



The frequency of involuntary autobiographical memories and future thoughts in relation to daydreaming, emotional distress, and age

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ABSTRACT

We introduce a new scale, the *Involuntary Autobiographical Memory Inventory (IAMI)*, for measuring the frequency of involuntary autobiographical memories and involuntary future thoughts. Using the scale in relation to other psychometric and demographic measures provided three important, novel findings. First, the frequency of involuntary and voluntary memories and future thoughts are similarly related to general measures of emotional distress. This challenges the idea that the involuntary mode is uniquely associated with emotional distress. Second, the frequency of involuntary autobiographical remembering does not decline with age, whereas measures of daydreaming, suppression of unwanted thoughts and dissociative experiences all do. Thus, involuntary autobiographical remembering relates differently to aging than daydreaming and other forms of spontaneous and uncontrollable thoughts. Third, unlike involuntary autobiographical remembering, the frequency of future thoughts does decrease with age. This finding underscores the need for examining past and future mental time travel in relation to aging and life span development.

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“I can only describe it as the inside of my head being like a darkened room with a large TV set in the corner. On the screen are images and events from my entire life back to about four or five years old. These images are constantly running” (Male, 58 years).

1. Introduction

Humans have an extraordinary ability to recollect our personal past and imagine our potential future. Sometimes this happens as a result of a deliberate and consciously initiated process. However, just as frequently, memories of past events and images of possible future events arise involuntarily, that is, with no preceding attempt to produce them (Berntsen, 1996). The quote in the beginning of this paper derives from a person, who contacted the first author with his unusual experiences. He has no psychiatric diagnoses and appears to be a completely normal person, who just extraordinarily frequently

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experiences involuntary memories. But exactly how remarkable is his case? At the present, we know little about the frequency of involuntary memories and involuntary future thoughts in daily life and how this varies among individuals. Here we begin to fill this gap in the literature. We first introduce a new scale, *The Involuntary Autobiographical Memory Inventory* (IAMI), to measure such individual differences. We next examine the relation between this new measure and daydreaming, emotional distress, and age.

Historically, most memory research has focused on voluntary (intentionally retrieved) memories examined in a laboratory context. More recently, a number of studies have examined involuntary autobiographical memories as they occur in daily life (e.g., Ball & Little, 2006; Berntsen, 1996, 1998; Berntsen & Hall, 2004; Berntsen & Rubin, 2008; Kvavilashvili & Mandler, 2004; Mace, 2004, 2005, 2007; Rubin, Boals, & Berntsen, 2008; Schlagman, Kliegel, Schulz, & Kvavilashvili, 2009; Schlagman & Kvavilashvili, 2008). However, these studies have largely focused on the characteristics of the memories and their retrieval mechanisms, and only rarely examined individual differences in their prevalence. Nonetheless, this research has provided a number of converging findings (see Berntsen, 2009, 2012, for reviews) that should be taken into account when attempting to measure individual differences. First, involuntary autobiographical memories are common in everyday life and (like voluntary memories) are predominantly emotionally positive (Walker, Skowronski, & Thompson, 2003) – in contrast to the stressful and negative involuntary memories observed in clinical settings (e.g., Ehlers, Hackmann, & Michael, 2004; Van der Kolk & Fisler, 1995). Second, the retrieval of most involuntary memories is facilitated by cues in the present context, either in terms of external features in the environment, or (less frequently) thoughts and feelings (see Berntsen, 2009, for a review). Third, involuntary memories most frequently come to mind in situations with diffuse attention, that is, during dull tasks or in situations that otherwise require little concentration (e.g., Berntsen, 1998; Schlagman et al., 2009). Fourth, in addition to cues in the immediate situation, more long-term concerns (e.g., Johannessen & Berntsen, 2010) or recent, stirring events in the personal past (e.g., Berntsen, 2001) also affect the content of the involuntary memories, suggesting an interaction between immediately present contextual cues and longer lasting constraints imposed by the life-situation of the individual (Berntsen, 2007). Fifth, compared with voluntary autobiographical memories, involuntary memories are more frequently about specific episodes and they tend to have more mood impact at the time of retrieval (e.g., Berntsen & Hall, 2004). They are also often rated as less central to the life story and identity (Berntsen, 2009, 2012, for reviews). Most likely, these differences are caused by the fact that the retrieval of the involuntary memories generally needs a distinct cue-item match (Berntsen, Staugaard & Sørensen, 2012) that may favor specific episodes over more abstract event knowledge as well as the fact that the rapid and uncontrollable retrieval of involuntary memories leaves little room for antecedent emotion regulation (see Berntsen, 2009, 2012, for extended discussions).

In summary, involuntary autobiographical memories are common in daily life, their activation is facilitated by situational cues and they typically arise in situations with diffuse attention. They share many characteristics with voluntary autobiographical memories, such as a dominance of emotionally positive events, but are the result of a more associative and context-sensitive form of retrieval that requires less effort.

Imaginations of possible future events, often called episodic future thoughts (Atance & O'Neill, 2001; Szpunar, 2010), also come to mind involuntarily during everyday activities (Berntsen & Jacobsen, 2008; Finnbogadottir & Berntsen, 2011). They appear to take place as frequently as involuntary memories (Finnbogadottir & Berntsen, 2013) and their occurrence seems strikingly similar to the involuntary memories. As with memories, they typically arise in response to situational features that overlap with features of their content (such as imagining receiving a speeding ticket, while speeding on the motorway) and in situations that require less concentration. Berntsen and Jacobsen (2008) found that their phenomenological characteristics differ from the characteristics of voluntary future thoughts in ways that parallel differences observed between involuntary and voluntary autobiographical memories in that the involuntarily generated future and past events more frequently referred to specific episodes and involved more (negative) mood impact than the voluntary counterparts. This agrees with research showing that episodic remembering and future thinking are affected similarly by at least some retrieval manipulations (see D'Armentau, 2012; Szpunar, 2010, for reviews).

1.1. Frequency of involuntary memories and future thoughts

Involuntary autobiographical memories are at least as frequent in daily life as autobiographical memories that are deliberately (voluntarily) retrieved (e.g., Rasmussen & Berntsen, 2011; Rasmussen, Ramsgaard, Berntsen, 2015; Rubin & Berntsen, 2009), although measures of their frequencies tend to vary with the amount of effort imposed by the recording task (Rasmussen et al., 2015). Importantly, substantial individual variability is seen, both when involuntary memories are recorded in real time in diary studies and retrospectively in survey studies (see Rasmussen et al., 2015, for a review). Only few studies have analyzed dispositional and demographic correlates of this variability.

In a diary study, Schlagman et al. (2009) found that older compared with younger participants reported fewer voluntary memories, but not fewer fully recorded involuntary memories. Yet, when taking into account uncompleted involuntary memory records (marked off with a tick), the older adults had significantly fewer involuntary memories. However, the older participants also had fewer years of education than the younger participants (who all were psychology students), which may have affected the results. In a survey study involving representative samples of more than 1000 Danes between the ages of 15 and 96 years, no effects of age was seen on the reported frequencies of involuntary and voluntary remembering of a specific recent and remote personal event. In a similar study, Berntsen and Rubin (2002) observed a general trend toward

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