fine-grained the descriptions of the processes are (Milkowski 2013:67).They can be readily extended from very simple perceptual processes to large action sequences, such as a human being going home from work, which can be performed in a large variety of ways, using a large variety of devices, but getting the same result. These may include such mental content as the memory of what bus to take, knowledge of the routines of public transport, map-like memory, and much more. Different content, analogous to different computer code for the "same" algorithm, would be involved if the person walked home or drove a car. But the result would be the "same."

If we think of the notion of affordances more broadly, we can enrich our picture of the extended mind, and show its relation to social theory. Perception is perception of affordances. Affordances are distributed in the environment. The relationship between perceiver and environment, rather than the environment taken by itself, consists of objective features. The objective features of the relationship, in turn, ground specific capacities.

Scaffolding is a term that originally referred, in the work of Lev Vygotsky "to the help and support that adults provide children in order for them to learn and develop complex cognitive abilities" (Estany and Martinez 2014:103). Thus scaffolding is a means to the transformation of mind and mental capacities itself. It has been extended in its meaning to include the tools we have which substitute for cognitive abilities, for example, "scaffolding as a source of capacities that complement those provided by the biological brain, such as a note pad; and language as scaffolding that allows us to freeze a thought or idea in words" (Estany and Martinez 2014:103). The idea is closely related to affordances: affordances are like the convenient handles of a tool, but are the handles given, so to speak, by the natural facts of our interactions with the environment. But as Donald Norman stressed, affordances can be created artificially, like tools, and serve as scaffolding—as a source of advanced or novel capacities and self-transformation.

The routines of the social world, like the educational practices that were the original concern of the psychological theorists of scaffolding, are such creations.

Connecting scaffolding to the routines of the social world, and thus to the institutions that are made up of these routines, and that constitute our social environment, allows for the following: to live in a society is simply to live in an extended cognitive system—where there are alternative means to goals, but only for some goals, through substitutability, and living in this system transforms our own minds.

The effect of this simple idea on the traditional concerns of social theory is remarkable. The traditional problem of social theory was set by the model of the individual who had to come into, and created, society. The explanatory problem was to account for the evident differences between societies. As Durkheim taught, these differences could not be explained by general principles of psychology: those principles held for all people; what needed to be explained was what was different, and varied between "societies." The presumption was that the explanation was to be found in "the social" itself, in something about the content of the social. It was assumed that "the social" and its specific content, such as norms, was produced out of social interaction alone.

This idea produced a standard discourse, in which theorists tried to conceive of this content—always a kind of theoretical abstraction—in different ways: Parsons's idea of a central value system was one; Bourdieu's notions of habitus and field is another; "culture" is yet another; so is "power," hegemonic power, and so forth; other theoretical traditions focused on the process of social interaction itself, or on the legitimating beliefs that sustained institutions. This generated a distinctive discourse involving the notion of "emphasis." Theorists criticized one another for "overemphasizing" one or another of these supposed contents of the social: culture, or power, or socialization, or whatever the unfashionable emphasis of the time was. In this discourse Weber "emphasized" action and belief, Durkheim and his heirs "emphasized" collective mental structures, like culture or habitus, and rational choice theorists emphasized problems of collective rationality.

The idea of society as an extended cognitive system, consisting of scaffolding of routines and substitutable technologies, such as the note pad, removes the explanatory burden from "the social." To understand the differences between societies, and to understand change, is to understand the ways in which routines and technology substitute for capacities and create capacities for action. Nothing special has to emanate from the posited space of "the social." The enactivist concept of participatory sense-making buttresses this insight, highlighting interactive dynamics between individuals that are endogenous to the encounters themselves, which do not presuppose a previously existent social domain (cf. Steiner and Stewart 2009). The way we act differently from the way people act in another society is largely determined by the affordances and scaffolding available to us: what is, in effect, convenient to do, or convenient to believe. This is a profound thought: and it can be made more profound if we think about the ways in which the affordances available to us shape our selves.

It also has deep implications for the traditional account of the social: it takes over the explanatory burden of such questions as "what holds society together" and shifts them from the abstractions familiar from social theory, and indeed from the supposed

realm of "the social" itself, and places these burdens on the facts of scaffoldings and the affordances they provide. The answer to the question of what makes people in different societies behave differently is that they have different options for substitution, and different scaffolding, with different affordances. In this sense, the critics of Clark are correct: the effect of the argument is precisely to displace explanations in terms of "the social."

