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I, ME, MINE: VARIATIONS ON THE THEME OF SELFNESS

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Scholars have often speculated about the nature of the self. In this article I contend that there is no such mythical beast. Instead, I argue that there are likely a number of different mental subsystems that contribute to self-relevant behavior and to selfness. These subsystems contain different structures, reflect the operation of different processes, and may reflect different biological substrates. Accordingly, I contend that research and thinking about the self needs to be very clear about which aspect of selfness lies at their core. I suggest that such specificity is necessary for an orderly accumulation of knowledge in research that explores the topic of the self.

The song lyrics to "I Me Mine," written by George Harrison and performed by The Beatles, were supposedly intended to echo the Bhagavad Gita. This ancient source highlights the power and ubiquitous presence of the self in everyday life, and emphasizes breaking out of the cage of my, me, and mine in search of enlightenment.

In one way, the lyrics are not unusual: References to the self in popular culture are everywhere. A similar ubiquitousness characterizes the self and its status in modern scientific psychology. I typed the word self into a PsychInfo search on October 19, 2011, and got a reply indicating 368,948 hits. Even accounting for the lack of adequate specificity in my search term, the magnitude of that number suggests that references to the self in the scientific literature are everywhere. Tesser, Martin, and Cornell (1996) highlighted this ubiquitousness, and the ever-increasing range of terms used to describe it, by offering the term *the self zoo.*

However, exactly what *is* this concept of "self" about which everyone is writing and that everyone is researching? Curiously, at least for now, there seems to be no authoritative definition. Moreover, it is often uncommon for scholars to precisely define their view of the self before describing their scholarship.

Some might claim that providing such a definition is unnecessary because everyone knows what the self is. However, the absence of such a definition can be a problem for researchers. When scholars differ in their view of selfness, the results

I thank the reviewers who were forced to endure a preliminary draft of this article. Although this article's content is solely my responsibility (for good or ill), the comments that were provided by the reviewers substantially contributed to this article.

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of one piece of scholarship exploring the self may not be at all applicable to another. Indeed, some scholars might point to the self zoo as one of the consequences of the failure to define the self when pursuing research into that topic.

However, it may also be the case that one contributing cause to researchers' inability to precisely define the self is that there is no such animal—or at least, there is no single entity that can be referred to as the self. Hence, a single definition of the self may not be possible. Self scholars might point to work by researchers such as McConnell (2011; also see Roberts & Donahue, 1994) and say "what's new—everyone knows that people have multiple selves." My point here is a bit different. I propose that not only are there selves that differ in content, as the multiple selves idea suggests, I also propose that there are multiple systems that reflect the concept of selfness. I suggest that these can operate from the most primitive levels to the most sophisticated. Moreover, I suggest that these different dimensions of selfness may sometimes be functionally distinct from each other. Accordingly, these systems may not rely on the same structures, principles, and mechanisms to operate, even when they seem to exhibit superficial similarities.

To help understand this idea, I use the memory system as an analogy. Psychologists have determined that human memory likely reflects the action of multiple memory systems (e.g., perceptual, episodic, semantic, procedural) each of which possesses some characteristics that differ from the others. I similarly suggest that the self actually reflects the action of a number of different underlying psychological systems. Thus, the take-home message to this article will be a simple one: Despite the fact that everyone knows what the self is, there are probably many different ways to construe the meaning of that term. Accordingly, it is probably a mistake to discuss the self, for there probably is no such singular animal. Instead, one needs to be mindful of the different systems that might reflect selfness, and of the fact that each individual system will probably be associated with different structures, different processes, and different neural substrates.

In the remainder of this article I will try to elaborate on this theme. In doing so, I will reference a scheme that Constantine Sedikides and I (Sedikides & Skowronski, 1997) described that linked the concept of selfness to human evolution. We discussed the idea that there are at least three aspects to the self: the subjective self, the objectified self, and symbolic self.

THE SELF AS AUTOMATON

Let me consider the first of these self aspects, the subjective self. Echoing Allport (1943), this term refers to an organism's capacity to crudely differentiate between the organism (the self) and the physical or social environment.

I confess to wishing that we departed from Allport's terminology and used an alternative label, such as the self-as-automaton. The reason that I prefer this latter label is that it implicitly conveys the idea that high-level cognition need not be a component of this aspect of self, although, as Carver and Scheier (1981) noted, high level cognition need not be excluded from the cybernetic activities encompassed in this view. Instead, at minimum, the automaton-like organism senses its internal state, senses its environment, and reacts based on the sensed internal state and the sensed opportunities presented by the environment. These reactions can be based on readouts of feedback loops that are responsive to changes in the organism's

internal state. Moreover, the activities here can be largely pre-programmed and do not need to rely on sophisticated mental representations of the self or on mental processes that refer to such representations. Instead, the system can function using what Carver and Scheier (1981) called TOTE (test-operate-test-exit) rules that, once started, can operate on their own without external intervention.

