

## Existence and the Brain

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The interface between an account of existence and an account of the brain *qua* information processing machine is discussed. Heidegger's "analytic of Dasein" is taken as the account of existence and Gibson/Neisser is taken as the machine account. It is shown that a Gibson/Neisser machine would be the right kind of machine so that to *be* that machine would be to "exist" (in the technical sense of *Existenz*). The heuristic value of existential considerations for the theory of the brain machine is illustrated.

The contemporary theory of the human organism prominently includes accounts of mind, brain and behavior. The theory of the human condition includes additionally an account of existence, what it is to *be* a human organism. Before proceeding to my topic of existence and the brain, some background must be given on the present radical shift from human organism to human condition.

Martin Heidegger, the founder of existential phenomenology, complained that western philosophy and science have forgotten about existence since the time of the Socratic philosophers. There is a fundamental "ontological difference," Heidegger held, between Being and beings (entities), between existence (*Existenz*) and things in the environment. Science properly focuses on entities and can forget about existence (to which its methods do not apply). For Heidegger, it is philosophy's task to remember existence (which is, after all, the ground for any scientific inquiry). In so doing, he unfortunately forgets all about the brain, as did Husserl before him. In Heidegger's shift of emphasis from beings to Being, the unique status of one special being, the brain, is lost to view.

My strategy here is to remember existence but not to forget the brain. Thus, I focus on both existence and the brain, and their connection. My endeavor is accordingly "neurophilosophical." But whereas P.S. Churchland's seminal *Neurophilosophy* considers the brain in the tradition of Anglo-American philosophy, I turn to the tradition of continental philosophy, specifically,

to Heidegger's "analytic of Dasein" found in his major work, *Being and Time* (1927/1962a). For the account of the brain *qua* information processing system, I turn to Gibson (1966, 1979) and Neisser (1976). I hope to show that these particular existential and scientific accounts are coherent, and that through them we can talk meaningfully of existence and brain "in the same breath."

My goal, while radical, is limited in scope. If I can open up a clear connection between Heidegger (arguably the most seminal figure in 20th century continental philosophy) and Gibson/Neisser (influential 20th century American psychologists), then my present aim will be achieved. If such unlikely bedfellows can be accommodated, then the larger task of establishing a framework that includes both existence and the brain, i.e., an "existential functionalism" (Globus, 1986), will appear more cogent.

A number of objections might be raised to such an endeavor from the very outset. It might be said that there is no such thing as "existence"; that even if there is, the meaning of existence is murky; that even if the meaning is clear, there is no way of verifying an existential claim; and so on. Such objections cannot be overcome decisively, although they are arguable.

My response is of a different kind: suppose we just accept existential talk and (overcoming our prejudices) "dwell" with Heidegger a while. We may assume that we exist and that existential claims are meaningful and verifiable. Even so, it would be surprising if all that murky existential talk and crisp information processing talk nicely cohered. If existence could fit the brain, then this lends credence to our endeavor. So my response is: let's put aside all initial objections that would constrain the present discussion and see if existential and brain talk might be compatible.

Another kind of objection holds that a species of category error is made in speaking of existence and brain together. This is the existential version of the putative category objection made in speaking of consciousness and brain together. A discussion of the general philosophical issues raised here would carry the present discussion far afield. I have elaborated elsewhere (Globus, 1988) an identity theory approach to the philosophical "existence/brain" problem that attempts to resolve the apparent category error.

### The Analytic of Dasein

*Dasein* is an entity, a being of the human kind. This being (entity) has a Being, a "to Be," the case of actually Being Dasein. Heidegger reserves the special name *Existenz* for Being Dasein; "existence" is always a technical term in what follows. (We do not say the tree "exists"; only Dasein exists.) As an entity, Dasein might properly be called *the* Dasein, but it is a very special entity in that it is the only entity whose own Being is an issue for it; drop-

ping the definite article in favor of plain "Dasein" flags this specialness, while keeping the article emphasizes that it is an entity.

We each know what it is to Be a Dasein: it is what we are. Dasein has a "pre-ontological understanding" of Being, of its own existence, an understanding before any philosophical thoughts about the issue of existence. Existence is given as the Dasein's, who always says, "My existence."

