

## THE SELF AND AUTOBIOGRAPHICAL MEMORY: CORRESPONDENCE AND COHERENCE

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A modified version of Conway and Pleydell-Pearce's Self Memory System (SMS) account of autobiographical memory and the self is introduced. Modifications include discussion of a fundamental tension between *adaptive correspondence* (experience-near sensory-perceptual records of goal activity) and *self-coherence* (a more abstracted and conceptually-rich long-term store of conceptual and remembered knowledge). This tension is examined in relation to each SMS component—the episodic memory system, long-term self, and the working self. The long-term self, a new aspect of the model, consists of the interaction of the autobiographical knowledge base and the conceptual self. The working self, depending on goal activity status, mediates between episodic memory and the long-term self. Applications of the SMS to personality and clinical psychology are provided through analysis of self-defining memories and adult attachment categories, as well as case histories of traumatic memory. The SMS's role in imagination is examined through a brief discussion of Wordsworth's poetry.

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In the Borges (1998) story, "Funes, his memory," Ireneo Funes, after a fall from a horse, finds that he has lost all capacity to forget any experience past or present. Confined to his bed, he literally remembers everything:

The truth was, Funes remembered not only every leaf of every tree in every patch of forest, but every time he had perceived or imagined the leaf. He resolved to reduce every one of his past days to seventy thousand recollections, which he would then define by numbers. Two considerations dissuaded him; the realization that the task was interminable, and the realization that it was pointless. He saw by the time he died he would still have not finished classifying all the memories of his childhood. (Borges, 1998, p. 136)

Overwhelmed and aging prematurely, Funes dies at the age of 21 of pulmonary congestion, drowned by the flood of his own recollections.

The fictional character of Funes captures a fundamental theme that guides this paper's exploration of the relationship of autobiographical memory to the self. Specifically, we assert that autobiographical memory emerges from the intersection of two competing demands - the need to encode an *experience-near* record of ongoing goal activity and the simultaneous need to maintain a coherent and stable record of the self's interaction with the world that extends beyond the present moment. The first of these demands we call *adaptive correspondence* and the second, *self-coherence*. The flexibility of the self-memory system to answer each of these demands in an appropriate and calibrated manner defines the healthy functioning of memory and self. Funes' hypertrophied capacity to record all aspects of ongoing reality (adaptive correspondence) ultimately led to the destruction of any filtered or delineated sense of self (self-coherence).

In the sections that follow we consider how different components of the Self Memory System (SMS; Conway & Pleydell-Pearce, 2000) mediate the tension between these two competing knowledge demands within the individual. To demonstrate applications of the SMS model to research in personality, clinical and social psychology, we look at a specific type of autobiographical memory the self-defining memory (J.A. Singer, 2004b; J.A. Singer & Blagov, 2004a, J.A. Singer & Blagov, 2004b; J.A. Singer & Salovey, 1993) and examine its relationship to adult attachment categories (Main & Goldwyn, 1998). We also look at the relationship of adaptive correspondence and self-coherence in traumatic memories. Finally, in the last section we draw on the work of the great poet of memory, William Wordsworth (1770-1850), to illustrate how this same tension between adaptive correspondence and self-coherence engenders the creative products of imagination.

## ELABORATION OF THE SELF MEMORY SYSTEM

Conway and Pleydell-Pearce (2000) introduced the SMS as a model of the relationship of autobiographical memory to the self. The SMS model postulated that autobiographical memories were the transitory mental constructions of a complex goal-driven set of control processes collectively referred to as the *working self*. One of the main proposed operations of the working self was the generation of mental models ( Craik, 1943; Johnson-Laird, 1983) that supported coherent realization of goals. In this scheme autobiographical memories were merely one class, albeit a highly distinctive class, of mental models generated from an underlying knowledge base. Autobiographical memories are distinct for three main reasons; they (1) contain episodic memories; (2) contain self knowledge; and (3) are the result of goal processing.

In this opening section we elaborate an account of episodic memories and goals to consider adaptive correspondence and self-coherence. We then present a modified view of the Self Memory System that depicts an *episodic memory system* interacting with the *working self* and the *long-term self* (see Figure 1). We have introduced the Long-term Self to encompass two aspects of non-immediate knowledge of the self—the *autobiographical knowledge base* and the *conceptual self* (See Figure 2). Later sections describe how the working self generates a dynamic model of the *psychological present* by categorizing, evaluating, and prioritizing goal-relevant knowledge and experience.

A key feature of the original SMS was that the working self was organized by a complex goal hierarchy that motivates and modulates cognition, affect, and behavior. However, the nature of goals and their relation to memory in the SMS was not developed in detail. Before turning to the specific structures within our modified SMS, we offer some more general remarks about the relationship of goals to memory.

## GOALS

In our current model of the SMS's working self, goals are viewed as processes. These goal processes contain a standard or ideal, some mechanism for assessing the discrepancy between the standard and current state of the world, and plans for reducing or increasing the discrepancy (see Carver & Scheier, 1998 for an extended discussion of goals). Thus, the whole goal-subgoal hierarchy of the working self is itself a complex process in which different sub-processes are either actively running and motivating cognition, affect, and behavior, or are above some threshold of activation and set to enter the current processing sequence when cued by control processes. We view control processes as largely non-con-

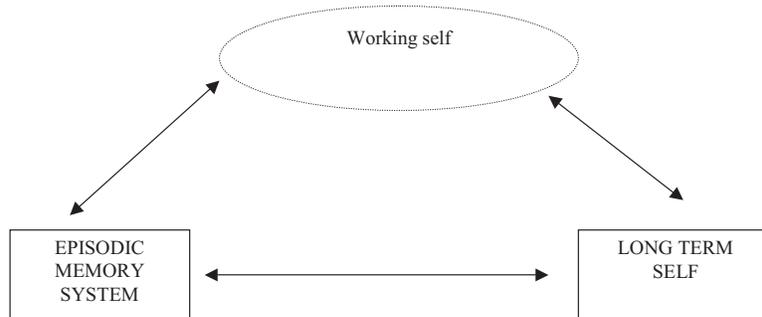


FIGURE 1. The Self-Memory System.

scious processes that assemble sequences of cognitions, affects and behaviors into mental models dedicated to the pursuit of goal-attainment (see Norman & Shallice, 1980 and Shallice, 1988). By this view, goals drive cognition. Furthermore, assessment of progress on goal attainment is experienced as emotion (see Oatley, 1992). Cognition and emotion are therefore linked by goals.

It is through this nexus of cognition, emotion, and goals that autobiographical memories are initially assembled (see the section ahead on the working self) and later constructed in acts of remembering. We suggest that one critical function of memory is to keep track of progress in goal attainment. In the short-term it is important to have very specific and detailed episodic memories of recent activities if behavior is to be structured, aim-oriented, and non-repetitive. Brain injured patients with anterograde amnesia who cannot form new episodic memories often repeat actions.

To take an extreme example, the patient studied by Wilson, Baddeley, and Kapur (1995), probably one of the most amnesic patients ever studied (the exact opposite of the fictional Funes), had very dense anterograde and retrograde amnesia, and kept a series of diaries in which every few minutes he repetitively wrote that each moment was like "waking from the dead." Keeping an accurate record of recent activities associated with goal processing is then a prerequisite of coherent activity. Conway (2001) argues that this is achieved in the short-term, i.e.

any twenty-four hour period, by the formation of episodic memories (these are considered in detail in the next section). In the longer term episodic memories become integrated with more abstract autobiographical memory knowledge structures such as general events and lifetime periods.

The period of consolidation or integration may be quite extended in time. Linton (1986), for example, provides some evidence that it may extend over a two-year period. It is even possible that the integration of episodic memories with memory knowledge structures is not fully achieved until the goals to which they relate have themselves been achieved or abandoned. In our terms this could equate to the transition from one lifetime period to another. One suggestion here is that the representation of a rememberer's current lifetime period in memory is not fully or finally integrated with other autobiographical knowledge until a transition is made in the goal structure of the working self. More generally, we believe that goal-transitions are critical events in memory formation and that they psychologically or cognitively mark event boundaries (cf. Zacks, Tversky, & Iyer, 2001). Thus, when one part of the working self goal structure is dysfacilitated and the ensemble of interlocked networks that supported that goal processing disassemble, a new set of goals are instantiated. This marks the psychological boundary of the end of one event and start of another.

