Embodied Mind and the Mimetic Basis for Taking the Role of the Other

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Taking the attitude or the role of the other provides the basis for George Herbert Mead's theory of mind, self and language. I want to ask, and then attempt to answer two questions: First, what is it that takes the attitude or role of the other? In other words, what is being reflected back to itself that becomes a self? There must be a basic level of consciousness that is developmentally prior to taking the attitude of the other and that develops into self-consciousness. Presumably this basic level of awareness is also prior in evolutionary terms. If so, then we likely share it with other animals. The idea of consciousness is, of course, notoriously problematic, especially in its relationship to the body. We can avoid at least some of these problems if the answer to this question is framed in terms of embodied mind. I will first identify some points of intersection between Mead and recent ideas of embodied mind, and then propose that it is the subject-body that takes the role of the other. Mead conceived his social psychology in terms of behavior or conduct. Since behavior is something that bodies do, it is not difficult to move from Mead's behavioral perspective to one of embodied mind. Moreover, Mead may have been the first to advance an embodied theory of social mind.

The second question I want to ask is, why can humans take the role of the other while other animals apparently cannot (or at least not to any great extent)? What is unique about our human animality that gives us this ability? As some scholars have noted, Mead does not provide an adequate answer to this question, and as a consequence his theory is incomplete.[1] I argue that it is our ability and desire for embodied mimesis that enables us to take the role of the other. Mime-

sis here includes, but is broader than, simple imitation and can be traced to the openness of the human subject-body.

Embodied Mind

Shigenori Nagatomo (1992) distinguishes between the subject-body and the object-body.[2] The subject-body is the body we are rather than the body we have. The body, not the mind, is the "epistemic center of consciousness." The subject-body is not a thing in the world with a physical boundary; it is the felt unity from which things in the world are perceived, and it is the standpoint from which things and other people are engaged. The object-body, on the other hand, has a definite boundary and takes its place among the other things in the world. Shaun Gallagher (2005) develops a similar distinction between the body schema and the body image. The body schema is a system of coordinated sensorymotor capacities that function without ever entering our conscious awareness; the body image is our own body as an object to ourselves (Gallagher p.24).

The functional relationship between the subject and object-body, and between the body schema and body image roughly corresponds to the relationship between Mead's "I" and the "me," and what he calls "the observer" (SW 142-46). According to Mead, we cannot talk about the self as object without talking about the self as subject. Or as he says, "a 'me' is inconceivable without an 'I'" (142). The "I" is our response to our own conduct. But the I as subject (like the subject-body or body schema) never presents itself in conscious experience. As soon as it does, it becomes an object, a part of the "me." It is that part of the self that was the subject just a moment ago but that now becomes an object of reflection. One notices or reflects on what "I" did. Because the subject-I never presents itself to consciousness, it is, says Mead, a presupposition. It is an implied subject at the center of all experience. It is implied because we can never catch it in the act. Instead, we have the memory image of the self who acted toward oneself (143). Mead says that we have a "running current of awareness" that is conscious of our own actions (144). He likens this self-awareness to an observer at the back of our head (145). He notes, however, that this awareness is not always present. At times we are so pre-occupied with things going on in our immediate situation that this accompanying self-awareness disappears. When we recall the experience we place an "I" in the center of it, but it was not there in the moments when we are absorbed in action. The observer at the back of our heads merges completely with the events that demand our attention. Actually, this is the case for every moment of experience, for although we may be aware of our some of own conduct, that observer in the back of our heads is immersed in that very act of self-awareness. If we put this discussion in terms of embodied mind, Mead's "observer" is the subject-body or body schema that can never be an object to itself and never see itself as an image. It is the capacity of spontaneous

response to the world and to the object-body as a part of the world. It is the implied "I."

According to Mead, since animals do not take the role of the other, an animal's own body as a unity cannot be an object to its awareness. Parts of the animal body can become "things" to its consciousness, but the animal does not make its total body into an object.[3] Parts of the animal body are responded to as parts of the environment from the point of view of the subject-body.

> [T]the individual organism does not set itself as a whole over against its environment; it does not as a whole become an object to itself (and hence is not self-conscious)…. On contrary, it responds only to parts or separate aspects of itself, and regards them, not as parts or aspects of itself at all, but simply as parts or aspects of is environment in general. (MSS 172)

The non-human organism, then, has a subject-body but not an object-body in a full sense.[4] In Gallagher's terms, the animal has a body schema that coordinates responses to events, but it does not have a body image.