The equation of "to Be the Dasein" with "to exist" fixes the meaning of the otherwise obscure sense of "Being" the Dasein. We first consider what it is to "Be" an entity in general. To "Be" that cabbage over there is quite a different state of affairs from Being the Dasein. Who knows what it is to Be the cabbage? Ask the cabbage! The only instance we can ever know of Being something is what it is to Be the Dasein, and that is our own existence. Out of all beings in the world-out-there, there is only one—the Dasein—where the question of what it is to Be that entity even makes any sense at all. The question of Being can only be approached through the Dasein. With respect to Being the rest, we in our finitude can only shrug (and defer to Kant's infinite being). So to "Be" anything else is unknowable but to "Be" the Dasein is human existence.

As already noted, Heidegger points to what he thinks of as a monumental lapse in the memory of western thought since the time of the Socratic philosophers: Being has been forgotten in a preoccupation with beings, a preoccupation epitomized in 20th century technology. The name Dasein ("to-be-Da") recalls us to our own Being, since it is our fate as human beings to be "Da." (The "Da" is explained below.) Having directed his own attention to the forgotten Being, we saw that Heidegger forgets about a certain special being on the other side of the ontological difference that is intimately connected to existence, i.e., the human brain. No brain, no *Existenz*. And what the brain out of all beings has to do with *Existenz* is that Being the brain is *Existenz*. So the brain cannot be forgotten even in the purest of ontological research. The present discussion is accordingly what Heidegger calls a "re-trieve"—but a re-trieve of Heidegger—thinking what he could not think but which was nevertheless implicit in his thought.

The entity that Heidegger names "Dasein" is differently labeled by the behavioral and brain sciences in accordance with their different purposes. But whether one says "that Dasein" or "that human organism," the entity picked out by the reference is the same. The terminological difference reflects different concerns about the same entity. Thinking along the ecological lines of Gibson (1979), that same entity could be called the "doubly embedded brain," which is the ecologically conceived brain embedded in the body. The body is in turn embedded in a fluctuating sea of ambient physical energies as it follows along its world line. So if we wanted to talk ecologically and existentially—take Gibson and Heidegger together—we would say: *To Be the doubly embedded brain is existence. Existence is the doubly embedded brain's.*

## A Doubly Embedded Brain with the Right Stuff

It immediately follows from the above argument that the doubly embedded brain has to be the right kind of wet machine so that in Being it, one could exist in all human existence's richness. The cabbage is wet enough, perhaps, but its machinery is clearly not the right stuff. (Nagel's [1974] bat is closer.) To Be the cabbage would not be much, if anything. But the brain *has* to have exceedingly rich capabilities if to Be that brain is to exist. The general thesis—that to Be the doubly embedded brain is existence—must continue to hold when the brain and existence are unpacked.

Unfortunately, the state of the behavioral, cognitive and brain sciences is such that we know very little about the doubly embedded brain at its highest level of functioning, which is the level relevant to existence. Brain science has made truly spectacular advances, but this has been primarily at the level of the neuron and below. Neuronal networks, and higher order systems of such networks, remain to be elucidated. We cannot yet say (and cannot even foresee a utopian era for brain science when we might say) that the brain is an information processing system of just the right kind that to Be the system would be to exist.

Given the current empirical insufficiency of brain science, we must say what we can say: *the account of existence tells us what kind of machine we should be looking for at the highest level of brain functioning.* Thus the existential is of heuristic value to the behavioral and brain sciences, for it tells us what the machine's capacities have to be. Of course, if no such machine is even conceivable, then the present endeavor must be aborted because it is completely wrong-headed. The next task, then, is a closer look at Heidegger's account of existence, and then we will want to think about what kind of wet machine is called for to support existence.

It should be noted that the brain's "support" of existence does not imply that the brain machine is other than existence, does not imply that there are two things, one supporting the other, like the foundation that supports the house. Existence and brain are one. "Support" means the brain system must be rich enough that in Being it, one would exist.

### How Goes It with Dasein?

I want to give a highly simplified, extremely truncated, account of existence, which will undoubtedly set Heideggerian teeth on edge; but otherwise we would get lost in the murk. My focus is on early Heidegger (1927/1962a, 1929/1962b, 1927/1982). I shall pick out, then, some basic characteristics of existence, and in the following section begin to develop a brain conception that might mesh with this simplified existence story.

By the *Da* I understand *presence*. We shake someone in a deep sleep and

ask, "Are you here (*da*)?" (We do not mean, "Are you located here in bed?" but "Are you present to the world-out-there?") A man passes out at a wild party and we call to him, "Say, are you there (*da*)?" (We do not mean, "Are you lying there in the punch bowl?" but "Are you present with us? Do you share our world?") Someone else at the party is "spaced out" and we inquire, "Is she all there (*da*)?" (We do not mean to imply, "Is a piece of her located elsewhere?" but "Is she present to the same world as the rest of us?") To be *Da* is an "essential disclosedness," an Openness, a clearing (*Lichtung*), a being-present to beings. Privatively, as in growing drowsy, we are less present, the clearing fades, the *lumen naturale* grows dim and the world-out-there veiled.