The critical point here is that disruptions or status changes in ongoing goal activity are experienced as challenges to existing self-coherence. At such moments, control processes in the working self shift from inhibition of autobiographical memories (which might distract attention from current goal activity), to instantiation of a retrieval mode that prompts a search through the long-term self. The attentional focus of the working self increasingly becomes engaged with processing remembered reality in parallel with the present moment. If the threat to goal attainment persists, this shift from adaptive correspondence to the demand for self-coherence will magnify, and knowledge based in the long-term self is likely to dominate attention. Having laid out this general framework of the relationship of goal activity to memory in the working self, let us turn to a more specific elaboration of each of the components of the SMS.

### EPISODIC MEMORY SYSTEM

One of the fundamental conceptual issues in research into human memory is whether (episodic) memories are best thought of in terms of 'coherence' or 'correspondence.' If memories are conceived of as primarily serving coherence functions, e.g. having an integrated 'life story' (Bluck & Habermas, 2001), then issues relating to memory accuracy are second-

ary. In contrast, if memories are viewed as representations that correspond to reality, then issues of accuracy become paramount and questions about coherence are secondary, if considered at all.

According to the SMS model, memories represent information about progress in goal attainment and therefore have to reflect reality to at least some extent. On the other hand, the working self operates to make knowledge and memories that confirm and support current self-conceptions highly available (see McAdams, 2001, for a review) and, as we shall see, may also operate to distort and/or inhibit memories that undermine the current self. Thus, from the perspective of the SMS model coherence and correspondence are equally important, but each for different reasons. In the short-term episodic memories must keep an accurate record of goal-relevant activities, the primary purpose of which is to minimize dysfunctional repetitions of action sequences. For example, if we could not recall that we had just locked the door to the house, we would endlessly return to lock it and never leave the driveway. Adaptive correspondence serves the specific function of allowing the working self to keep track of where it is in currently executing goal space. In the long-term, however, the goal systems of the working self move on to other goals and goal sequences - goal transitions - and the comparatively few episodic memories that are subsequently retained become linked to more enduring long-term knowledge in which their function becomes one of coherence. That is, as Markus and Nurius (1986) originally suggested, self-coherence binds the current working self to remembered reality and supports the generation of different images or versions of the self-in-the-past and the self-in-the-future. When the connection between episodic memories and the self becomes disrupted, as occurs following several different types of brain damage (see Conway & Fethenaki, 2000, for a review) and in certain forms of psychopathological illness, then coherence breaks down and ungrounded delusional versions of the self, divorced from reality, emerge.

The episodic memory system contains, then, experience-near event specific sensory-perceptual-cognitive-affective details that invoke the visual imagery and auto-noetic experience of mentally "reliving" a past event (Wheeler, Stuss, & Tulving, 1997). These memories are of comparatively short time-slices of experience (seconds, minutes, hours) and are formed at event boundaries when a change in goal-processing occurs (cf. Zacks et al., 2001). During the course of a day many episodic records will be formed by the working self and many of these will remain available to recall for short periods of time. Possibly many are lost during a sleep cycle with only some, because of their goal-relevance, being retained for longer periods of time during which they are slowly integrated with autobiographical knowledge.

By far, the majority of episodic memories are lost fairly rapidly, and these have been rather aptly described by Wordsworth in his autobiographical poem *The Prelude* (1805/1984) as memory for “the perishable hours of life” (XV11, 439-496). They are, however, only ‘perishable’ because they have served their function of retaining, albeit briefly, knowledge about transient goal-related activities. As depicted in Figure 1, the episodic memory system can provide input to the working self and so fulfill its adaptive correspondence function of keeping track of plan execution in the course of ongoing goal processing. At the same time memories may become integrated with knowledge and ground conceptual autobiographical memory knowledge structures in remembered reality.

Finally, we note that from a brain perspective it has become clear that episodic memories may be stored in networks situated towards the posterior of the brain in the medial and posterior temporal lobes and in the occipital lobes (see Conway, Pleydell-Pearce & Whitecross, 2001, for a review). Conway (2004) argues this may be a phylogenetically older memory system consisting of the medial temporal lobe memory system (Moscovitch, 1992, 1995) and occipital networks. The suggestion is that this is primarily a cue-driven memory system with relatively little in the way of conceptual organization. Cues that map onto memories activate them, i.e. memories are content-addressable. When the mapping is tight, major activation results; for weaker mappings the activation is less strong and more diffuse. This temporal-occipital memory system is controlled by a frontal-temporal system that can channel patterns of activation by elaborating the cues used to probe the older system; it can also inhibit patterns of activation from conscious awareness, and it can preferentially raise activation levels of sets of knowledge structures so that they become highly accessible. The phylogenetically later-developing frontal-temporal system contains the working self and what we now term the *long-term self*.

### LONG-TERM SELF

In the original specification of the SMS the more permanent aspects of the self that interacted with the autobiographical knowledge base to provide self-relevant information were not fully specified (Conway & Pleydell-Pearce, 2000). Here we draw on social-cognitive models of personality (Cantor & Kihlstrom, 1987, 1989; Cervone & Shoda, 1999; Kihlstrom & Hastie, 1997) to propose an integrated *Long-term Self* that contains the knowledge required by the working self to organize and instantiate active goal processes. As depicted in Figure 2 the long-term self consists of the *Autobiographical Knowledge Base*, and the *Conceptual Self*. Each of these is now considered in turn.

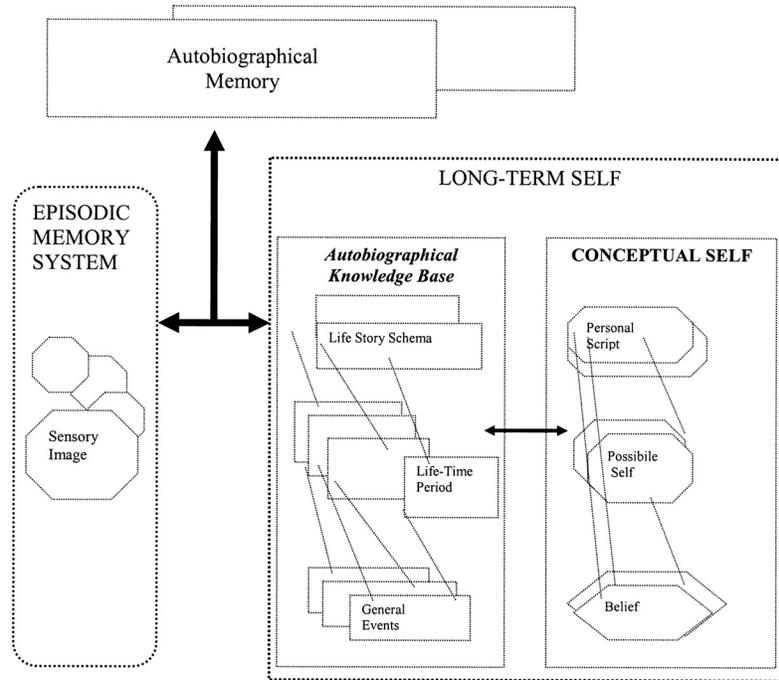


FIGURE 2. Generation of autobiographical memories.

### THE AUTOBIOGRAPHICAL KNOWLEDGE BASE

The autobiographical base consists of the lifetime period and general event knowledge structures that combine with the episodic memory system to generate specific autobiographical memories (see Figure 2). As indicated in the original SMS model, "lifetime periods" are larger units that reflect particular overarching goals and activities, for example, early years of marriage, graduate school, or a period of financial hardship. General events are categories of events linked across relatively brief time periods (a week, a day, a few hours) or organized by a shared theme, e.g., first-time experiences, academic meetings, and so forth. These types of organizing personal conceptual knowledge come into being in response to changes in goal processing. For example, as one changes job, house, or relationship, one's stable present gradually transforms into lifetime period knowledge. The emotional nature of periods

of transition may reflect the re-organization of the working self goal hierarchy and the formation of lifetime period structures in long-term memory (see Pillemer, 1998, for some related findings). Smaller units of conceptual knowledge, such as general events, may similarly arise but in response to more local rather than global goals.

We now propose to add a third level to this autobiographical knowledge base, the Life Story Schema, which consists of even more global personal history information than lifetime periods (Bluck & Habermas, 2000, 2001). The life-story schema consists of individuals' understanding of how the normative life story is constructed within our culture. This normative structure draws on social cognitive conventions with regard to temporal order, dominant themes, causal attributions, and evaluative stances toward experiences. It takes an individual's life as a whole and creates more general structures (e.g., my life as a woman in 21st century England or my career as a professor at an American university). The life story schema contributes to the individual's development of a more elaborated life story, which McAdams (1985, 2001) has argued is a key aspect of identity. The life story includes generalizations about "life chapters" and themes, as well as connections to cultural myths and narrative structures (e.g., recovery stories, J.A. Singer, 1997; "redemption themes," McAdams, in press, and generational identity themes, see Conway & Holmes, 2004).

