Schacter's Seven Sins of Human Memory: Implications for Record-Keeping by Organizations Owen Ambur, February 10, 2002

In *The Seven Sins of Memory: How the Mind Forgets and Remembers* (pp. 4 & 5) Daniel L. Schacter points out that "... memory's malfunctions can be divided into seven fundamental transgressions or 'sins'," as follows:

- ***Transience*** is a basic feature of memory, and the culprit in many memory problems.

- ***Absent-mindedness*** involves a breakdown at the interface between attention and memory.

- ... ***blocking*** entails a thwarted search for information ...

- ... ***misattribution*** involves assigning a memory to the wrong source ... Misattribution is far more common than most people realize, and has profound implications in legal settings.

- ... ***suggestibility*** refers to memories that are implanted as a result of leading questions, comments, or suggestions ...

- ... ***bias*** reflects the powerful influence of our current knowledge and beliefs on how we remember our pasts. We often edit or entirely rewrite our previous experiences – unknowingly and unconsciously – in light of what we now know or believe.

- ... ***persistence*** ... entails repeated recall of disturbing information or events that we would prefer to banish from our minds altogether ...

Introducing the risks associated with memory's sins, Schacter notes:

> Sometimes we remember doing things we only imagined, or recall seeing someone at a particular time or place that differs from when or where we actually encountered him ... People incorrectly claim – often with great confidence – having experienced events that have not happened. (p. 8)
>
> [Suggestibility] may well be the most dangerous of the seven sins ... Our memories are sometimes permeable to outside influences: leading questions or feedback from other people can result in suggested false memories of events that never happened. (p. 9)

Instructively, he counters the conventional wisdom concerning the operation of human memory:

> **... we tend to think of memories as snapshots from family albums that, if stored properly, could be retrieved in precisely the same condition in which they were put away. But we now know that we do not record our experiences the way a camera records them. Our memories work differently. We extract key elements from our**

> **experiences rather than retrieve copies of them. Sometimes in the process of reconstructing we add on feelings, beliefs, or even knowledge we obtained after the experience. In other words, we bias our memories of the past by attributing to them emotions or knowledge we acquired after the event.** (p. 9, emphasis added)

Schacter highlights three forms of bias (pp. 9 &10):

> ... "consistency biases" lead us to rewrite our past feelings and beliefs so that they resemble what we feel and believe now.
>
> "Egocentric biases" ... reveal that we often remember the past in a self-enhancing manner.
>
> "Stereotypical bias" influence memories and perceptions in the social world.

The last of these three is more commonly recognized than the other two. However, general recognition of the existence of stereotypical bias does not necessarily render it operationally ineffective. Indeed, it is doubtful that we could live without it. Bias is a convenient short cut that helps us overcome the frailty of human memory to deal with the complexities of reality. One aspect of reality is the weakness of the human mind in retaining information. As Schacter observes, "... transience [is] forgetting that occurs with the passage of time" (p. 11) and he goes on to note:

> **At relatively early time points on the forgetting curve – minutes, hours, and days, sometimes more – memory preserves a relatively detailed record, allowing us to reproduce the past with reasonable if not perfect accuracy. But with the passage of time, the particulars fade and opportunities multiply for interference – generally by later, similar experiences – to blur our recollections. We thus rely ever more on our memories for the gist of what happened, or what usually happens, and attempt to reconstruct the details by inference and even sheer guesswork.** (pp. 15 & 16, emphasis added)

Schacter suggests:

> ... transience is perhaps the most terrifying of the seven sins: it undermines memory's role in connecting us to past thoughts and deeds that define who we are. (p. 40)

Furthermore, he avers:

> When attempting to reconstruct past events based upon general knowledge or what usually happens, we become especially vulnerable to the sin of bias: when present knowledge and beliefs seep into our memories of past events. (p. 16)

In an observation of great import to the management of explicit as well as implicit knowledge, Schacter points out that:

> **... transience is influenced by what happens as people register or encode incoming information: more elaboration during encoding generally produces less transient memories.** (p. 26)

Explicit knowledge is that which is captured in records, persists with high fidelity over time and, thus, may be revisited, reviewed, and analyzed within its original contexts as well as within the context of new information. However, human memory and information processing capacities can easily be overwhelmed by the volume of explicit information produced and made available in the cyberage. Indeed, even with relatively simple tasks, Schater points out the relative fallibility of human memory in the short-term, along with the requisites for the operation memory over the long-term:

> ... when people were given the seemingly simple task of remembering three nonsense syllables, they forgot them almost completely in less than twenty seconds... The key to understanding the apparent anomaly lies in a crucial transition that takes place in the moments when a memory is born: from temporary or short-term memory to more permanent long-term memory. Retaining information across days, weeks, and years depends on two major forms of long-term memory.
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> Episodic memory supports remembering of personal experiences that occurred in a particular time and place ... Semantic memory allows the acquisition and retrieval of general knowledge and facts ... But a third type of memory intervenes between the moment of perception and the eventual establishment of long-lasting episodic or semantic memories. Referred to as "working memory," it holds on to small amounts of information for short periods of time – usually a few seconds.
>
> Working memory ... must constantly discard what is no longer needed at the moment, and devote its resources to the temporary storage of incoming information. Unless a special effort is made – such as repeating a sentence over and over again – information is lost from the system almost immediately after it enters. (p. 27 & 28)

