

Commentary

‘So That We Might Have Roses in December’: The Functions of Autobiographical Memory

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SUMMARY

Autobiographical memory is not merely declarative and episodic in nature. It also entails explicit self-reference, chronological organization and causal relations. It entails conscious recollection, in terms of remembering, knowing, feeling or believing. Its functions may be agentic or nonagentic, but all are assigned, not intrinsic, and thus are observer-relative features of reality. Questions about function risk committing the adaptationist fallacy. Intrapersonally, autobiographical memory is a critical component in the mental representation of self. Interpersonally, autobiographical memory provides a basis for establishing and maintaining social relationships. Autobiographical memory is an individual right, and it may also be an ethical obligation. The popularity of memoir as a literary genre indicates that it is also a means of making money. In a future world of artificial minds with infinite capacity for data storage, there still will be no substitute for the human capacity to remember what really matters and forget what does not. Copyright © 2009 John Wiley & Sons, Ltd.

Deborah Solomon: Do you plan to film your wedding?

David Lynch: No, it’s a hassle. So many things these days are made to look at later. Why not just have the experience and remember it?

DS: Because most people have the experience and forget it.

DL: Some things we forget. But many things we remember on the mental screen, which is the biggest screen of all.

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‘What the hell is it for?’, indeed. But a half a century before Baddeley (1988, p. 3) posed his question, J.M. Barrie, author of *Peter Pan*, already had an answer: ‘God gave us memory so that we might have roses in December’ (Knowles, 1998, p. 24). Memory frees our experience, thought, and action from control by the immediately present stimulus

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environment, and allows us to perceive, contemplate and respond to events in the past as well. Viewed from this perspective, memory would seem to be critical for what we ordinarily construe as intelligent behaviour. Certainly it is a necessary component in any system that can learn from experience.

WHAT IS AUTOBIOGRAPHICAL MEMORY?

Baddeley (1988) asked his question about memory in general. But this Special Issue is particularly concerned with autobiographical memory, and so we should focus first on those features that distinguish autobiographical memory from other forms of memory.

Autobiographical memory in the taxonomy of memory

Baddeley (1988) identified autobiographical memory as ‘episodic’ as opposed to ‘semantic’ memory (Tulving, 1972, 1983), and thus as a form of ‘declarative’ as opposed to ‘procedural’ knowledge (Anderson, 1976; Winograd, 1975). Autobiographical memories are declarative in nature, because they refer to factual knowledge—knowledge that can be given a sentence-like propositional representation—and they are episodic in nature, because they represent events that have a unique location in space and time. But Baddeley also understood that there is more to autobiographical memory than that.

For more than a century, the traditional verbal-learning paradigm has served as a laboratory model of episodic memory. Each list studied by the subject—and, indeed, each item on each list—constitutes an episode of experience, uniquely located in space and time, and the subject’s task is to remember that experience on a later test. Despite the objections of some that the traditional verbal-learning paradigm lacks ecological validity (e.g. Neisser, 1978), the basic principles of memory derived from such studies seem to have held up pretty well (Banaji & Crowder, 1989; Kihlstrom, 1996). Even the reconstruction principle, the heart of Bartlett’s (1932) critique of Ebbinghaus (and, by extension, of the verbal-learning paradigm which he initiated), is documented better by studies employing traditional verbal-learning paradigms (e.g. Loftus, 1975; Loftus & Palmer, 1974) than by anything Bartlett himself ever did. Paradigms expressly intended to be more ecologically valid such as the Galton technique (Crovitz, 1970) are often compromised by their inability to control the conditions of encoding and retrieval. If the traditional verbal-learning paradigm has some liabilities with respect to ecological validity, the ecological memory paradigm has its own, beginning with a lack of rigorous experimental control.