When the working self initiates a retrieval model that accesses the autobiographical knowledge base of the long-term self, generative retrieval usually begins at the general event level (Haque & Conway, 2001). When these events intersect with lifetime periods and the life story schema, a temporal and goal sensitive framework can guide search through specific episodic events stored within the episodic memory system. The pattern of activation that synthesizes the structures of the autobiographical knowledge base with specific episodic images from the episodic memory system yields the specific autobiographical memories that reach awareness. In a Social Intelligence model of the self, Cantor and Kihlstorm (1985, 1987, 1989) would refer to these emergent autobiographical memories as *declarative episodic knowledge*. Neisser (1988) has also referred to this location of the self in specific temporal episodes as *the extended self*.

## THE CONCEPTUAL SELF

Interacting with the autobiographical knowledge base and contributing to the organization of its hierarchical units and thematic grouping of lifetime periods and general events is the Conceptual Self (see Figure 2). The Conceptual Self (see also Neisser, 1988) corresponds to Declarative-Se-

semantic knowledge in Cantor and Kihlstrom's model, and to "traits" in Klein and Loftus (1993), both of which are separate from episodic memories. Interestingly in cases of amnesia following brain damage, knowledge from the conceptual self is often preserved while access to associated memories is lost (e.g. Klein, Loftus, & Kihlstrom, 1996; and see Conway & Fthenaki, 2000 for a review). Even more interestingly, some evidence indicates that the Conceptual Self cannot change once the ability to form new episodic memories is lost (cf. O'Connor, Cermak, & Seidman, 1995). The Conceptual Self is then depicted as a separate system in Figure 2 and consists of non-temporally specified conceptual self-structures, such as personal scripts (Demorest, 1995; Thorne, 1995; J.A. Singer & Salovey, 1993; Tomkins, 1979), possible selves (Markus & Nurius, 1986), self-with-other units (Ogilvie & Rose, 1995), conceptual aspects of internal working models (Bowlby, 1969/1982, 1973, 1980), relational schemas (Baldwin, 1992), self-guides (Strauman, 1990; Strauman & Higgins, 1987), attitudes, values and beliefs. All of these units are abstracted knowledge structures that exist independently of specific temporally defined incidents, but are connected to autobiographical knowledge and the episodic memory system to activate specific instances that exemplify, contextualize, and ground their underlying themes or concepts. The units of the conceptual self are socially-constructed schemas and categories that help to define the self, other people, and typical interactions with others and the surrounding world. These schemas and categories are drawn largely from the influences of familial and peer socialization, schooling, and religion, as well as the stories, fairy-tales, myths, and media influences that are constitutive of an individual's particular culture (Bruner, 1990; Pasupathi, 2001; Shweder & Bourne, 1984). As Figure 2 indicates, the reciprocal arrow between the autobiographical knowledge base and the conceptual self signifies that each informs and constrains the other.

The conceptual self consists, then, of abstracted knowledge about the self contextualized in terms of a person's life by autobiographical knowledge and ultimately grounded in episodic memories of specific experiences. Thus, an individual who held a view of himself as 'practical' instead of 'intellectual' might have a lifetime period representation of his time at university as being largely negative. General event and specific episodic memories might be preferentially available to confirm this belief (see Beike & Landoll, 2000). In general, conceptualizations of the self and of the existential problems faced by the self at different points in the life span are intimately connected to autobiographical knowledge and episodic memories (Conway & Holmes, 2004; Csikzentmihalkyi & Beattie, 1979). Moreover, transitions and (goal) changes in the conceptual self may have profound effects upon knowledge access and the capacity to recapture former patterns of activation in

the autobiographical knowledge base and the working self (see Pillemer, 1998, for a review).

To take a literary example, Proust, in the volume *'The Fugitive'* of his novel *Remembrance of Things Past*, (1925/1981) describes a moment when Marcel discovers that Albertine is alive, but he cannot recapture the emotions he once felt for her. The self, associated with her, is no longer in the foreground, or "active":

I should have been incapable of resuscitating Albertine because I was incapable of resuscitating myself, of resuscitating the self of those days. Life, in accordance with its habit, which is, by incessant infinitesimal labours, to change the face of the world, had not said to me on the morrow of Albertine's death: 'Become another person,' but, by changes too imperceptible for me to be conscious even that I was changing, had altered almost everything in me, with the result that my mind was already accustomed to its new master-my new self-when it became aware that it had changed; it was to this new master that it was attached. (Proust, 1925/1981, p.657)

And in an earlier passage when he discovers that Albertine has abandoned him

...and thus, at every moment, there was one more of those innumerable and humble 'selves' that compose our personality which was still unaware of Albertine's departure and must be informed of it... I was obliged...to announce to all these beings, to all these 'selves' who did not yet know of it, the calamity that had just occurred ... There were some of these 'selves' which I had not encountered for a long time past. For instance (I had not remembered that it was the day on which the barber called) the 'self' that I was when I was having my hair cut. I had forgotten this 'self,' and his arrival made me burst into tears, as, at a funeral, does the appearance of an old retired servant who has not forgotten the deceased. (p.437)

These vivid passages accurately capture the relation of current and past conceptual selves to periods of transition and change. We also note in the first passage Proust's insight that change is difficult and occurs imperceptibly (outside conscious awareness), a point to which we return when discussing traumatic memories below.

## THE WORKING SELF

In the original SMS model the working self was viewed largely as consisting of a complex hierarchy of goals that drove behavior and from

which mental models ( Craik, 1943; Johnson-Laird, 1983) could be derived, for example, to guide memory construction. In addition it was proposed that there were other working self control or executive processes that modulated goal pursuit and that also acted to coordinate cognition so that mental representations did not enter processing sequences inappropriately. In these respects the concept of the working self was closely related to other proposals concerning control processing (e.g., Norman & Shallice, 1980; Baddeley, 1986, 2001). However, following the ideas of contemporary self-regulation theorists (Austin & Vancouver, 1996; Carver & Scheier, 1982, 1998, 1999; Vallacher & Nowak, 1997; Vallacher & Wegner, 1987), the working self was principally viewed as an agent for goal processing.

Although we continue to see the working self as engaged in goal regulatory processes, we also see it as more than simply a comparator. The working self organizes current experience or what shall we refer to here as the *psychological present*. We conceive of this as a period stretching back to some recent point in goal history that forms an event boundary (Zaks, et al., 2001) and forward to some prospective target point in goal processing (a future possible event boundary), with 'now' located somewhere perhaps close to the center of the period. One possibility is that episodic memories are summary records of the psychological present and are formed as the working-self goal configuration, which defines a particular instance of the psychological present, changes in some specific way.

Representation of the psychological present can be conceived of in terms of three general principles: *categorization*, *evaluation*, and *prioritization* (J.A. Singer, 1995). These principles of organization date back at least to Aristotelian classifications (Gardiner, Metcalfe, & Beebe-Center, 1937) and Kant (1790, cited in Gardiner, Metcalfe, & Beebe-Center, 1937) who saw them as three different processes by which the mind divides the world. He argued that we apply feelings or preferences to the world—what he called “judgment.” We also divide up the world into categories that vary in abstraction—what he called “pure reason,” and we also perceive sequences of events or causal relations—what he called “practical reason.” These divisions can be translated into the primary activities of the working self, which are to categorize and organize the psychological present in terms of extant goals; to evaluate and signal preferences about this (e.g., positive-negative, good-bad) and in response to establish priorities and order goal processing sequences. The identification, evaluation, and prioritization of the psychological present in terms of goals by the working self allocates the distribution of attentional resources. It is perhaps this attentional distribution that determines in large

part which specific event features will be retained in an episodic memory's summary record of an epoch of the psychological present.

