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The Unbidden Past: Involuntary Autobiographical Memories as a Basic Mode of  
Remembering

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### Abstract

Involuntary autobiographical memories are memories of personal experiences that come to mind spontaneously – i.e., with no preceding attempt at retrieval. They were one of Ebbinghaus' (1885) three basic kinds of memory, but have been ignored by modern cognitive psychology. Recent work suggests that involuntary memories are a basic mode of remembering that operates on the same episodic memory system as voluntary (strategic) remembering and thus follows the same rules of encoding and maintenance. Due to their associative and unplanned retrieval, involuntary memories differ from voluntary memories by being more specific, less relevant to life story and identity and by involving more emotional reaction at the time of recall. Research on involuntary autobiographical memories has important implications for the understanding of intrusive memories in Posttraumatic Stress Disorder (PTSD).

Keywords:

Autobiographical memory, involuntary retrieval, intrusive memories

## The Unbidden Past: Involuntary Autobiographical Memories as a Basic Mode of Remembering

A student is lying on her sofa reading Gibson -- psychology of perception. She notices that it is blowing heavily outside and that it sounds like thunder. A memory from her time as a Danish au pair in the USA comes to mind: "I am together with the kids. It was in the beginning of my stay so everything was still quite unfamiliar. There is a thunderstorm outside, it sounds really bad. The kids and I are sitting on the sofa, covered by a blanket. The younger one is quite relaxed whereas the older is afraid of the thunder. I am talking to her -- trying to make her think of something else." (Berntsen, 2009, pp. 98-99).

Involuntary autobiographical memories are spontaneously arising memories of personal events. In contrast to voluntary (deliberately retrieved) memories, involuntary memories come to mind with no preceding attempt directed at their retrieval. They simply "pop up" during our activities in daily life (see example). Involuntary recall favors the recollection of past events with a distinctive feature match to the current situation and/or events that are highly accessible due to such factors as novelty and emotion (Berntsen, 2009).

Involuntary memories have been described in literature (e.g., Proust, 1928-1956) and by early pioneers of memory research. In the opening of his seminal book of memory, Ebbinghaus (1885) identified three basic modes of remembering, a voluntary mode, an involuntary mode and a non-conscious mode (p. 2). However, since

Ebbinghaus, modern cognitive psychologists have focused on either voluntary memories or on non-conscious (implicit) memory – largely ignoring the category of involuntary, but nonetheless conscious, memories. Moreover, some theoretical definitions of implicit versus explicit memory tie involuntary retrieval together with non-conscious awareness, thus completely excluding the category of involuntary conscious memories (see Berntsen, 2009, for a review).

In the neighboring field of clinical psychology, involuntary conscious memories have received substantial attention, but almost always in relation to negative and stressful experiences. For example, individuals who have experienced traumatic events suffer from disturbing involuntary recollections that involve high levels of conscious reliving of the stressful experience. Such intrusive trauma recollections are a key symptom of Posttraumatic Stress Disorder (PTSD).

The fact that involuntary conscious remembering for a long time was studied exclusively in clinical settings has generated the influential idea that such memories are closely related to emotional distress and that they therefore are rare in the daily life of healthy individuals. Recently, however, an accumulating amount of evidence refutes this idea and, consistent with Ebbinghaus, instead suggests that involuntary autobiographical memories are indeed a basic mode of remembering (Berntsen, 2009; Mace, 2007, for reviews). The claim is not that they are more basic than their voluntary counterparts, but that they are as indispensable manifestations of the episodic memory system as are memories that are recalled voluntarily. Viewing involuntary autobiographical memories

as a basic mode of retrieval has several implications that are summarized in Table 1 and will be described in more details in the following.

Table 1

Involuntary Autobiographical Memories as a Basic Mode of Remembering: Central Claims.

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Topic	Claim
Universality	Involuntary autobiographical memories are universal: Everyone with intact autobiographical memory has them
Frequency	Involuntary autobiographical memories are about as frequent in daily life as are voluntary autobiographical memories.
System	Involuntary autobiographical memories operate on the same episodic memory system as do voluntary memories: They share the same basic encoding and maintenance mechanisms, but differ on retrieval.
Functionality	Like voluntary memories, involuntary autobiographical memories are functional, but may have dysfunctional side-effects.

