
**Philosophical Conceptions of the Self:**

**Implications for Cognitive Science**

*Shaun Gallagher*

Philosophy and Cognitive Science

University of Central Florida

gallaghr@mail.ucf.edu

**Abstract:** Although philosophical approaches to the self are diverse, several of them are relevant to cognitive science. First, the notion of a 'minimal self', a self devoid of temporal extension, is clarified by distinguishing between a sense of agency and a sense of ownership for action. To the extent that these senses are subject to failure in pathologies like schizophrenia, a neuropsychological model of schizophrenia may help to clarify the nature of the minimal self and its neurological underpinnings. Second, there is good evidence to suggest that although certain aspects of the minimal self are primitive and embodied, other aspects may be accessed only in reflective consciousness. Employing a modified concept of the minimal self, it may be possible to construct a robotic form of non-conscious self-reference that depends on an interaction between the robotic body and its environment. In contrast to the minimal self, the narrative self involves continuity over time and is directly relevant to discussions of memory and personal identity. There is growing consensus among philosophers and cognitive scientists about the importance of narrative and its relation to episodic memory and left-hemisphere functions. There are, however, at least two different views of how the narrative self is structured. On one model it is nothing more than an abstract point. On a more extended view, proposed here, the self is a rich amalgam of narratives that allows for the equivocations, contradictions, and self-deceptions of personal life. Even in this case, however, neurocognitive models contribute to our understanding of how narrative identity is structured.

Ever since William James (1890) provided a catalogue of different senses of the self,
philosophers and psychologists have been hard at work refining and expanding the possible variations of this concept. Supplementing James' inventory of physical self, mental self, spiritual self, and the ego, Neisser (1988), for example, suggested important distinctions between ecological, interpersonal, extended, private, and conceptual aspects of self. More recently, reviewing a contentious collection of essays from various disciplines, Strawson (1999) found an overabundance of delineations between cognitive, embodied, fictional, and narrative selves, among others. It would be impossible to review all of these diverse notions of self in this short paper, so I have focused on several recently developed approaches that promise the best exchange between philosophy of mind and the other cognitive sciences. Because these approaches move in divergent theoretical directions they should help to convey the breadth of philosophical analysis on this topic. They can be divided into two groups that are focused, respectively, on two important aspects of self.

A first approach involves various attempts to account for a 'minimal' sense of self. If we strip away all of the unessential features of self, the intuition is that there is a basic, immediate, or primitive something that we are still willing to call a self. This approach leaves aside questions about the degree to which the self is extended beyond the short-term or 'specious' present to include past thoughts and actions. Although identity over time is a major issue in the philosophical definition of personal identity, the concept of the minimal self is limited to that which is accessible to immediate and present self-consciousness. Non-philosophers have found that certain aspects of the minimal self are relevant to current research in robotics. Furthermore, aspects of the minimal self that involve senses of ownership and agency in the context of both motor action and cognition can be clarified by neurocognitive models (developed to explain pathologies such as schizophrenia) that suggest the involvement of specific brain systems (including prefrontal cortex, SMA, and cerebellum).

A second approach involves conceiving of the self in terms of narrative, a concept imported into the cognitive-science context by Dennett (1991), but one which may have a more complex significance than indicated in Dennett's account. The narrative self is extended in time to include memories of the past and intentions toward the future. It is what Neisser refers to as the extended self, and what Dennett calls a 'nonminimal selfy' self. Neuropsychological accounts of episodic memory or loss of memory can help to circumscribe the neurological underpinnings of the narrative self.

**Self-reference and misidentification**

There are a number of ways to understand the notion of a minimal sense of self. In this section I approach the problem by discussing how we use the first-person pronoun in a self-referring way that never permits a mistake. This kind of self-reference has a feature that some philosophers call 'immunity to error through misidentification relative to the first-person pronoun' (Shoemaker, 1984). I will refer to it as the immunity principle. Once this principle is clarified we can ask whether it can ever fail. In the next section we will explore this possibility in relation to a neurocognitive model of schizophrenia that requires us to make a distinction between two aspects of the minimal sense of self: the sense of self-ownership and the sense of self-agency.