Recent neuroscience research seems to point to exactly this kind of processing activity by different affective and cognitive structures within the brain. Davidson, Pizzagalli, Nitschke, & Kalin (2003) have argued that cognitive-affective systems in the prefrontal cortex, anterior cingulate cortex, hippocampus, and amygdala are involved in activity concerned with the processing of approach and avoidance goals. The prefrontal cortex may play a vital role in the capacity to anticipate affective outcomes, and based on this anticipation, hold off more immediate goal pursuits in the interest of more important goals. The anterior cingulate cortex may mediate among conflicting goals, and in conjunction with the prefrontal networks, set priorities for where attention and goal-related action should be directed. More toward the mid-brain, the hippocampus may be involved in the linkage of affect to specific contexts that engender positive or negative affective responses. Pathological affective states, such as depression or mania, might be connected to ineffective functioning of the hippocampus with regard to context. For example, Davidson et al. (2003) reported studies that link lingering depression, despite no clear contextual clues warranting this response, to a reduction in the size of hippocampus. Finally, the amygdala (LeDoux, 1996) may play a particular role in evaluating threatening stimuli and generating defensive responses, as well as in the consolidation of emotional experiences in memory.

What integrates all of these brain networks is their effort to coordinate goal processing in the individual. The prefrontal cortex (the likely location of working self networks, see Conway, et al., 2002), in communicating to the rest of the brain about anticipated affect, determines that certain appetitive goals should take precedence over others. The anterior cingulate cortex, by monitoring conflicts in goal states, feeds back information to the prefrontal cortex about where priority among goals might be placed. The hippocampus sets situational and temporal limits on emotional investment in particular goals, while the amygdala relies on prior experience to guide the overall system toward or away from particular goal concerns. In all of these instances, stimuli received by the brain are constantly categorized, evaluated and ordered on the basis of goals. The interlocking of these systems (Damasio, 1989) then results in further coordinated allocation of biological, cognitive, affective, and behavioral resources in creating, modulating, and motivating a complex mental model of the psychological present that will determine the formation of episodic memories.

The working self, then, in generating a goal-oriented mental model of the psychological present, implicitly creates constraints placed on a re-

cord of a period (what one might call a psychological 'moment'). The psychological moment is defined by goal instantiation at the start and close of the moment and by some goal-driven distribution of attentional resources in between these two points. Thus, as proposed in the original SMS model, the working self mediates the formation of memories. However, this is a complex process that, by our earlier principle of adaptive correspondence, will be strongly influenced by the pattern of goal processing occurring in a psychological moment, which in turn derives from the working self processes of goal categorization, evaluation, and prioritization operating during the psychological present.

Having considered conditions that might lead to the formation of autobiographical memories, we now address the conditions under which significant autobiographical memories might be retrieved and the kind of role these memories play in the balance between adaptive correspondence and self-coherence. In each of the next sections, we address particular kinds of autobiographical memories that can provide critical input to the working self and that draw to different degrees on the episodic memory system, the autobiographical knowledge base, and the conceptual self.

### SELF-DEFINING MEMORIES

A self-defining memory (SDM) is a specific type of autobiographical memory that has the following attributes: affective intensity, vividness, high levels of rehearsal, linkage to similar memories, and connection to an enduring concern or unresolved conflict (J.A. Singer & Moffitt, 1991-1992; J.A. Singer & Salovey, 1993). Self-defining memories can be distinguished from other types of vivid memories. For example, flashbulb memories, as originally defined by Brown and Kulik (1977) are a particularly vivid and affective form of personal event memory (Pillemer, 1998), often about important public events. Conway (1995) has identified four interrelated variables that converge to produce these memories—surprise, consequentiality, importance, and emotion. Having these qualities does not necessarily indicate, however, that the memory is central to enduring goals or conflicts within the personality.

Though one of the authors can remember exactly where he was when he learned of the September 11th attack on the World Trade Center, he cannot say that this memory relates directly to the central themes or conflicts that preoccupy his sense of identity. It was surprising, consequential, important, and affective, but not self-defining. Thus, while some personal event memories may share the qualities of vividness and affective intensity ascribed to self-defining memories, and in some cases, may

be repetitively thought about for periods of one's life due to a proliferation of external cues (e.g., the media's flood of images of destruction related to the World Trade Center attack), the two distinguishing criteria for self-defining memories that differentiate them from other important and affective personal event memories are: (1) their linkage to other memories within the individual that share similar narrative themes and (2) their relevance to the individual's enduring concerns or unresolved conflicts.

Both of these features—linkage of similar memories and relevance to concerns and conflicts—have been supported through research on individuals' motivations and goal pursuits. For example, Thorne, Cutting, and Skaw (1998) looked at young adults' important relationship memories generated in two interviews over a 6-month period of time. Participants had freedom to describe similar or different relationship episodes in the second interview. Thorne et al. scored the memories for social motives for the memories that varied from Time 1 to Time 2, as well as the points of emphasis in the "twice-told" memories. For both unique memories and repeated memories, the authors found "moderate thematic consistency" (p. 258), indicating that these memories, even when varying in content, reflected similar motivational themes and narrative structures.

In an earlier study, Demorest and Alexander (1992) had raters code individuals' significant personal memories for overarching interpersonal scripts. A month later, these same individuals generated a set of fictional scenarios. Raters coded the themes of these scenarios and found striking overlap in terms of thematic continuity between the original memories and the imaginary stories. These results, along with Thorne et al. (1998), suggest that individuals link remembered and imagined experiences through personally significant themes. These themes originate, according to the SMS model, from the goals of the working self, but later can also serve to influence its ongoing goal processing.

As further evidence of the relationship of self-defining memories to individuals' enduring conflicts and concerns, Singer and colleagues (Moffitt & J.A. Singer, 1994; J.A. Singer, 1990) found the affective quality of self-defining memories to be a function of the relevance of the memories to the attainment of a person's most desired goals. This finding holds not only for memories relevant to the attainment of approach goals, but also for memories about active efforts to avoid the consequences of undesired outcomes (Moffitt & J.A. Singer, 1994). J.A. Singer, King, Green, & Barr (2002) additionally reported that the more personal growth students attributed to memories that grew out of community service experiences, the more likely these students were to place an overall emphasis on "generative" goal pursuits in their lives (see de St. Aubin & McAdams, 1995).

Similarly, in examining the relationship of turning point and other significant personal memories to overall themes of the personality, McAdams (1982; McAdams, Hoffman, Mansfield, & Day, 1996) has consistently found that power-oriented memories are linked to individuals' agentic motives, while intimacy-oriented memories reflect communal motives in individuals. Jardine (1999) found that her sample of women counselors who experienced life transitions during their clinical training associated themes from their self-defining memories with their set of "possible selves" (Markus & Nurius, 1986). In a series of clinical case studies involving both individual and couples psychotherapy, Singer has demonstrated that self-defining memories are linked to critical relationship themes that are expressed in both clients' intimate relationships and the transference dynamics of the therapy (J.A. Singer, 2001; J.A. Singer & Blagov, 2004a; J.A. Singer & Blagov, 2004b; J.A. Singer & Salovey, 1996; J.A. Singer & J. L. Singer, 1992; J.A. Singer & J. L. Singer, 1994).

In addition to their linkage to goals, SDMs also can play directive and mood regulatory functions for the self (Bluck, 2003; Pillemer, 1998, 2003). For example, SDMs have been found to play a role in providing life lessons or "integrative meanings" that help individuals in optimal adjustment and personal growth. Blagov and J.A. Singer (2004) demonstrated that individuals with larger numbers of self-defining memories that contained reflective themes or messages, as reliably coded by three raters (see J.A. Singer & Blagov, 2002 for a SDM coding manual), displayed optimal levels of self-restraint and emotional expression, as measured by the Weinberger Adjustment Inventory Short Form (WAI-SF - Weinberger, 1997, 1998). Thorne, McLean, and Lawrence (2004) found that, compared to other types of personal memories, individuals were more likely to rely on self-defining memories involving tension or goal conflict to provide insights and life lessons.

Individuals also employ personally significant and self-defining memories to regulate their mood states. Josephson, J.A. Singer, and Salovey (1996) demonstrated that non-depressed individuals enlisted positive memories to repair negative moods, while mildly depressed individuals were less likely to recruit positive memories after a negative mood had been induced. Similarly, Moffitt, J.A. Singer, Carlson, Nelligan, & Vyse (1994) found that depressed individuals were less likely to recall specific self-defining memories when asked to retrieve a positive memory, while they did not differ in memory specificity for negative memories. Williams (1996), though not specifically addressing self-defining memories, has argued that a lack of memory specificity in depressed and suicidal individuals reflects a cognitive deficit generalized from a learned defense against encoding and retrieving affectively

threatening self-relevant experiences. In sum, a broad range of studies has demonstrated that self-defining memories are linked to central goals or conflicts within the individual, while at the same time they provide integrative lessons or insights. Finally, these memories through their affective quality and content can play an important role in mood regulation processes for non-depressed individuals.