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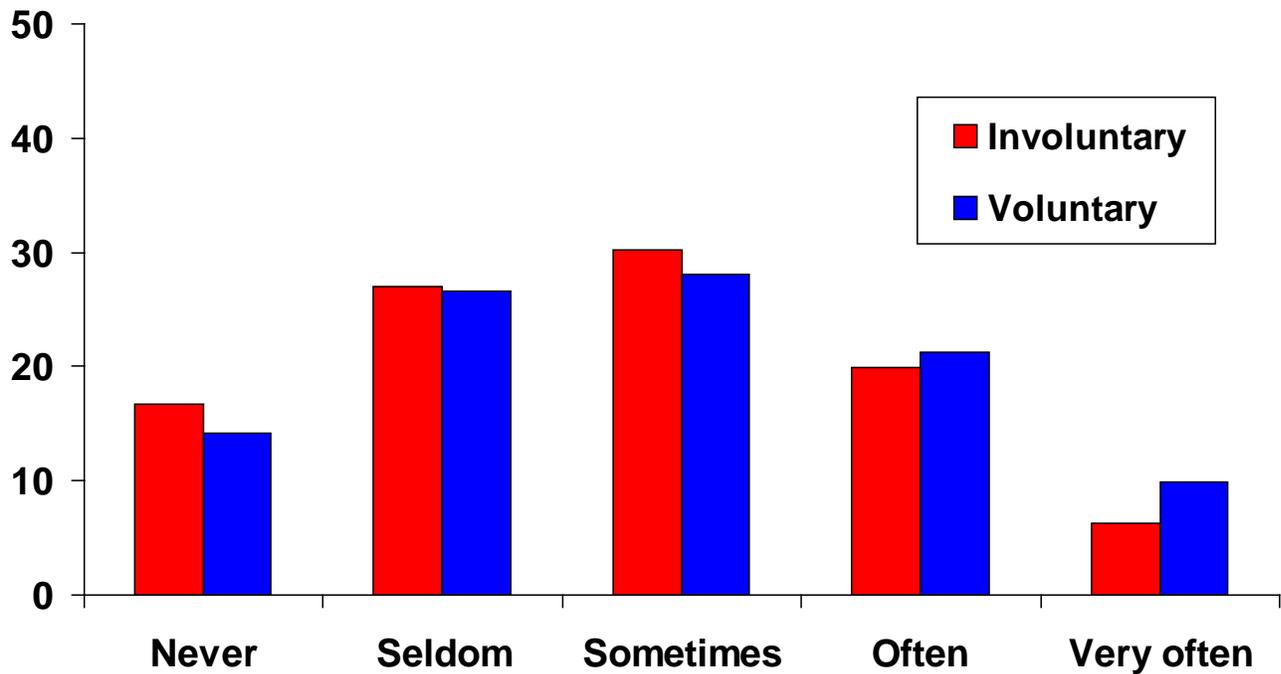
*Universality*

Involuntary autobiographical memories are assumed to be a universal phenomenon in the sense that everyone who has intact autobiographical memory will also

experience involuntary autobiographical memories. This theoretical claim may eventually be refuted. However, it is consistent with diary studies showing that large, non-selective samples of subjects, with very few exceptions, are capable of reporting involuntary memories as they occur in their daily life (e.g., Ball & Little, 2006). Survey studies with large stratified samples (e.g., Berntsen & Rubin, 2002; Rubin & Berntsen, 2009) also show that involuntary autobiographical memories are a well-known phenomenon, although estimates of their frequency are generally lower in such studies with retrospective assessments than in diary studies with on-line recording.

### *Frequency*

Involuntary autobiographical memories are frequent, but their frequency varies between individuals and within individuals over time. Typical frequency estimates are two to five involuntary autobiographical memories per day (Berntsen, 2009, for review). A recent study suggests that they are roughly as frequent in daily life as voluntary autobiographical memories. Rubin and Berntsen (2009) asked large stratified samples to assess how often they had involuntarily as well as voluntarily thought about a self-chosen important event from the last week and an important childhood event selected by the experimenter. Consistent with the idea that involuntary remembering forms a basic mode of remembering, the participants reported the involuntary remembering of the events to have taken place about as frequently as the voluntary counterpart, see Figure 1.