The body schema is not static; it is, says Gallagher, a dynamic capacity for movement. The role of movement is emphasized in Varela, Thompson and Rosch's (1993) enactive approach to embodied mind. Perception is not separate from action; it consists of sensory guided activity, with cognitive structures emerging from recurring sensorymotor patterns. These authors agree with Merleau-Ponty when he writes that the organism "chooses the stimuli in the physical world to which it will be sensitive" (Varela et al. p.174). Alva Noë (2004) maintains that perceiving is a way of acting, and that "what we perceive is determined by what we do" (p.1). He sees perception as "touch-like." We perceive things as we would touch them. Touching is not a passive reception of sensations; it an active movement of the hands and an attentive movement of the body through space (14-15, 96-100). The common feature among these approaches to subjectivity is that the subject is not a disembodied mind. Rather subjectivity is constituted by felt capacities and anticipations of bodily movement.

Mead had already asserted the role of movement in perception decades before the present interest in embodied mind. He saw that the organism is an active agent whose motor responses determine perception. "In the end what we see, hear, feel, taste and smell depends upon what we are doing, and not the reverse" (SW 37). He considered the phenomenon of attention to be clear evidence of an active organism determining its world (MSS 25). Also, like Noë, Mead saw perception as touch-like: the physical thing is perceived as it is experienced when in physical contact with the body.[5] Our distance perception sees the object in a way that anticipates our contact with it.

Two fundamental concepts in Mead's behavioral theory of mind—attitude and gesture—are wholly embodied. An attitude is an incipient movement of the body at the beginning of an act. Mead talks about these incipient movements as going on in the central nervous system (part of the object-body), but we could just as well talk about them as incipient movements of the subject-body. Atti-

tudes are felt capacities of movement that make up the subject-body or body schema. They help organize and coordinate movement. For movement to be coordinated there must be a bodily preparation for ways that a situation will likely unfold. For instance, to catch a ball I must be able to anticipate its trajectory. Attitudes subtly anticipate later phases of an action during the overt movements of the earlier phase of that action. Because the overt earlier phases are simultaneously present with incipient later phases they can be coordinated with each other, so that the earlier phases prepare the organism for the later phases. Mead gives the example of approaching a hammer:

> If one approaches a distant object he approaches it with reference to what he is going to do when he arrives there. If one is approaching a hammer he is muscularly all ready to seize the handle of the hammer. The later stages in the act are present in the early stages—not simply in the sense that they are all ready to go off, but in the sense the they serve to control the process itself….The act as a whole can be there determining the process. (MSS 11)

The attitudes of touching, grasping and using the hammer are already activated as the person approaches it, and this activation coordinates first the approach and then the actual grasping of the tool. These are attitudes in the subject-body.

Gestures are attitudes; they are incipient movements of the body within a social act (MSS 42-46). The only difference between gestures and other attitudes is that gestures are responded to by other individuals. Mead's idea of gesture is different from the usual idea of a gesture as an intentionally directed discrete movement of, say, the hands or arms. Any movement, however subtle, can become a gesture if it is responded to by another organism. It is embedded in a continuity of movement and often has no discrete boundaries. It is also a whole body affair. A conversation of gestures is a relationship of bodies adjusting themselves to each other's movements. This "conversation" is not a one where participants take turns. It is a relationship of mutual and simultaneous adjustment. As one organism adjusts to the other individual's movement, that second organism is already adjusting to movements of the first. The movement of the two bodies is a single dynamic system. Instead of a conversation, we could liken this relationship to a dance where partners are continually adjusting themselves to each other's movements with keen sensitivity to the positions of the limbs, tilts of the head, shifts in body weight, and so on. Barbara King (2004) uses the dance metaphor in her descriptions of the social life of African great apes, which she sees as a continual mutual adjustment of bodies to each other.

While attitudes function to organize the acts of individuals, gestures serve to organize the social act. Mead usually treats gestures from the objective viewpoint—as the behavior of the object-body. But like all attitudes, gestures are anticipatory movements of the subject-body. They are felt potentials of action within the social act. For highly social animals the subject-body is in large part a social body. The individual responds to its environment attuned to the movements of others. In such an animal, the body schema does not come fully formed

at birth, but is developed within social relationships. The body's felt potential of movement is always in relationship to the potential movements of other individuals. In the dance of gestures, the subject-body or body schema is continually adjusting to the object-body of others.