Wittgenstein (1958) distinguished between two uses of the first-person pronoun in self-
reference: 'as subject' and 'as object'. Use of the first-person pronoun as subject might best be discerned by understanding what a speaker could be wrong about, and the kinds of questions that one could sensibly ask her. For example, if someone says 'I think it is raining outside', she could be wrong about the rain. It may not be raining. But it seems that she could not be wrong about the 'I'. That is, she could not misidentify herself when she states that it is she who is thinking. So, according to Wittgenstein, the following question would be nonsensical: 'Are you sure that you are the one who thinks it is raining?' Such use of the first-person pronoun is immune to error through misidentification. In contrast, when we use the first-person pronoun 'as object' it is possible to misidentify ourselves. For example, in experimental situations a subject's arm may be deafferented (that is, the subject is deprived of normal proprioceptive feedback about the position of his limb and therefore cannot keep track of it without vision), and visual perception of arm movement manipulated through mirrors or videotape (Jeannerod, 1994; Deprati, et al., 1997). In such cases, the subject might be led to say, 'I am moving my arm to the left', when in fact the basis for his judgment is a videotape of someone else moving their arm (not the subject's arm) to the left. In that case, he makes a mistake about who is moving their arm to the left. To say 'I' in such a case involves an objective misidentification of oneself.

Shoemaker (1984) suggests that the immunity principle applies to the use of 'I' as subject because when we use the first-person pronoun as subject we are not actually attempting to identify ourselves. In other words, when I self-refer in this way I do not go through a cognitive process in which I try to match up first-person experience with some known criterion in order to judge the experience to be my own. My access to myself (my self) in first-person experience is immediate and non-observational (that is, it doesn't involve a perceptual or reflective act of consciousness). In this regard, the immediate self that is referred to here is the pre-reflective point of origin for action, experience, and thought. Are there any exceptions to the immunity principle? Is there any instance of someone using a first-person pronoun as subject, and being wrong in their reference? Following suggestions made by Feinberg (1978) and Frith (1992) about certain schizophrenic experiences (including auditory hallucination, thought insertion, and delusions of control in which subjects report that their body is under the control of other people or things), Campbell (in press) has proposed that such experiences might be counterexamples to the immunity principle. A schizophrenic patient who suffers thought insertion, for example, may claim that she is not the one who is thinking a particular thought, when in fact she is the one who is thinking the thought. Frith gives the following example: "Thoughts are put into my mind like "Kill God". It's just like my mind working, but it isn't. They come from this chap, Chris. They're his thoughts' (1992, p. 66). In such cases the schizophrenic patient misidentifies the source of the thought and seemingly violates the immunity principle.

Now whether or not Campbell is correct in his claim that this is a counterexample to the immunity principle (see Gallagher, 2000) the implications of his analysis are quite productive. His argument implies that a scientific explanation of schizophrenic phenomena such as thought insertion might also count as a scientific explanation of how the immunity principle works. Frith's neurocognitive model of the breakdown of self-monitoring in schizophrenia turns out to be a good candidate for explaining immunity to
error through misidentification. If we can identify which mechanisms fail at the
eurocognitive or neurological level when the schizophrenic patient suffers from thought
insertion, then we also have a good indication of the mechanisms responsible for (or at
least involved in) the normal immunity to error found in self-reference, and the
immediate sense of self. This insight moves us from the conceptual and often abstract
argumentation of philosophy to the more empirical inquiries of neuropsychology and
neurophysiology.

**A neurocognitive model of immediate self-awareness**

A brief consideration of motor action will help to clarify two closely related aspects of
minimal self-awareness: self-ownership (the sense that it is my body that is moving) and
self-agency (the sense that I am the initiator or source of the action). In the normal
phenomenology of voluntary or willed action, the sense of agency and the sense of
ownership coincide and are indistinguishable. When I reach for a cup, I know this to be
my action. This coincidence may be what leads us to think of ownership of action in
terms of agency: that the owner of an action is the person who is, in a particular way,
causally involved in the production of that action, and is thus the author of the action. In
the case of involuntary action, however, it is quite possible to distinguish between sense
of agency and sense of ownership. I may acknowledge ownership of a movement-- for
example, I have a sense that I am the one who is moving or is being moved-- and I can
self-ascribe it as my movement, but I may not have a sense of causing or controlling the
movement, that is, no sense of agency. The agent of the movement is the person who
pushed me from behind, or the physician who is manipulating my arm in a medical
examination. My claim of ownership (my self-ascription that I am the one who is
undergoing such experiences) can be consistent with my lack of a sense of agency. Phenomena such as delusions of control, auditory hallucinations, and thought insertion
appear to involve problems with the sense of agency rather than the sense of ownership
(see Stephens and Graham, 1994).