*Figure 1.* The frequency (percentages) of involuntary and voluntary recall for a remote and recent event (taken together) as estimated by a representative sample of 1975 Danes covering the entire adult life span (Rubin & Berntsen, 2009).

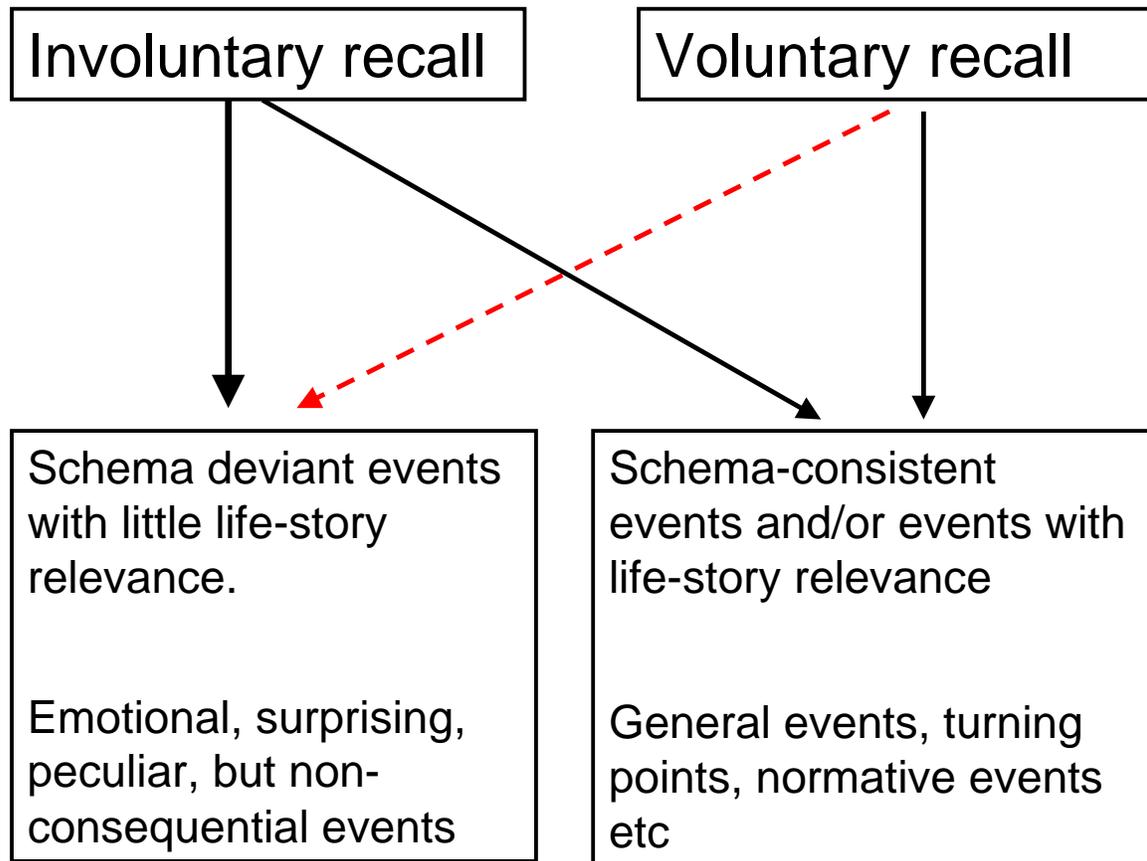
### *Memory System*

Voluntary and involuntary autobiographical memories operate on the same underlying episodic memory system – i.e., they share the same basic encoding and maintenance factors, but differ on how the system is accessed at retrieval. The first part of this claim is supported by a number of important similarities between the two types of memories. Both follow a standard forgetting function (e.g., Berntsen, 1998; Schlagman et al., 2009), both show a reminiscence bump – i.e., an increase of memories from young adulthood in middle-aged and older people (Berntsen & Rubin, 2002; Schlagman et al., 2009) as well as a lack of memories from the first two-three years of life (Berntsen,

2009). Emotional arousal at the time of the event enhances subsequent memory for both types of remembering (Hall & Berntsen, 2008, Ferree & Cahill, 2009). In non-dysphoric individuals, a marked dominance of positive events is present in both types of memories (Berntsen, 2009). Measures of memory characteristics correlate similarly for the two types of memories (Berntsen, 1998; Rubin & Berntsen, 2009).