For example, consider the tremendously complex problems posed to designers who want to send self-regulating robots into space. Desirable elements in a TOTE system for such robots would be: (1) the presence of internal standards that reflected ideal internal states (e.g., an optimum internal temperature range); (2) the ability to monitor the state of the self, (e.g., internal temperature sensors); (3) the ability to monitor the state of the external environment (e.g., external temperatures and light conditions); and (4) decision rules that could be used to maintain the optimum internal state (e.g., rules such as "if the internal temperature is below optimum range, engage wheel motors to move vehicle toward sunlight"). One could use these elements to construct a simple TOTE system: When the internal temperature range is below optimum levels, the robot's propulsion system can be engaged to move the robot toward warming sunlight (Test and Operate). This can continue until optimum internal conditions have been reached (e.g., keep Operating and Testing until the test is passed, leading to an Exit from the operation).

Clearly, the operation of TOTE systems requires that an entity has the ability to discriminate between the self (the organism) and the nonself (the rest of the world). In the case of my hypothetical robot, this is reflected in the capacity to know the difference between the within-robot temperature and the extra-robot temperature. When framed in terms of living organisms, these self-recognition abilities make survival possible in that they can allow the organism to perceive the environment, respond to and operate on it, and change it through self-initiated movements in which various components of the organism coordinate the action of each other. Such activities are essential to an organism's capacity to self-regulate, and indeed, can be crucial to survival.

For example, correct functioning of self vs. non-self detectors lies at the heart of the human immune system (for an overview, see Parham, 2005). When the immune system is functioning well, it accurately detects non-self tissues and responds to kill them. Indeed, part of the biological arms race with pathogens involves their ability to cloak themselves to avoid detection as non-self by the immune system so that they can wreak their havoc. The flu shot or vaccine that you recently received is designed to help the body recognize foreign invaders that might otherwise manage to fool the detection system in this way. However, problems occur because the immune system sometimes detects and responds when we don't want it to. For example, some autoimmune disorders occur when the detection system erroneously responds to self-tissue as if it were a non-self foreign invader. Similarly, organ transplants sometimes fail because of the body's effectiveness in detecting and attacking foreign tissue, despite the fact that such tissue might be desperately needed and the attacks unwanted.

Essential to the case that I am making is that in the case of the immune system, action ultimately reflects the operation of self- versus non-self-recognition systems. Moreover, in this case, self-recognition in immune functioning is only weakly regulated by the central nervous system (e.g., via the interaction of the CNS with the endocrine system). Implicit to this idea is that immune systems work in the absence of a psychological self: Most of the heavy lifting with regard to the

mechanisms of self- versus non-self-recognition is directly accomplished at the cellular level. Thus, one important lesson from this immune system example for psychologists is that the capacity for an organism to act in self-relevant ways need not involve a sophisticated mental representation of the self, nor must it involve sophisticated mentalizing about the self.

This is important because psychologists who study the self often treat the self as if it were a complicated cognitive beast (e.g., Ditzfeld & Showers, 2011). While such a view might sometimes be appropriate, I am suggesting that such a view might sometimes be wrong—behavior may sometimes reflect the action of simple TOTE rules that don't require sophisticated cognition. Indeed, others have expressed similar views (Metzinger, 2003), claiming that: "No such things as selves exist in the world," and that given an examination of the data, this conclusion appears to be "a rather trivial one" (p. 626; also see Blackmore, 2002; Metzinger, 2009).

This reality of the self argument is an issue that I will take up again later in this article. For now, I would simply argue that taking a view of self-as-automaton might sometimes be appropriate when understanding existing research that explores the self. For example, consider the widespread tendency for organisms to engage in self-protection (extending to self-preservation; e.g., Sedikides, Skowronski, & Gaertner, 2004). One area of psychology that relies on this self-protective tendency reflects how one feels about one's autobiographical memories on their retrieval. Given the claim of some authors that "bad is stronger than good" (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), one might expect that emotions would be particularly strong when recalling negative life events. This expectation is wrong. Instead, while exceptions do occur, across a range of people, events, and emotions, data suggest that the intensity of positive emotions prompted by recall of positive personal life events typically exceeds the intensity of negative emotions prompted by recall of negative personal life events. This phenomenon has been labeled the Fading Affect Bias (FAB; for recent work, see Ritchie, Skowronski, Hartnett, Wells, & Walker, 2009; Walker & Skowronski, 2009).

