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## *Hermeneutics and the Cognitive Sciences*

**Abstract:** *Philosophical hermeneutics, understood as the theory of interpretation, investigates some questions that are also asked in the cognitive sciences. The nature of human understanding, the way that we gain and organize knowledge, the role played by language and memory in these considerations, the relations between conscious and unconscious knowledge, and how we understand other persons, are all good examples of issues that form the intersection of hermeneutics and the cognitive sciences. Although hermeneutics is most often contrasted with the natural sciences, there are some clear ways in which hermeneutics can contribute to the cognitive sciences and vice versa.*

Hermeneutics is usually defined as the theory and practice of interpretation. As a discipline it involves a long and complex history, starting with concerns about the proper interpretation of literary, sacred, and legal texts. In the twentieth century, hermeneutics broadens to include the idea that humans are, in Charles Taylor's phrase, 'self-interpreting animals' (Taylor, 1985). In contrast to the narrowly prescriptive questions of textual interpretation, philosophical hermeneutics, as developed by thinkers like Heidegger, Gadamer, and Ricoeur, raises questions about the conditions of possibility for human understanding — not how we *should* interpret or understand something, but what interpretation and understanding are and how they work.

For the nineteenth-century philosopher Wilhelm Dilthey, the hermeneutical disciplines were very different from the disciplines of science, including the newly emerging science of psychology. In contrast to psychology, which, in part, attempts to *explain* the natural behaviour of human animals in causal terms, Dilthey (1926) thinks of the hermeneutical disciplines as attempting to *understand* the behaviour of human persons in terms of their experience and inner motivation. Inner life is not composed of a series of mechanistic starts and stops, but is woven together into a continuity (*Zusammenhang*) that has a structure, by

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which he means that any part must be understood in its relations, its intrinsic connections, to other parts of the whole. The same kind of structure can be found in texts that call for a kind of interpretation which is not just a mechanical linking of words, but a search for a meaningful coherence between the whole and the parts. In both cases, that is, in the case of the textual meaning and in the case of the human person, the whole is defined as including a dimension of history — who I am or what this text means cannot be understood simply by treating my observed actions or the meaning of words as absolutely present. Rather, the meaning and significance of these things are discovered as contextualized by the meaning of past practices and past texts. As Hans-Georg Gadamer suggests, that which is to be understood is not present in my actions or in my words in the same way that a cause is present in the effect (1989, p. 224).

This contrast between hermeneutics and psychology understood as a natural science, and more generally between hermeneutics and science, has its own complex history, both prior to and subsequent to Dilthey. Dilthey's distinction between understanding (*Verstehen*) and explanation (*Erklärung*) is a useful one to consider in this regard. Habermas (1988), for example, uses this distinction to define what he calls a 'depth hermeneutics'. By this he means a combination of a hermeneutical *understanding* of the meaning of a particular social practice (its significance to the people involved, for example) and a scientific *explanation* of why such practices exist (their hidden causes, which may be a matter of economic reality or the maintenance of a power relation).

For models of depth hermeneutics Habermas appeals to Marx's critique of ideology and Freud's model of psychoanalysis. Paul Ricoeur (1970) reads Freud in this same way. Freud wants both an interpersonal practice of psychoanalytic interpretation, and a scientific metapsychology that explains the mechanisms of the unconscious. If we were to apply this model of hermeneutics to contemporary studies of consciousness, we would seek *both* an understanding of the subject's first-person experience along with its significance for her everyday life, *and* a neuroscientific explanation of how the embodied brain generates this experience. My discussion in this paper is focussed on this model of hermeneutics, and I refer to it simply as 'hermeneutics' rather than as 'depth hermeneutics' or 'philosophical hermeneutics'.<sup>1</sup>

There is a clear tension in this model. On the one hand the distinction between hermeneutics and science is maintained, as we see in the distinction between understanding and explanation. On the other hand, this model requires hermeneutics and science to work together in order to generate a fuller account of consciousness, cognition, and human behaviour.