Involuntary and voluntary remembering differ from one another with regard to mechanisms of retrieval. Voluntary recall is a goal-directed process that requires executive functions to monitor the search process, whereas involuntary recall is an associative process -- instigated by situational cues -- that take place with little executive control and therefore relies less on frontal lobe structures than the voluntary mode. This claim is supported by a brain imaging study showing that both involuntary and voluntary recall of emotional pictures activate brain areas that are associated with retrieval success (the medial temporal lobes, the precuneus and the posterior cingulate gyrus), whereas voluntary compared to involuntary recall showed enhanced activity in areas in the prefrontal cortex that are known to be involved in strategic retrieval (Hall, Gjedde & Kupers, 2008). The assumption that involuntary retrieval requires little cognitive effort is also supported by markedly shorter retrieval times for involuntary as compared to voluntary autobiographical memories (Schlagman & Kvavilashvili, 2008). Involuntary autobiographical memories most frequently arise when the person is not concentrated and engaged in a particular task (e.g., Berntsen, 1998; Berntsen & Jacobsen, 2008), which may interfere with the automatic spreading activation that leads to the formation of an involuntary memory.

These differences regarding retrieval processes have consequences for the type of material that each of the two types of remembering most easily accesses. Voluntary recall is guided by our overall schematized knowledge about ourselves and therefore favors events that are consistent with such schematized knowledge and/or plays a central role in our life story (Conway, 2005). Involuntary recall, on the other hand, favors events that provide a distinctive match to features in the current situation, which serves as cues for the memory. For these reasons, schema-deviant events with little life story relevance (such as a non-consequential thunderstorm, as in the example above) are not as easily accessed through voluntary recall as through involuntary recall. One might say that because voluntary recall is a top-down search, it is hampered at accessing such material, relative to what is the case for involuntary recall. Figure 2 provides an illustration.



*Figure 2.* Involuntary and voluntary recall, and the types of autobiographical material that they most easily access. The dotted line indicates reduced access for voluntary *relative* to involuntary recall.

These claims agrees with a number of studies (see Berntsen, 2009, for a review) showing that involuntary memories more frequently than voluntary memories refer to specific episodes, defined as experiences that take place on a particular day in the past in contrast to summarized event representations of many similar occasions, (i.e., a memory of a particular thunderstorm versus a memory of thunderstorms in general). The dominance of specific episodes in involuntary recall is especially interesting, since

specific episodes appear to be harder to retrieve than general event representations, when retrieval is voluntary. Young participants outperform older participants regarding the specificity of autobiographical memories in voluntary recall. However, a recent study contrasting involuntary and voluntary memories in young and old participants shows that this age difference is not present for the specificity of involuntary memories sampled in a diary study (Schlagman et al., 2009). Also consistent with the claim that involuntary recall favors events with distinctive contents rather than events corresponding to higher order autobiographical themes, involuntary memories tend to be seen as less important to the person's life story and identity than do voluntary memories (e.g., Rubin et al., 2008). In addition, involuntary memories are accompanied with more immediate emotional reaction and more mood impact compared to their voluntary counterparts (Berntsen & Hall, 2004; Rubin et al., 2008). The increased emotional reaction is likely a result of less efficient emotion regulation (Gross, 2001) in relation to involuntary memories because the rememberer is unprepared for their sudden occurrence.

Not just memories of our past, but also images of future events come to mind spontaneously. Berntsen and Jacobsen (2008) examined representations of possible future events that came to mind involuntarily or that were generated voluntarily and compared these to involuntary and voluntary memories recorded in the same diary study. The involuntary versus voluntary future event representations largely replicated the differences between the involuntary and voluntary memories. For example, not just the involuntary memories, but also the involuntary images of future events, were more specific than their voluntary counterparts. Because the images of the future events refer to

events that have not yet been encoded and retained, these findings further support the view that differences between the characteristics of voluntary versus involuntary autobiographical memories are due to different retrieval processes.