There is good evidence to suggest that the sense of ownership for motor action can be
explicated in terms of ecological self-awareness built into movement and perception
(Neisser, 1988; Gallagher and Marcel, 1999). In contrast, experimental research on
normal subjects suggests that the sense of agency for action is based on that which
precedes action and translates intention into action (Marcel, In press; Fournieret and
Jeannerod, 1998). In addition, research which correlates initial awareness of action with
recordings of the lateralised readiness potential and with transcranial magnetic
stimulation of the supplementary motor area, strongly indicates that one's initial
awareness of a spontaneous voluntary action is underlain by the anticipatory or pre-
movement motor commands relating to relevant effectors (Haggard and Eimer, 1999;
Haggard and Magno, 1999).

It turns out that some schizophrenic patients who suffer from thought insertion also make
mistakes about the agency of various bodily movements. To explain this, Frith (1992)
appeals to concepts of efference copy and comparator mechanisms originally used to
explain motor control (Sperry, 1950; Holst and Mittelstaedt, 1950). According to the
most recent version of this model, and consistent with the findings cited above, a
comparator mechanism operates as part of a non-conscious premotor or "forward model" that compares efference copy of motor commands with motor intentions and allows for rapid, automatic error corrections (Frith et al., in press; Georgieff and Jeannerod, 1998). This mechanism, consistent with the findings cited above, anticipates the sensory feedback from movement and underpins an online sense of self-agency that complements the ecological sense of self-ownership based on actual sensory feedback (Gallagher, 2000) (See Fig. 1). If the forward model fails, or efference copy is not properly generated, sensory feedback may still produce a sense of ownership ('I am moving') but the sense of agency will be compromised ('I am not causing the movement'), even if the actual movement matches the intended movement (Spence, et al., 1997).

Figure 1

There is experimental evidence to show that schizophrenic patients who suffer from thought insertion and delusions of control also have problems with precisely this forward, pre-action monitoring of movement, but not with motor control based on a comparison of intended movement and sensory-feedback (Frith and Done, 1988; Malenka, et al., 1982) - - a comparator function that is thought to involve the cerebellum (Frith, et al., in press). By contrast, problems with forward monitoring are consistent with studies of schizophrenia that show abnormal premovement brain potentials associated with elements of a neural network involving supplementary motor, premotor, and prefrontal cortices (Singh, et al, 1992). Problems with these mechanisms might result in the lack of a sense of agency which is characteristic of these kinds of schizophrenic experience.

Following a suggestion made by Feinberg (1978), Frith (1992) postulates a similar model for cognition--specifically, for thought and inner speech. Phenomena such as thought insertion, hearing voices, perceiving one's own acts as alien, etc., suggest that something has gone wrong with the self-monitoring mechanism. Frith's model assumes not only that thinking, insofar as it is intended and self-generated, is a kind of action, but that, as in the case of a motor action, thinking has to match up to the subject's intention for it to feel self-generated. This suggests that although such intentions are not always consciously accessible, comparator processes that match intentions to the generation of thought and to the stream of thought bestow, respectively, a sense of agency and a sense of ownership for thought in a fashion similar to motor action. If the mechanism that constitutes the forward aspect of this monitoring fails, thought occurs in the subject's own stream of consciousness but does not seem to the subject to be self-generated or to be under the subject's control--it appears to be an alien or inserted thought (Fig 2).

Figure 2
Whether this kind of model is fully adequate to the phenomenon of inserted thought, or not, I want to suggest that the approaches taken by Frith and Campbell promise a way to cash out in specific neurological terms the immediacy involved in the senses of self-ownership and self-agency, and in the immunity principle. Such aspects of the minimal self find a neurological explanation in the proper workings of these mechanisms and are threatened by their failure.

The minimal self: embodied or disembodied

Taking the immunity principle as a point of departure, there are two other directions that one could follow. The first explores the idea that there is an even more primitive and embodied sense of self than that involved in the use of the first-person pronoun. This approach pursues the implications of what developmental psychologists have recently discovered about neonate experience. The second involves a more abstract self-reflective access to first-person experience, and, among other things, leads to issues that concern AI applications in robotics.