The processes that produce the FAB need not involve sophisticated cognitive structures that reflect thinking about the self. Instead, such effects might reflect the action of simple TOTE rules that help organisms to maintain adaptive functionality in their environments. Such a possibility is raised when researchers in this area use Taylor's (1991) mobilization/minimization view to explain the emergence of FAB effects. This theory allows for the possibility that the notion the FAB may simply reflect the tendency of biological systems to maximize initial responses to negativity (e.g., to aid flight) but to minimize those responses across time (e.g., to allow for exploration).

THE SELF AS A MENTAL CONSTRUCT—THE OBJECTIFIED SELF

However, the effects of the self on thought, emotion, and behavior can go beyond simple cybernetic mechanisms and implicate cognitive structures that contain self-relevant information and cognitive processes that reference those structures. Echoing related conceptions, Constantine Sedikides and I (Sedikides & Skowronski, 1997) discussed such ideas as a part of the concept of the objectified self. For example, objective self-awareness can be defined as an organism's cognitive capacity to "become the object of its own attention" (Gallup, 1992, p. 117), to be aware of its

"own state of mind" (Cheney & Seyfarth, 1992, p. 240), and "to know it knows, to remember it remembers" (Lewis, 1992, p. 124). This reflective capacity can occur at a substantially more explicit or conscious level than subjective self-awareness. Importantly, objective self-awareness allows for thinking that involves ideas about the self and the subsequent behaviors that follow from such thinking. For example, the presence of an objectified self-system allows the use of knowledge about the self to model the thoughts and behaviors of other organisms, and it allows this self-knowledge to be used as a standard against which to judge other organisms. The presence of this system also allows for mental time travel, so that organisms are not limited to consideration of the here-and-now but can think about themselves in the context of the past and can project themselves into the future (see Skowronski, Walker, & Betz, 2004; Skowronski, Walker, & Edlund, 2006).

Performing these tasks requires that individuals either possess or can generate a cognitive representation of the self, even if this representation is merely a transient mental construction. Such knowledge reflects a structural aspect of selfness: The memory system must contain knowledge about the self that is either represented in long-term memory or that can be used when needed to construct in working memory a temporary representation of the self.

This kind of selfness can manifest itself in numerous ways. For example, one of the psychological milestones that occurs in human development seems to be the capacity for an infant to recognize itself. One standard test of this capability is the mark test (also called the rouge test or the mirror test). In this test, a colored mark is secretly placed on an infant's forehead, and then the infant is placed in front of a mirror (see Amsterdam, 1972; Lewis & Brooks-Gunn, 1979; Nielsen & Dissanayake, 2004). It is assumed that the infant has developed the capacity for self-recognition if the infant reaches for the mark. That is, this behavior seemingly requires knowledge that the image in the mirror is not external, but is the self (see Asendorpf, Warkentin, & Baudonniere, 1996).

One intriguing aspect of this ability is that one might be able to explore its evolutionary origins: This test has been used to explore whether nonhuman animals possess self-recognition capability (see Suddendorf & Whiten, 2001). For example, Gallup (1970, 1977) applied paint to a chimpanzee's brow-ridge or ear when the chimpanzees were under anesthesia. The chimpanzees (and also orangutans; see Suarez & Gallup, 1981) seemingly recognized themselves in a mirror and removed the spots of paint. Extending such work, Savage-Rumbaugh (1986) reported that chimpanzees recognized themselves at television monitors and would even position their bodies properly to enhance observational clarity of their facial expressions, bodily postures, and methods of eating (for a cautious view of this literature, see Schilhab, 2004). It has also been suggested that some nonprimates can respond in ways that seem to reflect self-recognition. Animals implicated include an elephant (Plotnik, De Waal, & Reiss, 2006; but see Povinelli, 1989), magpies (Prior, Schwarz, & Gunturkun, 2008) and dolphins (Reiss & Marino, 2001).

The fact that self-recognition as reflected in the mirror test seemingly requires objectified self awareness allows an important point to be made about selfness: Similar self-relevant goals can be pursued in different ways at different levels of complexity. For example, recognition of self vs. non-self is clearly an important capacity, but it takes place on multiple levels, from cellular to psychological. Because of this multiplicity, I suspect that it will be unlikely that one will be able to pin the self down when one goes looking for a limited set of mechanisms and structures

that define the self, as when researchers go looking for the neural substrates of self-thought (e.g., Johnson, Baxter, Wilder, Pipe, Heiserman, & Prigatano, 2002). Instead, given the different ways in which the term self can be construed, I suspect that there are host of mechanisms and processes that are engaged in the pursuit of self-relevant activities, and that these mechanisms and processes might sometimes be fairly specific to the exact self-relevant task that one examines. This becomes quite apparent when one examines various characteristics of the self. Examples of these characteristics are that one perceives that one knows the self (e.g., via knowledge); one can think about and imagine the self in the past and in the future (i.e., engages in mental time travel); the self is perceived to be related to affective responses (e.g., the FAB); and one perceives the self to be a doer and a chooser (e.g., as in choosing to recall events to regulate current affective states). These diverse activities are likely related to different informational systems and their accompanying underlying neural substrates.

