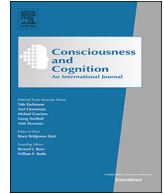




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Envisioning the times of future events: The role of personal goals

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ABSTRACT

Episodic future thinking refers to the human capacity to imagine or simulate events that might occur in one's personal future. Previous studies have shown that personal goals guide the construction and organization of episodic future thoughts, and here we sought to investigate the role of personal goals in the process of locating imagined events in time. Using a think-aloud protocol, we found that dates were directly accessed more frequently for goal-related than goal-unrelated future events, and the goal-relevance of events was a significant predictor of direct access to temporal information on a trial-by-trial basis. Furthermore, when an event was not directly dated, references to anticipated lifetime periods were more frequently used as a strategy to determine when a goal-related event might occur. Together, these findings shed new light on the mechanisms by which personal goals contribute to the location of imagined events in future times.

1. Introduction

People spend a great deal of time envisioning events and scenarios that might happen in their personal future, a capacity referred to as episodic future thinking (Atance & O'Neill, 2001; Suddendorf & Corballis, 2007). While the mechanisms and functions of episodic future thought have been intensively studied in the past few years (Schacter, Benoit, & Szpunar, 2017), little is known about how people estimate the times when imagined future events are expected to happen (Friedman, 2005). A recent study showed that the strategies used to date past and future events are largely the same, suggesting that common processes may be used for locating personal events in past and future times (Ben Malek, Berna, & D'Argembeau, 2017; see also D'Argembeau, Jeunehomme, Majerus, Bastin, & Salmon, 2015). It was found that participants most frequently used general knowledge about their life to infer or reconstruct temporal locations, in line with previous research on memory for the time of past events (for review, see Friedman, 1993, 2004; Thompson, Skowronski, Larsen, & Betz, 1996). Interestingly, however, some events were directly dated and these were judged to be more important for personal goals. This finding suggests that knowledge about personal goals facilitates the estimation of when imagined events are expected to occur, although this conclusion is limited by the correlational nature of the data. In the present study, we aim to examine more directly the role of personal goals in the temporal location process by experimentally manipulating the involvement of goals in imagined events.

A growing body of evidence indicates that episodic future thinking involves the mental simulation of specific events as well as more general autobiographical knowledge that contextualizes imagined scenarios in the individual's life story (D'Argembeau, 2015). Specifically, research has shown that people's aspirations and general expectations about their personal future, including anticipated

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lifetime periods (e.g., “when I’ll be married”) and general events (e.g., “my trip to Brazil next summer”), guide the construction of episodic future thoughts (D’Argembeau & Mathy, 2011) and help organize imagined events in coherent themes and sequences (D’Argembeau & Demblon, 2012). The evidence further suggests that personal goals is an important factor that drives the construction and organization of future-oriented autobiographical knowledge (D’Argembeau, 2016; Thomsen, 2015). Goals are cognitive representations of desired states or outcomes (Austin & Vancouver, 1996), and personal goals may be defined as personally important objectives that individuals pursue in their daily lives (Emmons, 1986; Klinger, 2013; Little, 1983; McAdams, 2013). Goal-related knowledge is represented in a hierarchical structure that organizes higher-order goals (e.g., having a successful academic career) in sequences of sub-goals (e.g., receiving a PhD degree with highest honors, finding postdoc positions in competitive laboratories) that specify how to attain desired states (Austin & Vancouver, 1996; Wadsworth & Ford, 1983). This hierarchical and sequential representation of goals and sub-goals may drive the construction of a personal timeline that facilitates the temporal location of goal-relevant future events. In turn, the ability to locate goal-relevant events at specific future times may play a critical role in planning and goal pursuit. Indeed, goal achievement often requires a sequence of actions that need to be ordered and carried out at specific times (e.g., on a given day or within a particular temporal window). However, whether and how personal goals contribute to temporal location processes remain to be investigated in detail.