### SELF-DEFINING MEMORIES IN THE SMS MODEL

In considering how SDMs are part of the SMS model, we examine the relationship of SDMs to the Long-term Self. We conceive of SDMs as particularly powerful integrations of personal scripts within the Conceptual Self and knowledge within the Autobiographical Knowledge Base that is linked thematically to these scripts. The underlying theory behind this integration of conceptual and episodic knowledge is Tomkins's (1979, 1987) script theory. Tomkins considered affect to be the central motivating system of personality. Individuals strive to maximize positive affect and minimize negative affect, as well as communicate and control their emotions. To accomplish these affective ends, individuals develop cognitive-affective structures called "scripts" that organize experience and direct thought and behavior. Scripts are built from "scenes." A scene is the basic unit of personality consisting of an affect (e.g., sadness, happiness, fear) and the object of that affect. Scenes can grow in complexity to contain sequences of action, affect, and outcomes. "Psychological magnification" is the linking of one scene to another through the connection of the same affective pattern shared across scenes. Similar to a semantic memory process, accumulated similar scenes yield an abstracted script. The script is "an individual's rules for predicting, interpreting, responding to, and controlling a magnified set of scenes" (Tomkins, 1979, p. 217).

Scripts then are abstract structures within the conceptual self that contain templates for sequences of actions, affects, and outcomes. Tomkins identified several types of scripts that reflected common affective sequences for individuals. For example, McAdams et al. (2001) studied contamination scripts (where positive affect is followed by a negative affective outcome) and redemption scripts (where negative affect is followed by a positive affective outcome). More generally, several different investigators have provided empirical support for both the concept of scripts and the process of psychological magnification (Carlson & Carlson, 1984; Demorest, 1995; Demorest & Alexander, 1992; McAdams, Reynolds, Lewis, Patten, & Bowman, 2001; Thorne, 1995), while clinical case studies have also demonstrated the utility of the theory (Carlson, 1981; Magai, 1996; J.A. Singer & Salovey, 1996; J.A. Singer & Blagov,

2004a; J.A. Singer & Blagov, 2004b; J.A. Singer & J. L. Singer, 1992; J.A. Singer & J.L. Singer, 1994). According to script theory, SDMs are memorial representations that ground narrative sequences of actions, affects, and outcomes in specific autobiographical memories.

Having specified the nature of SDMs and their relationship to structures in the SMS, we now explore the activation of a self-defining memory in the SMS in response to goal status change. According to the above account of goal-driven episodic memories, they are being formed, and lost, fairly continuously in response to changes in goal processing. But relatively few of these memories become integrated with long-term knowledge structures and even fewer with SDMs and the networks of memories in which they are embedded. In order for this to occur, a memory or set of episodic memories must contain knowledge of high value to central goals in the goal hierarchy of the working self. Conway and Pleydell-Pearce (2000; see also Conway & Holmes, 2004) have suggested that goals generated within the working self are particularly sensitive to developmental demands across the lifespan. Developmental milestones and challenges related to growth, autonomy, achievement, intimacy, generativity, aging, and loss, and the existential problems they address generate and derive from central goals (Erikson, 1959; 1963). It is through these goals that SDMs are originally encoded and later constructed. Thus, SDMs will be closely associated with major developmental goals and will become most active when these goals undergo change.

In the SMS model goal change is always associated with appraisal experienced as affect (Oatley, 1992). Affect, however, need not be intense and the mild satisfaction/dissatisfaction that accompanies the completion or lack of completion of most everyday tasks will not give rise to the encoding or retrieval of SDMs. Instead goal status change must be large enough that highly arousing affect is experienced. Numerous goal-based models of self-regulation (Carver & Scheier, 1998, 1999; Oatley, 1992; Roseman, 1984; Simon, 1967) assume that large discrepancies between input and goal standards will result in more intense experiences of affect. This alerting arousal will immediately engage the self, activating non-conscious affect routines (LeDoux, 1996), and will also spread activation throughout the autobiographical knowledge base of the extended self and the various knowledge structures of the conceptual self. Self-defining memories are then especially sensitive to status changes in developmentally important goals and the related intense affect to which these status changes give rise.

Normally, the working self relies on ongoing self-in-world models that consist of goal hierarchies, self-other images, and life facts. These working self-models guide attention and require relatively little con-

scious processing once directed action in response to the working self model is initiated. Control processes within the extant working self tend to limit the activation of competing working selves and their associated goals, images, life facts, and connections to the self. Episodic memories that are relevant to the goal of the extant working self are activated through direct retrieval with little effort or conscious recall. These episodic memories reflect very little conceptual processing or active integration with self-structures stored in the self. They are relatively self-contained autonomous quanta of memory that accrue to the typical goals that individuals pursue in the course of daily activities.

When the working self model confronts a change in goal status (an important goal in the hierarchy is achieved, blocked, or experienced as in direct conflict with another goal in the hierarchy), an affective triggering process occurs. Patterns of activation that connect to the self increase rapidly, sending the working self into retrieval mode. The intensity of affect and activation is escalated when a developmentally central goal is in question. Now the control processes of the working self, guided increasingly by the arousal feedback of affective processes, direct attentional focus to input from the long-term self in order to achieve effective categorization, evaluation, and prioritizing of the goal status change.

A retrieval model instantiates information simultaneously from the conceptual self and autobiographical knowledge base. Personal scripts from the conceptual self specify a goal-action-affect sequence relevant to the working self goal under scrutiny, while autobiographical knowledge sets limits and activation constraints on the personal scripts generated by the conceptual self. The activated personal script further organizes the search through autobiographical knowledge—leading to specification of lifetime periods and general events that then guide selection of specific memory images from the episodic store. These patterns of activations are, in fact, yielding past working selves (past goal states, self-other images or life facts) that might have relevance to the particular goal status change now under scrutiny.

As more automatic affective processes continue to press for response to the goal status change, the long-term self increasingly organizes its search through autobiographical knowledge based on the scripted template, finally yielding a specific self-defining memory, an integrated representation of the self, others, goal, action, outcome, and affective response. This “recollective” representation that emerges in consciousness provides goal-relevant cognitive and affective information and guidance to the working self in response to the goal status change (see Figure 3).

Due to the density of imagery and affect associated with the memory and its extensive connection to similar memories that share its theme

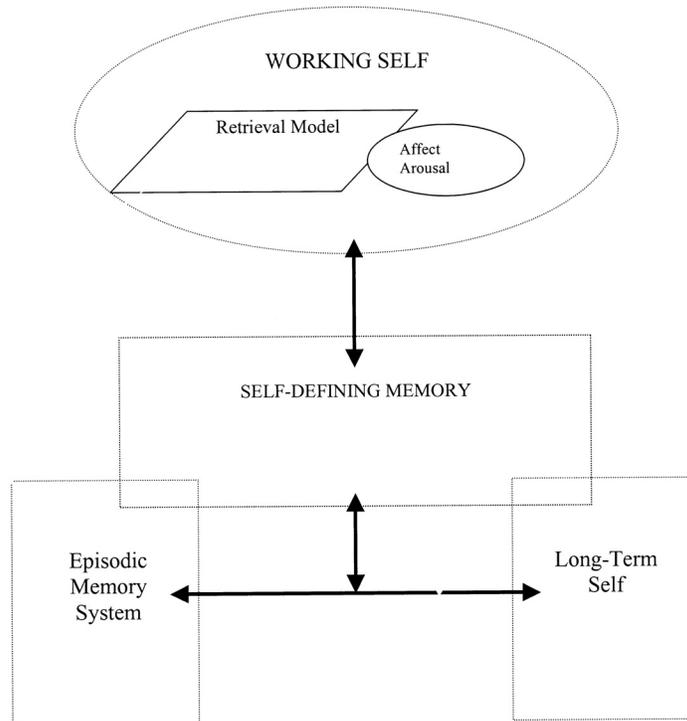


FIGURE 3. Generation of self-defining memories.

and affective quality, the self-defining memory can preoccupy much of the attentional resources of the working self and dominate the control processes involved in the ongoing categorization, evaluation, and prioritizing of information related to the goal. The result is that the current experience is interpreted through the goal-action-affect structure of the self-defining memory's underlying script. In effect, the self-defining memory and its associated conceptual script co-opt the image generating aspects of the episodic memory system, imposing a structure of goal-self-other images-life facts on its encoding functions. This means that new memories that are generated in conjunction with the working self are highly prone to fit the existing narrative sequence of the activated self-defining memory. This is precisely what Tomkins meant by psychological magnification, and though it can allow for efficient, fo-

cused, and integrated processing of new goal-relevant experiences, it can also produce distorted and over-determined interpretations of situations that actually bear only slight resemblance to the self-defining memory's imposed pattern, i.e., memory errors in departures from adaptive correspondence.