In other quarters of hermeneutical theory there is a deeper tension in the sense of a genuinely perceived opposition between hermeneutical interpretation and

[1] To clarify this, my interest is in a hermeneutics that is (1) *philosophical* insofar as it is concerned to raise questions about the conditions of possibility for understanding the world and other people, and about what makes us self-interpreting animals, and (2) *a depth hermeneutics* only in the sense that it includes the explanatory power of science. Habermas ties depth hermeneutics to a critical project, that is, a project that takes as its goal a liberation by means of a perfected communicative praxis. I am not opposed to a critical use of hermeneutics, but it is not essential to my concern here.

science, and one often gets the impression that if one is doing hermeneutics, then one cannot be doing science, and vice versa. I think, however, that there is no question that if you sit down with practicing scientists who are at the cutting edge of their fields, they will be the first to admit as an obvious fact what Gadamer, among others, has suggested. The practice of science is itself hermeneutical. That is, scientists make interpretations, and their interpretations are biased in a very productive way by the scientific tradition to which they belong, and the specific kinds of questions that they ask. Explanation is no less interpretation than understanding. The interpretation of quantitative data, for example, relies on certain developments in the history of science, and on *qualitative* judgments among scientists, including judgments that the way they interpret their data is important and valuable for the community of scientists and the funding agencies that constitute part of their audience.

In this paper, I intend to explore the possible relations between hermeneutics and the cognitive sciences in a way that goes beyond any simple opposition between understanding and explanation. Specifically I want to show three things:

- (1) That what hermeneutics discovers is not really in opposition to what the cognitive sciences discover — in fact these disciplines are in agreement about a number of things;
- (2) That hermeneutics has something to contribute to the cognitive sciences, and to the science of consciousness; and
- (3) That the cognitive sciences have something to contribute to the field of hermeneutics.

I intend to do this by considering three different questions that will act as exemplars rather than an exhaustive explication of how these disciplines are related.

- *How do we know objects?* That is, how do we learn about and come to understand the variety of objects that exist in our world? The answer to this question shows that hermeneutics and cognitive sciences are not really in opposition.
- *How do we know situations?* That is, how do we actually perform cognitively on various types of pragmatic tasks or in various situations? The answer to this question shows what hermeneutics can contribute to the cognitive sciences.
- *How do we understand other people?* The answer to this question shows what the cognitive sciences can contribute to hermeneutics.

### **Circles, Schemas and Prototypes**

How do we learn about and know the things around us? At least one important aspect of learning about objects involves our ability to refer them to the right contexts; another involves our ability to classify them as belonging to certain types. In hermeneutical approaches, answers to these problems are worked out in terms of what is called the hermeneutical circle. One basic formulation of this notion is that all understanding has a circular structure, but one that is not

logically vicious. A traditional approach is to think of this circle in terms of understanding a text. To understand the meaning of a particular passage one needs to see how it relates to the text as a whole; and to understand the whole of the text, one needs to see how each part contributes to that meaning. Numerous theorists from the eighteenth century onwards also insisted that to further understand a text, one needs to place it within a larger historical whole that includes knowledge about the author, her society, her economic position, and so on. I understand X only by putting it into the proper context; and I understand the context better when I understand X. This clearly applies to learning about any kind of object. When I endeavour to learn about something, I begin to understand it only by relating it to something I already know — that is, I put it into some context with which I am familiar.

This, of course, may mean that I am led to misunderstand the object. I am naturally biased by what I already know and I often try to fit a new object into an established framework. In the end, however, accommodation must occur if learning is to progress. As Dilthey says, ‘failure shows itself when the individual parts cannot be understood by this method. This then requires that the meaning be redefined so that it will take account of these parts’ (Dilthey, 1926, p. 227). By some dialectical, back-and-forth process, or with some guidance by a teacher, I should finally discover the proper context and come to some acceptable understanding. When I do so, I am able to identify the object as similar to like objects; I am able to say what kind of thing it is.

This account, as far as it goes, is perfectly consistent with accounts given in cognitive psychology under the names of ‘schema theory’ and ‘protocol theory’. Theorists from Bartlett (1932) to Piaget (1952) to Arbib and Hesse (1986), and many others, have appealed to the notion of corrigible cognitive schemas to explain how we come to understand an object. The concept of a schema signifies that the knowledge we already have does not consist of disconnected pieces of information but is organized into patterns that we access and use in the acquisition of new knowledge. Such patterns or schemas allow us to ‘assimilate’ new information into already established frameworks. Importantly, new information can also cause a change in previously established schemas; schemas can change or ‘accommodate’ themselves to the new object. In the give and take between schema and object, as Anderson suggests, we construct an interpretation, and expressing this explicitly in terms close to hermeneutics, he states: ‘Text is gobbledygook unless the reader possesses an interpretive framework to breathe meaning into it’ (Anderson, 1977, p. 423). Objects are meaningless unless we have recourse to some interpretive framework that will to some degree facilitate understanding.