The embedding, enactivist, and ecological arguments, as well as the embodiment argument, can work in concert with this new account of "society," but face, so to speak, in the opposite direction: not from the individual toward her extensions, but from the extensions to the individual. A paradigm of these outward-inward directional arguments is the claim that practices, that is to say the continual and repeated enactment of particular routines, shape the mind, and the body (Roepstorff et al. 2010). Embedding generalizes this kind of argument, to say that even within the self or mind, or as a constitutive part of any content, there is the incorporation or embodiment of habit, which is produced by the external things with which we engage. Thus the mind-body is no longer a calculating machine, but a plastic product of the world it interacts with, and of the interactions themselves. The effect of this is to dissolve the individual and also to dissolve the social and the intersubjective as categories, and to eliminate, on the grounds of interchangeability, nature-culture, object-human distinctions, as well.

This picture may seem very strange, but there are close parallels in science studies: the idea of distributed cognition (Giere 2007; Latour 1987), in which the agent is surrounded by actants, objects and nonhumans understood as having their own limited agency, and discussions of where knowledge is located which point to the recognition that knowledge may reside in routines, objects, instruments (Turner 2007) and the like, as well as in people's heads. There are also classical parallels: Weber made the point that persisting conduct could result from persisting intentions, but it could also result from such things as contagion (Turner and Factor 1994:34). Omar Lizardo has recently argued that Bourdieu in his early work already had a kind of view of the psychological implantation of frameworks as a result of the material environment. He suggests,

> The key point to keep in mind is that for Bourdieu "a child brought up in a Berber house by Berber parents picks up Berber notions, just because the material nature of the house, as well as the behavior of the people with whom he interacts [itself constrained by the material nature of the house], contains in itself the specific history of the Berbers." Therefore, "the [material] environment is not neutral but is itself culturally constructed." (Lizardo 2010:6)

Lizardo also suggests that Bourdieu changed his views on habitus in the 1990s, and moved away from "the remnants of the structuralist inspired 'encoding-decoding' model of aesthetic appreciation that still survives in that early work" (Lizardo 2010:17) in such a way that "the 'semiological' conceptualization of culture as a system of elements connected by arbitrary relations of significance is reduced to a minimum in favor of culture as a system of action and perception that is acquired in a tacit state through tacit mechanisms" (Lizardo 2010:19). The mechanisms involve, as Lizardo quotes Ingold,

"the kind of practice mastery that we associate with skill—a mastery that we carry in our bodies and that is refractory to formulation in terms of any system of mental rules and representations" (Ingold 2000:162, quoted in Lizardo 2010:9). Although it is questionable whether Bourdieu finally breaks free of the notion of a system of representations, the change in emphasis is evident.

In the new view we have been outlining here, agency does not vanish, but the agent becomes a person in a world which already has a plethora of, so to speak, handles, handholds, and footholds, which do not "constrain" her so much as endow her and others—differentially—with capacities or powers. In this picture it is not the rational choices of the agent that explains social differences, but the embedded character of all choice. This approach is what Damasio would call anti-Cartesian (1994): it characterizes as an error the attribution of something like the conscious thought of folk psychology, such as decision-making and rational choice, to something that in cognitive terms is in fact executed by reliance on others, on habit, on devices, or on the scaffolding provided by routines.

This is a clue: we are predisposed by our folk psychology and by preverbal mechanisms to overintentionalize action, a notion familiar from attribution theory. But differences in behavior may be produced by something else—affordances and scaffolding. The point of the idea of the extended mind, or more prosaically, substitutability, together with considerations of embodiment, embedding, enactivism, and interactivism, is just this. Where the standard model adds to its explanations through boxology—or epicycles—these accounts at least point the way to the possibility of making empirical questions about substitutability and its effects out of what had formerly been theoretical speculation. And this is especially important in relation to the hypothetical domain of mysterious causes called "the social," which we can now see as a byproduct of a particular model of the individual, common to Cartesianism, Hobbes, and the computational model of mind.

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