**The Seven Sins of Memory**

Seven different ways that memory can mess with your head and your life, and ways to identify them.

By Daniel Schacter, published on May 1, 2001 - last reviewed on March 1, 2011



In Yasunari Kawabata's unsettling short story, *Yumiura*, a novelist receives an unexpected visit from a woman who says she knew him 30 years earlier. They met when he visited the town of Yumiura during a harbor festival, the woman explains. But the novelist cannot remember her. Plagued recently by other troublesome memory lapses, he sees this latest incident as a further sign of mental decline. His discomfort turns to alarm when the woman offers more revelations about what happened on a day when he visited her room. "You asked me to marry you," she recalls wistfully. The novelist reels while contemplating the magnitude of what he had forgotten. The woman explains that she had never forgotten their time together and felt continually burdened by her [memories](https://www.psychologytoday.com/basics/memory) of him.

After she finally leaves, the shaken novelist searches maps for the town of Yumiura with the hope of triggering recall of the place and the reasons why he had gone there. But no maps or books list a town called Yumiura. The novelist then realizes that he could not have been in the part of the country the woman described at the time she remembered. Her detailed, heartfelt and convincing memories were entirely false.

Kawabata's story dramatically illustrates different ways in which memory can get us into trouble. Sometimes we forget the past and at other times we distort it; some disturbing memories haunt us for years. Yet we also rely on memory to perform an astonishing variety of tasks in our everyday lives. Recalling conversations with friends or recollecting family vacations; remembering appointments and errands we need to run; calling up words that allow us to speak and under stand others; remembering foods we like and dislike; acquiring the knowledge needed for a new job -- all depend, in one way or another, on memory. Memory plays such a pervasive role in our daily lives that we often take it for granted until an incident of forgetting or distortion demands our attention.

Memory's errors have long fascinated scientists, and during the past decade they have come to occupy a prominent place in our society. Forgotten encounters, misplaced eyeglasses and failures to recall the names of familiar faces are becoming common occurrences for many adults who are busily trying to juggle the demands of work and family, and cope with the bewildering array of new communications technologies. How many passwords and "PINs" do you have to remember just to manage your affairs on the Internet, not to mention your voice mail at the office or on your cell phone?

In addition to dealing with the frustrations of memory failures in daily life, the awful specter of [Alzheimer's disease](https://www.psychologytoday.com/conditions/alzheimers-disease) looms large on the horizon. As the general public becomes ever more aware of its horrors, the prospects of a life dominated by catastrophic forgetting further increase our preoccupations with memory.

Although the magnitude of the woman's memory distortion in Yumiura seems to stretch the bounds of credulity, it has been equaled and even exceeded in everyday life. Consider the story of Binjimin Wilkomirski, whose Holocaust memoir, *Fragment*s, won worldwide acclaim for portraying life in a [concentration](https://www.psychologytoday.com/basics/attention) camp from the perspective of a child. Wilkomirski presented readers with raw, vivid recollections of the unspeakable terrors he witnessed as a young boy. Even more remarkable, Wilkomirski had spent much of his adult life unaware of these [traumatic](https://www.psychologytoday.com/basics/trauma) [childhood](https://www.psychologytoday.com/basics/child-development) memories, only becoming aware of them in [therapy](https://www.psychologytoday.com/basics/therapy). Because his story and memories inspired countless others, Wilkomirski became a sought-after international figure and a hero to Holocaust survivors.

The story began to unravel, however, when Daniel Ganzfried, a Swiss journalist and himself the son of a Holocaust survivor, published a stunning article in a Zurich newspaper. Ganzfried revealed that Wilkomirski is actually Bruno Dossekker, a Swiss native born in 1941 to a young woman named Yvone Berthe Grosjean, who later gave him up for adoption to an orphanage. His foster [parents](https://www.psychologytoday.com/basics/parenting), the Dossekkers, found him there. Young Bruno spent all of the war years in the safe confines of his native Switzerland. Whatever the basis for his traumatic "memories" of Nazi horrors, they did not come from childhood experiences in a concentration camp. Is Dossekker/Wilkomirski simply a [liar](https://www.psychologytoday.com/basics/deception)? Probably not: he still strongly believes his recollections are real.

