



Involuntary (spontaneous) mental time travel into the past and future

Dorthe Berntsen*, Anne Stærk Jacobsen

Department of Psychology, University of Aarhus, Nobelparken, Jens Chr. Skousvej 4, 8000 Aarhus C., Denmark

ARTICLE INFO

Article history:

Received 21 November 2007

Keywords:

Autobiographical memory
Involuntary memories
Episodic future thinking
Mental time travel
Autonoetic awareness
Cultural life script

ABSTRACT

Mental time travel (MTT) is the ability to mentally project oneself backward in time to re-live past experiences and forward in time to pre-live possible future experiences. Previous work has focused on MTT in its voluntary (controlled) form. Here, we introduce the notion of involuntary (spontaneous) MTT. We examined involuntary versus voluntary and past versus future MTT in a diary study. We found that involuntary future event representations—defined as representations of possible personal future events that come to mind with no preceding search attempts—were as common as involuntary autobiographical memories and similar to them regarding cuing and subjective qualities. Future MTT involved more positive and idyllic representations than past MTT. MTT into the distant future/past involved more representations of cultural life script events than MTT into the immediate past/future. The findings are discussed in relation to cultural learning and MTT considered as a higher mental process.

© 2008 Elsevier Inc. All rights reserved.

1. Introduction

Mental time travel refers to the ability to mentally project oneself backwards in time to re-live past personal experiences or forward in time to pre-live possible events in the future. It is usually described as a strategic and goal-directed process (Wheeler, Stuss, & Tulving, 1997). We here introduce the notion of involuntary mental time travel to refer to mental time travel that takes place spontaneously—that is, with no preceding conscious attempt at mentally projecting oneself forward or backward in time.

Mental time travel has to do with the *conscious act* of remembering past events and imaging future ones, which is also called autonoetic awareness (Wheeler et al., 1997). It is distinct from merely knowing that some event happened in the past (or is likely to happen in the future) without consciously re-living (or pre-living) the experience. Mental time travel and its ensuing autonoetic awareness are considered as the hallmark of episodic memory defined as a separate neurocognitive system (Tulving, 2002; Wheeler et al., 1997). Research on mental time travel in both its past and future forms has concentrated on voluntary (i.e., strategic and intentionally initiated) mental time travel. In such studies, the participants are typically asked to deliberately recall past experiences or deliberately construct representations of possible future events. For example, in standard episodic memory experiments, participants are asked to recall previously presented word lists. In typical autobiographical memory studies, participants are asked to deliberately recollect memories of personal events (or generate representations of future events) in response to word cues.

Following this research, theorists have argued that mental time travel is a goal-directed and intentional process that requires the engagement of executive functions located to the prefrontal cortex. It is considered to be a late evolutionary development that is most likely to be specific to humans (e.g., Suddendorf & Corballis, 1997; Tulving, 1985, 2002; Wheeler et al., 1997). For example, Tulving (1983) argues that recall of information in the episodic system “tends to be deliberate and

* Corresponding author.

E-mail address: dorthe@psy.au.dk (D. Berntsen).

usually requires conscious effort” (p. 46). Suddendorf and Corballis (2007) observe that “the data so far continue to suggest that mental time travel is unique to humans” (p. 307; see also Tulving 2002).

However, the view that mental time travel is always a voluntary and goal-directed process that requires higher order executive mental functions is challenged by recent research documenting the occurrence of *involuntary* autobiographical memories—that is, memories of personal experiences that come to mind with no preceding conscious attempt at retrieval (e.g., Baars, Ramamurthy, & Franklin, 2007; Ball & Little, 2006; Berntsen, 1996, 1998; Berntsen & Hall, 2004; Mace, 2006, 2007; Schlagman, Kvavilashvili, & Schulz, 2007; see Berntsen, 2007, for a review). The most frequently quoted example of such involuntary memories is probably the French author Marcel Proust’s (1932–1938) description of how the taste of a petite madeleine, dipped in tea, unexpectedly evoked a long forgotten scene from his childhood. More systematic studies have shown that involuntary autobiographical memories are an everyday phenomenon (Berntsen, 2007, *in press*, for a review).