Indeed, one implication of the objectified self view is that that people are choicemakers who attempt to manipulate and control their own emotions. To this end, results of some studies show that people can intentionally recall events to manipulate their current affective state (Singer & Salovey, 1993). Given the powerful mood-altering properties of autobiographical memories (e.g., Bryant & Veroff, 2007; Gebauer, Broemer, Haddock, & von Hecker, 2008; Kensinger & LeClerc, 2009; Kross, Davidson, Weber, & Ochsner, 2009; Philippe, Lecours, & Beaulieu-Pelletier, 2009), it would have been surprising if reminiscence was not a loyal servant of emotion regulation.

These ideas suggest that the FAB may not simply reflect cybernetic mechanisms, but may also reflect the choices of people actively engaging in processes of self-regulation. For example, Walker, Skowronski, Gibbons, Vogl, and Thompson (2003) found that dysphoric individuals (who typically evince distortions in the self) evinced a smaller FAB than did non-dysphoric individuals. Walker et al. (2003) ascribed their results to the altered self-thinking that accompanies dysphoria. However, they did not examine alternative explanations for their finding. For example, one such explanation is that this data pattern was a simple consequence of the persistent negative affect characteristic of dysphoria. Hence, the extent to which this study unambiguously supports a link between the FAB and the self is limited.

Ritchie, Skowronski, Wood, Walker, Vogl, and Gibbons (2006) examined the self-FAB relation more directly. They showed that the FAB was smaller for events perceived to be important to the self than for events perceived to be unimportant to the self. This pattern was largely due to the fact that all self-important events, regardless of valence, tended to maintain their affect. The relevance of the self to the FAB was also suggested by the fact that the magnitude of the FAB was small when autobiographical events were psychologically open (i.e., relevant to the current self; Beike & Wirth-Beaumont, 2005) and when they were perceived to be caused by the individual. Data collected by Ritchie, Skowronski, and Sedikides (2012) extended these findings by replicating the finding that the usual FAB was reduced for events that were high in self-relevance. Moreover, results of meditational analyses were consistent with the possibility that the FAB is mediated by the perceived extent to which events were linked to the self.

One implication of the FAB example is that a given finding or outcome can be related to multiple self-relevant systems, each of which has different properties and

characteristics. Hence, understanding self-relevant phenomena, such as the FAB, should, of necessity, make attempts to understand the operation of these various subsystems.

THE SELF AS COMMUNICATOR: THE SYMBOLIC SELF

A third self-relevant subsystem that may affect self-relevant phenomena such as the FAB reflects the human capacity to use language. The incorporation of verbal/semantic information into selfness was an idea that Constantine Sedikides and I (Sedikides & Skowronski, 1997) considered when we thought about the emergence of the self from an evolutionary perspective. We suggested that human behavior and thought reflected a third level of selfness (a level beyond the self-as-automaton and the objectified self), that we termed *the symbolic self*. In proposing this term we attempted to offer a distinction between the psychological selves of humans and those that may be possessed by nonhumans. That is, we offered the notion of the symbolic self in an attempt to acknowledge the special importance of the processes of language-based communication to the human self.

This symbolic self construct thus incorporated both abstract and language-based representations of one's own attributes and suggested how these representations could be used to enhance effective functioning in affective, motivational, and behavioral domains. For example, we suggested that the symbolic self refers to the seemingly unique capacity of the adult human organism to: (1) use language in the process of generating self-representations; (2) communicate this symbolic self to other organisms and negotiate the content of the symbolic self with other organisms in an effort to establish personal and social relationships; (3) set social or achievement goals that are prompted by the symbolic self far into the future and to perform goal-guided behaviors; (4) evaluate the outcome of these behaviors (i.e., judge whether the behaviors have fulfilled the relevant goals); (5) link the behavioral outcome to feelings toward the symbolic self (e.g., high self-esteem or pride when goals are met, and shame or embarrassment when goals are not met) and (6) defend the symbolic self against threatening events and ideas by employing several strategies, such as avoidance of negative feedback, derogation of negative evaluators, rejection of negative feedback, and even self-deception.

Data illustrative of the action of the symbolic self come from those researchers exploring narrative approaches to the study of individual lives (for an overview, see McAdams, 2008). A key concept in this work is the idea of a *narrative identity*: An individual's integrated, internalized, and evolving idea of the self as reflected in the stories that are constructed about the self. Research now suggests that self-narratives are conveyed frequently (e.g., Rimé, Mesquita, Philippot, & Boca, 1991), begin to be constructed in adolescence and young adulthood (e.g., Blagov & Singer, 2004; Habermas & Bluck, 2000; McLean, 2005; Thorne, 2000) and continue to develop and change across the life span.