Narrative and plot in autobiographical memory

Still, the feeling lingers that there is something missing in the verbal-learning paradigm, which prevents it from capturing autobiographical memory as well as it might. Baddeley (1988) put his finger on this, too: ‘Autobiographical memory... is particularly concerned with the past as it relates to ourselves as persons’ (p. 13). To really qualify as autobiographical, a memory ought to have some *auto* in it, and in most applications of the verbal-learning paradigm the self is not really psychologically present, except in the somewhat trivial form of ‘*I* remember that *I* read word X in list Y’. Taking a leaf from Fillmore’s case–grammar approach to linguistics (Fillmore, 1968; see also Brown & Fish, 1983), it seems that in every autobiographical memory the self is represented as either the

agent or object of some action (compare ‘*I gave a present to Lucy*’ vs. ‘*Lucy gave a present to me*’) or as the stimulus or experiencer of some state (compare ‘*I made Lucy happy*’ vs. ‘*Lucy made me happy*’).

Autobiographical memory also represents the person’s cognitive, motivational and emotional state at the time of the event—what the person was thinking at the time, what he or she wanted, and how he or she felt (Pillemer, 1998). Although the person’s emotional and motivational state provides important elements of context at the time of retrieval, the emotions present at the time the experience is initially encoded are also represented in memory, as evidenced by phenomena such as mood-congruent encoding and mood-dependent retrieval (Kihlstrom, Eich, Sandbrand, & Tobias, 2000).

Autobiographical memory is not just about episodes, and it is not just about *auto*: it is also *biographical*. It is not enough to construe autobiographical memory as memories of one’s own experiences, thoughts and actions, strung together arbitrarily as if they were items on a wordlist or even the responses to the cues of the Galton technique. That is to say, autobiographical memory is the story that the person tells about him- or herself—or, at the very least, it is part of that story (e.g. Habermas & Bluck, 2000; McAdams, 1993; Singer & Salovey, 1993). As such, we would expect autobiographical memory to have something like an Aristotelian plot structure: An ‘arrangement of the incidents’ into a chronological sequence.

Autobiographical memories are episodic memories, but Aristotle argued in the *Poetics* that purely episodic plots, in which the only thing that bound individual episodes together was that they all involve the same person, were the worst kind of plots. At the very least, in autobiographical memory, there ought to be some sense of beginning, middle and end—some sense of how individual episodes are related to each other in the flow of personal time. The sequence of events makes a difference to their meaning. Moreover, it seems doubtful that this chronological organization consists of a single unbroken string beginning with the earliest recollection to the most recent. Rather, it seems likely that autobiographical memory is organized into chunks or epochs such as Erikson’s (1950) eight ages of man. More likely, however, each individual imposes his or her own idiosyncratic organization on his or her own life, and this temporal chunking may be constantly rearranged as the events of life occur. Whatever the particular case may be, how an individual divides his or her own life into epochs may be as important an aspect of autobiographical memory as the individual memories themselves.

But plot does not simply involve a chronological organization of events: It also entails a *causal* organization of them, an analysis of causality that makes a difference to the meaning of both events. Perhaps autobiographical memories classify as one or another of the elements of Aristotelian tragedy: Incentive moments, climaxes, resolutions, complications, unravelings, catastrophes, reversals of intention, moments of recognition and catharsis. Similarly, Pillemer (1998) has classified autobiographical memories as originating events, turning points and anchoring events in the life story. Traditional social psychology offered a rather ham handed distinction between ‘personal’ and ‘environmental’ causes of behaviour, resulting in claims that people tended to explain their own behaviour in terms of situational causes, and the behaviour of other people in terms of dispositional causes (Jones & Nisbett, 1972). On the other hand, revisionist approaches to attribution theory paint a more complex picture (Malle, 2006; Malle, Knobe, & Nelson, 2007). In any case, we would expect autobiographical memory to be embedded in a web of causal explanation in a way that the items in a verbal-learning experiment are not. Aristotle disdained the *deus ex machine* as a plot device, but sometimes the most important events in our lives come out of nowhere, unpredicted and unbidden and bring a particular plotline to an end.

For Aristotle, character supports plot, and personal motives play a role in the causal linkages among events. In this way, the events represented in autobiographical memory are also relevant to *character*. Not every remembered episode reveals our tragic flaws, not least because not every life is a tragedy: Still, our memories say something about *ourselves*, and about the other people in the events we remember—which is perhaps just another way of saying that they say something about us (McAdams, 1993). Freud famously believed that we forgot—that is, we repressed—those (traumatic) events that were most crucial in shaping our character (Freud, 1915/1957). By contrast, Adler believed that we selected our autobiographical memories so as to be consistent with our personality—what he called our ‘life style’; those memories support the lifestyle when it is challenged, and when our life style changes, so do our memories (Adler, 1937).