Memory's errors are as fascinating as they are important. They can be divided into seven fundamental transgressions or "sins," which I call transience, absentmindedness, blocking, misattribution, suggestibility, [bias](https://www.psychologytoday.com/basics/bias) and persistence. Just like the ancient seven deadly sins -- pride, [anger](https://www.psychologytoday.com/basics/anger), [envy](https://www.psychologytoday.com/basics/jealousy), greed, gluttony, lust and sloth -- the memory sins occur frequently in everyday life and can have serious consequences for all of us.

Transience, absentmindedness and blocking are sins of omission: we fail to bring to mind a desired fact, event or idea. Transience refers to a weakening or loss of memory over time. It is a basic feature of memory, and the culprit in many memory problems. Absentmindedness involves a breakdown at the interface between attention and memory. Absentminded memory errors -- misplacing your keys or eyeglasses, or forgetting a lunch appointment -- typically occur because we are preoccupied with distracting issues or concerns, and don't focus attention on what we need to remember.

The third [sin](https://www.psychologytoday.com/basics/ethics-and-morality), blocking, entails a thwarted search for information we may be desperately trying to retrieve. We've all had the experience of failing to produce a name to a familiar face. This frustrating experience happens even though we are attending carefully to the task at hand, and even though the desired name has not faded from our minds -- as we become acutely aware when we unexpectedly retrieve the blocked name hours or days later.

The next four sins of misattribution, suggestibility, bias and persistence are all sins of commission: some form of memory is present, but it is either incorrect or unwanted. The sin of misattribution involves assigning a memory to the wrong source: mistaking fantasy for reality, or incorrectly remembering that a friend told you a bit of trivia that you actually read about in a newspaper. Misattribution is far more common than most people realize, and has potentially profound implications in legal settings. The related sin of suggestibility refers to memories that are implanted as a result of leading questions, comments or suggestions when a person is trying to call up a past experience. Like misattribution, suggestibility is especially relevant to -- and sometimes can wreak havoc within -- the legal system.

The sin of bias reflects the powerful influences 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. The result can be a skewed rendering of a specific incident, or even of an extended period in our lives, that says more about how we feel now than about what happened then.

The seventh sin -- persistence -- entails repeated recall of disturbing information or events that we would prefer to banish from our minds altogether: remembering what we cannot forget, even though we wish that we could. Everyone is familiar with persistence to some degree: Recall the last time you suddenly awoke at 3 a.m., unable to keep out of your mind a painful blunder on the job or a disappointing result on an important exam. In more extreme cases of serious [depression](https://www.psychologytoday.com/conditions/depressive-disorders) or traumatic experience, persistence can be disabling and even life-threatening.

New discoveries, some based on recent breakthroughs in [neuroscience](https://www.psychologytoday.com/basics/neuroscience) that allow us to see the brain in action as it learns and remembers, are beginning to illuminate the basis of the seven sins. These studies allow us to see in a new light what's going on inside our heads during the frustrating incidents of memory failure or error that can have a significant impact on our everyday lives. But to understand the seven sins more deeply, we also need to ask why our memory systems have come to exhibit these bothersome and sometimes dangerous properties: Do the seven sins represent mistakes made by Mother [Nature](https://www.psychologytoday.com/basics/environment) during the course of evolution? Is memory flawed in a way that has placed our species at unnecessary risk? I don't think so. To the contrary, I contend that each of the seven sins is a byproduct of otherwise desirable and adaptive features of the human mind. Let's consider two of the most common memory sins: transience and absentmindedness.

TRANSIENCE

Take, for example, the conclusion of the most publicized trial in recent history: a jury acquitted O.J. Simpson of murder. Word of the verdict spread quickly, nearly everyone reacted with either outrage or jubilation, and many people could talk about little else for days and weeks afterward. The Simpson verdict seemed like just the sort of momentous event that most of us would always remember vividly: how we reacted to it, and where we were when we heard the news.