One of the ideas that underlies research in the self-narrative area is that people think about major events and major changes in their lives and fit these into major self-themes. For example, Bauer and McAdams (2004) see four growth themes emerging from narratives told about life transitions. The first two growth themes (integrative and intrinsic) incorporate two broad dimensions of personality development: social-cognitive maturity and social-emotional well-being. The second

two growth themes (agentic growth and communal growth) incorporate ideas about differences between transition satisfaction specifically and well-being globally. McAdams (1985, 1993; McAdams, Hoffman, Mansfield, & Day, 1996) has outlined four qualities of agency that appear in people's life stories: (1) impacting one's environment; (2) achieving valued outcomes; (3) self-mastery; and (4) status and prestige. Similarly, consistencies have been identified in those stories that include themes of communal growth. These include: (1) friendship and love; (2) dialogue and sharing; (3) connections with groups, society, humankind, or a god or higher power; and (4) helping and caring for others.

While one can speculate on the personal, interpersonal, and cultural origins of these themes, more relevant is the simple fact that all of these themes reflect the notion that people seek meaning from their life events and that one typical outcome of such meaning-making efforts is the perception that encountering events often prompted personal growth. For purposes of this article, even more important is that such effects would seem to be difficult to explain in the absence of language: These effects seem to be facilitated by the fact that people can construct narrative stories about themselves and can convey them to others.

Another important extension of these ideas links back to the FAB and relates to ways in people might cognitively handle negative life events. Such events often involve conflicts and negative life changes, such as the loss of loved ones and the loss of personal resources. Indeed, losses, conflicts, and negative life changes often threaten an individual's sense of personal continuity, and such, are thought to mobilize the individual's cognitive resources. One way in which this can be done is to explain negative events in such ways that discount the events (e.g., Freeman, 1993), for example, by suggesting that the event has no relevance to one's life.

However, one can also work to integrate negative events into the self in positive ways. For example, one consequence of reflecting on negative events can be to inform the self about its potential to change and progress beyond such events. Indeed, Pals (2006) suggests that there is consistency in how people approach such a process. In the first step an individual explores the event in depth, thinking long and hard about the experience. Such thoughts are presumed to include how the event came to be, how it felt, the directions in which the event might lead, and the implications that the event might have for the self. The second step involves a resolution of the event that implies a positive self. Such themes can involve seeing personal growth as a consequence of negative events, and seeing eventual good as coming out of past bad (It was a good thing that Jane dumped me; otherwise I would not have found my soulmate, Lara). Such activity can obviously buffer the self from the consequences of the negative events. Indeed, research now suggests that the capacity to make sense of losses occurs frequently in response to such negative events and can lead to personal resilience in the face of those events (Bauer & Bonanno, 2001; McAdams, 1993; Pasupathi, Weeks, & Rice, 2006).

VIEWING "SELFNESS" IN TERMS OF MULTIPLE SYSTEMS AND MODULES: EVIDENCE FROM DISSOCIATIONS

The example of the FAB that I have used in this article suggests that the self may be not be a singular, tightly knit, coherent mental system (as seems to be implied by Mischel & Morf, 2003). Instead, many activities that are performed in the ser-

vice of the self may reflect the activity of a set of loosely linked, interacting mental modules.

The three self systems notion that I have described in this article is not the only approach that can be used to illustrate this point. Another example of such a conception was outlined in Associated Systems Theory (Carlston, 1992, 1994). This model is based on the assumption that there are different kinds of mental systems that process information. Carlston proposed that there were four of these: visual, verbal, affective, and action. The characteristic representation for the visual system is a visual image of a person's appearance, including physical expressions and mannerisms as well as static features such as height and attractiveness. The verbal system involves words and propositions, including personality trait concepts. The affective system involves the experience of emotion. The action system involves the representation of behaviors.

Carlston's conception probably did not include a sufficient number of mental modules. For example, a reasonable case has been for the distinction between different forms of memory (e.g., perceptual memory, episodic memory, and semantic memory; see Casale & Ashby, 2008; Henson & Gagnepain, 2010). A similarly reasonable case has been made for separate systems devoted to approach/positive evaluation and avoidance/negative evaluation (see Norris, Gollan, Berntson, & Cacioppo, 2010). Nonetheless, the modular approach to cognition has led to some interesting insights into cognitive activities that underlie self-relevant thought, emotion, and behavior.

