1 Introduction to the unbidden past

> It has been said that, in its haste to step into the twentieth century and to become a respectable science, Psychology skipped the preliminary descriptive stage that other natural sciences had gone through, and so was soon losing touch with natural phenomena.
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> (Tinbergen, 1963, p. 411)

Imagine that each time you wanted to remember a past experience you had to stop and make a clear decision and a commitment to remember. You would then move on and make a rough description, sketching what you wanted to remember. And once that was done, you would start looking for a memory fitting the description. Clearly, conscious recollections are sometimes the result of such explicit decisions and plans. We sometimes look for particular memories, and we sometimes succeed in finding what we are looking for. But imagine that this were the only possible way in which you could recollect your personal past. What a laborious and inflexible system that would be.

Fortunately, our memory is not just driven by conscious goals and commitments to remember. Often memories of past events come to mind in a manner that is completely unexpected and involuntary. They come with no preceding decision to remember, with no plans and no commitment. They may suddenly pop up in response to stimuli in our environment or aspects of our current thought. A piece of music accidentally heard on the radio may stir an image of a moment in the past that we feel we have not thought about for years, or at least not for a while. A random face in the street, the taste of a new brand of toothpaste, an email message on the computer screen, or encountering a familiar object at the bottom of the closet may serve as triggers for involuntary memories. Often

involuntary memories are hardly noted in the flow of daily experiences. Sometimes they may make us stop and contemplate for a moment, and maybe change our ongoing behavior. In more rare cases, involuntary memories may torment the individual by bringing to mind upsetting details of traumatic events, as observed in Post-traumatic Stress Disorder (PTSD) and other clinical disturbances (American Psychiatric Association, 2000). The possible content of involuntary autobiographical memories is diverse. Occasionally they are simply a surprising source of amusement during a dull task, as in the following example reported by a young female participant in one of my studies. The involuntary memory comes to her mind when she is on hold during a telephone conversation with the central administration at the university. It seems that this prolonged contact with the telephone receiver, forced upon her in the situation, enabled the activation of a childhood memory in which a telephone receiver also played a key role:

> I remember the first telephone we had in my childhood. It was placed on the bookshelves in the living room. My sister and I were racing one another to answer it when it eventually rang. One day my sister reached the phone first and yelled, short of breath, into the receiver: "It's Vera!" (that was my name – her name was Louise).

This book is about such involuntary autobiographical memories – operationally defined as memories that come to mind with no preceding conscious attempt at retrieval. They are contrasted with voluntary memories, which are memories that are called to mind in a strategic and goal-directed fashion. These operational definitions do not imply that "free will" is a causal factor for voluntary but not for involuntary memories. Invoking free will as an explanation for mental phenomena is a risky endeavor, because we generally do not have very good access to what causes our behavior (e.g., Wegner, 2002). For example, most researchers agree that we have little awareness of the processes underlying successful retrieval. In the

present context, the notion of involuntary memories therefore refers to memories that are *subjectively* experienced as unintended, whereas their voluntary counterpart is memories that are subjectively experienced as intended.

Involuntary autobiographical memories were for a long time neglected in cognitive psychology, whereas they attracted interest in clinical psychology in relation to specific disorders such as PTSD (a point to be elaborated in Chapters 2 and 7). Most cognitive psychologists seem to have worked under the assumption that memories are called to mind as the result of a conscious decision and plan to do so. In this view, involuntary autobiographical memories are an exception to the standard and might most appropriately be viewed as a curiosity. As I will point out later in this chapter, there are good historical reasons why this view has been pervasive in cognitive psychology. Nonetheless, I shall argue that it is wrong. The evidence instead suggests that involuntary remembering is a basic mode of remembering the personal past.

During the last ten to fifteen years, an increasing amount of research has been conducted on involuntary autobiographical memories. Maybe one of the most important findings from this research is that involuntary autobiographical memories are pervasive in daily life. For example, in a recent study (Rubin and Berntsen, 2008) we found that people rated the frequency of involuntary memories in relation to a particular event roughly as high as they rated how often they had voluntarily brought the same event to mind. Findings from diary studies indicate that most people have several involuntary autobiographical memories per day (Berntsen, 1996, 2007).