The risk is that self-defining memories activated under affectively intense circumstances may lack an appropriate distance from ongoing experience. The merging of the psychological present and "remembered reality" means a breakdown in the balance between adaptive correspondence (i.e., a reasonably accurate rendering of immediate past events) and self-coherence (i.e., retrieval from the long-term self of episodic and conceptual knowledge structures that help to give meaning to experience). Social psychologists interested in the influence of self processes on the interpretation of social phenomena have demonstrated many instances in which the need for self-consistency or the desire to protect self-esteem leads to distortions of remembered experience. For example, Giesler Josephs, and Swann (1996), in a research program on "self-verification," have demonstrated that depressed individuals will recall confirming *unfavorable* information about themselves in order to maintain a coherent and predictable view of themselves. Kwan and her colleagues (Kwan, John, Kenny, Bond, & Robin, 2004) have documented how individuals engaged in "self-enhancement" will filter information to produce the most favorable self-evaluation compared to judgments by others. In either case, these efforts at consistency or enhancement illustrate how the long-term self may distort or counteract more veridical rendering of immediate past events. These breakdowns in accuracy can induce many of the contradictory interpretations of events by individuals that often lead to interpersonal conflict.

### ADULT ATTACHMENT STYLES AND SELF-DEFINING MEMORIES

To examine this last point in depth, we present ongoing research (Tagini, Conway & Meins, 2004) on one form of mental model that can become dominant in the working self—the Internal Working Model of relationships (*IWM*, Bowlby, 1973, 1980) and its expression in self-defining memories. The following protocols from this research demonstrate how complex interactions of IWMs across the conceptual self, autobiographical knowledge base, and episodic memory invoke self-defining memories that influence the working self's efforts at adaptive correspondence to current goal activity.

Within the developmental framework of attachment theory, Bowlby (1969/1982, 1973, 1980) postulated that individuals form mental models,

named internal working models (IWMs), which are abstracted from their experience with primary caregivers during childhood. IWMs organize goal-oriented cognitive and emotional processing in attachment-related contexts (Main, 1995) and mediate characteristic modes of relating to others and the surrounding world (Bowlby, 1980). Due to their longstanding role in organizing interpersonal responses of the self, IWMs tend to be recruited to guide processing during periods where goal status changes or challenges threaten the integrity of self-coherence. In terms of our current thinking about the SMS, we can conceive of IWMs as particular instantiations of the WS that include components of the conceptual self and the autobiographical knowledge base. An IWM encompasses autobiographical knowledge from childhood, some episodic memories, core conceptual beliefs about the self and significant others, and above all, goal structures forming the nucleus of the working self goal hierarchy.

Individual differences in adults' IWMs can be inferred by means of a narrative measure, the Adult Attachment Interview (A.A.I.; George, Kaplan, & Main, 1984). During the A.A.I., individuals are required to access and reflect on plausible autobiographical memories. At the same time, participants need to engage in task monitoring to maintain a coherent and collaborative discourse (Hesse, 1996). A.A.I. protocols are assigned to one of three attachment categories (Main & Goldwyn, 1998):

*Secure-Autonomous*, when the narrative of childhood experiences is coherent and plausible and specific autobiographical memories are easily accessed;

*Preoccupied or Entangled*, when the narratives indicate an excessive and confused or angry preoccupation with attachment figures or with traumatic events;

*Dismissing*, when the discourse is aimed at reducing attention to unfavorable childhood experiences by failing to recall specific memories or by dismissing the self-relevance of negative experiences.<sup>1</sup>

One might consider these attachment patterns and the associated memories as reflecting different orientations of the relative balance between adaptive correspondence and self-coherence. The secure individual, as defined by the A.A.I., has developed a cognitive-affective processing style that allows the self to engage with, and step back from, ongoing ex-

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1. Two additional categories have been described: involving a brief disorganization of discourse (Unresolved, Main & Solomon, 1990) when discussing traumatic experiences, or failure to maintain a strategy in the interview as a whole (*Cannot Classify*, Hesse, 1996).

perience. This knowledge processing style parallels the fluid interaction of the secure mother-child dyad, with the child's reliance on its caregiver's consistent accessibility and contingent responses permitting a comfortable rhythm of exploration of the world and return to the familiar.

In contrast, the two insecure styles of attachment have associated processing styles that lack the flexibility and openness of the secure individual. Although insecure individuals invoke their familiar ways of organizing the world to retain a sense of self-coherence in the face of goal threat, both processing styles fail to achieve an optimal balance between the demands of accurate short-term processing and retrieval of knowledge from the long-term self.

Due to a history of unpredictable and contradictory care-giving, the preoccupied individual has developed a hyper-vigilant processing style (Main, 1995) that allows for little abstraction and emotional distance from remembered experience. The resulting conflation of immediate and long-term knowledge often leads to confusing tangents, misinterpretations of cues, and unregulated intense affect. Although this chaotic response to goal challenge recreates the childhood experience, and therefore achieves a sense of familiarity and self-coherence, it is hardly functional for problem-solving and effective goal attainment in interpersonal situations.

In contrast, dismissing individuals have developed an IWM based on a consistent experience of rejection or neglect by caregivers. Their defensive response is one of avoidance and minimization (Main, 1995). Rather than engage in hypervigilance to try to identify and predict the threatened assault on the self, dismissing individuals attempt to divert attention from potential harm inflicted by the caregiver. Self-coherence is maintained in the face of goal threat by a denial of any elements within immediate sensory-perceptual experience or the long-term self that would allow acknowledgement of strong negative emotion.

The first example from our research is that of a self-defining memory recalled by a participant, Ruth, whose A.A.I. protocol was classified as secure-autonomous. Ruth's A.A.I. narratives were coherent and realistic, and she was able to shift effortlessly between recollecting detailed memories and evaluating past attachment experiences in terms of the present. Ruth's SDM recounts a particularly distressing but significant episode from her adolescence:

*I remember how nasty I could be to my Mum. That always comes back to me whenever I'm remotely not very nice to anyone...That one time, when I was shopping for shoes for school, and I was especially nasty to her, that's the one memory that I always get. We were shopping for school-shoes and I was being*

*deliberately obnoxious. I was saying, 'I don't like these ones, and I don't like those, go and get me other ones'. And then it was as if something clicked in my head, when she said, 'If you don't stop being like this, I'll cry in the middle of the shop!' And then it just dawned on me, what I'd been doing, I was about twelve or thirteen. I think that was the start of me thinking, I have to be nice to people."*

During the Self-defining Memory Task, Ruth recalled diversely themed memories, which referred to a variety of relationship and achievement themes. The memories were both highly specific and integrative (Blagov & J.A. Singer, 2004), reflecting the ability to merge affect and cognition in an optimal manner. As in the memory cited above, Ruth repeatedly described how she employed her memories to regulate her current emotions and interpersonal interactions, demonstrating a highly adaptive directive function. Ruth was able to move fluidly between the demands of adaptive correspondence (current goal-relevant experiences) and self-coherence (more abstract knowledge from the self). The apparent boundaries between these two aspects of the working self were more open or permeable for her, allowing for both the assimilation of and, accommodation to, ongoing experience.

Consider next a SDM recalled by a participant whose A.A.I. received a primary classification of Preoccupied. During the A.A.I., Mnemosyne described her mother as alternating violent rejection of her daughter's attachment needs with over-protectiveness. Both parents had unrealistic expectations concerning her academic and artistic achievements. Mnemosyne's memory narrative was disrupted by her current involved anger towards her mother. The discourse was confused, excessively detailed and contradictory, reflecting her experience of her mother's caregiving behavior (Main, 1995). Mnemosyne recalled when she first performed in a play and failed to remember her lines during a soliloquy:

*"And I remember the first two acts of the play, were absolutely fine. And then I got to the third act, and I can't even remember how I went wrong, but my legs were shaking, and I went wrong so drastically ... and it shocked me so much, that I forgot my lines, I couldn't tell where I was anymore, I couldn't tell how to recover...But I just remember feeling absolutely humiliated! ... And my parents, god, I didn't even want to think about what they were thinking! Cause I was thinking about how disappointed they were, how embarrassed they were on my behalf, embarrassed for themselves, and how angry they would be because I'd done badly, and just you know ... later they said, they said stuff along the lines of, 'You acted really badly. And what went wrong? Why? You know, did you not rehearse hard enough?' ... And they'd say, 'Oh no, the other people, you could tell, we were looking at their faces, and at some point we didn't even want to look at their faces, cause we were embarrassed. And you know, we couldn't believe you'd acted that badly', and you know, 'Why? Why did you do that?' ... I*

*remember thinking, 'You know, what did I do to deserves this? I mean, you know, am I being punished for something'..."*

All but one of Mnemosyne's self-defining memories reiterated the same theme: the failure to attain a goal and the consequent humiliation by her caregivers. Her SDMs consisted of clusters of specific, negatively valenced memories. These were interspersed with what she defined as "rambling," that is, extensive descriptions of loosely related general events and associated conceptual commentaries.