We are *Da*—in a way. We are not open for just everything in the world but are instead *situated* for some things. We are always situated for possible worlds before the actual world is even unveiled, and the world unveiled depends on our situatedness. Our situatedness is not static but continually fluctuates; we exist within a changing horizon of meanings. So we are *situated Da*.

The situatedness just discussed was only perceptual. We are also situated *Da* as expectations, beliefs, plans, hopes and the other non-perceptual "propositional attitudes." In the case of a successful perception, the propositional attitude is "transparent," filled sensuously by a definite world; when the perception is unsuccessful, the attitude remains "opaque," purely cognitive, empty of any particular fulfillment. Heidegger calls Dasein's situatedness "Being-in-the-world" (*in-der-Welt-sein*). (Note that "world" here is a horizon of meanings, not the world-out-there of beings "present at hand" and "ready to hand.")

Dasein as situated is "thrown possibility" (*geworfene Möglichkeit*), a potentiality. Our thrownness is the very facticity of the condition in which Dasein finds itself: "that it is and has to be" (Heidegger, 1927/1962a, p. 174). As thrown possibility, Dasein always finds itself in a certain way; it has no choice but to Be as possibility, spontaneously "in every case what it can be" (Heidegger, 1927/1962a, p. 183). Possibility as an *existentiale*, a basic characteristic of Dasein, is what Heidegger calls the "understanding" (*verstehen*). Understanding as thrown possibility is a basic mode of Dasein's Being.

... [A]s potentiality-for-Being, understanding has itself possibilities which are sketched out beforehand within the range of what is essentially disclosable in it. (p. 186)

So our situatedness holds possibilities for disclosing the world-out-there. *Dasein exists as situated for possible worlds that might be disclosed.*

Our existence—situated *Da*—is grounded in a fundamental movement that situates us *Da*. Heidegger calls this movement "Temporality" (*Temporalität*). Temporality is a unique process; Heidegger emphasizes that "Temporality temporalizes itself." In this process of temporalizing, time is variously stretched—into a now (now, this season; now, while you are reading), a past (yesterday; since you came to California) and a future (tomorrow, till the first of the

year). Time thus stretched serves as temporal horizon, situating Dasein's existence temporally. Without the temporality which grounds existence, situatedness of all kinds collapses and the set of all possible worlds past, present and future shrinks to a point. Speaking in a simplistic and truncated way, *our existence is a process situating us Da*. We find ourselves a flowing process, situated and present to a particular world.

### A Machine That To Be It Is to Exist

We now want to look toward the kind of machine such that to Be that machine is to exist. I turn initially to Gibson's (1966, 1979) ideas, which have an affinity to Heidegger's. Gibson, however, did not think meaning was the doubly embedded brain's contribution; meaning was there in the flowing array of the stimulus, specified in the input flux to the brain, available to be picked up. Gibson has been sharply criticized for his anti-cognitive stance (Fodor and Pylyshn, 1981; Ullman, 1980), and Neisser (1976) has cognitivized Gibson's position. Where Gibson says the brain "picks up" information in the input flux by "resonating" to that information, and meanings are just higher-order relations ("affordances") within the input flux to be picked up, Neisser says the brain is already prepared to pick up certain information in virtue of "schemata," and we can only pick up what we are ready to pick up. Information pickup is cognitively penetrated for Neisser, and continually so. So the doubly embedded brain machine I am discussing cognitivizes Gibson (against his will).

We now want to see how this brain is such that to Be it is to exist. Suppose, then, there exists a doubly embedded brain machine that picks up information of the world. To Be that brain would be to have the information picked up, i.e., to have the information of the world. We would be *present to the world in virtue of having its information*. To be *Da*, then, is to Be a brain that picks up information of the world. That is what it is to Be a doubly embedded information processing machine like the brain: one is present to the world, *Da*, in virtue of picking up its information.

Suppose the machine was prepared to pick up certain information in virtue of its schemata. The machine generates sets of abstract specifications, and picks up information in the input flux that meets the specs. Information that is not already specified is not picked up. *To Be that brain with specifications set on input is to be situated with respect to information of the world*.