Since involuntary autobiographical memories are common it is reasonable to ask why we have them. I shall argue in this book that involuntary autobiographical memories may be an evolutionary forerunner of voluntary autobiographical memory. Consistent with this view, I review evidence suggesting that involuntary memories are largely similar to their voluntary counterparts on basic factors determining encoding and maintenance, but differ on mechanisms

related to retrieval in that involuntary memories depend on associative mechanisms whereas voluntary memories reflect a top-down schema-driven search process. I shall also argue that although involuntary autobiographical memories may sometimes seem to disturb us, we are generally lucky to have them. If we did not, if remembering the personal past was always contingent upon decisions, plans, and effortful searches, we would probably live much more in the present than we actually do. This would be harmful to our survival both as individuals and as a species. Both voluntary and involuntary memories of the past play an important role for planning ahead. As many theorists have pointed out, we consult memories of past experiences when we envision possible future events (e.g., Addis, Wong, and Schacter, 2007; Miller, 1962; Suddendorf and Corballis, 2007). Having involuntary autobiographical memories helps to keep our temporal horizon wide. Through such memories, past events are rehearsed and maintained with little cognitive effort. Involuntary memories automatically make us aware of the fact that our life extends way back into the past and probably a great distance into the future as well. They tap us on the shoulder and remind us that we should adjust our present behavior accordingly.

Our remarkable ability to recollect the personal past and foresee possible future events gives humans a great advantage compared to other species. Although other species clearly learn from experience, the time range over which their learning spans is substantially shorter than what can be observed in humans (Roberts, 2002). Despite the fact that some of us may think that it is important to live "here and now," being stuck in the present is a clear disadvantage from an evolutionary point of view. Involuntary memories automatically take us out of the present. They are therefore an important and basic mechanism of mental life.

Consistent with this view, Hermann Ebbinghaus (1885) described involuntary conscious memories as a basic form of remembering when he launched experimental research on human memory in the world's first book on this topic. However, some eighty

years later, in 1962, another famous cognitive psychologist, George Miller, dismissed the topic as "the complete antithesis of all we have learned to call scientific" (1962, p. 180). How can two such opposing views exist in the same field? Let us begin our journey into the unbidden past with a quick glance at its history in cognitive psychology.

THE FORGOTTEN MEMORIES

Hermann Ebbinghaus (1885) opened his ground-breaking book on experimental studies on memory with a distinction between three basic modes of memory: a voluntary mode, an involuntary mode, and a non-conscious mode. He described involuntary memories as occurring when "mental states once present in consciousness return to it with apparent spontaneity and without any act of the will" (p. 2). This was opposed to voluntary memories, described as when "we call back into consciousness by an exertion of the will directed to this purpose the seemingly lost states" (p. 1). Further, voluntary and involuntary memory were distinguished from non-conscious memory, which he described as when "the vanished mental states give indubitable proof to their continuing existence even if they themselves do not return to consciousness at all" (p. 2).

One advantage of Ebbinghaus's taxonomy is that he distinguished between conscious versus non-conscious awareness and intentional versus unintentional retrieval, which allows a category of memories that are unintentional and conscious – that is, involuntary conscious memories (see Table 1.1). This category is overlooked in definitions equating conscious recollection with intentional retrieval. This applies to the way the contradistinction between implicit and explicit memory has been defined by some implicit memory researchers, namely as a distinction between unintentional and intentional retrieval (Schacter, Bowers, and Booker, 1989). Schacter *et al.*'s definition was a revision of the original implicit memory definition – i.e., the facilitation of the performance of a certain task by an earlier experience in the absence of conscious

Table 1.1. *A taxonomy of memory: conscious vs. non-conscious memory by intentional vs. unintentional retrieval*