Schemas play a conservative role in the assimilation of new meaning; but the fact that they are relatively plastic means that we can adjust to information that has a high degree of novelty — and one could here speak about the importance of imagination, a subject to which I will return in the next section. In the cognitive sciences there are interesting debates about how schemas are generated, and how best to explain them. Is the underlying structure of schemas computational? Is

the plasticity of schemas best explained in terms of the plasticity of the brain? Should we rather consider schemas as generated within the framework of embodied actions? However you might answer these questions, they are questions that address the underlying mechanisms which allow us, as human seekers of understanding, to enter into hermeneutical circles that enable learning.<sup>2</sup>

Objects are different, yet in some sense they may share common features. Such differences and common features help us to interpret and understand objects. One theory developed in the cognitive sciences, prototype theory (e.g., Rosch, 1973; Lakoff, 1987), is quite consistent with hermeneutical approaches.

Some objects are prototypical — we know them very well; they contain clear and relatively well-demarcated instances of typical or defining features. Consider, for example, birds. One might think that a pigeon is an example of a typical bird. In this respect it operates as a useful prototype of the concept bird. But there are birds that are so unlike pigeons (e.g., chickens) that use of pigeon as a prototype doesn't capture everything there is to know about birds or operate as a definitive example. A prototype helps to map out the territory; to clarify what's different and/or the same in situations. A prototype is not simply one good example; rather it defines a cluster of phenomena, some of which are central and some peripheral.

A prototype is a pathway into a hermeneutical circle. If one thinks of schemas as a finite set of well-ordered (perhaps hierarchically ordered) categories, prototypes are more like radial organizations of meaning (Lakoff) — rather than a perfect fit, they are more a matter of degree. They also allow for a certain relativity. In some cultures, for example, pigeons are more prototypical for birds than chickens or penguins. But one can think of how that would be different where chickens or penguins constitute the majority of the bird population. Consistent with the hermeneutics of Gadamer (more so than with the hermeneutics of Dilthey or Schleiermacher) prototype theory suggests that interpretation will be more ambiguous, less objective, more a matter of degree than of complete and full understanding. The meaning of an object will be harder to pin down, and it will be more dependent on the situation. It is more about what Wittgenstein would call 'family resemblance' than about pigeon holes.

There is no opposition here between the cognitive sciences and hermeneutics. The accounts given by schema theory and protocol theory are perfectly in tune with accounts given of the hermeneutical circle. One account would enrich the other and indeed there would be a mutual enrichment and a deeper understanding of cognition if we put these two kinds of accounts together.

In the cognitive sciences, of course, there are unsettled debates about how prototypes are generated, and how best to explain them. Should we think of

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[2] Arbib and Hesse (1986) are among the very few to make a direct connection between the cognitive scientific schema theory and hermeneutics. For them, schema theory 'provides a model for all controlled interpretation of texts, and schemas themselves constitute the perspectives (or in Gadamer's terms, the preunderstanding) within which such interpretation takes place' (p. 181). More generally they are in agreement with philosophical hermeneutics that 'cognitive science is itself a human interpretive science (that is, a hermeneutic science) so what we have said about hermeneutics should apply to it also' (p. 182).

prototypes as metaphorical structures generated in what Lakoff and Johnson (2003) call ‘kinaesthetic image schemas’. Is it possible to develop a computational model of prototypically organized knowledge? Such questions about schemas and prototypes are parts of a larger whole — a larger question: is it possible to explain the ambiguity and relativity of human understanding in strictly objective computational terms? It is in respect to this question that I think hermeneutics has something to offer the cognitive sciences.