Mnemosyne's proliferation of memories suggests a deficit in the regulation of affect and recall processes. Her re-experiencing of past adverse experiences compromises her capacity for adaptive correspondence and brings about a disengagement from the present context, disrupting current cognitive and contextual processing. As a consequence, both source memory errors (e.g., confusing memories and dreams during the A.A.I.) and task-monitoring errors (forgetting the interview context during the SDM task) occurred.

Mnemosyne was overwhelmed by a near past experience and the intensity of her associated affect. Her SDM indicates the potentially destabilizing effect of remembering in the absence of selective control processes that constrain the working self. The lack of control processes is clear from the vignette, which originally consisted of 2,385 words. As Mnemosyne explained: "it just seems like things will flood into my head...I can think of a memory, and a million things will come to mind...I do sometimes really get bogged down in the emotions and feelings of it all..."

The potential for her SDMs to serve an integrative function, as Ruth's memories do, is reduced by the lack of distance from the remembered reality. One possible explanation for this lack of perspective is that the original working self goal structure through which these memories were encoded remains highly active. Consequently when these vivid attachment memories are accessed, activation rises still further and spreads through the knowledge base in an unconstrained way with the effect of "a million things" coming to mind. It is as if the self, still prone to respond to the unpredictability of threat that repeatedly surfaced in childhood, can only operate in one mode of preoccupied concern and heightened affective response.

In contrast to Mnemosyne, the last example is a SDM recalled by an individual whose A.A.I. was classified as Dismissing. Violet persistently failed to support the bland positive descriptions of her parents with specific memories. From her narratives about childhood experiences it could in fact be inferred that the parents had been emotionally aloof and unavailable.

*I'm not sure if this is what it's supposed to be ...I don't really have any specific thing that I say, 'Well this is what I love to do, and this is my pattern, this is what I put my life into doing'. Ahm, sort of not sports, music or theatre or anything like that, it's sort of always, kind of, my interests branch off into all these different things, but nothing that I could go and say, well that is the one thing that kind of I was born to do. And I think that maybe that has to do with the fact that I've moved around and have always had to, kind of, change and adapt to what's been available at any given place. And I can't remember any sort of ever having always done one thing, like having gone every Tuesday go to ballet class or something, and hence really loving ballets and going to ballets and things like that. Ahm, so I don't know, that's kind of an absence of a memory which is self-defining."*

Violet recalled only three self-defining memories, all consisting of emotionless descriptions of activities. These memories conveyed a vague, diffuse sense of self, and significant others were subsumed under the generic term "we." Her self-defining memories were over-general, structurally similar to those observed in depressed samples (Williams, 1996), although depression was ruled out by her Beck's (1996) Depression Inventory score of zero. Violet's self-defining "absence of memory" might be thought of in terms of the activity of inhibitory processes of the working self that control access to the autobiographical knowledge base. Memory construction is terminated at the level of general events and she is unable to bring specific episodic memories to mind. In this case the need for self-coherence hinders the formation of links between recalled autobiographical knowledge and remembered reality.

This type of defense probably serves two functions: first it keeps specific details of experiences from the working self that might be destabilizing and threatening for its goal structure as well as for the belief structures of the conceptual self. Second, it allows construction of versions of the self and other ('as if' versions), which are not constrained by remembered reality. These mildly delusional self-other conceptualizations support a version of interpersonal reality that does not threaten working self goals. Additionally we may speculate that since the working self also modulates encoding (Conway, 2001), the lack of specific memory could reflect a process of "selective inattention" (Sullivan, 1953) to attachment-related issues, with subsequent fewer episodic memories being integrated in the autobiographical memory knowledge base.

The defensive over-regulation of attention and recall echoes the observable dismissal of attachment needs by children who are assigned to the equivalent attachment category (Ainsworth, Blehar, Waters, & Wall, 1978; Main, 1995). Violet described her memory difficulties in the following manner, "If I start trying really, really hard, I have the feeling that

it is kind of tiring, I stop, because you can't force it. The more you look ... the less you think of something." This comment suggests a sustained inhibition by the working self of access to autobiographical knowledge and episodic memories.

### **MEMORIES OF TRAUMATIC EXPERIENCE: DEFENSIVE FUNCTIONS OF THE WORKING SELF**

If people with dismissing attachment patterns have attenuated access to the autobiographical knowledge base, then patients suffering from post traumatic stress disorder (PTSD) surely have the reverse: uncontrollable intrusions of vividly recollected episodic memories of their trauma experience. However, and as we shall see, the working self and conceptual self may also operate here to protect the integrity of the SMS from extreme goal change.

Indeed we might note at the outset one comment that appears to be almost universally made by those who have recovered from their PTSD symptoms is that they are a different person now from the person who existed before the trauma. Trauma ultimately is imposed upon the self and to be traumatic must contain a threat to the self-system. Often this is in the form of near death experiences or severe physical injury coupled with very negative cognition and affect. The cases in this section are taken from Conway, Meares, & Standart (2004) and they illustrate how the SMS responds to extreme duress.

#### **CASE 1. MEMORY FOR A ROAD TRAFFIC ACCIDENT**

A man who drove cars for a living was involved in a road traffic accident. He was a back seat passenger in a car when it was in a high speed collision with another vehicle; activation of the air bags in the front of the car produced a cloud of powder, which he thought at the time was smoke. At the time he could smell petrol and thought the car might ignite and remembers thinking 'I will be burned alive.' His wife was unconscious after the impact and he thought that she had died. He remembered thinking to himself 'What am I going to do now?' as he thought about his future alone without his wife.

Subsequently he experienced severe guilt about this thought, which suggested to him that he was a selfish person. It became one of his intrusive flashbacks and always induced an overwhelming guilt. In addition, he was a highly professional driver and he had anticipated the crash, but did not cry out. He felt that he could have averted the crash if he had done this. He experienced intrusive thoughts, such as 'I should have

shouted' (to warn the driver) and he relived the feeling of guilt he felt when he thought his wife had died, which he believed to be his fault because he did not shout out.

In this case the intense guilt and anxiety experienced when he intrusively recalled his failure to shout out was destabilizing, so much so that daily activities were disrupted. During cognitive behavioral therapy, however, which included re-imagining the event and a visit to the actual crash site—it became apparent that the way in which the accident occurred (the speed and orientation of the vehicles and their very rapid collision) meant that there could not have been sufficient time to shout a warning. It then became apparent that his flashback contained a *time expansion* distortion and once the patient was able to recognize this, the intrusiveness of the memory and its associated experience of guilt and anxiety diminished.

This memory distortion is particularly interesting as it served to make the patient responsible for the accident and in so doing it kept from awareness a far more destabilizing cognition: that not only was he not responsible but in fact the accident had been completely beyond his control. This meant abandoning the core belief that he was always in control when driving. This would mean revision to the conceptual self and associated goal change. We believe that one general operating principle of the SMS is the avoidance of change, especially change to goals and the conceptual self. This may be because the cognitive and affective costs of such change are high and, moreover, there is usually no guarantee that new goals and new models of the self will be any more effective than those they replace. Distorting an episodic memory in order to resist change may then be one defense the working self has against widespread goal change.

## CASE 2. MEMORY FOR A FALL

A young man suffered severe PTSD after he fell off an oil rig. When first seen, almost two years after his fall, he had severe depression and marked PTSD. He had a vivid and intrusive memory of falling down an interior shaft in the oil rig platform wearing a heavy workman's tool belt. This was accompanied by intense anxiety that he would fall into water and drown. In reality, however, there was a metal grid at the bottom of the shaft but it was not present in his flashback in which the sun was very bright and reflected back up the shaft making the grid difficult to see. The culmination of his fall was in hitting the grid where he suffered a severe head injury. In therapy the patient and therapist worked at drawing the grid back into his flashback image. When they achieved

this, after several sessions, he then suddenly remembered the pain he felt as he hit the grid. This was followed by the realization that he was alive. From this point his depression fell and PTSD symptoms, including the frequency of memory intrusions, subsided. From the present perspective this is an instance of the working self distorting a memory in order to protect against recalling intense physical pain.