First, are there any aspects of the minimal self that are more primitive than those identified in terms of the immunity principle. In speaking about self-reference we are already speaking of a self that is capable of linguistic communication—at the very least, the person is capable of using the first-person pronoun. If one considers language and conceptual capacity to develop in parallel, this may mean that the person’s immediate and pre-reflective access to the self already involves the mediation of a conceptual framework. Is it possible to speak of a non-conceptual access to the self—a more primitive self-consciousness that does not depend on the use of a first-person pronoun?

Bermúdez (1998) explores the detailed terrain opened up by this question. Following Gibson’s ecological psychology, part of what Bermúdez calls non-conceptual first-person content consists of the self-specifying information attained in perceptual experience. When I perceive objects or movement in the external environment, I also gain information about myself—information that is pre-linguistic and non-conceptual. This is what Neisser (1988) calls the ecological self. The fact that non-conceptual, ecological self-awareness is operative from the very beginning of life can be seen by the important role it plays in neonatal imitation. Neonates less than an hour old are capable of imitating the facial gestures of others in a way that rules out reflex or release mechanisms, and that involves a capacity to improve to match the presented gesture (Meltzoff and Moore, 1977, 1984). For this to be possible the infant must be able to (1) distinguish between self and non-self, (2) locate and use certain parts of its own body proprioceptively, without vision, and (3) recognize that the face it sees is of the same sort as its own face (the infant will not imitate non-human objects [Legerstee, 1991]). One possible interpretation is that these three capacities constitute a primitive self-consciousness, and that the human infant comes already equipped with a minimal self that is embodied, enactive, and ecologically attuned (Bermúdez, 1996; Gallagher, 1996; Rochat, 1995).

One can, however, move in a second direction by asking whether it is possible to capture and explicate the pre-reflective minimal self in a reflective, and conceptually informed
introspection. In this case, one may still talk about the most abstract aspect of what we experience to be ourselves, even if it is mediated through reflection. Galen Strawson's (1999, 1999b, 1997) recent essays on the self make it clear that he is seeking the most basic and stripped-down version of a self that can still be called self. He begins with a reflective description of his experience of the self. Once underway, this phenomenologically reflective approach naturally leads to a characterization of the self as a subject of experience. Thus, Strawson is led to define the self as a subject of experience that is a single (hiatus-free) mental thing. This is a momentary self without long-term continuity, and so, without a history, 'a bare locus of consciousness, void of personality' (1999, p. 492).

On this view, a human being consists of a series of such transient selves, each one lasting only as long as a unique period of experience lasts, coming into existence, going out of existence, without continuity. Despite the 'local' character of Strawson's approach, that is, an approach that focuses on his own experience, the self that he seeks to define is not restricted to the human case. It would be quite possible for the immediate self he describes to be instantiated in a non-human animal with the right cognitive equipment. At least one theorist has argued that it may even be possible to create the minimal self in a machine, or more precisely, in a robot (see Box 1), but this would entail dropping Strawson's idea that the self is a conscious subject of experience.

Box 1: Robotics and the Minimal Self

Tani (1998) explores the possibility of establishing an artificial version of Strawson's minimal self in a machine to use terms like 'subjective mind' and 'self-consciousness' in his objective account (1998, pp. 150, 173). Tani, however, in contrast to Strawson, makes it clear that the robotic self he is designing is the result of physical interaction between the robotic body and its environment. Specifically, its short-term existence is generated only in cases where the interaction fails to go smoothly. These problems are difficult to resolve in hybrid systems where top-down mechanisms are designed to follow the logic of dynamical systems, so that their interface takes place in a shared metric space. During unsteady or conflictive phases, an arbitration process takes place in that shared space, and the robot is required to take its own current state into account. Specifically it needs to take into account ("become aware of") the conflict in its own system, and its own degree of familiarity with the surrounding environment. This, in Tani's view, is the robotic equivalent of self-consciousness. A self comes into existence when the relation between top-down "mental" processes and bottom-up sensory-motor processes becomes incoherent, that is, on the occasion of a failure to cope with environmental demands. This self is not an entity that continues over the long-term, but, consistent with Strawson's view, a short-term phenomenon, and in this case one that emerges only on occasions that motivate self-reference.

Furthermore, on Strawson's view, this minimal self is not essentially embodied or enactive within an environment. The self-consciousness that captures this self is not ecologically embedded, but is one that operates on a conceptual level, already in
possession of the concept self. Strawson is nonetheless a materialist, and considers the self as 'mental thing' to be a physical thing which, in the human case, is likely to be cashed out in terms of brain processes. What is metaphysically the case, however, does not always show up in the phenomenological record. I can be conscious of myself as a minimal subject of experience which is a single mental thing, without being aware of the embodiment or brain functions that may (or may not) generate the self. This is quite consistent with self-reference that is immune from error through misidentification since it specifies an access to the self that does not depend on applying empirical (in this case physical) criteria of identity. Even if it is the case that the information that constitutes the minimal self is generated in ecologically embodied experience, and even if, in practice, a human being is capable of knowing that this is the case, one does not gain the self-consciousness that goes along with the minimal self by knowing this or being able to employ empirical criteria to show this.

The self extended and mediated by narrative

So far we have considered only a minimal self, a concept of self that seems quite at odds with our common sense conception of who we are. Surely we think and speak of ourselves as entities extended in time. Indeed, is it not undeniable that we have memories and that we make plans, and that there is continuity between our past and our future? And do we not, as individually identical selves, encompass that continuous experience? What is the nature of this sense of a continuous self? Is it carried by a succession of momentary minimal selves that are tied together by real connections? Or are momentary minimal selves simply abstractions from a more substantial continuity that is the more genuine self? The philosophical traditions are replete with a vast variety of answers to these questions.

One famous answer given by Hume (1739) suggests that the self consists of a bundle of momentary impressions that are strung together by the imagination. In effect, an extended self is simply a fiction, perhaps a useful one because it lends a practical sense of continuity to life, but a fiction nonetheless. The narrative theory of self is a contemporary version of this view. Dennett (1991, 1988) offers one rendition of this theory which he views as consistent with recent developments in our understanding of how the brain works. Since neurological processing is for the most part distributed in various parts of the brain, and there is no real, neurological center of experience, then there is no real simplicity of experience at one time nor real identity across time that we could label the self. At best, we might refer to a minimal biological self as something real. But the latter is nothing more than a principle of organization involving the distinction between self and non-self. Furthermore, it is found throughout living nature, and is not something sufficient for the purpose of a coherent continuity or identity over time found at the level of human experience. We humans, however, do have something more than this: we have language. And with language we begin to make our experience relatively coherent over extended time periods. We begin to use words to tell stories, and in these stories we create what we call our selves. We extend our biological boundaries to encompass a life of meaningful experience.
Two things are to be noted in Dennett's account. First, we cannot prevent ourselves from inventing our selves. We are hardwired to become language users, and once we are caught up in the web of language and begin spinning our own stories, we are not totally in control of the product. As Dennett puts it, 'for the most part we don't spin them [the stories]; they spin us' (1991, p. 418). Second, an important product of this spinning is the narrative self. The narrative self, however, is nothing substantially real. Rather, it is an empty abstraction. Specifically, Dennett defines a self as an abstract "center of narrative gravity," and likens it to the theoretical fiction of the center of gravity that one finds in any object. In the case of narrative gravity, however, an individual self consists of the abstract and movable point where the various stories (of fiction or biography) that the individual tells about himself, or are told about him, meet up (Fig. 4a).

Figure 4

The notion of a narrative self-constitution finds confirmation in psychology and neuroscience. In the former discipline, Neisser's concepts of the extended and the conceptual self, initially explicated in terms of memory, have been enhanced by considerations about the role that language and narrative play in developing our own self-concept (Neisser and Fivush, 1994). In the realm of neuroscience, Gazzaniga (1995, 1998) has suggested that a specific function, which he calls the 'interpreter', in the left hemisphere of the brain is responsible for generating narratives. He uncovered this interpreting function in his work with split-brain patients. In these cases the left hemisphere has no internal access to right-hemisphere experience due to the severing of the corpus callosum. Nonetheless, in properly designed experimental circumstances, the left hemisphere devises interpretations for meanings, actions, and emotions delivered or produced by the right hemisphere. Such interpretations show consistency with the experiential context belonging to the left hemisphere rather than the original right-hemisphere context. The left hemisphere, for example, may remain ignorant of the content or cause of an emotion generated in the right hemisphere, but the left-hemisphere experience of that emotional valence motivates an interpretation of the event in terms relevant to the content available to the left hemisphere. The interpreter weaves together autobiographical fact and inventive fiction to produce a personal narrative that enables the sense of a continuous self. Gazzaniga, however, contends that the self, in this regard, is not a fiction since the normal functioning of the interpreter tries to make sense of what actually happens to the person. At most, in the non-pathological case, it may be only 'a bit fictional' (Gazzaniga and Gallagher, 1998, p. 713). Perhaps we cannot help but enhance our personal narratives with elements that smooth over discontinuities and discrepancies in self-constitution.

A necessary condition for the non-fictional aspects of a narrative self is the proper working of episodic memory. Pribram (1999) suggests that this depends on a frontolimbic system that includes the anterior poles of the frontal and temporal lobes, and
elements of the limbic formation. Specifically, this system provides a proper sense of time. The importance of episodic memory and time-sense on the formation of the narrative self is indicated in the case of a young boy diagnosed with congenital damage to the right hemisphere and frontal cortex. He suffers from a profound episodic amnesia and because he lacks the ability to quantify the passage of time or to appreciate the meaning of temporal units, he is unable to formulate certain essential structures of narrative, namely, sequential structure and the demarcations of beginning and end (Pribram, 1999; Ahern, et al., 1998).

**Further extensions of the narrative self**

If, in the current context of contentious disagreements on a large range of issues, a general consensus among a divergent group of cognitive scientists concerning the constitution of the narrative self seems surprising, it is perhaps even more surprising that there is some consensus within philosophy itself on this point, even across the great divide between continental and analytic philosophers. What Dennett, Neisser, Gazzaniga and Pribram have to say about the narrative self echoes in some respects an earlier discussion in continental circles. Concerning the nature of narrative and the making of the narrative self, perhaps Paul Ricoeur is the best representative of this earlier discussion (1984, 1992). Ricoeur explores the nature of narrative and the constitution of the narrative self carefully and in depth, reaching conclusions that are not inconsistent with the view outlined in the cognitive-science discussion. In contrast to Dennett, however, Ricoeur conceives of the narrative self, not as an abstract point at the intersection of various narratives, but as something richer, more substantial and concrete. Importantly, Ricoeur insists, one's own self narrative is always entangled in the narratives of others.

We may extend Ricoeur's model beyond what he takes to be a unified life narrative and suggest that the self is the sum total of its narratives and includes within itself all of the equivocations, contradictions, struggles and hidden messages that find expression in personal life (Fig. 4b). In contrast to Dennett's center of narrative gravity, this extended self is decentered, distributed and multiplex. On a psychological level, this view allows for conflict, moral indecision and self-deception, in a way that would be difficult to work out in terms of an abstract point of intersection. Furthermore, with respect to neurological models, even more than Dennett's abstract center, this extended model is consistent with the concept of distributed processing and with what Gazzaniga describes as the mixing of fact and fiction by the left-hemisphere 'interpreter.' By extending the idea of a narrative self in this way, we come closer to a concept of the self that can account for the findings of the cognitive neurosciences, as well as our own experience of what it is to be a continuous self, discoverable in phenomenological reflection.

**Concluding Remarks**

In a recent book, Damasio (1999) has insightfully captured the difficulty involved in expressing the interrelations between the minimal ("core") self and the narrative ("autobiographical") self. The difficulty is due to complexities that are apparent on both the personal and the subpersonal, neurological levels. Episodic memory, necessary for the
construction of the narrative self, is subject to constant remodeling under the influence of factors that include innate and acquired dispositions as well as social and cultural environments. The registration of episodic memory as "my" memory of "myself" clearly depends on a minimal but consistently reiterated sense of self that I recognize, without error, as myself. In some respects, as Damasio insists, this depends on narrowly defined embodied capabilities and feelings. In other regards the core features of the self are constantly being reinterpreted by the narrative process. In the neurological terms used by Damasio this means that there are extremely complex demands made on the processes that link early sensory cortices which hold information on the minimal or core self, and convergence or dispositional zones that contribute to the generation of the narrative self. In this regard, he makes it clear that at present the neuroscientist, like the philosopher, can offer, at best, informed speculation on these processes.

In this review I have tried to show that philosophical ideas about the self can be aligned with and can inform ideas in current cognitive science. I also believe that philosophers can learn about the nature of the self from psychologists, neuroscientists, and other cognitive scientists. Thus, collaborative efforts between philosophers and scientists promise to open up more subtle and sophisticated avenues of research that will define more fully the concept of the self.

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References


Campbell, John (1999). Schizophrenia, the space of reasons and thinking as a motor process The Monist, 82, in press


awareness of voluntary movements Experimental Brain Research 126, 128-33


Strawson, G. (1999b) Self, body, and experience Proceedings of the Aristotelian Society (Supplement) 73, 307-332