### **Computation and Understanding**

Computational models, even if not strictly closed or complete in logical terms, are meant to be strict, precise and predictable. The human cognitive system, however, is not designed to work with strict and definitive categories, but with corrigible schemas and flexible prototypes. This suggests an important difference between human understanding and computational models. Here I can appeal to Hubert Dreyfus’s analysis of what computers can and cannot do (Dreyfus, 1992). He argues that computers are quite good in contexts that are well-defined, narrowly circumscribed, and rule-governed. A good example of this is playing the game of chess. In contrast, computers are not very good at solving problems in circumstances that are ill-defined, ambiguous and without clear-cut rules to follow.

Computers are good at memory games, maze problems, word-by-word translation, responding to rigid patterns. In such activities mechanical association is important but meaning and context are irrelevant. Such activities can be handled by decision trees, list searches or templates. Computers are also good at simple formal activities, such as computable games (like tic-tac-toe), combinational problems (straightforward means-ends), mechanical proofs in mathematics. In such cases the meaning is completely explicit and context-independent. Complex computers may even be good at complex formal activities, such as games like chess, but also planning, and recognition of complex patterns in noise. In such cases meaning is still explicit but quantitatively complex. Such activities require, for example, ‘search-pruning’ heuristics (see Dreyfus, 1992).

Computational models, however, are inadequate for cases that involve non-formal everyday activities. Ill-defined games (e.g., riddles), open-structured problems that require insight which is not reducible simply to organizing a quantity of information, translation of natural language, recognition of varied or distorted patterns. In such cases there are implicit meanings that are highly context-dependent. These are cases in which there are no clear-cut rules to follow. Dreyfus appeals to the phenomenological tradition, especially Merleau-Ponty and Heidegger, to define such ambiguous, embodied, pragmatically contextualized situations. One could also appeal to the cognitive sciences themselves to find distinctions between non-contextualized and either pragmatically or socially contextualized situations — especially studies informed by neuropsychology (see Gallagher & Marcel, 1999).

I want to suggest that hermeneutics also offers a good model for understanding just those contexts that define the limits of computational approaches. Computational models fail in what Gadamer calls ‘hermeneutical situations’. These are precisely situations that are ill-defined, ambiguous, and not open to rule-following or methodological solutions. Interpretation in such contexts, as Gadamer points out, is not accomplished simply by proceeding in a methodical fashion. Gadamer reaches back to Aristotle to find a way to describe this. Aristotle, in his *Nicomachean Ethics*, outlines a concept of *phronesis* — usually translated as ‘practical wisdom’ or sometimes, as ‘prudence’ in its original sense — that is, an ability to know the right thing to do and how to do it. *Phronesis*, rather than computation, is precisely what is needed in situations where there are no rules, and yet decisions have to be made. In such situations we face a diversity of possible meanings, and there is no ultimate principle for their rank ordering.

Aristotle makes an important distinction between *phronesis* and cleverness. In the ethical context, an immoral person, a criminal, for example, can be very clever but does not have *phronesis*. Cleverness or quick wittedness can be a natural talent; *phronesis*, however, depends entirely on education or enculturation in the most basic sense. Specifically, it is something that can only be developed within the right social and educational setting. One gets *phronesis*, according to Aristotle, by hanging out with the right kind of people and by learning to act by following the example of good people. Without this informal educational backdrop, one can still be clever, but not necessarily a good person.

This moral concept of *phronesis* undergoes some important modifications in hermeneutical theory, and in this respect, I think it constitutes an important contribution that hermeneutics can make to the cognitive sciences. First, Gadamer takes it as a model for the act of interpretation, not only in moral contexts, but more generally in messy and ambiguous hermeneutical situations where there are no rules and where there exists more than one right answer (Gadamer, 1989, pp. 21–22, 312ff). More recent discussions of *phronesis* (found in the radical hermeneutical writings of Lyotard (Lyotard & Thébaud, 1985); Caputo, 1987; and others)), emphasize the idea that *phronesis*, while not reducible to cleverness, includes the use of a quick imagination. *Phronesis* depends on the use of imaginative or intuitive insight to arrive at solutions to problems that develop in the indefinite milieu of human life. In any of these cases the sought-for decision or action cannot be arrived at by precise solution through a process of eliminating alternatives or by following purely rational (rule-governed) computational procedures. As such, it goes beyond anything that can be modelled computationally.