These facets of the operation of human memory in retaining tacit knowledge have parallels in the operations of organizations in retaining explicit knowledge, i.e., records. For example, groupthink creates a disposition for members of organizations to fail to accept much less retain information that appears inconsistent with that which is "known" or believed within the organization. In other words, that which does not conform to the "common wisdom" may be taken as "nonsense" and quickly discarded without critical thought, much less retention and application. In most instances the results are beneficial because such inattention enables the organization to focus and bring its forces to bear on the accomplishment of its mission, in support of its shared vision. However, in some instances the effects may be catastrophic. In *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations*, Dietrich Dorner notes:

> It appears that, very early on [in evolution], human beings developed a tendency to deal with problems on an ad hoc basis... [Prehistoric tasks] were problems of the moment and usually had no significance beyond themselves. (p. 5) ... we have a strong tendency to

> visualize when we form hypotheses about the world and events that take place within it and ... our minds therefore have great difficulty grasping problems that cannot be visualized. (p. 6) Real improvements can be achieved, however, if we understand the demands that problem-solving places upon us and the errors that we are prone to make when we attempt to meet them. Our brains are not fundamentally flawed; we have simply developed bad habits. When we fail to solve a problem, we fail because we tend to make a small mistake here, a small mistake there, and these mistakes add up. (p. 7) **... real-world decision-making processes are rarely well documented, and it is hard, if not impossible, to reconstruct them. Reports on real processes ... are often unintentionally distorted or even intentionally falsified.** (p. 9, emphasis added)

Indeed, the title of the first chapter of Charles V. Ford's book is "Everybody Lies." In the introduction to *Lies! Lies! Lies! The Psychology of Deceit*, Ford asserts:

> ... lying is part of the interface between a person's internal and external worlds ... there is an internal world composed of beliefs, fantasies, and perceived realities, and there is an external world of shared beliefs, or "reality"... we lie if we deceive others as to what we believe in our personal internal world, or we engage in self-deception if we distort or change information as it passes from the external world into the internal world... lying, self-deception, and the assessment of reality are closely related to one another. (p. xii)

Ford concludes his introduction to the topic of lying by suggesting the most important lesson we can learn is how we use lies to deceive ourselves (p. xiii) – an observation that should be taken into account with reference to Dorner's conclusion:

> Failure does not strike like a bolt from the blue; it develops gradually according to its own logic... We can learn, however. People court failure in predictable ways... the sources of ... failings are often quite simple and can be eliminated without adopting a revolutionary new mode of thought. (p. 10)

While we may not need to adopt revolutionary thoughts, at least we must be able to retain that which we "learn." Moreover, as least with respect to some behaviors, it appears that human beings are very resistant to learning at all. Based upon his research, Princeton University psychologist Daniel Kahneman says:

> The thing that is striking is how little people learn... A lot of so-called mistakes are the simplifications people need to do to just get on with their lives... our attention can be switched from one thing to another, and our brains are limited.[1]

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[1] As reported in "... And the New Thinking About Money Is That Your Irrationality Is Predictable: It's Our Irrational Actions That Make Things Interesting," an article by Steven Pearlstein in the January 27, 2002, edition of *The Washington Post*, pp. H1, H4 & H5.

Aside from the limitations of our brains and whether or not revolutionary thinking is necessary, Schacter offers insight into what is required for us to commit information to longer-term memory and why we commonly fail to do so:

> Thinking and talking about experiences not only helps to make sense of the past, but also changes the likelihood of subsequent remembering. Those episodes and incidents we discuss and rehearse are protected, at least partially, from transience; those that we don't ponder or mention tend to fade more quickly. (p. 31)
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> **... a major principle for countering transience – enhance elaborative encoding – along with some tools for realizing it, have been established experimentally. The main stumbling block involves effective implementation of encoding techniques in everyday life**. (p. 36, emphasis added)

Encoding requires effort, and substantial effort may or may not be worth expending – depending upon the importance of the information in question. Just as elaborate encoding may not be justified in order to retain tacit knowledge in human memory, nor may it be warranted for explicit knowledge represented in electronic records. However, in many instances the value of any particular kernel of knowledge at any point in the future may not be known at the exact point when it is perceived and must be encoded in order to be retained. Moreover, unlike the retention of tacit knowledge, which depends solely upon the ability and motivation of the individual, the retention and use of explicit knowledge is of vital importance to the ability of groups of people to work effectively together in organizations. Equally important, the ability of external stakeholders to objectively assess the integrity of the behavior and the effectiveness of the performance of individuals within organizations is entirely dependent upon the availability and usability of records.