Consciousness and recollective experience

So far, this discussion had concerned *conscious* autobiographical memory, begging the question of whether there are *unconscious* autobiographical memories as well. Certainly implicit memories, which influence experience, thought and action outside of conscious awareness and conscious control (Schacter, 1987), are autobiographical in the narrow sense of being episodic (and thus declarative). The studied item that gives rise to priming effects is, after all, an event in the subject’s life. But autobiographical memories are intrinsically self-referent, and implicit memories lack self-reference (Kihlstrom, 1995, 1997). When I complete the stem *ash*—with ‘ashcan’ rather than ‘ashtray’ because I read the former word on an earlier list of items, I am saying something about a word, but I am not saying something about myself. The whole point of dissociations between explicit and implicit memory is that implicit memories represent an event in the objective past that is not a part of autobiographical memory. It follows, then, that autobiographical memory cannot be unconscious. The rare exceptions that test this rule are found mostly in the functional amnesias of the dissociative disorders—which are very special cases indeed (Kihlstrom, 2005; Kihlstrom & Schacter, 2000).

Conscious recollection, in turn, comes in many forms. Tulving (1985) distinguished between two primary varieties of recollective experience: *Remembering*, which entails one’s concrete awareness of oneself in the past, and *knowing*, or a more abstract knowledge of the past. I clearly remember swimming across Lake Keuka (this was a sort of rite of passage for kids who were raised in upstate New York). I know that my parents took me to visit Santa’s Workshop Village in North Pole, New York, that is part of my autobiographical memory, too, but I do not remember a thing about it. It’s just a fact about my life, and I know it because of family story-telling around the Thanksgiving table, photographs in my mother’s scrapbook, and the like.

Milvena Dean, the last survivor of the Titanic disaster, died on 31 May 2009—interestingly, on the 98th anniversary of the ship’s launching. In her later years, especially after the release of James Cameron’s movie, *Titanic* (1997), she enjoyed some degree of celebrity, but she had no personal recollection of the event—not least because she was only 9-week-old when the ship went down, and she only learned that she had been on the ship at the age of 8. She *knew* she was a *Titanic* survivor, and that fact played an important part in her life, but she had no recollections of the event at all.

It appears, however, that remembering and knowing do not exhaust the varieties of recollective experience. At the very least, both ‘remembering’ (viewed as full-fledged conscious recollection of an event as part of one’s subjective autobiography) and ‘knowing’

(viewed as retrieval from semantic memory of an event as part of one's objective biography) can be further distinguished from an intuitive 'feeling' that something happened in the past (e.g. Kihlstrom & Kim, 1998). The 'feeling of knowing' state is well documented in studies of verbal learning (Hart, 1965) and retrieval from semantic memory (Nelson & Narens, 1980), but the same sort of feeling occurs in genuine autobiographical memory, as when we have a feeling that we have met someone somewhere before, but cannot say where or when. I have a feeling that I saw Woody Allen's *Midsummer Nights Sex Comedy* at the New Yorker Theatre in Manhattan in 1982, soon after its premiere, but—with apologies to the friends who must have been with me at the time—I do not actually remember it; and I know full well that Woody Allen movies premiered at the Beekman Theatre, not the New Yorker. Perhaps the memory is, at least, in part, the product of priming: I spent a lot of time in New York City in the early 1980s, and I am a long-time subscriber to *The New Yorker*.

In addition, the controversy over recovered memories of child sexual abuse and other trauma (Crews, 1995; Kihlstrom, 2006; McNally, 2003) suggests yet a fourth variety of recollective experience: Believing that something happened, on the basis of something else you know (or, at least, *think* you do), in the absence of any personal recollection or independent evidence. The belief may be wrong, of course, and the event may have never happened at all. It might be right. I believe that I once met Edler Hawkins, an early civil rights pioneer, because he was a friend of my parents. But I have no personal recollection of the event, nor is there any evidence in the documentary record. This only underscores the fact that autobiographical memory is one's *mental representation* of one's own personal past—and, like all mental representations, it may depart substantially from historical truth (Spence, 1982).