A conversation of gestures gives rise to what we could call "gestural meaning" as distinct from symbolic meaning. Mead uses the word "meaning" in two different ways. Sometimes he uses it to apply to situations where organisms take the role of the other (SW 244, MSS 73). This is symbolic meaning. The symbol has the same meaning—or stimulates the same response—for both organisms engaged in a communicative act. However, in the context of a non-symbolic conversation of gestures, a gesture "means" the outcome of the social act only for the individual on the receiving end of the gesture (MSS 76). In this case, the gesturing individual does not respond in the same way to its own gesture as the other organism does. Not responding to its own gesture, it is not conscious of its meaning. Thus the gesture is not symbolic. It is not picked out as a separable social object. It is part of the anticipation of the subject-body and its felt capacity to respond. Gestural meaning is fully embodied meaning.

If the subject-body of the animal does not objectify itself, then the animal is fully engaged non-reflectively in its world all the time. There is no separation between subject and object, or between consciousness and the content of consciousness. Animal mind throws itself into animated relationships with the things of its world with no distance between itself and other things. This immediacy of animal experience includes gestural relationships with other organisms. There is no separation between self and other, or between the gestures of another organism and the perceiving animal's mind. The animal is totally absorbed in its social relationships and focused on the movements of others without self-consciousness.

The Mimetic Basis for Taking the Role of the Other

How does communication get from the immediacy of gestural meaning characteristic of animal life to the symbolic meaning of human language? More basically, how is it that the human organism can respond to its own gestures, and why does it respond to them in the way that others respond to them? To put it another way, how does the subject-body, including its gestures, become an object to itself?

Much of *Mind, Self and Society* is devoted to explaining how mind, self and language grow out of the ability to take the attitude or role of the other. Unfortunately, Mead does not provide an adequate explanation as to why humans have this ability to take the position of the other toward our own gestures while other animals do not. Many of Mead's predecessors proposed that the basis of human abilities is imitation, or more specifically an imitation instinct. Mead repeatedly rejects the existence of any imitation instinct (SW 95-101, 146, 243). He consid-

ers imitation to be a result of our taking the attitude or role of the other, not an underlying factor.

Gary Cook (1993) has criticized Mead's attempts to explain our ability to take the role of the other. In Mind, Self and Society, Mead uses an example of a sparrow picking up the song of a canary (MSS 62-68). Cook points out that Mead's attempts depend on several dubious assumptions.[6] One is that there are already elements in the behavioral repertoire of the sparrow that just needed the "added weight" of hearing or seeing those elements in the behavior of another individual (MSS 62). This is even more dubious in the case of human children. In "The Social Self" Mead suggests that when we respond to ourselves, "there naturally flows" into our own responses the memory images of the responses of others to our own actions (SW 146). But why do we respond to ourselves in the first place when other animals do not. Cooks asks if Mead is relying on some kind of "attitude-taking instinct" (Cook 88). Furthermore, is this "flowing" of memory images into images of our own responses and the resulting self-stimulation not a kind of imitation? In "The Genesis of the Self and Social Control," Mead considers how the human infant is dependent on the adult responses to its own behavior, and is peculiarly sensitive to these responses (SW 285). But why would this sensitivity lead the child to respond to her own gestures?

In "The Mechanism of Social Consciousness" Mead suggests that adult gestures are at first simply stimuli that call out instinctive responses of the infant, and that later the adult gestures bring back the images of the child's own responses (SW 137). But this does not explain why we can take the role of the other toward ourselves. In "What Social Objects Must Psychology Presuppose?" Mead raises the possibility that when incipient responses fail to reach complete expression, the inhibition of responses can call up an image of a gesture of another individual (SW 110-11). When a gesture that was part of an inhibited act stimulates a memory of another individual's gesture, Mead says there is a favorable condition for consciousness of meaning to emerge. But no further explanation is given. In the afore mentioned "Genesis" paper, Mead considers the unique structure of the human cortex as a possible basis for this inhibition that makes possible taking the role of the other (SW 282). But though inhibition may be a necessary condition for the emergence of symbolic meaning, it is likely not a sufficient condition. True, the more complex the brain, the greater the likelihood that conflicting responses will inhibit and mediate each other in the nervous system, and this may increase the likelihood of our taking the position of the other, but it still does not provide an account of an underlying process. Other animals appear to experience some degree of inhibition due to a conflict between potential responses, but this does not mean that they respond to their own gestures.