Schater defines the sin of absent-mindedness as:

> lapses of attention that result in failing to remember information that was either never encoded properly (if at all) or is available in memory but overlooked at the time we need to retrieve it. (p. 42)

That which is not recorded cannot be recalled and that which is recorded but not properly encoded cannot be recalled when needed. Such information is effectively lost. To have utility, information must be available when, where, and in the form needed. Otherwise it is valueless. Worse yet, its value may be negative because it clutters the mind and/or organizational filing system and, thus, inhibits the perception, encoding, retrieval, and use of other information. The impact of being overloaded with poorly encoded information is cumulative because it inhibits not only the retrieval and use of previously recorded information but also the recording and encoding of new information. Our minds and organizational files are filled with information with which we are vaguely familiar but whose relevance and importance we may not appreciate in a timely

manner. Yet we may be forced to deal with it at inopportune times, thereby distracting us from more productive pursuits. As Schacter notes:

> ... dividing attention during encoding has a drastic effect on subsequent recollection, and has little or no effect on familiarity. This phenomenon probably happens because divided attention prevents us from elaborating on the particulars that are necessary for subsequent recollection, but allows us to record some rudimentary information that later gives rise to a sense of familiarity. (pp. 44 & 45)
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> Attentional lapses that yield absent-minded forgetting are particularly likely for routine activities that do not require elaborative encoding... "Operating on automatic" provides us with the cognitive freedom to focus on unrelated matters as we perform what once was an attention-consuming task... But automaticity has a cost: the virtual absence of recollection for activities that were performed "on automatic." (p. 46)

Contrary to the cost of "automaticity" with respect to the retention of tacit knowledge, however, to the degree that electronic systems are used to conduct business, the necessary encoding for timely retrieval can be largely, if not fully automated. As Schacter notes, "... sophisticated electronic devices are now available to help us **record** and plan our future action. (p. 59, emphasis added) Indeed, automated collection and association of metadata with E-records frees up the processing capacities of the human mind for attention to higher-level tasks. Schacter highlights that there are two types of memory-dependent tasks: "Event-based prospective memory involves remembering to carry out a task when a specific event occurs... Time-based prospective memory ... involves remembering to carry out an action at a specific time in the future." (pp. 51 & 52)

Computers are particularly good at keeping track of time and, to the extent that events can automatically be recorded, computers can readily prompt humans to act in response to them as well. Schacter points out: "The best prospective memory triggers tend to be highly distinctive cues that have few other associations in long-term memory, and hence are not likely to remind us of irrelevant information." (p. 52)

Fortunately, just as there are techniques to enhance the effectiveness of encoding of tacit knowledge for retention in human memory, so are there tools that can be used to encode records for future retrieval. Specifically speaking, electronic document management systems can assist with "elaborative encoding" of the records that we create in the routine course of our business and, increasingly, our social processes. In terms of document management, "encoding" means associating metadata with each record. Metadata is information about information, such as the information in a library card catalog. Just as we determine which books may be of interest to use by scanning bibliographic information about them, relevant records are distinguished from those which are less so by the application and use of metadata. However, the information that is available at any point in time to assist in the retrieval of relevant information is dependent upon encoding processes that occurred in the past, and as Schacter notes, those efforts may be

inadequate in the present context:

> When we write a note to ourselves, all the surrounding information is available in working memory, so the reminder seems perfectly adequate. But ... the reminder that seemed self-evident when related information was available in working memory becomes a cryptic – and frustrating – puzzle when that information has faded with time. **To aid future recall, we need to transfer as many details as possible from working memory to written reminders.** (p, 53)

In other words, not only do we need to record as much information as possible in explicit records but we also need to associate as much metadata as possible with those records. Fortunately, most, if all not all of the information necessary to facilitate subsequent retrieval and use of information is known at the time it is created and processed, and if electronic document/records management systems are used, the necessary metadata can be captured automatically. However, as Schacter notes: "... we often merely admonish ourselves to remember to carry out a task at a future time, rather than generating concrete cues or reminders that will help us do so." (p. 56) In other words, we pay mental lip service to the need while failing to take the necessary action, i.e., we fail to create the necessary records and to capture and associate the appropriate elements of metadata with those records. The result is predictable and the way to avoid it is clear. As Schacter points out:

> Because prospective memory so heavily depends upon the availability of cues that trigger intended actions, the most effective way to counter absent-minded prospective memory failures is to develop effective external memory aids. The most effective such cues pass two key criteria: they are sufficiently informative, and are available at the time an action needs performing. (p. 58)

Metadata is key not only to retrieving information but also to avoiding recall of that which is irrelevant or untimely, for as Schacter notes, there is a cost associated with such information:

> ... the act of retrieving information from memory can inhibit subsequent recall of related information. (p. 81)

> ... whenever we selectively retrieve some memories in response to a particular cue, but not others, inhibition of the nonretrieved information occurs. (p. 82)

> For Arnaud ... deja vu had nothing to do with either the paranormal or partial memories of a similar past episode. Instead, he characterized it as a kind of bad judgment: misattribution of current sensations and experiences onto the past. (p. 89)