	Memory awareness	
Retrieval	Conscious	Non-conscious
Intentional	Voluntary memories	–
Unintentional	Involuntary memories	Implicit memory

recollection of this experience (Schacter, 1987). However, many scholars considered the original implicit memory definition as problematic, because it is not clear whether the notion of conscious recollection should refer to intentional retrieval or to phenomenological awareness of the study episode (e.g., Kinoshita, 2001; Richardson-Klavehn, Gardiner, and Java, 1994; Schacter *et al.*, 1989). To clarify, Schacter *et al.* (1989) thus recommended a distinction in terms of retrieval intentionality rather than in terms of conscious awareness, partly because the intentionality criterion seems easier to control. Nonetheless, the consequence of equating conscious memory with intentional retrieval and unconscious memory with unintentional retrieval is of course that the important distinction between involuntary *conscious* and involuntary *unconscious* memories is lost. As a result, involuntary – but nonetheless conscious – memories are overlooked (e.g., Kinoshita, 2001; Richardson-Klavehn *et al.*, 1994). An advantage of Ebbinghaus's taxonomy is that it does not confound these two forms of unintended memory.

Ebbinghaus (1885) explained involuntary conscious memories as a product of association. This agrees very well with modern cognitive explanations of the phenomenon. As we shall see later in this book, encoding specificity – which implies association via contiguity – is one of the most frequently invoked explanations for involuntary memories among modern memory researchers. In 1885 Ebbinghaus observed:

> As more exact observation teaches us, the occurrence of these involuntary reproductions is not an entirely random or accidental one. On the contrary they are brought about through the instrumentality of other, immediately present mental images. Moreover they occur in certain regular ways which in general terms are described under the so-called "laws of association" (p. 2).

Ebbinghaus's reliance on associations agreed very well with the spirit of his time, which was characterized by a strong tradition of regarding associations as the basic building blocks of the mind. Laws of association were central in theories about thought and memory during the Enlightenment. They were discussed by several philosophers of mind, such as René Descartes, Thomas Hobbes, John Locke, George Berkeley, and David Hume, and considered as the elementary means for connecting sensory impressions or "ideas" (see Warren, 1916, for a review). Also, in the Wundtian school of psychology – contemporary with Ebbinghaus – isolated sensory data were assumed to compose coherent percepts by mechanisms of association (Rapaport, 1967).

The emphasis on association as the basic regulator of behavior continued through the behaviorist era, but changed with the cognitive renaissance in the 1960s. With the new cognitive paradigm and its analogy with the computer, the basic structure of behavior was no longer taken to be strings of associations or reflexes, but the feedback loop (Miller, Galanter, and Pribram, 1960; Wiener, 1948). Briefly, feedback models assume that the organism controls its own behavior by comparing its current state against a goal state and by acting so that the difference between the current and the goal state is reduced and eventually abolished (i.e., the goal state is reached). The cybernetic idea of the feedback loop as an organizer of mental life and its inherent connection to rules and plans is probably our best key to understanding why cognitive psychology for a long time neglected involuntary conscious memories.

A good example of the central role played by the feedback loop is Miller *et al.*'s (1960) theory of the organization of behavior. Their

model was intended to explain a range of problem-solving activities, including retrieval from long-term memory. They exemplified their model with the rather simple activity of hammering a nail into the wall. The conception of the feedback loop as described in their model involved three components: (1) a plan specifying a desired outcome; (2) a test phase; and (3) an operation phase. In the test phase, the current state of the problem-solving attempt is compared to a representation of the desired outcome. In the case of incongruity, the organism moves on to the operation phase (e.g., hammering), which is then followed by a test phase (e.g., checking how far the nail has gone into the wall). If incongruity is still identified, the operation is resumed. Thus, a negative feedback causes the operation to be repeated until congruity between the test and the desired outcome is eventually achieved. The feedback loop renders the organism (or computer) capable of structuring and controlling its own behavior.