Since Mead fails to give the needed account, we need to reconsider the possibility that some form of imitation is indeed involved. Hans Joas (1985) thinks that Mead's position "is not the final word on the precise definition of the function of imitation"(p.117). Cook thinks that Mead went too far in his complete rejection of imitation and proposes what he calls "indirect imitation" that is cer-

tainly a form of imitation, but it does not depend on an imitation instinct. I believe that Cook is on the right track. But before we can be more specific about what indirect imitation might entail we first need to understand some things about imitation and its behavioral cousins.

Though there is disagreement in comparative psychology as to what counts as imitation in different species, the unique thing about human imitation is that it is intrinsically rewarding. For instance, apes do not attempt to replicate directly the behavior of others just for the sake of its replication. They sometimes spontaneously "emulate" the behavior of others when they see that a behavior of another ape results in, say, obtaining a desirable food item. After seeing the success of others they will then do something similar, but they learn how to do it by trial and error.[7] Apes can to a certain extent be trained or induced to imitate, but the reward is usually food or some other desirable item or condition. In contrast, children want to do what an adult (or other child) is doing for no other reason than just to do the act itself, regardless of the action's outcome or its meaning for the adult. Children imitate easily and spontaneously without any training or extrinsic reward. So while Mead was correct to point out that imitation is not widespread in other animals (MSS 58), he was wrong when he said it is not prevalent in children.

Adults, too, enjoy imitation. We just have to think of various kinds of dance where everyone does the same steps together. Marching is another clear example. In such activities, the gesture of one individual evokes the same gesture or attitude in another, whereas in non-human animals a gesture of one individual evokes a different attitude in the other. King uses the analogy of a dance to describe ape social relations, but there is an important difference between ape social relationships and human dancing. When humans dance we like to synchronize our movements *with* others, not just respond to them. Humans enjoy being bodily "in synch" with others, linking up movements of our own subject-body with the movements of the object-body of others.

This being in synch with others lies, I believe, at the root of our uniquely human animality. It is this very basic ability rather than something more cognitive such as like tool use that distinguishes us from other primates. We often hear impressive anecdotes of chimpanzees doing something that seems very human-like. We now know that they use tools and organize hunting expeditions, for example. But truly astonishing would be discovering chimps cracking nuts in perfect rhythmic unison while grunting along in time, or seeing bonobos lined up and mirroring each other's actions in something like a line dance. We can say with assurance that this is not going to happen. Only humans do these sorts of things, and it is not because of our superior cognitive abilities. There is something more basic going on, something in the nature of the human subject-body. There is a desire for the movement of the subject-body to come into fit with the movement of the bodies of others.

Another behavior that is uniquely human is declarative pointing. While apes in captivity can be trained to point, and those raised in close relationship with humans have been known to take up pointing spontaneously, in all cases we find

only imperative pointing (Call & Tomasello 1996). This is pointing to request or demand something. Meaning is gestural, not symbolic. In contrast, declarative pointing is showing something to another individual. This appears in children between the ages of nine and twelve months and often for no other purpose than the showing itself. A child may point to something interesting just to indicate her interest to an adult or to get the adult to pay attention to that object with her. This behavior is evidence that the child understands the other as having an experience or a perspective. Because declarative pointing involves taking the attitude of the other, it is a (perhaps the) basic form of symbolic communication, a primordial symbolic act. Humans like to share experiences and perspectives on things. When watching a movie or a concert with a friend, it feels good to know that you both are enjoying the experience, and even better when you are both appreciating the same elements of the performance. In both children and adults, the motivation appears to be a desire for someone to share an experience or perspective, and that this sharing is an end in itself, just as imitation is an end in itself.

Both imitation and declarative pointing involve an embodied mutuality or "getting in synch." The first emphasizes doing and the other emphasizes undergoing. Declarative pointing is a request to share or mutually undergo a perspective. It is, in a sense, a request for someone to "imitate" one's own perspective. The subject-body tries to be in synch with another subject. We want to share attitudes. Imitation, on the other hand, is a mutual doing. We saw that for Mead and for those who work in the area of embodied mind, perception and movement are intimately related. Doing and undergoing are two phases of any act and are separable only analytically (Dewey 1934). So imitation is not only a mutual doing, it is also a perspective sharing where performing the same movement as another person puts us to some extent in that person's perspective. We take the attitude of the other. Thus imitation and declarative pointing can be understood as two phases of the same kind of activity, which I am simply calling "getting in synch" with others, an activity of the subject-body. But the question remains, why do we find this getting in synch enjoyable?

