Phenomenology and Situated Action

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Abstract

Situated Action, the newest approach to Artificial Intelligence (AI), is in need of a coherent theoretical foundation both to support it and to unify its proponents. To that end, we believe that the work Merleau-Ponty will prove invaluable. In the past, Heidegger's work has been referred to from time to time in Situated Action literature. However, we believe that Merleau-Ponty's work is better suited to Situated Action, as it is heavily grounded in both biology and psychology. In addition, Merleau-Ponty broke with traditional Phenomenology for many of the same reasons that Situated Action researchers have broken with traditional AI. As a result, we believe that Merleau-Ponty's work is demonstrably better suited for constructing a theoretical foundation for Situated Action.

In Situated Action literature it is not unheard of to see references to Heidegger (Beer 1990; Brooks 1990), however it is exceedingly rare to see Phenomenology explicitly incorporated into Situated Action. We believe that this situation is problematic for two reasons: the first is the reluctance to incorporate Phenomenology into Situated Action, and the second is the choice of phenomenologists. Phenomenology has a great deal to offer to AI, but until now it has only been used to criticize AI (Winograd and Flores 1986; Dreyfus and Dreyfus 1990a; Dreyfus 1990b; Dreyfus 1979). With the birth of Situated Action, however, it is possible to bring phenomenology to bear on AI in a positive way. To that end, we believe that it is Merleau-Ponty, and not Heidegger, who is best suited to this task.

Although Heidegger is more well known than Merleau-Ponty, his work tends to take place at an abstract level (Heidegger 1962, 1991) and as a result a considerable amount of effort must be spent applying his work to specific individuals. In addition, Heidegger's work deals with people (*Dasein*[1]) rather than intelligent agents in general; therefore a significant amount of effort must once again be spent extending this work so as to make it applicable to Situated Action insofar as Situated Action is concerned with intelligent systems in general. In contrast to Heidegger, and indeed all other phenomenologists, Merleau-Ponty's work is immediately applicable to Situated Action and is easily incorporated into it.

What makes Merleau-Ponty's unique in phenomenology is its scientific grounding. One of Merleau-Ponty's chief dissatisfactions with phenomenology is that it posits a consciousness that is divorced from the corporeal world. Merleau-Ponty's goal was to ground consciousness in the body and to develop the notion of an incarnate *cogito*, (insofar as cognition is part of our conscious life it too must be grounded in the body). For Merleau-Ponty it is not that bodies *have* consciousness, but rather that bodies *are* conscious. For Merleau-Ponty it is, in some sense, bodies and not merely minds that are cognitive. This dissatisfaction, and his resulting work, parallels the criticisms that Situated Action theorists have leveled against traditional AI and the solutions that have been proposed; *viz.* that it is a mistake to treat cognition as being independent of embodiment and that the proper course of action is to begin with a study of embodiment. While Merleau-Ponty's work moves from consciousness down to embodiment in an attempt to ground consciousness (and cognition) in the body, Situated Action moves from the body up to cognition in an attempts to get intelligence to emerge from bodily interaction. As a result, Merleau-Ponty's work and that of Situated Action are reciprocal and complementary. Their union might also make possible a symbiotic relationship, while Merleau-Ponty's philosophical work could be used in the theoretical development of Situated Action, Situated Action could be used to provide empirical validation for Merleau-Ponty's theories.

Both Merleau-Ponty and Situated Action have developed positions that are in keeping with Mies van der Rohe's famous dictum "form follows function" and in both cases the positions espoused were reactions to traditional approaches in their respective fields. Phenomenologists from Husserl onward have focused on consciousness and its relation to the external world, either ignoring the body entirely or treating it as a delimiter. The fact that consciousness

[1] Roughly translated Dasein means: to be the occasion on which the world comes into being.

is tied to the world via motility and perception was omitted, or at best, treated as a minor detail that could be safely dealt with in a cursory manner. Because consciousness (function) can be divorced from the body (form) conceptually, it was implicitly and erroneously concluded that it could also be divorced from the body when attempting to understand it. Merleau-Ponty rebelled against this notion, arguing that the mind and body, form and function, are inextricably bound to one another. The body determines the way in which learning, intelligence, and consciousness manifest themselves. From the perspective of Merleau-Ponty's work, the kind of intelligence and learning that arise in an artificially intelligent organism will depend largely upon the structure of the organism's body and its relation to the environment (*Umwelt*). It follows then, that the form an artificially intelligent organism takes is not something that can be done after the fact, but rather must be carefully planned out from the outset.

Similarly, the traditional approach to artificial intelligence rests on the physical symbol system hypothesis, which maintains that what is important about human intelligence is that it consists of symbol manipulation. Here again we find the implicit assumption that because we can separate function from form conceptually, we can do the same when attempting to implement intelligence. The assumption is that it is possible to implement human-like intelligence in a form that is decidedly unlike the human body, or any other body. Another way to put this assumption is that intelligence can be implemented in some box first, and then later put into a robot. In contrast to this, Situated Action researchers have argued that intelligence emerges from perception and motility. As a result, when planning the creation of an intelligent agent, the form it takes, its perceptual motor abilities, will determine the intelligence that emerges: form follows function.

