Involuntary autobiographical memories

Involuntary autobiographical memories (IAMs) seem to pop up into consciousness unexpectedly and more frequently than voluntary memories. Occurring without any deliberate attempt at retrieval and often during undemanding everyday activities, IAMs also appear to be more resistant to ageing and dementia. However, more contemporary strands of research suggest that IAMs are actually a relatively normal part of our mental lives, and that they form a useful and important directive function, guiding present and future thinking and behaviour. Cues in the environment can provide rapid access to past experiences, which may have survival value in situations that could be life threatening, or require problems to be solved quickly (Rasmussen & Bengtson, 2009).

IAMs occur spontaneously without any deliberate intention to recall anything. In fact they are most likely to occur when individuals are engaged in regular automatic activities that are not attentionally demanding, such as walking, driving or eating. It is estimated that they occur on average three to five times a day (Bengtson, 1996), and up to three times as frequently as voluntary memories (Rasmussen & Bengtson, 2011). For so many people they are common, unexpected occurrences, but occasionally they can be extremely meaningful, as described by Proust, or surprising. ‘Colin, who has dementia, clearly describes this kind of unexpected memory...’

I think if you get a little stimulus you can then remember quite a lot of the incident and what connects with it branch by branch...you can work your way up to the roots...for example I saw a picture of a man digging a hole in a piece of ice somewhere and instantly what did was make me think of the time I was in Kazakhstan somewhere in winter’ (Clegg, 2010, p.133).

How can they be measured?

Over the decades since Ebbinghaus first described these types of memories, different methods have been used to study them. Some writers followed the self-testing approach advocated by Ebbinghaus, such as Esther Salaman (1970), who analysed systematically her own involuntary memories, but there were few empirical studies. It was only in the final decade of the 20th century that involuntary memories became an area of interest to cognitive psychologists, and it is now becoming a steadily growing field of research (e.g. Bengtson, 1996, 2009; Mace, 2007, 2010).

Involuntary memories can be difficult to trigger experimentally because they require personal, or idiosyncratic cues, and once a person becomes aware of trying to bring back a memory it becomes a voluntary memory. Moreover, in the last 10 to 15 years there have been studies of diary and questionnaire participants to keep records of any involuntary memories that occurred over a specific time period, with details of how they were cued, and their content, vividness, etc. These studies have led to interesting and replicable findings concerning the frequency and nature of specifically recalled memories.

However, more recently several laboratory paradigms have been developed to study IAMs under controlled conditions. For example Mace (2006) showed that participants reported experiencing IAMs when recalling specific memories in response to cue phrases such as ‘being at a picnic’ – so-called memory chaining. Ball (2007) elicited IAMs in college students using the free word association method, with participants instructed to generate continuous associations cued by words such as ‘coffee’ or ‘thunder’, until the experimenter stopped them after 20 to 30 seconds. The responses were recorded and after three word-association trials participants listened to their replies and stated whether or not a past personal experience had come to mind during the task. IAMs were reported during 86 per cent of the trials. In our replication study with 31 adults aged 21 to 80 years, we showed that a word-cued task failed to lead to the generation of vivid IAMs in 90 per cent of our participants (Bradley & Moulin, 2009). For example, a 73-year-old male recalled a violent hailstorm in North Wales that he experienced 55 years before, triggered by the word ‘storm’. He remembered the sight of the storm coming, and felt the forecast was seized upon and ridiculed. Furthermore, Schlagman and Kavoussi (2008) developed a laboratory paradigm that enables researchers to measure retrieval times of IAMs while participants are engaged in an easy vigilance task requiring the detection of target vertical lines amongst a stream of horizontal lines. The IAMs are reported as being triggered by random words that participants are asked to ignore, displayed in the centre of the array of lines.

Results from these and other studies have consistently shown that IAMs are more likely to be of a specific event, and come to mind significantly later than voluntary autobiographical memories. They are also more likely to result in bodily reactions and impact on current mood than voluntary memories (Bengtson & Hall, 2004). However, no differences were observed in terms of perspective experienced in memory (field vs. observer) and the accuracy (measured by participants’ own confidence ratings) of recorded memories (Mace et al., 2011).