The answer may be partly found in our enjoyment of repetition. It feels good to whistle a familiar tune, settle into a regular routine, or practice a skill. Repetition is often an important part of rituals that are invested with deep meaning. In most cases of repetition a tension of anticipation in the subject-body arises at the beginning of an action and is resolved in the completion of the act. Satisfaction is experienced when one's present action comes into fit with one's anticipations and with the kinesthetic memory of past acts. This coming into fit is inherently satisfying for the subject-body. Repetition brings structure to activity, and when a relatively unstructured situation gains structure, this too is satisfying. As we know, humans come into the world with little in the way of genetically inherited behavioral structures compared to other creatures. At birth, we have a minimally structured body-schema. To the kinesthetically unstructured human body, repetition may be rewarding just because it provides an important source of structure. The desire for a certain amount of structure in the body-

schema, which amounts to the desire for an organized world, becomes the enjoyment of repetition.

Now for an organism whose body-schema and nervous system is comparatively unstructured and open to modification by experience, repeating another's action may be just as easy and rewarding as repeating its own action. Imitation may be a form of repetition. All that would be required for this to be the case would be overlapping modalities of perceptual memory. When an organism repeats its own actions, the kinesthetic feeling of the performance in the subject-body comes into fit with a kinesthetic memory of a previous action. When the organism repeats the actions of others, the kinesthetic feel of one's own actions fits with an auditory or visual memory of the actions of others. The movements in one's own body schema fits with the image of the bodily movements of others. There is an integration of the kinesthetic, auditory and visual modalities that allows our own attitudes to line up with the attitudes of others. Where repeating one's own actions is satisfying, now repeating the actions of others is also satisfying on the same basis. That is, it is satisfying as a repetition, bringing structure to the act. Thus repetition, imitation and declarative pointing are all aspects of the same process, which we can call mimesis. *Mimesis as repetition* is an individual's re-enactment of her own previous action, where present activity is synched to memories of her past activity. *Mimesis as declarative pointing* is a mutual enactment where bodies undergo similar experiences. For pointing to be meaningful, each individual must take the attitude of the other in present activity. *Mimesis as imitation* is either bodies synchronized with each other in simultaneous activity, or it is the fitting of one's action with memories of past actions of others. In both cases one individual takes the attitude of the other.

The neurological basis for this situation is likely to be found in the unstructured nature of the human neocortex and the integrative function that this area of the brain provides to other neurological functions.[8] This lack of structure makes possible two things: the strongly rewarding nature of repetition, and the overlapping of sensory modalities that allows imitation to be a form of repetition. Thus the lack of structure both requires and allows imitation to emerge out of repetition as a unique human trait. This might be, as Mead suggests, especially easy for vocalizations (MSS p.58). We can hear our own vocal sounds as easy as we can hear the sounds of others. Much has been written recently about mirror neurons and their possible role in imitation and self-consciousness. It has been noted that mirror neurons are active in monkeys (where they were first discovered), yet monkeys are not great imitators. Also, the original researchers have not claimed that mirror neurons alone can account for imitation.[9] In humans, the lack of structure and the resulting lack of modularity in the human neocortex may open the way for mirror neurons to support imitation where it does not do so in monkeys or apes.

Because of our embodied desire and ability for mimesis, we enjoy doing what others do and paying attention to what others pay attention to. The young child learns to pay attention to things adults are attending. One of the things that the adult is attending is the child herself. But adults are not just paying attention

to the child's object-body; they are attending something else—the child as a center of experience. Thus the child as a subject-body mimetically learns to pay attention to herself and objectify herself through the attention of others. The child not only objectifies her own body, but also her own center of experience. In so doing, this center of experience actually becomes a self, something distinguished both from the objects of the world and from the child's body. The child develops a "me" and an "I." As a consequence, a full-fledged distinction between subject and object-body and between self and world emerges and it develops as the child develops. This is the fundamental process that is at the root of Mead's theory of the mind, self and language.