### *Functionality*

Involuntary autobiographical memories are functional. Although they may have disturbing and/or maladaptive side-effects, as observed in some clinical disorders, such as PTSD, they are normally an adaptive expression of memory. An important overall function may be to prevent us from 'living in the present', which we would probably do to a much greater extent if all autobiographical remembering (and thoughts of the future) had to be initiated in a voluntary, goal-directed fashion. It is generally accepted that such a narrow time perspective would be highly maladaptive. The involuntary mode enables us to rehearse lessons from the past (and envision possible future events) in relatively effortless ways (Berntsen, 2009).

Furthermore, the involuntary mode operates in a way that optimizes relevance. Recency, novelty and emotion enhance the ease with which events are recalled involuntarily (as well as voluntarily). In addition, the involuntary mode favors the recollection of past events with distinctive overlapping features to the ongoing situation. Both factors increase the probability that the remembered event will bear relevance to the current situation. For these reasons, and because they owe their occurrence to relatively simple mechanisms of association and rely less on frontal lobe structures, it seems likely that involuntary remembering may also take place in non-human species (Berntsen, 2009; Donald, 1991).

*Implications for our Understanding of Intrusive Memories*

People who have experienced highly stressful and/or traumatic events often suffer from involuntary, intrusive memories of the event. One important practical implication of research on involuntary autobiographical memories of healthy individuals is that it suggests an alternative explanation of intrusive memories in PTSD. According to the traditional (and still prevalent) view, intrusive memories in PTSD go hand in hand with marked difficulties at voluntarily recollecting the traumatic event (e.g., Ehlers & Clark, 2000). The memory is assumed to be poorly integrated, for which reason it is hard to access in a deliberate and controlled fashion while it often comes to mind involuntarily, according to this view. The traditional view thus assumes that involuntary and voluntary memories behave radically different. The alternative view, on the other hand, assumes that they show the same pattern, consistent with the idea that they derive from the same episodic memory system and therefore are subject to the same basic encoding and maintenance mechanisms (Berntsen, 2009). According to this view, any distinctive and highly emotional event will be extraordinarily well encoded and consolidated in memory. This will enhance its accessibility relative to other memories and thus increase the likelihood that it comes to mind involuntarily as well as the ease with which it is remembered voluntarily.

Recent evidence supports the alternative view. Emotionally stressful material is not more accessible for involuntary than for voluntary recall. Instead the evidence suggests that highly emotional experiences, such as traumatic events, show increased accessibility for both types of remembering (see Hall & Berntsen, 2008; Ferree & Cahill,

2009). Do these findings generalize to people with symptoms of PTSD? This question was examined recently in a study comparing individuals with high versus low levels of PTSD symptoms on a variety of autobiographical memory tests, including a diary study of involuntary and voluntary memories (Rubin et al., 2008). The participants with high levels of PTSD had thought more about their autobiographical memories and had stronger emotional reactions to them. Importantly, this effect was found for both involuntary and voluntary memories. Also, the participants with high levels of PTSD symptoms reported more memories with a trauma-related content. Importantly, they did so for both their involuntary and voluntary memories, again showing that the two types of memories follow the same pattern. The involuntary memories were accompanied by more mood impact and emotion reaction than the voluntary memories, but this effect was found in both subject groups, and is consistent with what we know about involuntary memories in daily life. Thus, findings on involuntary memories in daily life and how they differ from voluntary memories have suggested a new understanding of intrusive memories after traumatic events (Berntsen, 2009; Rubin et al., 2008).

In summary, involuntary autobiographical memories reflect a basic mode of remembering that operate on the same memory system -- and is likely to be as important to our survival and well-being -- as the much more studied voluntary mode of episodic memory. Research on involuntary remembering has important implications for our understanding of intrusive memories in PTSD and related disorders.

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### Recommended readings

Berntsen, D. (2009). (See references) A comprehensive review of what is known about involuntary autobiographical memories.

Berntsen, D. & Jacobsen, A.S. (2008). (See references). Examines involuntary and voluntary remembering in comparison with involuntary and voluntary episodic future thinking.

Mace, J. H. (Ed.). (2007). (See references). A broad introduction to the topic of involuntary memory.

Rubin, D.C., Boals, A., & Berntsen, D. (2008). (See references) Examines involuntary versus voluntary memories of traumatic versus non-traumatic events in participants with high versus low levels of PTSD.

Schlagman, S., Kliegel, M., Schulz, J., & Kvavilashvili, L. (2009). (See references). Examines the effects of aging on involuntary versus voluntary autobiographical remembering.