DISSOCIATIONS BETWEEN SEMANTIC MEMORIES AND EPISODIC MEMORIES

For example, from a unitary self view one might expect that various forms of self-relevant information might typically not be used in a fashion that is independent of the other forms of available self-relevant information. For example, when one thinks about oneself in terms of social categories (e.g., professor), one might simultaneously be expected to access information from the visual, semantic, episodic, and affective systems. Similarly, self-evaluations may access information from the verbal system and the affective systems. Indeed, from a unitary self view, one would expect that such combinations are probably indicative of a well-functioning self.

However, one implication of an Associated Systems Theory view of the self is that the modules have the potential to become functionally dissociated from each other. For example, work from Stan Klein's research team (e.g., Klein, Loftus, Trafton, & Fuhrman, 1992) has documented the fact that accessing semantic facts about others does not require access to specific episodic facts. Corroborating evidence comes from clinical settings. For example, Stuss and Guzman (1988) report a case in which a patient with severe episodic amnesia relearned many autobiographical events via communication with others. The patient reported that the relearned memories seemed to lack a feel of real happenings in his life: They felt more like stories and facts told to him by others. Thus, while the patient knew his memories were about him, he did not remember them as temporally and spatially acquired in the correct context (that is, when they transpired). In other words, the memories

were experienced as semantic memories, not episodic ones: the real episodes were not available.

Similar findings indicative of dissociations between semantic and episodic memory have been produced in experimental settings. While early efforts tried to fit such data into some form of associative network model (e.g., Carlston & Skowronski, 1986), results that have emerged elsewhere make it more likely that the result reflects the notion that self-relevant information is stored in different self-modules. For example, in some cases of retrograde amnesia following brain damage, access to episodic memory seems to be eliminated, while access to some semantic memories (e.g., memory for lifetime period knowledge and general events) remains intact (for reviews, see Conway & Fthenaki, 2000; Klein & Lax, 2010). Moreover, even patients suffering total anterograde and retrograde episodic amnesia can reliably and accurately describe their personal characteristics (for reviews, see Klein, 2001, 2004). The notion of separate semantic and episodic memory modules is reinforced by the results of neuroimaging studies suggesting that different parts of the brain are active when accessing semantic memories and episodic memories Levine et al., 2004; Prince, Tsukiura, & Cabeza, 2007; Smith & Lah, 2011).

The fact that semantic memories are often involved in these dissociations points to the relevance of the notion of the symbolic self that was described earlier in this article. The relative importance of this linguistic aspect of self is also seemingly emphasized by the reactions of those individuals who have lost the ability to remember specific episodic information about themselves. Such studies suggest that the symbolic self may have particular importance to the maintenance of the self-concept. For example, Illman, Rathbone, Kemp, and Moulin (2011) reported the case of E.B., who reported epilepsy-induced loss of autobiographical memory. Despite the autobiographical memory impairment, E.B. had no difficulty in producing a range of self-thoughts (e.g., I am a husband). Thus, while E.B. produced fewer episodic memories at times of self-formation, this impairment did not seem to impact the maintenance of the self-concept. Such results suggest that the self may be maintained in the face of episodic memory deficits. That is, the self-concept appears to be maintained, in part, because of the ability of semantic memory (e.g., the symbolic self) to support the construction and maintenance of the current self.

However, it would be a mistake to conclude that the symbolic self is solely tied to semantic memory. Again, one theme of this article is that many different structures and mechanisms may be important to the self, and that certainly seems to be the case for memory. For example, Klein (e.g., Klein, Loftus, & Kihlstrom, 2002) notes that, by itself, semantic memory may not necessarily promote a sense of personal identity across time. This is illustrated by the case of the patient D.B. (Klein, Cosmides, Costabile, & Mei, 2002). Following an episode of cardiac arrest that led to presumed brain damage, D.B. retained knowledge of his own traits. However, D.B. lost the ability to engage in mental time travel in that he was unaware that he had a past (e.g. he lost the ability to access episodic memories) and was unable to imagine what his experiences might be like in the future. Because of such deficits, D.B. reported an absence of the perception that he existed in the past. Thus, while not essential to maintaining some sense of self, the ability to engage in mental time travel and the ability to generate episodic memories may be important to that element of the self that promotes the sense of personal identity across time (see also Atance & O'Neill, 2005).

This conclusion returns me to the main point of the article: research into the self may involve the actions of multiple interacting subsystems. Thus, when one explores the self, one needs to be very specific about the self-systems that underpin the research. In this case, the empirical relation between the self and memory may very much depend on the kind of memory that is assessed. Hence, if I am exploring how ideas about the self are related to memory, I need to be very specific about the exact kind of memory in which I am interested.

DISSOCIATIONS BETWEEN SELF-PERSPECTIVES AND PSYCHOLOGICAL PERCEPTIONS

One other important element of self-related thought is the ability to generate the perception that thoughts, feelings, and memories are owned by the self. When a person sees their own hand move, they usually have the perception that the hand is theirs. When they recall an event from their life, they have the perception that the recalled event is theirs.