Now, can you recall how you found out that Simpson had been acquitted? Chances are that you don't remember, or that what you remember is wrong. Several days after the verdict, a group of California undergraduates provided researchers with detailed accounts of how they learned about the jury's decision. When the researchers probed students' memories again 15 months later, only half recalled accurately how they found out about the decision. When asked again nearly three years after the verdict, less than 30% of students' recollections were accurate; nearly half were dotted with major errors.

The culprit in this incident is the sin of transience: forgetting that occurs with the passage of time. Research has shown that minutes, hours or days after an experience, memory preserves a relatively detailed record, allowing us to reproduce the past with reasonable if not perfect accuracy. But with the passing of time, the particulars fade and opportunities multiply for interference -- generated by later, similar experiences -- to blur our recollections.

Consider the following question: If I measure activity in your brain while you are learning a list of words, can I tell from this activity which words you will later remember having studied, and which words you will later forget? In other words, do measurements of brain activity at the moment when a perception is being transformed into a memory allow scientists to predict future remembering and forgetting of that particular event? If so, exactly which regions allow us to do the predicting?

Our group at the imaging center of Massachusetts General Hospital came up with an experiment to answer the question. Holding still in this cacophonous tunnel [the magnetic resonance imaging or MRI scanner], participants in our experiment saw several hundred words, one every few seconds, flashed to them from a computer by specially arranged mirrors. To make sure that they paid attention to every word, we asked our volunteers to indicate whether each word refers to something abstract, such as "thought," or concrete, such as "garden." Twenty minutes after the scan, we showed subjects the words they had seen in the scanner, intermixed with an equal number of words they hadn't seen, and asked them to indicate which ones they did and did not remember seeing in the scanner. We knew, based on preliminary work, that people would remember some words and forget others. Could we tell from the strength of the signal when participants were making abstract/concrete judgments which words they would later remember and which ones they would later forget?

We could. Two regions of the brain showed greater activity when people made abstract/concrete judgments about words they later remembered compared with those they later forgot. One was in the inner part of the temporal lobe, a part of the brain that, when damaged, can result in severe memory loss. The other region whose activity predicted subsequent memory was located further forward, in the lower left part of the vast territory known as the frontal lobes.

This finding was not entirely unexpected, because previous neuroimaging studies indicated that the lower left part of the frontal lobe works especially hard when people elaborate on incoming information by associating it to what they already know.

These results were exciting because there is something fascinating, almost science fiction-like, about peering into a person's brain in the present and foretelling what she will likely remember and forget in the future. But beyond an exercise in scientific fortune-telling, these studies managed to trace some of the roots of transience to the split-second encoding operations that take place during the birth of a memory. What happens in frontal and temporal regions during those critical moments determines, at least in part, whether an experience will be remembered for a lifetime, or drop off into the oblivion of the forgotten.

ABSENTMINDEDNESS

On a brutally cold day in February 1999, 17 people gathered in the 19th floor office of a Manhattan skyscraper to compete for a title known to few others outside that room: National Memory Champion. The winner of the U.S. [competition](https://www.psychologytoday.com/basics/sport-and-competition) would go on to challenge for the world memory championship several months later in London.

The participants were asked to memorize thousands of numbers and words, pages of faces and names, lengthy poems and decks of cards. The victor in this battle of mnemonic virtuosos, a 27-year-old administrative assistant named Tatiana Cooley, relied on classic encoding techniques: generating visual images, stories and associations that link incoming information to what she already knows. Given her proven ability to commit vast amounts of information to memory, one might also expect that Cooley's everyday life would be free from the kinds of memory problems that plague others. Yet this memory champion considers herself dangerously forgetful. "I'm incredibly absentminded," Cooley told a reporter. [Fearful](https://www.psychologytoday.com/basics/fear) that she will forget to carry out everyday tasks, Cooley depends on to-do lists and notes scribbled on sticky pads. "I live by Post-its," she admitted ruefully.