In other words, not only is inadequate encoding responsible for many memory retrieval failures but it also contributes to false and distorted memories. Indeed, Schacter says:

> ... misattributions in remembering are surprisingly common. Sometimes we remember events that never happened, misattributing speedy processing of incoming information, or

> vivid images that spring to mind, to memories of events that did not occur. Sometimes we recall correctly what happened, but misattribute it to the wrong time or place. And at other times misattribution operates in a different direction: We mistakenly credit a spontaneous image or thought to our own imagination, when in reality we are recalling it – without awareness – from something we read or heard ... misattribution can alter our lives in strange and unexpected ways. (pp. 90 & 91)

And, as Schacter points out, the consequences can be severe:

> How many times have ... misattributions produced inaccurate eyewitness testimony leading to conviction of an innocent person? Nobody knows for sure, but consider two facts. First, according to estimates made in the late 1980s, each year in the United States more than seventy-five thousand criminal trials were decided on the basis of eyewitness testimony. Second, a recent analysis of forty cases in which DNA evidence established the innocence of wrongfully imprisoned individuals revealed that thirty-six of them (90 percent) involved mistaken eyewitness identification. (p. 92)

Schacter addresses several types of misattribution:

> "unconscious transference" [occurs when] a witness ... incorrectly attributes a face's familiarity to the wrong source because he unconsciously transfers memory of the individual from one context to another. (p. 92)

> Source confusions are sometimes attributable to bonding failure: at the time an event occurs, an action or object is not properly bound to a particular time and place. Binding failures may also contribute to memory confusions between events we actually experience and those we only think about or imagine. (p. 94)

> Binding failures can also result in a striking illusion known as "memory conjunction error." ... [Pieces of a name or face are] remembered correctly ... but mistakenly combined ... into a new one. (p. 95)

And he notes:

> Source misattributions and memory conjunction errors can also occur because of faulty memory retrieval processes. (p. 96)

> A strong sense of general familiarity, together with an abundance of specific recollections, adds up to a lethal recipe for misattribution. (p. 97)

> ... witnesses tend to rely on relative judgments: they choose the person who, relative to others in the lineup, looks the most like the suspect. The problem is that even when the suspect is not in the lineup, witnesses still tend to choose the person who looks the most like him. Witnesses rely on general similarities between a face in the lineup and the actual culprit, even when they lack specific recollections. (p. 97)

In other words, witnesses rely upon their best guesses and those guesses are highly influenced by many factors other than truly objective assessments of their perceptions of physical reality. Moreover, in terms of the inner workings of our minds, human beings are apparently not well

wired to discern the differences between true and false memories. As Schacter points out, experimental evidence indicates:

> Brain activity was, overall, remarkably similar during true and false recognition: a network of regions showed heightened activity regardless of whether people were claiming to remember words they had heard previously or [associated words] they only thought they had heard. (p. 99)

There is some cause for hope in that:

> ... results suggest that misattributions can be mitigated by encouraging people to base their memory decisions on specific recollections, rather than relying on overall familiarity. (p. 102)

However, Schacter cautions:

> We often need to sort out ambiguous signals, such as feelings of familiarity or fleeting images, that may originate in specific past experiences, or arise from subtle influences in the present. Relying on judgment and reasoning to come up with plausible attributions, we sometimes go astray. **When misattribution combines with another of memory's sins – suggestibility – people can develop detailed and strongly held recollections of complex events that never occurred**. (p. 111, emphasis added)

In short, people know what they know and, in some cases, may be unlikely to be dissuaded by the facts. On the other hand, in other instances, we are also prone to be too easily persuaded to change our recollections. As Schacter notes:

> Suggestibility in memory refers to an individual's tendency to incorporate misleading information from external sources – other people, written materials or pictures, even the media – into personal recollections. Suggestibility is closely related to misattribution in the sense that the conversion of suggestions into inaccurate memories must involve misattribution. However, misattribution often occurs in the absence of overt suggestion, making suggestibility a distinct sin of memory. (p. 113)

Interestingly but disturbingly, Schacter observes:

> ... misleading suggestions ... can create false memories of an event **even when people recall that the misinformation was suggested**... when suggestive questioning is used, **memories for an original event may be altered even when people realize that the interrogator mentioned a critical bit of information**. (p. 115, emphases added)

In other words, we may be unwitting accomplices in our brainwashing, *even if we know we are being subjected to propaganda*! It is as if our minds are ill-equipped for continuous reality-checking, so we succumb to falsehood despite the fact we know that it is false. Indeed, Schacter notes that suggestibility even causes people put themselves at risk of incarceration, when:

> ... in a subset of false confessions – nobody knows exactly how many – people develop a false belief that they committed a crime. (p. 120) ... some individuals may be especially prone to false confessions because they are easily suggestible... "interrogative suggestibility" [is] the tendency to change claims about the past in response to misleading information and suggestive questions. (p. 122)

In an interesting play on the cliche that "a single picture is worth a thousand words," Schacter points out:

> Hyman's results implicate visual imagery as a culprit in suggested memories. People in studies who produced false memories of childhood experiences scored higher on scales that measure vividness of visual imagery than did individuals whose recollections were more accurate... If imagery is a kind of mental signature of true recollections, then embellishing a false memory with vivid mental images should make it look and feel like a true memory. (p. 125)

Dreams may be a source of highly vivid mental images, and the boarder between dreams and reality seems to be tenuous and subject to suggestibility, as Schacter notes:

> ... when they were again asked about early experiences two weeks after having their dreams interpreted, the majority now claimed to remember one or more of the three suggested experiences for which they had previously denied any memory. (p. 126)

Indeed, apparently it is not even necessary for a person to have dreamed something in order to come to believe it to be true. Schacter cites research evidence indicating:

> The mere suggestion that participants should expect to recall something from the first day of life was sufficient to lead half of an otherwise ordinary sample of introductory psychology students to believe that they had recovered a patently preposterous memory. (p 128)

Schacter drives home an important point:

> **Suggestibility's pernicious effects highlight the idea that remembering the past is not merely a matter of activating or awakening a dormant trace or picture in the mind, but instead involves a far more complex interaction between the current environment, what one expects to remember, and what is retained from the past. Suggestive techniques tilt the balance among these contributors so that present influences play a much larger role in determining what is remembered than what actually happened in the past.** (p. 129, emphasis added)

And he highlights a hopeful outcome from recognition of the dynamics associated with the sin of suggestibility:

> **By revealing just how permeable to suggestions our recollections can be, the new studies provide weapons that can allow society to better protect the integrity of memory from external influences that, if left unchecked, are likely to corrupt it.** (p. 137, emphasis added)

Turning to the sin of bias, Schacter references George Orwell's famous novel, *1984,* and says:

> ... forces that resemble the Ministry of Truth ... operate in our individual minds: our memories of the past are often rescripted to fit with our present views and needs. The sin of bias refers to distorting influences of our present knowledge, beliefs, and feelings on new experiences or our later memories of them. (p. 138)

Delving more deeply into the topic of bias, he notes:

> Five major types of biases illustrate the ways in which memory serves its masters. Consistency and change bias show how our theories about ourselves can lead us to reconstruct the past as overly similar to, or different from, the present. Hindsight biases reveal that recollections of past events are filtered by current knowledge. Egocentric biases illustrate the powerful role of the self in orchestrating perceptions and memories of reality. And stereotypical biases demonstrate how generic memories shape interpretation of the world, even when we are unaware of their existence or influence. (pp. 138 & 139)

Schacter cites Leon Festinger's theory of cognitive dissonance and suggests that it may play a potent role in memory, even if we are unaware of the source of our discomfort:

> **Consistency and change biases may help to reduce what social psychologists call "cognitive dissonance" – the psychological discomfort that results from conflicting thoughts and feelings. People will go to great lengths to reduce cognitive dissonance... Dissonance reduction can occur even when people don't recall the event that is responsible for the dissonance... a variety of dissonance-reducing operations, including consistency and change bias, occur even when people have limited awareness of the source of the conflicts they are trying to manage.** (p. 144, emphasis added)[2]

He suggests that mis-reconstruction of the past is as much the rule as it is an exception to the rules of operation of human memory:

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[2] See also my March 15, 2000, presentation to the Northern Virginia chapter of ARMA International, in which I posited the reduction of cognitive dissonance as a motivation for the failure of organizations to keep good records. The presentation is available at http://ambur.net/ARMA/index.html. See especially http://ambur.net/ARMA/sld016.html.

> **Hindsight bias ... is ubiquitous: people seem almost driven to reconstruct the past to fit what they know in the present.** In light of the known outcome, people can more easily retrieve incidents and examples that confirm it. Recent evidence links this
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> selective recall to the combined influence of two forces: general knowledge that influences the perception and comprehension of events, and vulnerability to misattribution. (p. 147, emphasis added)

Not only does bias affect recollection of past events but it may also hinder our ability to learn from present experiences, particularly when protection of ego is at issue:

> **Hindsight biases are worrisome insofar as they can reduce or even prevent learning from experience**: if we feel that we knew all along what would happen, then we may be less inclined to profit from the lessons a particular incident can teach us. But at the same time, the comforting sense that we always knew the way things would turn out makes us feel good about ourselves, inflating our estimates of our own wisdom and prescience.**.. self-enhancing biases are pervasive features of attempts to reconstruct the personal past.** (p. 149, emphases added)
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> ... people are commonly subject to "positive illusions" characterized by inflated estimates of self-worth... The self's preeminent role in encoding and retrieval, combined with a powerful tendency for people to view themselves positively, creates fertile ground for memory biases that allow people to remember past experiences in a self-enhancing light. (p. 151)

It is understandable and perhaps excusable that we would selectively look for ways to enhance our own self-images. However, as Schacter notes we also apply our biases to other people as well as to objects in the world, not entirely without justification but certainly at some risk:

> Stereotypes are generic descriptions of past experiences that we use to categorize people and objects. Many social psychologists think of stereotypes as "energy-saving" devices that simplify the task of comprehending our social world. (p. 153)
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> Considered in statistical terms that apply to groups of people ... stereotypical biases are not necessarily erroneous. The problem arises because people are sometimes willing to act on these biases in cases in which they are entirely unwarranted, resulting in ... "guilt by association" rather than "guilt by behavior" ... (p. 155)
>
> ... congruity bias is especially likely to occur when people hold strong stereotypes about a particular group... Stereotype bias also tends to occur when we don't make an effort to consider an individual's particular characteristics because we are mentally preoccupied with other matters... **When events unfold in a way that contradicts our expectations based on stereotypes and related knowledge of the world, we may be biased to fabricate incidents that never happened in order to bring our memories in line with our expectations**. (p. 156, emphasis added)

Needless to say, such fabrications depend upon our ability to insulate ourselves from reality, which in turn depends upon the lack of authoritative records that are subject to our attention at the time we render our memories and our judgments about them. Schacter offers a number of observations about the workings of our brains as they encounter stimuli from the external world:

> ... the left brain contains an "interpreter" that is continually drawing on general knowledge and past experience to try to bring order to our psychological worlds. These activities can produce memory bias. (p. 158) The left brain relies on inferences, rationalizations, and generalizations as it tries to relate past and present, and in so doing probably also contributes to consistency, change, hindsight, and egocentric biases. The interpreter may help to confer a sense of order in our lives, allowing us to reconcile our present attitudes with our past actions and feelings, generating a comforting sense that we always knew how things would turn out, or enhancing our opinions of ourselves. But it also has the potential to lead us down the path of delusion. If the facile explanations and rationalizations offered by the interpreter generate powerful biases that prevent us from seeing ourselves in a realistic light, we are clearly at risk for repeating past failures in the future. (p. 159) Fortunately, the left brain interpreter is balanced by systems in the right hemisphere that are more attuned to the constraints of the external world. (p. 159)

Schacter's own scholarly experience leads him to the somewhat defeatist conclusion:

> ... various forms of bias are so deeply embedded in human cognition that few good remedies exist for overcoming them altogether. Perhaps the best we can do is to appreciate that current knowledge, beliefs, and feelings can influence our recollections of the past, and shape our impressions of people and objects in the present. (p. 160)

That may be true in terms of purely social interactions and the so-called "tacit knowledge" that resides in the minds of individual human beings. However, when it comes to business transactions and the organizations we form to carry them out – including the business of "We the People" – we can do much better than Schacter implies: Instead, we can have clear and complete records of what actually transpired, as well as the context in which it occurred. Indeed, with highly automated electronic information systems and rapidly declining storage costs for electronic records, perhaps the only reason that any organization would not have clear and complete records of its activities is the desire of its officials not to be held accountable for their actions (and inactions). A more charitable way of saying the same thing is that maintaining good records may simply not be a priority for those empowered to establish organizational goals. As Schacter notes:

> When we relate a current experience to short- or long-term goals, we engage in a kind of reflection and analysis – elaborative encoding – that promotes subsequent memory for experiences. (p. 163)

In other words, the memory that best serves the interests of those in power is that which they construct and "elaborate" for themselves in their own minds, unencumbered by records generated by the business processes in which they are engaged. Records restrict the ability of people to

elaborate reality to their own advantage, not only in their own remembrances but also, if they are charismatic or powerful enough, in the images they impress upon the minds of others as well.[3] With reference to short- and long-term goals, it is noteworthy that the Government Performance and Results Act (GPRA) requires the leaders of U.S. federal agencies to consult with their stakeholders, establish long-term goals and annual performance objectives, and measure and report progress in attaining their objectives. The process mandated by GPRA is analogous to the memory process highlighted by Schacter, in that stakeholder consultation parallels the internal, mental processes of reflection and analysis. Unfortunately, however, few if any agencies have drawn the connection between those processes and the need to elaboratively encode (i.e., associate elements of metadata) with the records they are creating in their business processes. And without such metadata, not only is it impossible for stakeholders to assess how well agencies are carrying out their missions but, just as memory fails us, it is also difficult for agencies merely to retrieve their own records when needed to support ongoing business processes, much less to be able to see the broader picture framed by those records. Thus, it should not be surprising that many agencies seem to lurch from one crisis to another, focusing on that which seems "urgent" rather than that which may truly be important. It is a dynamic which, again, is highly analogous to another feature of human memory highlighted by Schacter: "[In a phenomenon called] 'weapon focus' ... [t]he emotionally arousing object draws attention automatically, leaving few resources to help encode the rest of the scene." (p. 164) If we spend disproportionate time and attention focusing on narrow but urgent facets of reality, it is inevitable that we will miss more important features of the bigger picture, thereby leading to repeated failures. In his treatise on the causes of failure, Dorner says:

> Conflicts between importance and urgency often arise... Becoming conscious of such conflicts is usually all we need to do to resolve them. When we are pressed for time, however, we can lose sight of the importance and urgency of the individual problems in our bundle, and then we revert to" muddling through," focusing on urgent but often unimportant problems and ignoring the truly important ones. (p. 56)