The capacity to feel ownership of a perception or memory may be a logical outgrowth of the objectified self's notion that the self can be represented as an abstract construct in working memory. Such self-representations may be necessary for the concept of the self to become attached to mental constructs. To better understand this idea, consider the possibility that others can also be represented as mental constructs, and events can be imagined from their perspective. Hence, to know that memories are episodic (i.e., it happened to me) one needs to incorporate perspective (self or other) into a memory. This may only happen when the sense of self is both appropriately activated and becomes attached to some perceptual or memorial experience.

Samsonovich and Nadel (2005) explain this idea using the following example. Assume that one is looking at a tree, and one's brain has a representation of this experience: "I see a tree." In fact, without the self awareness component, the actual content of the experienced state could just be "there is a tree." To indicate that this is a self-memory, the I must be perceived as current (as opposed to past or future) and must be used to label the raw experience. Thus, Samsonovich and Nadel argue that it is only when one links the current self to sensory percepts that one experiences a mental construction (which they call a mental state) that can become an episodic memory.

This attachment of self to percept probably most often occurs automatically, without conscious reflection. In fact, to most people this probably seems to be so natural that it seems to be an intrinsic part of episodic memory. However, it need not be so. Sheen, Kemp, and Rubin (2001, 2006) found that people can become confused about memory ownership. For example, one twin will sometimes remember a negative event as happening to the other twin when, in fact, it was an event that occurred in the life of the first. Similarly, in a clinical context, Klein and Nichols (in press) report the case of R.B., who lost episodic memory for a short period before an accident, but retained episodic memory for old events. R.B. describes this experience as follows:

> What I realized was that I did not 'own' any memories that came before my injury. I knew things that came before my injury. In fact, it seemed that my memory was just fine for things that happened going back years in the past (The period close to the injury was more disrupted). I could answer any question about where I lived at different times in my life, who my friends were, where I went to school, activities I enjoyed, etc. But none of it was 'me.' It was the same sort of knowledge I might have about how my parents met or the history of the Civil War or something like that.

This ability to correctly attach the self-label to perceptions is also disrupted in other disorders. For example, such disruptions are often observed in schizophrenic patients, who sometimes experience states that can be characterized by the perception that actions, thoughts, or emotions are produced by some external agent. These can include auditory hallucinations or commands from an external agent (see Frith, 1992; Herold, Tenyi, Lenard, & Trixler, 2002). The disturbing and debilitating nature of such disturbances again implicate the importance of mental mechanisms that facilitate proper attribution of source to the flow of information that is generated by perceptual systems.

The importance of being able to attach a sense of ownership to perceptions is similarly illustrated by phenomena such as hemispheric neglect (for reviews of various forms of neglect, see Heilman, Watson, & Valenstein, 2003). One example was reported by Daprati, Sirigu, Pradat-Diehl, Franck, and Jeannerod (2000). They examined an individual who sustained a right thalamic-temporo-parietal lesion, which produced severe hemispatial neglect. The patient's ability to recognize his own movements was analyzed using a screen that allowed the viewing of either the patient's or the examiner's moving hand. Accurate patient judgments could be produced only by comparing an internal representation of the executed movement to the visual image on the screen. Instead, when moving the hand that was opposite to the side of the brain on which the lesion occurred, the patient denied being the owner of the hand displayed on the screen, whether it was his or not.

An important element of this disorder is that patient responses often do not indicate lack of knowledge: instead, the patient fails to explicitly perceive half the world, but at the same time exhibits implicit knowledge about this denied half (for reviews see Prigatano & Schacter, 1991). Hence, this disorder suggests the possibility that at least two sets of mechanisms may be involved in self-relevant responding: one that involves explicit access to cognitions about the self that are facilitated by the linking of self-tags to perceptions, and a second set of mechanisms that respond to the perceptions themselves, independently of the explicit recognition that the events are experienced by the self.

This conclusion returns me to the main point of the article, which I again repeat: Research into the self may involve the actions of multiple interacting sub systems. When one explores the self, one needs to be very specific about the self-systems that underpin the research. In this particular case, understanding how one attaches the self to mental perceptions requires understanding of: (1) how the mental system generates the sense of self; (2) how the mental system determines perceptions and memories; and (3) how a third mental subsystem works to attach the sense of self to perceptions. This breakdown might be further complicated by the

fact that the various forms of perceptions (memories, emotions, proprioceptions) may themselves have different properties. Thus, in this research domain, understanding the self may necessitate an understanding of those properties.