The image of a National Memory Champion dependent on Post-its in her everyday life has a paradoxical, even surreal quality: Why does someone with a capacity for prodigious recall need to write down anything at all? Can't Tatiana Cooley call on the same memory abilities and strategies that she uses to memorize hundreds of words or thousands of numbers to help remember that she needs to pick up a jug of milk at the store? Apparently not: The gulf that separates Cooley's championship memory performance from her forgetful everyday life illustrates the distinction between transience and absentmindedness.

The kinds of everyday memory failures that Cooley seeks to remedy with Post-it notes -- errands to run, appointments to keep and the like -- have little to do with transience. These kinds of memory failures instead reflect the sin of absentmindedness: 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 is overlooked at the time we need to retrieve it.

To appreciate the distinction between transience and absentmindedness, consider the following three examples:

A man tees up a golf ball and hits it straight down the fairway. After waiting a few moments for his partner to hit, the man tees up his ball again, having forgotten that he hit the first drive.

A man puts his glasses down on the edge of a couch. Several minutes later, he realizes he can't find the glasses, and spends a half-hour searching his home before locating them.

A man temporarily places a violin on the top of his car. Forgetting that he has done so, he drives off with the violin still perched on the roof.

Superficially, all three examples appear to reflect a similar type of rapid forgetting. To the contrary, it is likely that each occurred for very different reasons.

The first incident took place back in the early 1980s, when I played golf with a patient who had been taking part in memory research conducted in my laboratory. The patient was in the early stages of [Alzheimer's](https://www.psychologytoday.com/basics/dementia) disease, and he had severe difficulties remembering recent events. Immediately after hitting his tee shot, the patient was excited because he had knocked it straight down the middle; he realized he would now have an easy approach shot to the green. In other words, he had encoded this event in a relatively elaborate manner that would ordinarily yield excellent memory. But when he started teeing up again and I asked him about his first shot, he expressed no recollection of it whatsoever. This patient was victimized by transience: he was incapable of retaining the information he had encoded, and no amount of cueing or prodding could bring it forth.

In the second incident, involving misplaced glasses, entirely different processes are at work. Sad to say, this example comes from my own experience -- and happens more often that I would care to admit. Without attending to what I was doing, I placed my glasses in a spot where I usually do not put them. Because I hadn't fully encoded this action to begin with -- my mind was preoccupied with a scientific article I had been reading -- I was at a loss when I realized that my glasses were missing. When I finally found them on the couch, I had no particular recollection of having put them there. But unlike the golfing Alzheimer's patient, transience was not the culprit: I never adequately encoded the information about where I put my glasses and so had no chance to retrieve it later.

The third example, featuring the misplaced violin, turned into far more than just a momentary frustration. In August 1967, David Margetts played second violin in the Roth String Quartet at UCLA. He had been entrusted with the care of a vintage Stradivarius that was owned by the department of music. After Margetts put the violin on his car's roof and drove off without removing it, UCLA made massive efforts to recover the instrument. Nonetheless, it went missing for 27 years before resurfacing in 1994 when the Stradivarius was brought in for repair and a dealer recognized the instrument. After a lengthy court battle, the violin was returned to UCLA in 1998.

There is, of course, no way to know exactly what Margetts was thinking about when he put the violin on his car's roof. Perhaps he was preoccupied with other things, just as I was when I misplaced my glasses. But because one probably does not set down a priceless Stradivarius without attending carefully to one's actions, I suspect that had Margetts been reminded before driving off, he would have remembered perfectly well where he had just placed the violin. In other words, Margetts was probably not sabotaged by transience, or even by failure to encode the event initially. Rather, forgetting in Margett's case was likely attributable to an absent-minded failure to notice the violin at the moment he needed to recall where he had put it. He missed a retrieval cue -- the violin on the car's roof -- which surely would have reminded him that he needed to remove the instrument.

Even though they often seem like our enemies, the seven sins are an integral part of the mind's heritage because they are so closely connected to features of memory that make it work well. The seven sins are not merely nuisances to minimize or avoid. They 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 that allows us to link the mind with the world.

*Adapted from Daniel Schacter, Ph.D.'s The Seven Sins of Memory: How the Mind Forgets and Remembers (Houghton-Mifflin, 2001)*