Goal-related knowledge might facilitate the temporal location of imagined future events in at least two ways. First, when envisioning ways to attain desired goals people may consider the exact dates when goal-relevant events will likely occur. The temporal location of some goal-relevant future events may thus be encoded in memory (as part of “memories of the future”; Jeunehomme & D’Argembeau, 2017; Szpunar, Addis, McLelland & Schacter, 2013), allowing people to directly access temporal information when thinking again about these events. Second, knowledge about personal goals may facilitate the temporal location of associated future events even when exact dates have not been considered on a previous occasion. As noted above, goals may drive the construction of temporally defined autobiographical periods (i.e., anticipated lifetime periods and extended events) that can be used to estimate when specific events might occur (Thomsen, 2015). For example, the goal of doing a postdoc in the U.S. defines a future period of two or three years on one’s mental timeline, which can be used to locate specific events in future times (e.g., as occurring before, during or after this period). Goal-relevant future events may be more easily linked to this temporal framework, allowing one to determine when they will likely happen.

To investigate the role of personal goals in the temporal location of future events, in the present study we asked participants to imagine a series of future events that were cued by personal goals, familiar places, or scenarios imposed by the experimenter and, for each event, they then described everything that came to their minds while attempting to determine when this event will likely occur. Following our previous findings (Ben Malek et al., 2017), we expected that participants would frequently rely on inferential strategies (using lifetime periods and factual knowledge, in particular) to locate future events in time, regardless of the nature of events (i.e., related to goals, places or scenarios). However, considering the role of personal goals in the organization of episodic future thinking (D’Argembeau, 2016), we hypothesized that goal-related events would be directly located in time more frequently than place- and scenario-related events. Furthermore, because personal goals are strongly linked to autobiographical knowledge structures and may drive the organization of lifetime periods (Conway, 2005; D’Argembeau, 2015; Thomsen, 2015), we hypothesized that when future events are not directly located in time, anticipated lifetime periods would be more frequently used as a temporal location strategy for goal-related than place- or scenario-related events.

2. Method

2.1. Participants

Fifty young adults who were mostly undergraduate students at the University of Liège volunteered to participate in the study. One participant was excluded because she could not follow the instructions. The final sample consisted of 49 participants (24 females), ranging in age from 18 to 25 years ($M = 22.98$, $SD = 1.96$). This sample size was estimated a priori using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) in order to achieve a statistical power of above 90% to detect a significant difference between two conditions, considering an alpha of .05 and a medium within-subjects effect size ($d = 0.50$). Participants were all native French speakers (one of them was a native bilingual) and reported to be free of neurological, psychiatric, and language disorders. This study was approved by the Ethics Committee of the Faculty of Psychology, Speech and Language Therapy, and Education of the University of Liège.

2.2. Materials and procedure

Participants were asked to think aloud while they attempted to locate a series of future events in time. The experimental task was inspired from previous work on past and future event dating (Ben Malek et al., 2017; Brown, 1990; Brown, Schweickart, & Svob, 2016; Nourkova & Brown, 2015) and involved four phases. First, participants were invited to produce six personal goals (‘goal’ condition; e.g., graduating from university, travelling around the world) and six places (‘place’ condition) that could be frequently encountered in their future (e.g., my future apartment, my workplace), which were then used as cues for the imagination of future events. Second, participants were asked to imagine specific events in response to each of these cues; furthermore, six non-personal cues were also presented (‘scenario’ condition), which represented familiar settings (e.g., imagine walking in a shopping street, imagine sitting in a crowded bar) and were inspired from previous work (Hassabis, Kumaran, Vann, & Maguire, 2007; de Vito, Gamboz & Brandimonte, 2012). For each cue (i.e., goal, place, and scenario), participants were instructed to imagine a personal and specific future event (i.e., a unique event occurring in a particular place at a particular time, and lasting no more than 24 h). A brief

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