This does not make *phronesis*, or the kind of understanding that is at stake in hermeneutical contexts, magical. To move away from strict and narrowly conceived computational models to the more dynamic models found in neuroscience is a challenge for the cognitive sciences. But if there are forms of cognition or understanding that belong to a realm that is simply not reducible to a sub-personal, computational level, and that involve personal and interpersonal processes, then new models that incorporate the effects of social interaction are

required. In this regard, Gadamer suggests that understanding is dialogical. Here one can go back to Aristotle's idea that *phronesis* is gained in informal social and interactive contexts. There is something in second-person human social interaction that is irreducible to subpersonal computations. Second-person interactions cannot be adequately characterized as the interactions of two or more computational systems, or even as the interaction of two brains.

Dilthey and his nineteenth-century Romantic hermeneutical colleagues spoke of this in terms of *empathy* — something that transcends both first-person and third-person perspectives. If we look at how the proponents of Romantic hermeneutics talked about empathy, we find an appeal is made to a shared spiritual dimension that is universally human. An optimistic view is given in 1819 by Schleiermacher, who speaks of subjective–divinatory interpretation in textual hermeneutics, a form of interpretation that goes beyond following a set of rules.

By leading the interpreter to transform himself, so to speak, into the author, the divinatory method seeks to gain an immediate comprehension of the author as an individual. . . . The divinatory is based on the assumption that each person is not only a unique individual in his own right, but that he has a receptivity to the uniqueness of every other person (Schleiermacher, 1977, §2.6).

Forty years later, Johann Droysen took a more pessimistic view. The genuine person who we try to understand is really inaccessible;

[the person] is reserved in its own realm in which it communes with itself and God alone . . . this is a sanctuary which research cannot penetrate. One person may understand another person well; but this is only superficial; he apprehends his deeds, speech, and gestures as separate moments, never truly, never completely. (1988, §38).

Whatever we might think of such Romantic, transcendental, or theological ideas — and there is certainly much to think of here — none of this looks very scientific. Is this where, finally, we find an incommensurable opposition between hermeneutics and science? One way to sidestep this opposition is simply to deny the profound differences between persons and things. As Arbib and Hesse (1986) suggest,

the hermeneutic approach does not require such dualism [‘a radical distinction between things and persons’],

and they go on to argue for

a continuity between natural and hermeneutic science based on the fact that they both have the same domain of objects (namely, bodies, including persons' bodies) carrying their properties around in space and time. . . . The choice of persons and participatory meanings as fundamental concepts in the hermeneutic sciences is not a necessary one' (p. 183).

Although choosing the right vocabulary, and the right levels of description for the analysis of understanding is important, what is at stake here is something more than vocabulary. It is not out of the question, or beyond the bounds of naturalism, that there just is a radical difference between things and persons. In the



following section I want to suggest that in regard to just this issue, hermeneutics can learn from important insights that have been recently gained in the cognitive neurosciences.

### Understanding Others

I suggested that second-person interactions cannot be characterized as simply the interaction of two brains — or the presence of shared representations in two brains. I do not mean that we should ignore neuroscience. Indeed, if there were not at least two brains involved, there would be no second-person interaction. Cognitive social neuroscience can contribute to our understanding of how we understand each other, as persons, and how empathy is possible. But this is also a central aim of hermeneutics. First, I want to briefly rehearse some familiar recent work in neuroscience that helps us to understand, from that scientific perspective, how we interact with other people. Second, I want to discuss how cognitive scientists interpret these findings.

The work on mirror neurons is now well known. Mirror neurons were discovered in the premotor cortex (area F5) of the Macaque monkey and, there is good evidence to suggest that they can be found in the premotor cortex and Broca's area in the human (see Fadiga *et al.*, 1995; Rizzolatti *et al.*, 1996; Grafton *et al.*, 1996). Mirror neurons respond *both* when a particular motor action is performed by the subject *and* when the same goal-directed action performed by another individual is observed. Mirror neurons thus constitute an intermodal link between the visual perception of action or dynamic expression, and the first-person, *intrasubjective*, proprioceptive sense of one's own capabilities. Vittorio Gallese (2001) suggests that such neurons contribute to a cognitive neuroscience account of empathy. He suggests that empathy, or social cognition, consists of a 'resonance' existing between the observer's and the observed agent's motor systems, forming a 'shared manifold' between the observer's body schema and the agent's body schema.

Before we consider this and other interpretations, let's look at some more recent discoveries that are quite consistent with and extend the work on mirror neurons. Brain imaging studies of subjects who (1) engage in instrumental action, (2) observe another person act, (3) simulate the action of another, or (4) plan to imitate the action of another, show that brain areas activated for each of these tasks overlap (Jeannerod, 1997; Ruby & Decety, 2001; Grezes & Decety, 2001). If I see you pick up a glass to take a drink, the very same areas in my brain are activated as when I myself pick up a glass to take a drink. Here we are not talking about individual neurons, but neural systems. Moreover, when I consciously simulate or imagine myself doing a certain action, or imagine you doing that action, or prepare to imitate an action that you have just completed, the brain areas activated for my cognitive acts are the very same ones that are activated for my own actual motor behaviour.

These studies of mirror neurons and shared neural representations have directly informed debates that are central to the concerns of hermeneutics, that is, debates about the nature of understanding others and empathy. In effect, when

philosophers of mind, psychologists, and neuroscientists address what is usually referred to as *theory of mind*, they are (and in most cases unknowingly) entering into the older hermeneutical debates about understanding and empathy.

Theory of mind is defined as our ability to ‘mentalize’ or mind-read the mental states of others in order to explain and predict their behaviour. There are ongoing debates between those who champion a theory approach to theory of mind and those who defend a simulation approach. The first group, the ‘theory theorists’, propose that the way we understand others involves the employment of a theoretical stance: we theorize (implicitly or explicitly) about others in order to explain or predict their behaviour. In contrast, *simulation theorists* argue that our understanding of others is based on our ability to simulate what the other person is thinking or feeling. For example, we virtually put ourselves in the other person’s place, run a simulation routine in our own mind, and then infer that this is what she must be thinking.

Simulationists now appeal to the evidence from cognitive neuroscience discussed above (e.g., Gallese & Goldman, 1998; Gordon, 2002; in press). Simulation is possible because we have similar brains with mirror neurons and shared representational areas activated in the appropriate way. Theory theorists are not completely without scientific resources, however. They can appeal to false-belief tests that show that understanding the minds of other seems to involve a theoretical stance that is gained around four years of age in normal, non-autistic children. Importantly, both theory theorists and simulation theorists claim that theory of mind is the primary way we go about understanding others, not just when we’re four, but throughout our life.

*Interaction theory* is an alternative to both theory theory and simulation theory (see Gallagher 2001; 2003). This approach can also appeal to the neuroscience evidence about mirror neurons and shared neural representations, and a large body of evidence from developmental psychology concerning the abilities of infants to parse and understand the intentions of others in a non-mentalistic way.<sup>3</sup> This view pushes the age of *understanding*, if not of reason, back to infancy and suggests that throughout our life our primary way of *understanding*, if not of explaining or predicting, is more embodied and socially embedded than our ability to mentalize through the use of theory or simulation.

These different positions offer different interpretations of the scientific evidence — and here it is tempting to once again point out the hermeneutical nature of science itself. But my point is different. What I want to emphasize here is that in our attempts to explain how we understand others we do not have to appeal to an obscure universal human spirit, as Schleiermacher, Droysen, and Dilthey did. We now have the means to see the meaning of a universal human spirit in the behaviour of the infant and in the activation of common brain areas, and to give a hermeneutical account of empathy that is closely tied to these natural phenomena.

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[3] My intention here is not to provide the complete argument for this view (see Gallagher, 2001; 2003). Important sources for this view can be found in the work of Trevarthen (1979) on ‘primary’ and ‘secondary intersubjectivity’, and in Hobson (2002).

We can cash out Schleiermacher's notion of divinatory power in terms of the capacity of infants to detect and complete the intentions of others. With this innate capability (Baron-Cohen, 1995) infants are able to interpret bodily movement as goal-directed intentional movement, and are capable of perceiving other persons as agents.<sup>4</sup> This 'divinatory power' is embodied and perceptual, and as Scholl and Tremoulet suggest, 'fast, automatic, irresistible and highly stimulus-driven' (2000, p. 299). Whether we should think of this as a capacity for mentalizing, or as a non-mentalistic performance, is part of the ongoing debate.

Dilthey emphasized the importance of context for understanding the actions and intentions of others.

There is a regular relation between an action and some mental content which allows us to make probable inferences. But it is necessary to distinguish the state of mind which produced the action by which it is expressed from the circumstances of life by which it is conditioned. . . . So action separates itself from the background of the context of life and, unless accompanied by an explanation of how circumstances, purposes, means and context of life are linked together in it, allows no comprehensive account of the inner life from which it arose. (Dilthey, 1988, p. 153).

This emphasis is consistent with what Trevarthan shows about secondary intersubjectivity. Around the age of one year, infants go beyond the person-to-person immediacy of primary intersubjectivity, and enter into *contexts* of shared attention — shared situations — in which they learn what things mean and what they are for (see Trevarthan & Hubley, 1978).

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

Eighteen-month-old children can understand what another person intends to do. They are able to re-enact to completion the goal-directed behaviour that an observed subject fails to complete. The child, seeing an adult who tries to manipulate a toy in the right way and who appears frustrated about being unable to do so, quite readily picks up the toy and shows the adult how to do it (Meltzoff 1995; see Meltzoff & Brooks, 2001). This kind of understanding of actions depends on shared attention and the pragmatic context. Just as we understand our own actions on the highest pragmatic level possible (see, e.g., Gallagher & Marcel, 1999; Jeannerod, 1997), we understand the actions of others in the same way. That is, we understand actions at the most relevant pragmatic level, and this is always tied to contextualization.

This level of understanding is called 'elementary understanding' by Dilthey, and he distinguishes it from higher forms of understanding, which include empathy. If, as Dilthey suggests, the logic of elementary understanding may be expressed as an inductive process, he struggles to work out the correct account (1988, p. 154). Inferences are not made from effect to cause in such cases. That

[4] Baldwin and colleagues have shown that infants at 10–11 months are able to parse some kinds of continuous action according to intentional boundaries (Baldwin & Baird, 2001; Baldwin *et al.*, in press).

is, in our interpersonal relations we are not looking for a causal explanation of why the other person is acting in a certain way (although this would be the theory theorist's view). Rather, we are reading the other's expression (the action, the gesture, the facial expression) for *meaning*. This is as far as Dilthey can go, however, in his account of elementary understanding. But his inclination is to turn to observations of children, and he suggests that before the child learns to talk it is already immersed in socially organized contexts and the expressions that constitute the objective manifestations of the mind, all of which form a background context for understanding another person.

My point is that the scientific studies of primary and secondary intersubjectivity, and so forth, support Dilthey's intuitions about elementary understanding. Understanding others is not magical; nor do we need to appeal to a divinatory spirit to account for our capacity to communicate, to empathize, to fall in love, and so forth. Indeed, to be realistic, the same accounts are capable of shedding light on pathologies, the prejudices of racism and sexism, and the hatred that sometimes leads to war — such things that we would be hard pressed to explain as emanating from our divinatory spirit. More generally, it seems clear that studies and debates in the cognitive sciences can contribute to and make more precise the important insights about elementary and empathetic understanding found in the hermeneutic tradition.

### Conclusion

I've tried to show, first, that what hermeneutics discovers is not in opposition to what cognitive science discovers — in fact they are in agreement about a number of things; second, that hermeneutics has something to contribute to the cognitive sciences; and third, that the cognitive sciences have something to contribute to the field of hermeneutics. I've done this by considering three questions: How do we know objects? How do we know situations? How do we understand other people?

Let me move to a quick conclusion by asking one more question. What does it mean to be scientific? People too often give an easy answer to this question by appealing to the objectivity of scientific procedure. Indeed, this is Dilthey's answer. If we cannot attain some degree of objectivity about a subject matter, then it cannot be the subject of a scientific study. Some people think that science is restricted to quantitative accounts, and that if something cannot be quantified, it doesn't allow for scientific study. In the cognitive sciences there are still people who will insist that the task of science is to be reductionistic: a good account is one that can be mapped out completely in sub-personal terms. I think that it is better to think of science as using any means possible to explain *what there is*. And if *what there is* includes such things that cannot be reduced to computational processes or the subpersonal activation of neurons, or cannot be quantified, or objectified without loss — such things that nonetheless have meaning for human life, and that therefore fall into the province of hermeneutics — then to turn away from them and to deny their actuality is in fact being unscientific.

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