Triggers of IAMs

One consistent finding that has emerged from the literature is that the majority of IAMs are triggered by easily detectable cues in one’s environment or thoughts. Mace (2004) investigated the reported IAMs that most likely to elicit IAMs in healthy adults aged 21 to 58 years. Participants recorded their memory cues and triggers in diaries covering a two-week period. The results showed that more triggers were triggered by 31 adults, 21 to 80 years, than by 31 adults aged 21 to 80 years, and that many of the reported verbal/linguistic cues (68 per cent) than by sensory/perceptual cues (32 per cent). Similarly, in a one-week long diary study of young and old participants, Schlagman et al. (2007) found that the reported IAMs were equally likely to be linguistically based or sensory/perceptual. Mace (2004)
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Significant age effects have also been observed in the (voluntary) autobiographical memory test, where older adults recall fewer memories in response to word cues than younger adults. In addition, it takes them longer to recall all these memories, and they are less likely to recall memories of specific events that happened at a particular time and place. These findings are explained by older adults' reduced ability to engage in controlled retrieval processes. However, will similar specificity of voluntary IAMs be found? According to Conway and Pleydell-Pearce (2000) influential model of autobiographical memory, during involuntary recall 'episodic' cues can bypass the usual top-down strategic retrieval pathway involving activation of the left frontal lobe, resulting in a rapid formation of memory. This automatic route to remembering may be preserved in older adults, producing involuntary memories, while more willful, strategic search processes are diminished or impaired. Therefore older adults' IAMs should be as specific as in younger adults, and the frequency of these memories should be comparable across the age groups. However, initial research has produced somewhat inconsistent findings. Thus, older adults tend to report fewer IAMs in their everyday life than younger adults, which is similar to findings from voluntary autobiographical memories. Young and older participants in the study of Schlagman et al. (2009) had to recall involuntary autobiographical memories in response to word cues and record their IAMs in a diary for seven days. Results showed that older adults recalled fewer IAMs than younger adults. However, while there was a significant effect of the specificity of the memories, older adults' IAMs were as specific as younger adults' IAMs, provided support to Conway’s theory that older adults may have automatic access to some memories in response to strong external or internal cues (Conway & Pleydell-Pearce, 2000). One way to explain why older adults report fewer IAMs is to suggest that due to limited attentional resources, older adults are less aware of memories automatically produced in response to cues owing to their attention being focused on ongoing activities. Indeed, several studies have demonstrated that older adults are more likely to engage in involuntary memory retrieval of a number of remote memories that were previously inaccessible. These memories were verified by his wife. Formal inferences revealed that one of the recovered memories was retrieved with the same level of contextual richness, or specificity, as matched controls. This overlap offers a chance to examine the underlying neural mechanisms responsible for both, which converge on erroneous activation of the temporal lobe, decoupled from other structures. In short, we suggest that déjà vu experiences and involuntary memories may lie on a continuum, with unexplained feelings of familiarity being déjà vu, but recollection of prior events being involuntary memory (Illman et al., 2012). The main evidence for this idea comes from studies of temporal lobe epilepsy, an area of research that is overlooked in the involuntary memory literature, and in particular, intracortical stimulation studies. Famosly, Penfield (e.g. Penfield & Perot, 1963) was able to induce déjà vu by electrically stimulating the temporal lobe. The resulting phenomena included sights, sounds and emotions of past events, which the patients noticed spontaneously as personal experiences, and noted that their ‘vividness or wealth of detail and the sense of immediacy that goes with them serves to set them apart from the ordinary process of recollection’ (p.679). Penfield’s work, and that of later researchers using similar methods shows that this artificial process generates ‘illusions’ such as déjà vu, and also fully formed memories – which we suggest are experienced in a similar way to involuntary memories. Such experiences do also occur spontaneously in epilepsy without stimulation. In The Man Who Misook His Wife for a Hat Oliver Sacks (1985) describes the case of an elderly lady, Mrs. O.C., who experienced epileptic seizures after suffering a small thrombosis in her temporal lobe. For a few months following the stroke she experienced vivid memories that transported her back to her childhood, to her long-forgotten home, in the arms and presence of her mother. Sacks describes this as a ‘trembling, profound and poignant joy’, like the opening of a door... which had been stubbornly closed all her life” (p.136). He contends that these kinds of ‘Prouston’ memories should be investigated further. As a concluding new and beautiful “existential” science and therapy (p.142) which may help to understand and support brain-damaged patients.

People may deliberately keep objects around them, knowing they can evoke involuntary memories, and thus help them (resembling Oliver Sack’s patient, the man who mistook his wife for a hat). London: Picador.


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Ageing and IAMs

Memory research has a rich tradition of drawing upon the experiences and performance of older adults to better understand memory function. There is a large body of research showing that older adults perform worse than young adults in laboratory episodic memory tasks such as free recall, recognition and cued recall. That is, their autonomic (self-regulating) memories of experiencing events diminish, but they retain a sense of poetic familiarity (just knowing) that the event occurred.