Finally, consider how this protective function can work for intense negative emotion.

### CASE 3. AN EYEWITNESS TO THE SEPT. 11TH ATTACKS

A middle-aged woman observed the planes going into World Trade Center from a street close by. Two months later she was referred to the CBT clinic and appeared to be very distressed, anxious, and with marked avoidance. She had a powerful distorted image flashback in which she saw herself high above the ground observing the collision of plane and building. The scene is very peaceful and there is no noise. Whenever the image intruded into consciousness, which it frequently did, she felt intense, destabilizing guilt. In therapy it was realized that this image meant strong avoidance of the actual memory. Early in her treatment she started to practice at imaging, coming back to ground, hearing the cries of the crowd standing around her (as they had in real life), and to feel strong emotions of anger and fear. After only a few sessions practicing this, she had reinstated her original perspective and could be aware of the strong negative emotions she felt at the time. Regaining her original perspective was associated with a sharp reduction in his PTSD symptoms and a restoration of her memories of witnessing the attack.

These transitory memory errors of time distortion, lost details, and radically changed perspective are all violating what we earlier termed 'adaptive correspondence.' These memories contradict the accurate rendering of reality that is necessary for survival value. Indeed, consistent misrepresenting of experience might entail a significant survival cost. In the above cases the influence of the long term self has been to distort episodic memories temporarily in order to maintain existing self-coherence. (Note that we are not suggesting that this occurs in all or even the majority of cases of PTSD. The cases we have described here, and in Conway, Mearers, & Standart 2004, simply illustrate how the SMS might give rise to memory distortion in memory for extreme experiences). If, as we have suggested, the SMS operates on a principle of conservatism and resists change or only supports gradual change, then these distortions might be adaptive in the sense that they delay radical change to self-con-

ceptions and working self goals. But as the distorted memories form part of the PTSD symptoms of intrusive flashbacks, it might be that the distortions retain a strong link to the working self goals and self-conceptions through which they were encoded and frequently intrude into awareness because of that link (cf. Conway & Pleydell-Pearce, 2000). In effect they signal that something is wrong with that part of the goal system, without signaling exactly what, which would lead to (extensive) self-change.

### EMOTION REMEMBERED IN TRANQUILITY: WORDSWORTH'S POETIC IMAGINATION

To conclude this paper, we would like to speculate about the role of the SMS in the generation of creative products of the imagination. Our argument is essentially that much artistic activity involves a capacity to move flexibly between the rich sensory and perceptual world of immediate experience and the more distant knowledge of remembered reality and past working selves. As he worked with his friend and fellow poet, Samuel Taylor Coleridge, to create a new aesthetic of lyric poetry in the beginning of the 19th century, William Wordsworth, the prominent English Romantic poet, stated a similar position in his *Preface to Lyrical Ballads, with Pastoral and Other Poems* (1802),

I have said that Poetry is the spontaneous overflow of powerful feelings: it takes its origin from emotion recollected in tranquility: the emotion is contemplated till by a species of reaction the tranquility disappears, and an emotion, kindred to that which was before the subject of contemplation, is gradually produced, and does itself actually exist in the mind. (Wordsworth, 1802/1984, p. 611)

The power of poetic creation lies neither in an immediate unfiltered account of recent experience, nor in the removed reserve of abstracted retrospection. Only through one's capacity to synthesize the adaptive correspondence of the working self's depiction of reality with the long-term self's contemplation of that past self does an emotionally-informed imaginative product emerge.

Three of Wordsworth's greatest poems, *Lines Written a Few Miles above Tintern Abbey*, *Ode (there was a time)* (also known as *Intimations of Immortality*), and *The Prelude* are all poems that contemplate the relationship of more remote memories to the poet's current imaginative efforts to recreate and make sense of these earlier experiences (Lau, 2002a, 2002b). A common thread through all three poems is Wordsworth's recognition that for memories to continue to claim emotional power and inspiration,

they must be re-translated through the imaginative process of the contemplative self.

For example, in Book 7 of *The Prelude* (1805 version, in Wordsworth, 1984), Wordsworth writes of a period he spent in London immediately after university as a time in which he recorded a variety of experiences, but subsequently did little to integrate them with the core concerns of his long-term self. He refers to such unmediated recollections (what we would consider poorly contextualized episodic memories) as

...the curious props  
By which the perishable hours of life  
Rest on each other, and the world of thought  
Exists and is sustained. (Book 7, lines 493-496)

When contemplating these memories, he writes that the "...imaginative Power/Languishes within me" (Book 7, lines, 499-500). In another memorable phrase, he indicates these memories of perishable hours, despite their emotional intensity at the time, fail to pass beyond the "suburbs of the mind" (Book 7, line, 507) and do not lead to poetic inspiration due to their failure to engage enduring concerns of the self.

In contrast, Wordsworth identifies "spots of time" (Book 11, lines 258-278) that retain a "distinct preeminence" (Book 11, line 259) and rise above the "...the round of ordinary intercourse" (Book 11, lines 263-264). It is precisely because these moments of memory have been integrated with the greater depth of the self that they retain their power in the imagination

This efficacious spirit chiefly lurks  
Among those passages of life in which  
We have had deepest feeling that the mind  
Is lord and master, and that the outward sense  
Is but the obedient servant of her will.  
(Book 11, lines 269-273)

In other words, these original memories have linked with the mind's own power, and the integration of rich records of experience with the mind's pre-existing ideas lifts the self to the creative realm of poetry.

In another poem from this period of his life, *Ode (There was a time)*, Wordsworth had raised the concern that the vivid power of previous episodic memories, particularly those from childhood, are lost forever to the adult, whose current concerns and goal pursuits are radically different from the child,

There was a time when meadow, grove, and stream,  
 The earth, and every common sight,  
     To me did seem  
     Apparrelled in celestial light,  
 The glory and the freshness of a dream.  
 It is not now as it has been of yore;-  
 Turn wheresoe'er I may  
 By night or day,  
 The things which I have seen, I now can see no more.  
 (Wordsworth, 1807/1984, p. 296, Lines 1-9)

However, as the poem unfolds, Wordsworth expresses the view that although unmediated memories of childhood experience are lost to the older self, the long-term self is able to reconstruct these memories through the filter of more recent working selves. This reconstructive process gives an additional depth and meaning to the former memories,

Though nothing can bring back the hour  
 Of splendour in the grass, of glory in the flower;  
 We will grieve not, rather find  
 Strength in what remains behind,  
 In the primal sympathy  
 Which having been must ever be,  
 In the soothing thoughts that spring  
 Out of human suffering,  
 In the faith that looks through death,  
 In years that bring the philosophic mind.  
 (Wordsworth, 1807/1984, lines 182-189)

Not unlike the individuals who recovered from PTSD described earlier in this paper, Wordsworth had come to understand that we must inevitably look at the past through the lens of our current goals and meaning-making (see Pennebaker, 1995). Otherwise, we will remain haunted by moments that are irrevocable and incapable of revision. Creative and healthy memory is never simply a recursive loop of past records, but rather a look backward that takes the individual forward in understanding and self-knowledge.

The contribution of autobiographical memory to the self is its capacity to render accurate records of the working self's engagement in goal activity, while at the same time insuring that such activities reinforce the coherence of the long-term self. Vivid and affectively intense goal-oriented memories, such as self-defining memories, can aid in this process, as long as the balance between adaptive correspondence and self-coherence is not overwhelmed. In individuals for whom attachment struggles

or recent trauma have raised significant challenges to goal attainment, the long-term self's demand for coherence may compromise memory's base in reality and undermine the working self's effort to achieve this delicate balance. In contrast, the appropriate blending of emotional recollection of reality through the lens of the philosophic mind may lead to the creative state that Wordsworth praises in his lines in *Tintern Abbey* - a state to which we might all aspire,

...and in after years,  
 When these wild ecstasies shall be matured  
 Into a sober pleasure, when thy mind  
 Shall be a mansion for all lovely forms,  
 Thy memory be as a dwelling place  
 For all sweet sounds and harmonies.  
 (Wordsworth, 1798/1984, lines 138-143)

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