The aim of the present work is twofold. We want to follow up upon previous work on involuntary autobiographical memories and examine whether involuntary mental time travel also takes place for future events. In other words, do people experience spontaneous flash forwards in the same manner as they experience spontaneous memories of the past? We show that this is the case, and we next examine whether the involuntary versus voluntary distinction affects the characteristics of past and future event representations in similar ways.

1.1. *Involuntary versus voluntary mental time travel*

Research on involuntary autobiographical memories has shown that such memories are common in everyday life and that their occurrence is generally preceded by identifiable cues in the environment or in thought. It is also well-established that involuntary autobiographical memories arise most frequently in situations that are not attention demanding (e.g., Ball & Little, 2006; Berntsen, 1996, 1998; Berntsen & Hall, 2004; Mace, 2006; Schlagman et al., 2007; see Berntsen, 2007, for a review). Involuntary autobiographical memories differ from their voluntary counterparts in systematic ways. Involuntary memories are generally more specific and distinctive than voluntary memories and they are more frequently accompanied by an identifiable impact on the person’s mood as well as by a behavioral/physiological reaction at the time of recall (Berntsen, 1998; Berntsen & Hall, 2004). They do not seem to differ from their voluntary counterparts on factors that are known to affect encoding and maintenance. For example, emotional arousal and rehearsal enhance accessibility for both types of recall (Berntsen & Rubin, 2008; Hall & Berntsen, 2008) and the two types of memory show similar distributions across the life span (Berntsen & Rubin, 2004). The observed differences between voluntary and involuntary memories regarding their content and qualities are therefore most likely to reflect the outcome of different retrieval processes operating on the same episodic memory system—i.e., a strategic, schema-driven “top-down” process for the voluntary memories versus an associative “bottom up” process for the involuntary memories (Berntsen, *in press*; Berntsen & Hall, 2004). This view is supported by a recent brain scanning study showing that both involuntary and voluntary recall activate brain areas that have been 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 right prefrontal cortex that are known to be involved in strategic retrieval (Hall, Gjedde, & Kupers, 2008). These brain imaging findings confirm that successful episodic memory recall can take place with no preceding strategic search and are consistent with the idea that phenomenal differences between involuntary and voluntary episodic memories mainly reflect dissimilar retrieval mechanisms.

Findings on involuntary episodic memories thus show that mental time travel can take place in an involuntary mode in addition to the frequently studied voluntary mode. Since this suggests that mental time travel can occur with no involvement of higher order executive functions, these findings potentially hold important implications for how exclusive mental time travel should be regarded. However, so far studies on involuntary mental time travel have concentrated on past events. That is, it has not been examined whether also future mental time travel can take place involuntarily. This is an unfortunate gap in our knowledge since theorists have argued that the ability to construct and pre-live possible *future* events should be the litmus test for the presence of mental time travel (Suddendorf & Corballis, 2007). Thus, we need to examine whether future mental time travel occurs involuntarily or whether the involuntary form of mental time travel is in fact restricted to the past—and thus restricted in range and content compared to mental time travel in its voluntary form.

1.2. *Daydreaming and other possibly related notions*

Future mental time travel should be kept separate from other related, but nonetheless different, notions. One such notion is daydreaming. Daydreaming became subject to systematic scientific studies through the pioneering work of Singer and Antrobus and their colleagues in the sixties (e.g., Singer, 1966, for a review). The notion of daydreaming is not limited to imagining events in the future. Daydreaming may also involve memories of past experiences. Singer (1966) described the contents of daydreaming broadly as ““pictures in the mind’s eye” the unrolling of a sequence of events, memories, or creatively constructed images of future events of various degrees of probability of occurrence” (p. 3). In addition, daydreaming need not involve the self as a character, according to Singer. Daydreaming may be about purely fictitious characters distinct from the self, such as superheroes showing great abilities and accomplishments. Thus, although daydreaming may sometimes involve mental time travel (in either a voluntary or involuntary form), it does not map directly on to that notion. The same can be said about the notion of task-unrelated-thought, which grew out of the daydreaming research and is used as an operational definition of daydreaming activity during vigilance tasks (Giambra, 1989). Mind wandering (Smallwood &

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات