

Individual differences in the phenomenology of mental time travel: The effect of vivid visual imagery and emotion regulation strategies

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Received 13 July 2005

Available online 17 October 2005

Abstract

It has been claimed that the ability to remember the past and the ability to project oneself into the future are intimately related. We sought support for this proposition by examining whether individual differences in dimensions that have been shown to affect memory for past events similarly influence the experience of projecting oneself into the future. We found that individuals with a higher capacity for visual imagery experienced more visual and other sensory details both when remembering past events and when imagining future events. In addition, individuals who habitually use suppression to regulate their emotions experienced fewer sensory, contextual, and emotional details when representing both past and future events, while the use of reappraisal had no effect on either kind of events. These findings are consistent with the view that mental time travel into the past and into the future relies on similar mechanisms.

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Keywords: Mental time travel; Memory; Imagery; Emotion

1. Introduction

As humans, we frequently engage in “mental time travel,” remembering our past experiences and projecting ourselves into possible future events (Suddendorf & Corballis, 1997; Wheeler, Stuss, & Tulving, 1997). When traveling backwards in time, we may remember an event with considerable detail, for instance by “seeing” in our mind the location where the event took place and the persons and objects that were present, remembering what we thought during that event, feeling what we felt, and so forth. These details give us the subjective experience of mentally reliving a past event—a feeling of “warmth and intimacy” as William James wrote (James, 1890)—which is the hallmark of episodic memory (Tulving, 2002; Wheeler et al., 1997). This subjective experience has been intensely investigated in recent years, by asking people to rate the phenomenal characteristics of

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their memories (e.g., Johnson, Foley, Suengas, & Raye, 1988; Rubin, Schrauf, & Greenberg, 2003) or to report their states of awareness during memory retrieval (e.g., Gardiner, 1988; Tulving, 1985). By contrast, surprisingly few studies have examined the subjective experience associated with projecting oneself forward in time to pre-experience an event, or what has been called “episodic future thinking” (Atance & O’Neill, 2001).

Suddendorf and Corballis (1997; see also Suddendorf & Busby, 2003, 2005) argued that mental time travel into the future and into the past may employ very similar mechanisms. Memories for past events are transient mental representations constructed from specific sensory–perceptual details, as well as more general semantic knowledge (e.g., Conway & Pleydell-Pearce, 2000). Similarly, imagining future events involves combining some basic elements (e.g., actors, objects, and actions), some of which are extrapolations from past events while others come from general semantic knowledge, to generate potential scenarios. In addition, mental time travel, whether it be into the past or the future, crucially involves the notion of experiencing the self in time or what Tulving calls “autonoetic” consciousness, which is “the kind of consciousness that mediates an individual’s awareness of his or her existence and identity in subjective time extending from the personal past through the present to the personal future” (Tulving, 1985, p. 1). Data that are consistent with these propositions can be summarized as follows. First, developmental research suggests that episodic memory and episodic future thinking emerge approximately at the same time (around age three to four; Atance & O’Neill, 2005; Levine, 2004; Suddendorf & Busby, 2005). Second, patients with brain damage who are unable to recall their personal past typically have difficulties in imagining possible future experiences (Klein, Loftus, & Kihlstrom, 2002; Tulving, 1985). Third, some neuroimaging data suggest that common cerebral bases might underlie thinking about the future and past (Okuda et al., 2003). Finally, the factors that influence the phenomenal characteristics associated with remembering, such as the emotional valence of the events and their temporal distance from the present, have similar effects on the phenomenal characteristics associated with projecting oneself into the future (D’Argembeau & Van der Linden, 2004).

Thus, although this is a relatively new area of research, the existing data are consistent with the view that the ability to remember the past and the ability to project oneself into the future are intimately related. Our goal in this study was to further examine this relationship, focusing specifically on whether certain individual differences affect mental time travel into the past and into the future in the same way. Recent data indicate that some personality dimensions are related to the phenomenology of memory. Rubin and Siegler (2004) found that, of all the domains and facets of personality assessed by the NEO Personality Inventory (Costa & McCrae, 1992), openness to feelings showed by far the strongest relation to the phenomenology of memory for past events, correlating with measures of belief in the accuracy of memories, sense of recollection, amount of sensory details, and feeling of emotions while remembering. Arguing that the opposite of openness to feelings is the suppression of emotions, Rubin and Siegler related their findings to those of Richards and Gross (2000), who found that people who habitually suppress the expression of their emotions (a) report having a poorer memory for conversations and (b) recall emotion regulation episodes less well than people with a lower emotion suppression tendency. By contrast, people who habitually regulate their emotions by altering how they think about the situations (i.e., reappraisal) had no better or worse memory than people who do not habitually reappraise (Richards & Gross, 2000). Together, the findings of Rubin and Siegler (2004) and Richards and Gross (2000) thus suggest that the subjective experience associated with remembering past events is affected by individual differences in emotion processing, and particularly the tendency to regulate emotion by means of suppression. Our first goal in this study was to examine whether the subjective experience associated with projecting oneself into the future is also affected by individual differences in the use of emotion regulation strategies.

The second individual difference dimension we were interested in concerns the vividness of visual imagery. Most philosophers and psychologists consider that visual imagery plays a key role in memory for past events (see Brewer, 1996), and neuropsychological data support that claim, by showing that damage to areas known to support visual imagery can, as a secondary consequence, result in an impairment of memory (Conway & Fthenaki, 2000; Greenberg & Rubin, 2003). According to Conway (2001), a crucial function of episodic memory is to keep track of ongoing goal processing, and mental images, especially visual ones, play an important role in representing information about personal goals (Conway, Meares, & Standart, 2004). Episodic future thinking is also closely related to personal goals. Indeed, projecting oneself into the future involves representing future states of the self that are both related to current goals (i.e., representing episodes of achievement of

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