The varieties of recollective experience in autobiographical memory imply that there are many different sources of autobiographical memory: Personal recollection, independent knowledge, intuition and belief. Just as Bartlett's reconstruction principle reminds us that remembering is more like telling a story than reading one, so the varieties of recollective experience in autobiographical memory remind us that there are at least two forms of personal story. Autobiography, like biography, is objective and well documented, limited to recollections that can be verified and facts that can be sourced. Memoir, on the other hand, is private, and subjective, and includes recollections, inferences and beliefs that cannot be verified. In the final analysis, checking autobiographical memory against historical fact, the same way we check recall and recognition against the list of words that subjects actually study, may miss the point of autobiographical memory (Kihlstrom, 2002). It is our memories that guide our experience, thoughts and actions, not the historical record. But in the absence of independent corroboration, autobiographical memories should be viewed sceptically, and when they conflict with the historical record, something has got to give. Arguably, history should trump memory.

THE MEANING OF FUNCTION

The function of autobiographical memory is a legitimate question (Bluck, 2003; Conway, 2003), but in asking it we should be careful to avoid what Gould and Lewontin called the *adaptationist fallacy*—the assumption that every trait evolved because it was good for the species (Gould & Lewontin, 1979; see also Pinker, 1990). Some traits just happen, as accidents of common ancestry: We do not have two arms and two legs because that

combination was particularly useful in the environment of early adaptation. Apparently, we have two arms and two legs simply because we are descended from fish that had four fins—and that is all there is to it. Some of the papers in this special issue seem to verge on this kind of adaptationism—explaining how various errors and biases in memory, such as inaccuracies in remembering past emotional states (Levine, Lench, & Safer, 2009), the fading affect bias (Walker & Skowronski, 2009), the post-identification feedback effect and the generally weak relationship between accuracy and confidence (Wells & Quinlivan, 2009) and forward and backward telescoping (Wilson, Gunn, & Ross, 2009) are adaptive after all. The arguments are intriguing, and sometimes persuasive. On the other hand, perhaps these errors and biases do not have any *function* after all. Perhaps they just reflect the way memory works.

A case in point is the associative memory illusion (Roediger & McDermott, 1995) and other expressions of false memory (Newman & Lindsay, 2009). Far from having some subtle positive value, false memory may be a ‘sin’ of memory after all, as Schacter (1999, 2001) has suggested. Certainly the damage potential in false recollection is very high, as shown by the controversy over recovered memories of ostensibly repressed or dissociated traumatic memories (e.g. Gleaves, Smith, Butler, & Spiegel, 2004; Kihlstrom, 2004). Or, if false memories are not occasions for sin, perhaps they are simple byproducts of the way memory works, such as spreading activation and reconstruction.

Memory as spandrel

While some evolved species traits may be adaptive, others are not themselves adaptive, but are incidental byproducts of traits that are adaptive—these are Gould and Lewontin’s spandrels. Memory in general might simply be a consequence of how the nervous system works—a byproduct of the biochemical properties of neurons, which happen to give rise to long-term potentiation, which in turn enables organisms to learn from experience. Arguably, a species that is perfectly adapted for its environment would have no need for memory, or the capacity for learning that it enables, and could get along just fine as a Cartesian stimulus-response machine. The frog’s eye could tell the frog’s brain that there’s something buglike in the environment, where it is, and what it is doing, and the frog’s brain could direct the frog’s tongue accordingly (Lettvin, Maturana, McCulloch, & Pitts, 1959). In an environment where the buglike thing actually is a bug, even memory in general would have no function. Of course, a perfectly adapted species that lacks memory, and thus a capacity to learn, would be at a distinct disadvantage if suddenly transported to a radically different environment, where the ratio of bugs to pebbles is different, because it would likely go extinct before evolution could hard-wire a new set of behavioural capacities. So, memory would seem to have a function after all: It permits the individual organism to adapt to rapid environmental change.

Intrinsic and observer-relative functions

We often ask what the function of something is, as if its function is an inherent property of the thing itself, but this is not always the case. Searle (1995) has argued that some features of the world are intrinsic, in that they exist independent of any observer; while others are observer-relative, or observer-dependent, in that they depend for their existence on the intentionality of some sentient being. To use Searle’s own example (p. 12), it is an intrinsic feature of the world that the moon causes tides and that earthquakes tend occur where

tectonic plates meet, because these statements are true or false regardless of what anyone believes. But that the moon is beautiful and that earthquakes are bad for real-estate values are observer-relative, because they are true only because there is someone who thinks so. Searle further points out that while intrinsic facts are epistemically objective, observer-relative features of the world are not necessarily epistemically subjective: It may be subjectively true that the moon is beautiful, because someone else might not share your opinion; but it is objectively true that earthquakes are bad for real-estate values—even though real-estate values themselves exist only by virtue of the intentionality of real-estate agents.

The point of all this is that functions are not always (Searle would say that they are *never*) intrinsic to objects; instead, functions are sometimes (often, always) *assigned* to objects by observers. To take another of Searle's examples: An object may be a stone, and this is an intrinsic fact about that object; and we use the stone as a paperweight, but this is a function assigned to the stone by the observer; to another observer, the stone might function as a projectile for slaying giants. William Harvey 'discovered' that the function of the heart is to pump blood, and this was surely its function before the early 17th century. But Searle points out that even this discovery of a seemingly natural function occurred only in the context of an observer-relative assignment of value—in this case, to life. Without this prior assignment of value, the causal fact that the heart pumps blood is just one of those 'brute facts of nature'.

Nature has no purpose, but people do. Some functions are agentive, because they are the uses to which intelligent agents put certain objects; other functions are nonagentive, because they refer to natural causal functions to which observers have assigned a purpose. Nonagentive functions are as close as Searle comes to agreeing that some functions are intrinsic and observer-independent. But in the final analysis, both types of functions are observer-relative features of reality. So when we ask what the function of memory is, we need to be clear about whether we are asking about its agentive or its nonagentive function—and we need to be clear about the difference.

Memory enables organisms to learn from their experience, and that is its nonagentive function. So far so good, but why do we not simply retain the knowledge acquired through learning? Why do we have to remember the learning experience as well? One answer has been offered by Klein and his associates, who have suggested that episodic memory places boundary conditions on the generic knowledge recorded in semantic memory—much as knowledge of specific category instances supplements, constrains and corrects knowledge of general category prototypes (Klein, Cosmides, Gangi, Jackson, Tooby, & Costabile, 2009; Klein, Cosmides, Tooby, & Chance, 2002). But this does not address the question of the function of autobiographical memory as I have described it here, as something more than a mere record of specific events—indeed, as a narrative which includes both the chronological and causal relations among individual events. What the hell is *that* for?

THE FUNCTIONS OF AUTOBIOGRAPHICAL MEMORY

So then, what is the function of autobiographical memory? It seems almost tautological to say that the function—the *nonagentive* function—of autobiographical memory is to permit individuals to consciously remember individual episodes of past experience, thought and action. But that is what it is, and even that function only exists in a world in

which people value the ability to remember the past—if only, *pace* Santayana, so that they will not be condemned to repeat it.

The difference between agentive and nonagentive functions is illustrated by involuntary memory. It is certainly true that involuntary memory ‘takes us out of the present’ (Rasmussen & Berntsen, 2009, p. 1). This is an action-directive function of autobiographical memory (Alea & Bluck, 2003; Bluck, 2003; Bluck & Alea, 2009). On the other hand, as Barrie noted, that is also a function of voluntary memory. In some ways, the distinction between voluntary and involuntary memory parallels that between voluntary and involuntary attention (Prinzmetal & Landau, 2008; Wundt, 1902). In either case, the nonagentive function of attention is to bring the object into conscious awareness, so we can choose to make use of the perceptual representation, or shift our attention elsewhere. Similarly, both voluntary and involuntary retrieval bring some aspect of the past into consciousness—at which point we can choose to let the event sink back into permanent storehouse of latent memory, or to use it in some way; in either case, we will have assigned it some agentive function.

Intrapersonal functions

So now let us ask what the *agentive* functions of autobiographical memory are. Given the nature of autobiographical memory, what are the uses to which sentient beings put it? Again, Baddeley got it right, at least to a first approximation. After distinguishing autobiographical memory from episodic memory in general, he noted that ‘Autobiographical memory . . . is particularly concerned with the past as it relates to ourselves as persons. . . . [It] is important because it acts as a repository for those experiences that constitute one’s self-concept. If you lose contact with your past, then presumably you lose contact with much of yourself’ (p. 13).

Of course, there is more to the self-concept than autobiographical memory (Kihlstrom, Beer, & Klein, 2002). Viewed as a knowledge structure encoded in memory (e.g. Kihlstrom & Cantor, 1984; Kihlstrom & Klein, 1994), the self includes not just episodic self-knowledge concerning the individual’s past experiences, thoughts and actions, but also semantic self-knowledge, concerning the individual’s more general traits, attitudes, physical and demographic characteristics. Semantic self-knowledge is generally spared in amnesic patients, supporting evidence from other paradigms that episodic and semantic self-knowledge are represented independently in memory (e.g. Klein & Loftus, 1993; Klein, Robertson, Gangi, & Loftus, 2008). Still, there is no doubt that autobiographical memory is an important component of the self: While semantic self-knowledge reminds us who we are, episodic self-knowledge reminds us how we got that way. Autobiographical memory also records those episodes in which we were true to ourselves, and those in which we were not. By recording those episodes, it allows us to behave the same way the next time, or not—it is up to us to determine how we will use what we remember.

Interpersonal functions

But the function of autobiographical memory is not just *intrapersonal*: It is also *interpersonal*. We do not simply rehearse our autobiographical memories to ourselves: We also share them with others, and this sharing of autobiographical memories in and of itself constitutes an important form of social interaction, binding the participants together. In a singles bar, one of the most popular pick-up lines (so I am told) is ‘Come here often?’.

Another is ‘Don’t you hate places like this?’. Both are invitations to share our personal experiences with another, as an initial step towards finding common ground (surely some evolutionary psychologist will now propose that the function of autobiographical memory is to support mating activities). The sharing of autobiographical memories is an important experience for both children and their parents—one which, interestingly, is crucial for the development of memory itself (e.g. Fivush, Berlin, Sales, Mennuti Washburn, & Cassidy, 2003; see also Ochs & Capps, 1996; Pasupathi, 2001; Thorne, 2000). How many times have we shared our memories for where we were when we learned of the Kennedy assassination, or the terror attacks of 9/11—saying, in effect, ‘I was there—Were you there too?’ (Neisser 1982/2000, 2003). How many marital spats concern the past (‘No I didn’t’ ‘Yes you did!’—not to mention the ever-popular ‘You forgot our anniversary!’). How many were resolved by the injunction to ‘forget and forgive’ (and how many actually get forgotten)?

Alea and Bluck underscore the social function of autobiographical memory in their survey of the uses to which people put autobiographical memory (Alea & Bluck, 2003). Both younger and older adults, and men and women alike, reported thinking about the past and talking about the past, in order to maintain social bonds. In fact, the social functions of autobiographical memory—introducing oneself, developing a closer relationship, strengthening a friendship, finding out what another person is like, helping someone or getting help—seem to outshine the action-directive and self-defining functions. When we enter into an intimate relationship with another person, in a very real sense their autobiographical memories become our own and *vice versa*. If the relationship ends, there typically ensues a kind of anterograde amnesia for what the other has been doing since the breakup—and, perhaps, a retrograde amnesia as well.

Amnesic patients still retain their semantic self-knowledge, but their anterograde amnesia, affecting autobiographical memory, must put severe constraints on their social relationships. Can one even have a serious relationship with someone who lacks autobiographical memory? Amnesics can acquire new preferences (Multhaup, Johnson, Phelps, Hirst, Mattes, & Volpe, 1994), but can they fall in love? I have long lamented the fact that, for all the attention given to the memory functions of H.M. and other amnesic patients, so little attention has been given to their social relationships—except by a science writer (Hilts, 1995). Here, I confess that I have always wanted to take a page from Rokeach’s (1964) book and put three amnesics together, just to see how they got along.

Traumatic memories

Krans and her colleagues argue that even the worst autobiographical memories—intrusive, vivid, unbidden memories of traumatic experiences—have an adaptive purpose (Krans, Näring, Becker, & Holmes, 2009). In their paper, they seem to be verging close to the adaptationist fallacy—assuming that even traumatic memories, because they exist, must have adaptive value in the grand evolutionary scheme of things. But they make a pretty convincing case: Traumatic memories prevent future harm, elicit social support and enhance intimacy. While this is true, it is also true that these are uses to which trauma victims can put traumatic memories, if they choose to do so. Other victims may use the same traumatic memories as reasons to avoid others or reject offers of support.

Krans et al. also argue (with Conway, Meares, & Standart, 2004) that traumatic memories also, paradoxically, protect the self. They give the example of an auto accident victim whose intrusive memory appeared to support his belief—probably incorrect, as it

turned out—that he was in control as the accident occurred. Precisely how this is adaptive is not clear: If he remembered, probably correctly, that he was *not* in control, he might not feel so guilty about the accident. An alternative possibility, from the point of view of protecting and maintaining the self-concept: That, being a professional driver, he usually is in control of events, and that this is a singular exception.

On the other hand, maybe intrusive traumatic memories have no intrinsically adaptive function: Maybe they are what they are, simply by virtue of high levels of beta-adrenergic activation (Cahill & McGaugh, 1996). Being so deeply encoded, they are hard to forget, much less actively repress (assuming that repression ever actually occurs at all); and, because they will not go away, some victims may choose to put them to positive use. The recent announcement of the discovery of a drug which might one day erase traumatic memories (Shema, Hazvi, Sacktor, & Dudai, 2009) reminds us not only of the central role played by autobiographical memory in personal identity, but also the ethical obligation to remember the past (Margalit, 2002). Even if such a drug were found to have highly selective effects, so that it could erase a victim's memory of trauma (or, for that matter, of your *faux pas* at that party last weekend) it is not at all clear that it should be used. People have a right to remember what happened to them, and they may also have an obligation to do so.

Marketing memories

Autobiographical memory can also be put to economic use, enabling people to earn a living (Baxter, 1999; Hampl, 1999). Perhaps the most amazing trend in the modern publishing world has been the proliferation of memoirs—most of which are by people of whom we are totally ignorant, and most of which sell like hotcakes (Atlas, 1996). To all appearances, the reading public prefers memoirs to works of fiction—even if the memoirs themselves prove to have been fabricated. William Grimes, inspired by the idea that all of world literature consists of just a very few basic plots, has even offered a taxonomy of memoirs: The retired-statesman (or -bureaucrat) memoir, the military memoir; memoirs of traumatic childhoods or substance abuse, illness or sexual exploitation, spiritual journey or show business; memoirs of food, or ethnic identity, or vanishing small-town America, bad jobs or bad journeys (Grimes, 2005). Grimes also writes that the work of memoirists 'may be as fundamental as breathing'. Arguably, this is because the recalling and telling of our personal stories is such a central part of both our sense of self and our relations with others. But if Dr Johnson was right that 'No man but a blockhead ever wrote, except for money', we might just as well all pay each other for putting it down on paper.

WILL MEMORY OUTLIVE ITS USEFULNESS?

An April 2008 press release from IBM predicted that 'Forgetting will become a distant memory' with the development of 'smart appliances' equipped with microphones, video cameras and memory to record, store, analyse and retrieve all the 'details of everyday life' (IBM, 2008)—apparently one further step towards the great singularity of man and machine (Kurzweil, 2005). At that point, presumably, autobiographical memory will have no function at all. Or maybe not. After all, if the great singularity happens, we will have had a rehearsal of sorts when the art of memory began to be replaced by cheap paper and moveable type. Even then, memory retained its usefulness. As Anthony Grafton notes: 'As

shelves groaned and notebooks swelled to bursting, memory remained the only thread that could lead one back through paper labyrinths to the facts and data that mattered' (Grafton, 2008, p. 77). In a world of artificial minds with infinite capacity for data storage, there will still be no substitute for human consciousness, with its capacity to remember what really matters, and forget what does not.

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