Misdirected attention compounded by repeated failure is likely to lead to one or both of two outcomes: denial of reality and/or diminished ego, leading in turn to defensiveness and further attempts to deny reality, such as by discounting the evidence contained in records. Relative to ego, Schacter points out that:

> Psychologists refer to the compilations of past experiences that influence our current evaluations as "self-schemas." Built up over years and decades, self-schemas contain evaluative knowledge of our own characteristics. (p. 168)
>
> ... people with a "ruminative" style, who focus obsessively on their current negative moods and past negative events, are at special risk for becoming trapped in ... destructive

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[3] For a discussion of social power, see http://ambur.net/French&Raven.htm
See also reference to "groupthink" at http://ambur.net/Cult&Tech.htm.

> self-perpetuating cycles. (p. 170)
>
> Women ruminated by asking questions about why they were depressed, thereby activating a wealth of negative memories: past experiences in which they felt inadequate or otherwise saw themselves in a negative light. These negative memories further deepened an already black mood, leading to more prolonged and painful depression. By fleeing into distracting activities, men escaped the downward spiral. (p. 171)

However, he notes:

> It is important to distinguish between ruminating about a painful experience and disclosing it to others... Disclosing difficult experiences to others ... can have profoundly positive effects... by writing or talking ... for several days... narratives the people create produce surprising benefits: more positive mood, enhanced immune system functions, fewer visits to the doctor, higher grade point averages, reduced absenteeism at work, and even higher rates of reemployment following job loss. (p. 171)

Of course, there may be a fine line between disclosing our thoughts and experiences versus engaging in perseveration, particularly if our thoughts lack clarity and specificity. Schacter notes: "Patients suffering from suicidal depression may have difficulty coming up with coherent narratives because they persistently recall and ruminate over ... 'overgeneralized memories'." (p. 171) On the other hand, proffers:

> Repetition of just about any stimulus or experience will result in what researchers call *habituation* – a reduced physiological response to the stimulus. (p. 177)
>
> [In] "testimony therapy" ... survivors retell and relive their traumatic experiences, and try to relate them to traumas suffered by others in their society... "where the survivors explicitly understand that their remembrances are becoming part of a collective inquiry ... testimony can reduce individual suffering, even when survivors have not explicitly sought trauma treatment." (p. 178)
>
> ... concerning the beneficial effects of disclosing disappointments, losses, and other negative experiences. In the short term, persistence is a virtually inevitable consequence of difficult experiences. But for the long term, confronting, disclosing, and integrating those experiences we would most like to forget is the most effective counter to persistence. (p. 178)

While simply talking about problems may be sufficient for some people to "integrate" those experiences and thereby avoid being overcome by them, talk is no substitute for action – particularly as far as large organizations are concerned. Moreover, due to the password effect, differing motivations among the people making up the organization, etc., talk is no substitute for complete and authoritative records of the activities of the organization. Schacter unapologetically suggests:

> ... it is a mistake to conceive of the seven sins as design flaws that expose memory as a fundamentally defective system. To the contrary, ... the seven sins are products of otherwise adaptive features of memory, a price we pay for processes and functions that serve us well in many respects. (p. 184)

However, what may be understandable, acceptable, and even necessary in our social lives as individuals may entirely unnecessary and unacceptable for the organizations we form to overcome our inadequacies as individuals. That is true with respect to the larger corporate bodies we form to carry out complex and important business processes, and it is especially important in the case of government agencies having the power to coerce action under the power and penalty of law. Schacter argues:

> Transience – forgetting over time ... has an adaptive side. Forgetting can be frustrating, but it is often useful and even necessary to dismiss information that is no longer current... information that is unimportant or no longer needed will tend not to be retrieved and rehearsed, thereby losing out on the strengthening effects of post-event retrieval and becoming gradually less accessible over time. (p. 187)
>
> A system the renders information less accessible over time is ... highly functional, because when information has not been used for longer and longer periods of time, it becomes less and less likely that it will be needed in the future. On balance, the system would be better off setting aside such information – and transience leads to exactly that outcome. (p. 188)

However, it is also true that those who fail to learn from the past may be condemned to re-live it, and what may be acceptable for individuals is not acceptable for organizations, corporate bodies, and government agencies. Moreover, information technology now embodies the potential to automate the process Schacter describes. For example, the number of times Web pages are accessed can be automatically counted. Records that are frequently accessed can be duplicated and "cached" to storage facilities that are distributed around the world so as to facilitate rapid retrieval and reduce needless traffic over the network. Finally, records that are due to be eliminated based upon legal requirements or other factors can be automatically destroyed (provided they have not been duplicated in an uncontrolled manner, e.g., being printed on paper, distributed via E-mail, etc.)

Turning to the sin of blocking, Schacter notes:

> Some types of blocking reflect the operation of inhibitory processes that render information inaccessible ... inhibition is a fundamental feature of the nervous system: the brain relies on mechanisms that reduce activity as much as mechanisms that intensify it. (p. 189)
>
> [Without such inhibitory mechanisms] it would be a bit like using an Internet search engine, typing in a word that has many matches in a worldwide database, and then sorting through the thousands of entries that the query elicits. We wouldn't want a memory

system that produces that kind of data overload. (p. 190)

Just as inhibition of the retrieval of information is essential for operation of the human mind, blocking can be very useful in organizations as well – such as, for example, when corporate officials choose to plead the Fifth Amendment to the Constitution in order to avoid self-incrimination. (Reference the bookkeeping practices and subsequent failure of Enron.) Certainly, information overload is a major problem not only for individuals but also organizations in the cyberage. However, unlike the mind, whose features are limited by evolution that occurs very slowly over eons, organizations have the benefit of technology that is improving at cyberspeed. Indeed, for organizations – including the organization known alternatively as "Uncle Sam" or "We the People" – the librarian's tradeoff between precision and recall is now a false choice. If records are appropriately "elaboratively endcoded" with metadata that is commonly known during the routine course of the business process, it becomes possible to recall *exactly* those records that are needed, exactly *when* they are needed, and *only* those records.

As Schacter notes, elaborative encoding is required to avoid the sin of absent-mindedness:

> Absent-minded errors occur in part because establishing a rich memory representation that can later be recollected voluntarily requires attentive, elaborative encoding. Events that receive minimal attention and elaboration as they are occurring also stand little chance of being recollected subsequently... An elaboration dependent system ensures that only those events that are important enough to warrant extensive encoding have a high likelihood of subsequent recollection. (p. 190)

> When we can perform routine tasks by relying on automatic processes, we are free to devote attention to more consequential matters. (p. 191)

That's one of the beauties of modern electronic document/records management technology: Most, if not all of the encoding (metadata) required to facilitate retrieval can be captured automatically. Continuing his argument that the weaknesses of human memory are features of its strengths, Schacter says:

> The "less is more" principle also applies to two of the sins involving memory distortions: misattribution and suggestibility. (p. 191)[4]

> ... what would be the consequences and costs of retaining the myriad of contextual details that define our numerous daily experiences? ... We seldom need to remember all the precise sensory and contextual details of our every day experience. Would an adaptive system routinely record all such details as a default option, or would it carefully record such details only when circumstances warn that they may later be needed? Our memories

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[4] An interesting form of misattribution cited by Schacter is *cryptomnesia*, unintentional plagiarism, whereby an author quotes another verbatim without realizing it. (p. 191)

> operate on the latter principle, and most of the time we are better off for it. We pay the price, however, when we are required to recollect detailed source information about an experience that did not elicit any special effort to encode source details. (pp. 191 & 192)

Schacter's observations are consistent with those of Donald Norman in *The Psychology of Everyday Things (POETS)*. Norman noted that precise information is frequently not required because behavior that approximates the norm is good enough for the routine affairs of life. (p. 55) Schacter continues:

> ... the ability to remember the gist of what happened is also one of memory's strengths: we can benefit from an experience even when we do not recall all of its particulars... Memory for gist information is fundamental to such abilities as categorization and comprehension, allowing us to generalize across and organize our experiences... We need to notice and retain the recurring features ... and ... ignore the idiosyncratic details... generalization ... "is central to our ability to act intelligently." Yet ... "such generalization gives rise to distortions as an inherent by-product." (p. 193)
>
> False recognition is, in part, a price we may pay for the benefit of generalization. (p. 193)
>
> Though stereotypes can produce ... undesirable consequences, they also make our cognitive lives more manageable by promoting generalizations that, on average, are reasonably accurate. (p. 194)

From an egocentric point of view, one of the benefits Schacter cites is: "... bias often results in memories that depict the self in an overly favorable light." (p. 194) In turn, "Remembering the past in an overly positive manner may encourage us to meet new challenges by promoting an overly optimistic view of the future." (p. 194) On the other hand, Schacter acknowledges:

> The irritation of absent-minded errors, the momentary frustration of blocking, and the potentially shattering consequences of eyewitness misidentifications and false memories resulting from misattribution or suggestibility all have the power to disrupt our lives, temporarily or permanently. (p. 204)

Nonetheless, he concludes:

> The seven sins are not merely nuisances to minimize or avoid. They also illuminate how memory draws on the past to inform the present, preserves elements of present experience for future reference, and allows us to revisit the past at will. Memory's vices are also its virtues, elements of a bridge across time which allows us to link the mind to the world. (p. 206)

However, what may be good enough to serve the whims of our own egos as individual human beings is not good enough to support the activities of the organizations we form to serve our collective interests. In particular, embracing the "seven sins" as virtues is not sufficient to uphold the interests of "We the People" in the actions of our Government. It is not merely a matter of whether we will be doomed to re-live the mistakes of the past, but also whether the

“past” is more than a figment of our imaginations, quite literally speaking. If we fancy ourselves as higher-order animals, we owe ourselves more than that. We owe ourselves a record that is clear and sufficiently comprehensive to ensure that no important meaning is lost and left to chance.