Much of the foregoing is admittedly speculative. Nevertheless, we know that repetition is often rewarding for humans. We know that imitation is also very rewarding to humans and is taken up by children effortlessly and spontaneously at a very young age. And we know that this kind of spontaneous imitation and declarative pointing are unique to our species. I am proposing that imitation and declarative pointing are two phases of the same bodily process of "getting in synch" with others. I am also proposing that in humans there is a close link between repetition and imitation. Both are phases of embodied mimesis. It is not much of a stretch to understand imitation as the repetition of another's behavior instead of one's own. The more speculative proposal is that this is made possible by the unstructured nature of the human body schema and the human neocortex.

Some of Mead's explanations of taking the role of the other are headed in the right direction. When he talks about our images of others' behavior flowing into images of our own (SW 146), he is talking about the integration of different modes of perceptual memory. The special sensitivity of the child (SW 285) is the unstructured nature of the human neonate. The complexity of the human brain discussed by Mead (SW 283) allows the integration of perceptual memories so that repetition becomes imitation. However, as Mead maintains, imitation is not an instinct. It is actually a lack of any instincts or pre-formed ways of acting that open up both the possibility and the necessity for imitation and mimesis, and which lays the basis for taking the attitude of the other.

Notes

1. Gary Cook (1993) and Hans Joas (1997).

2. Using these terms, Nagatomo is following the work of Hiroshi Ichikawa (1979) who brings together Japanese Buddhism and European phenomenology.

3. Researchers investigating mirror self-recognition have claimed that animals recognize themselves in mirrors and thus have a sense of self. The original and most famous work is by Gallop (1970) and his associates. However, the results of this research are open to other interpretations. In addition, other researchers have not been able to replicate Gallop's results (Swartz and Evans 1997).

4. Without a proper object-body, strictly speaking the animal doesn't have a subject-body either since there is no separation between subject and object. Merleau-Ponty's term

the "phenomenal body" or "lived body" might ultimately be more appropriate, but "subject-body" will serve present purposes.

5. *Philosophy of the Act*, Parts I and II.

6. Cook reminds us that this may be due to problems in the student notes upon which the text is based.

7. In a now classic experiment (Tomasello et al. 1987), juvenile chimpanzees saw an adult use a rake to pull a food item toward its cage. The juveniles did not imitate the action but saw that the a rake afforded a way to pull in food and then learned on their own how to use it. When the same experiment was done with children using a rake to obtain a toy (Nagell et al. 1993), the children closely imitated how the adult was using the rake. They even imitated some demonstrated ways of using the rake that were less effective. It was more important to the child that it was using the same methods of the adult than it was to find the best way of using the rake. In other experiments, it has been found that chimpanzees will replicate some human actions on a device in what is called a two-action problem-solving situation, but only where the mechanism of the device is not immediately evident (Whiten 1998).

8. This assumes that the human mind is not modular (which runs against the widely held view that it is, e.g. Fodor 1983 and Pinker 1997). The modularity hypothesis derives from an analysis of the human brain as a computing machine with cognitive modules functioning in much the same way as the modules of a computer. Embodied mind supports the opposite conclusion, that mind is not modular. For example, see the work of Mark Johnson (1987, 2007). The enactive view of mind, where perceptual "inputs" and movement "output" are not separate, also throws into doubt the idea that mind is modular. Furthermore, modularity does not fit with the structure of physiology of the neocortex. For instance, the Brocca and Wernicke's areas of the brain are sometimes claimed to be the biological correlates of a language module, but these are not well-defined areas in the brain, and there are "no microanatomical criteria" by which they can be identified (Deacon, p.288). Terrance Deacon suggests instead that we look at these areas as "bottlenecks" though which neural processes must pass, due primarily to their location in relation to auditory and motor regions of the brain. The indexical function of words involves several modalities and cross-modal relationships (Deacon p.301). Finally, there is no neurological evidence of a "central processor" that modularity theories require to coordinate the functions of the various parts. Modularity, to the extent that it is found in adults, is more likely the result of learning and experience. "Modularity develops in response to experience" (Gibson 1993, p.189). Symbols and language are not located in any specific region in the brain. Nor are they the result of a "higher-order" information processing system within the brain as a whole. They are, according to Mead, located in social behavior and social experience.

9. See Jones (2005) for a succinct review of this issue.

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