Suppose the machine is prepared to pick up possible worlds of information; it sets wide specifications in filtering possible inputs, and makes its best match with the information actually available in the input. *To Be that brain always specifying possible worlds of information is to be thrown possibility*.

Suppose the machine setting up abstract specifications continually tuned those specifications. (Using Pylyshn's [1984] terms, the filters are "cognitively

penetrated.") The very specifications for time are continually determined by the tuning process. The specifications determine a now, a past and a future. A determinate space is also specified, so that some things are near at hand and others far away. Entities are specified too. *To Be that brain with such a tuning process is to Be a movement that situates us Da*. So a brain machine that continually tuned abstract specifications for information pickup sounds like a machine with the right stuff: to Be that brain would be to exist.

To summarize, a Gibson/Neisser machine that could continually tune specifications for information to be picked up, and could pick up information that satisfied its abstract conditions, would be a machine with the right stuff to be the Dasein's brain. To Be that functioning machine is to be a process that continually and spontaneously situates itself as possibility with regard to information from the world potentially available in the input flux and at the same time the process is present (*Da*) in virtue of picking up the world information actually available in the input flux.

### Discussion

Even granting existence and Heideggerian claims about it, and even granting that a Gibson/Neisser brain information processing system is a machine with the right stuff to "support" existential properties (in that to *Be* a machine with those capabilities is just what it is to exist)—that is, even granting my Heideggerian openers and the mapping to Gibson/Neisser—so what? What would it buy if there were a vital interface between existential phenomenology and cognitive science?

Now cognitive science is faced with the formidable task of understanding that virtual machine, with its functional architecture, generated by the brain. Existential phenomenology can provide a functional guide. This can be illustrated as follows.

We have seen that Dasein is "situated" in the sense that it specifies possible worlds. As Dreyfus (1979) brings out in his critique of artificial intelligence, this horizontal situatedness is not to be thought of as a list of isolated determinate rules. The horizon is instead an unlimited network of relations that opens up to the whole of human concerns and practices. Dasein's *situatedness is thus holistic*. This calls for a brain machine that follows holistic principles.

Now, given world enough and time, a digital computer can simulate a system that follows holistic principles, but it does not naturally function holistically. The "digital" principle relies on exact independent units arranged in a pattern (strings of symbols) that can be syntactically transformed. The computer is quintessentially an analytic, not a holistic, device. It does not have the right stuff to naturally support Dasein. A truly holistic device is needed.

An example of a holistic machine is found in parallel distributed processing (PDP) [Rumelhart, McClelland and the PDP Research Group, 1986]. In

these machines the elements are *richly interconnected*, both positively and negatively, so that when input comes into the system, *the system as a whole is activated* in a highly complex way. But the activated whole is unstable and begins to reorganize itself, tending towards some harmonious end state that is stable. This self-organizing process is holistic, too. There are no particular rules of repatterning followed. The system as a whole “settles” into a solution following thermodynamic equations which tend towards minimization of a certain quantity. (Such machines are accordingly called “Boltzmann machines.”) There is, then, a natural affinity between parallel distributed processing devices and the analytic of Dasein.

Another kind of holistic machine is the optical information processing system, which follows a “Fourier logic” (Yevick, 1975). Here the whole information is in the part (as when a small piece of a hologram stores the whole image). Such whole-in-the-part information is called by Bohm (1980) “enfolded” or “implicate” order. When whole-in-the-part information is used as a filter on suitably transformed input, information can be abstracted from input, recognized, and associated to memory. The basic operation of such optical devices is thus not a rearranging of digital elements, not syntactical, but a *filtering of a whole by a whole*.

The existential call for holistic principles of operation in the machine that “supports” existence thus turns us away from the computational theory of mind—the mainstream of cognitive science—to self-organizing systems, to optical systems, to perhaps yet to be conceived of holistic devices. Here existential phenomenology is of *heuristic value* to science; it closes off some lines of possibility and holds open others.

There is a deeper but less tangible benefit of the present endeavor that is worth mentioning. In their “heart of hearts” many believe that the scientific discipline, despite its brilliant advances, leaves something terribly important out of its account of human beings. That something has been presently construed as *Existenz*. The existential discipline on its part is equally incomplete in its account. It is an existential conceit that *all* science can be ignored because scientific praxis presupposes existence and is therefore not foundational. Let the existentialist try to conduct foundational ontological inquiry without a brain! Existence and the brain go ineluctably together, integral to the human condition. Accordingly, existential and neuroscientific disciplines should go together. Their present schism is historically conditioned and unnecessary. My aim has been to support their mutual accommodation.

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