IMPLICATIONS OF MULTIPLE SYSTEMS FOR THE STABILITY AND VARIABILITY OF "THE SELF"

The study of the self presents many paradoxes. Some of these might be seen as less puzzling in light of the multiple systems view that I advocate. For example, as Mischel and Morf (2003) note, the self is at the same time both stable and variable. Indeed, many would argue that there is an unexpected degree of variability in the self. Such unexpected variability seems to be at odds with the idea that the self can be conceived of as a single cognitive structure that is stored in long term memory and that reflects one's ideas, thoughts, and perceptions of the self.

In contrast to this single-structure view of the self, it seems reasonable to suggest that there are vast arrays of different kinds of self-relevant information that are stored in the various memory systems that can reflect self thought, action, and emotion. These knowledge sources can be called upon and modified by on-line processes to form working selves as required by different situations.

This is not a view that is idiosyncratic to me. In recent years a number of scholars have explored the view that the self reflects temporary constructions that emerge in working memory as a function of the constraints placed on memory and the processing system as a function of both the individual and the situation. Indeed, given my knowledge of the current literature, I am reluctant to dismiss the claims of those who claim that there is no single construction that can be labeled the self (Metzinger, 2003, 2009)—at least in the sense that there is a long-term, unchanging, and constant metal structure that can be called the self and that has a corresponding underlying mental substrate. Instead, I find it to be plausible that the various mental systems that contain self-relevant knowledge can be used as needed to continually generate temporary views of the self.

Importantly, consider how these temporary self-concepts might change as circumstances prompt access to different subsystems that contain self-knowledge. For example, the self-concept might change substantially when one is prompted to visualize one's appearance, as opposed to recalling one's publications, as opposed to reflecting on one's traits, as opposed to recalling one's behaviors with colleagues, as opposed to reflecting on how one feels as one is reading this passage. Indeed, in this regard, Nowak, Vallacher, Tesser, and Borkowski (2000) argued that the self could be formally modeled as a dynamical system (a thought echoed by Samsonovich & Nadel, 2005). They noted that the properties that characterize a dynamical system as a whole reflect the interactions among the system's elements. Thus, in principle, very different self-concepts, each characterized by unique values of global variables (e.g., self-esteem), can be built from the same set of self-relevant thoughts, memories, and feelings. Although not implemented as a formal dynamical systems model, similar ideas are reflected in the writing of other self scholars (e.g., Conway, 2005; Conway & Pleydell-Pearce, 2000; McConnell, 2011).

If the sense of self reflects serial temporary constructions, how can the self seem to be so stable? Tesser (2002) argues that there can be numerous sources of stability. One source can come from biological temperaments. A second can come from consistency in the environments that people inhabit. In a third case, stability can also come from consistency in the kinds of information that people might tend to habitually access when engaged in self-thought (e.g., semantic information vs. episodic information). A final source of stability can come from the nature of the information that is contained in a given memory system when engaging in self-thought. For example, autobiographical memory research often exhibits a reminiscence bump—enhanced recall of events during times that are especially important to the self during a particular period of time (e.g., Janssen, Rubin, & St. Jacques, 2011). Such enhanced recall might be expected to support the stability of the self-concept, especially when current circumstances are similar to those that were present during that particular time (e.g., one remains married to the same spouse; one has retained the same kind of job).

At the same time, of course, life changes. Jobs change, cultures change, roles change, and people physically change. From a dynamical systems point of view, these changes can all change the constraints that are put on the dynamical system that generates the temporary selves. Variations in these constraints can alter the outcome of a dynamical cognitive system, producing a new self that differs from the selves that may have emerged in the face of prior constraints.

These reflections suggest that an understanding of the stability vs. variability problem with regard to the self should be enhanced by a better understanding of the subsystems that contribute to self thought. That is, how, how much, when, and why the current self conception of self reflects the action of a given mental subsystem is likely to depend on the characteristics of each subsystem, the content of each subsystem, and what happens when a given subsystem is forced to interface with a different subsystem. It is rare for current scholarship on the self to reflect such views. Instead, many scholars seem to be content with the idea that their research explores the self, and give little consideration to exactly what the self is (at least in their research) and to how various subsystems might affect their specific results.

A REPRISE: THE THEME OF MY, ME, MINE, AND ITS IMPLICATIONS

Such considerations return me to the take-home message of this article: Despite the fact that everyone knows what the self is, there are probably many different ways to construe the meaning of that term. Accordingly, it is probably a mistake to discuss the self, for there probably is no such singular animal. Instead, one needs to be mindful of the fact that there are likely to be many mental subsystems that each contain self-relevant knowledge. Each individual subsystem will probably be associated with different structures, different processes, and different neural substrates. In my view, to advance the area, researchers should make more of an effort to be specific about the subsystems that are involved in their empirical exploration of the self.

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