Similar feedback models have been employed in theories of memory retrieval. In Norman and Bobrow's (1979) model of retrieval from long-term memory, retrieval begins with a specification of the information that is being sought. The specification consists of a target description and verification criteria. The second step is a matching process in which candidate records are accessed and selected. In the third phase, the selected records are then evaluated against the verification criteria. The third phase can be seen as corresponding to the test phase in Miller *et al.*'s (1960) feedback model. If the evaluation is negative, the retrieval process is continued (which may involve a reformulation of the search criteria). If it is positive, the retrieval process is terminated.

There are other accounts of retrieval based on feedback models, such as Conway and Pleydell-Pearce's (2000) recent notion of generative retrieval from autobiographical memory or Morton, Hammersley, and Bekerian's (1985) headed records model. The models differ on details and also on whether they are presented as exhaustive explanations or supplemented by descriptions of other kinds of retrieval. However, in the present context, the point is simply that

such feedback models describe retrieval as a goal-directed search beginning with a conscious specification of the material to be brought forward. They therefore depict retrieval as a self-initiated, voluntary process. As Neisser (1967) concluded, "in this sense remembering is always a form of problem-solving, and therefore a higher mental process" (p. 294).

Furthermore, instead of the passive encoding and reactivation of memory traces that may be implied by the notion of association, cognitive psychologists emphasized the constructive nature of both encoding and retrieval. As argued by Neisser (1967), "stored information is not revived, but simply used, in the constructive activity of recall" (p. 289). He argued against what he called the "Reappearance Hypothesis" (p. 281), referring to the idea that information is stored in a permanent form from which it can be passively activated.

Indeed, involuntary conscious memories have sometimes been described and even named as *passive remembering* (Spence, 1988). This label seems to imply the idea of a passive reactivation of memory traces. Probably the most frequently cited example of this view is the French author Marcel Proust's (1928) description of how the taste of a *petite madeleine* dipped in tea suddenly evoked a long-forgotten and very detailed childhood memory. Proust described several instances of involuntary memories (to be discussed in Chapter 6 of this book). In his account, they seem to be passive activations of very detailed memories that may be almost exact copies of past experiences. Clearly, such a view of memory is counter to the cognitivist emphasis on goal-directed retrieval and active reconstructions of the past.

Even though cognitive psychology at its outset rebelled against the associationist approach and instead emphasized the active and constructive nature of the mind, both George Miller and Ulrich Neisser nonetheless acknowledged the existence of involuntary autobiographical memories. In his now classic textbook *Psychology: The science of mental life*, Miller (1962) opens his chapter on memory by quoting Proust. Miller comments:

> Proust's little cake set off a psychological accident, so unique, personal, unexpected, and unexplained as to seem the complete antithesis of all we have learned to call scientific. The contrast does not concern the truth of Proust's account – one can grant that there is a sense in which this is true even though it may never have occurred. The contrast is in his method of displaying the truth. Consider the difficulties that would face any scientist who wanted to study such mental phenomena. His first difficulty would be that he has no way to capture the thing he wishes to study. He can only sit and wait, hoping for the improbable (p. 180).

Neisser (1967) too acknowledged the existence of involuntary memories and similar uncontrolled mental phenomena. And in contrast to Miller (1962), he even encouraged cognitive psychologists to study such involuntary mental occurrences. As he pointed out: "It would be pointless to develop a theory of thought and memory that had no room for these phenomena" (p. 299). As he observed, thought is not always goal-directed:

> Thought is by no means always coordinated toward a particular goal. We are not forever engaged in "filling up gaps in the evidence" (Bartlett, 1958, p. 20), nor in following out some strategic plan. It is true that I may construct an image in the course of directed train of thought, but more often the image just "comes by itself" (p. 297).

In short, cognitive psychologists did not deny the fact that there was more to the mind than consciously initiated processes governed by rules and plans. For a long time, however, they decided to concentrate on the latter and turn a blind eye to involuntary conscious remembering.

DAYDREAMING AND THE STREAM OF CONSCIOUSNESS

A very different focus was taken by another approach that was also launched in the 1960s, namely research on daydreaming (Singer,