Merleau-Ponty and Situated Action are also united in their rejection of the belief that the world can be described propositionally from a detached perspective. Husserl argued that:

> the world, the background of significance, the everyday context, was merely a very complex system of facts correlated with a complex system of beliefs, which ... have truth conditions. One could, in principle, he held, suspend one's dwelling in the world and achieve a detached description of the human belief system. (Dreyfus and Dreyfus 1990a: 322)

Merleau-Ponty rejected Husserl's attempt to view the world from a detached third person perspective (epoche), and argued that we are drawn out into the world and bound to the world by the body. As a result, if we are to understand intelligence as it is manifested we must examine it as it occurs in the course of our interaction with the world. Once again, for Merleau-Ponty intelligence, learning, and consciousness are best understood not as mental phenomena so much as bodily phenomena.

As noted by Dreyfus and Dreyfus (1990a) Husserl's position here is much the same as that of the early AI researches. This approach in AI gave rise to the use of non-monotonic reasoning, scripts, frames and all the attending difficulties that go with these approaches. One of the strongest motivations for a situated approach to AI is the fact that these early endeavors have met with limited success. Studying intelligence apart from embodiment is as distasteful to Situated Action researches as it was to Merleau-Ponty. It appears, then, that if Situated Action is successful it may provide empirical validation for Merleau-Ponty's philosophical convictions.

Merleau-Ponty also sought to provide a suitable alternative to behaviorism (Merleau-Ponty 1963), one of the dominant paradigms in his day. Situated Action is no stranger to charges of behaviorism (Hayes 1994) and, unfortunately, there may be some basis for these accusations. Two terms commonly found in Situated Action literature, "Merkwelt" and "Umwelt," are often attributed to Von Uexkull[2] (Brooks 1990; Hendriks-Jensen 1994) and this work contains several behaviorist notions that Merleau-Ponty argued strenuously against (Merleau-Ponty 1963). It is, therefore, quite possible that Situated Action theorists employing Von Uexkull's work may have unknowingly incorporated behaviorist themes into their work. In addition, the strict engineering approach adopted by Brooks (1990, 1991,1995) may harbor behaviorist tendencies as well. As a result, the incorporation of Merleau-Ponty's work into Situated Action would serve to exorcise the specter of behaviorism from Situated Action.

Merleau-Ponty is unique among phenomenologists partly because his work was founded on a study of the nervous system of various organisms, and developmental psychology (Merleau-Ponty 1962,1963,1964). In his first major work, the *Structure of Behavior* (Merleau-Ponty 1963) Merleau-Ponty developed his notion of the "species *a priori*" and "bodily intentionality." The species *a priori* is an attempt to find the conditions for the appearance of the world in the biological makeup of an organism. This endeavor closely resembles Situated Action's motivations for the use of the terms *"Merkwelt"* and *"Umwelt."*

[2] The term Umwelt has a long history in phenomenology and was employed by Husserl as early as the late 19th century, well before Von Uexkull's article.

The notion of "bodily intentionality" allowed Merleau-Ponty to talk about the body's seemingly intentional behavior prior to consciousness. This makes it possible to employ Merleau-Ponty's work without having to grapple with consciousness and the attending difficulties. This concept was developed from a detailed study of the neuro-physiology of a wide variety of animals, not unlike Beer's (1990a, 1990b) study of animal nervous systems and his subsequent emphasis on adaptability and reflexes. Like Thelen and Smith (1995), Merleau-Ponty sought to explain human development in terms of interaction and physiology.

The claim in Situated Action that various dysfunctions (Brooks 1995, Thelen and Smith 1995) might offer insights into the composition of functioning bodies and brains was anticipated by Merleau-Ponty. In the *Structure of Behavior* Merleau-Ponty provided a detailed examination of various neuro-physiological pathologies in an attempt to develop an adequate theory of human development and behavior. In that work Merleau-Ponty, like Situated Action theorists, argued that the behavior of an organism cannot be properly understood apart from the context in which in it occurs. Nor did he believe that the activities of one part of the nervous system can be completely understood without reference to the rest of the nervous system. Neuro-physiological phenomena must be understood relative to the internal conditions of the organism as a whole, and the external conditions obtaining in he environment. Contrary to behaviorism, in Merleau-Ponty's work, organisms are not receptive to stimuli, but to situations (c.f. Thelen and Smith 1995). Once again, these claims are supported by an analysis of a wide variety of experiments conducted on a range of animals: the effects of amputation in insects, brain lesions in mammals, spinal damage in squids etc. (Merleau-Ponty 1963).

In short, Merleau-Ponty's phenomenology is uniquely suited to Situated Action because of its theoretical aims and its scientific grounding, and both phenomenology and Situated Action would benefit from such a union. Phenomenology offers literature regarding the theoretical grounding for the work done in Situated Action, and Situated Action offers the hope of empirical validation for Merleau-Ponty's phenomenology. Finally, we believe that for the first time in the history of AI, phenomenology and AI are no longer opposed to one another, but rather share a common ground. It is our hope that this unique opportunity will not be overlooked.

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