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## The impact of perceived self-efficacy on mental time travel and social problem solving

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### ABSTRACT

Current models of autobiographical memory suggest that self-identity guides autobiographical memory retrieval. Further, the capacity to recall the past and imagine one's self in the future (mental time travel) can influence social problem solving. We examined whether manipulating self-identity, through an induction task in which students were led to believe they possessed high or low self-efficacy, impacted episodic specificity and content of retrieved and imagined events, as well as social problem solving. Compared to individuals in the low self efficacy group, individuals in the high self efficacy group generated past and future events with greater (a) specificity, (b) positive words, and (c) self-efficacious statements, and also performed better on social problem solving indices. A lack of episodic detail for future events predicted poorer performance on social problem solving tasks. Strategies that increase perceived self-efficacy may help individuals to selectively construct a past and future that aids in negotiating social problems.

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### 1. Introduction

Mental time travel (MTT), the cognitive capacity to subjectively recall and re-experience episodes from our past or 'pre-experience' our lives in the future through imagination and simulation, is a pervasive part of everyday life. Although debate surrounds whether or not this mental capacity is uniquely human (Suddendorf & Corballis, 2007), converging evidence from neuropsychological, clinical, developmental, and neuroimaging studies indicates that the processes and neuroanatomical structures underlying the reconstruction of autobiographical memories and the projection and simulation of personal future events are closely linked (for a review see Schacter, Addis, & Buckner, 2008; Szpunar, 2010). For example, brain imaging studies demonstrate extensive overlap in neural activation when individuals are asked to recall autobiographical memories and imagine personal future events (e.g. Addis, Wong, & Schacter, 2007). Moreover, autobiographical memories and imagined future events respond similarly to experimental manipulations (Berntsen & Jacobsen, 2008; D'Argembeau & Van Der Linden, 2004) and individuals with clinical disorders tend to exhibit similar deficits and biases when asked to generate past and future events (e.g. D'Argembeau et al., 2008; Moore & Zoellner, 2007; Williams et al., 1996).

Converging theory and empirical findings suggest that a core function of MTT is the use of memories to navigate present and future concerns, decisions, and behaviors. The capacity to retrieve specific autobiographical memories allows individuals to draw on past personal experiences, which in turn serve as important guides for problem solving (Beaman et al., 2007; Williams, 2006). Similarly, Schacter et al. (2008) propose that the capacity to project and simulate one's self in the future

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is likely to aid in the negotiation of current and anticipated future problems. In contrast, studies show that in patients with depression, posttraumatic stress disorder (PTSD), and complicated grief, deficits in episodic specificity (overgeneral autobiographical memory) is linked with poor social problem solving (Evans, Williams, O'Loughlin, & Howells, 1992; Maccallum & Bryant, 2010; Sutherland & Bryant, 2008).

Based on current models of autobiographical memory, we propose that the extent to which an individual recalls the past and imagines the future with episodic specificity, and in turn their performance in social problem solving, will vary with one's current representations of self-identity. Although self-identity is multi-dimensional (e.g. Conway, Singer, & Tagini, 2004; McAdams, 2001), it appears to overlap with MTT insofar as they both provide temporal coherence and continuity between one's personal past, present, and future (e.g. Markus & Nurius, 1986; McAdams, 2001; Schacter et al., 2008). Furthermore, Conway and Pleydell-Pearce (2000) propose that autobiographical memories are retrieved within the context of a self-memory-system (SMS) to support "the working self," which involves active representations of one's current and future goals. Conway (2005) argues that the current and future goals of the working self may inhibit or facilitate knowledge that is discrepant or may threaten ideal views of the self.

If the working self serves as a critical guide in the construction of past and future events, then changes in the working self will likely correspond with changes in episodic specificity. Williams (2006) argues that the capacity to retrieve specific autobiographical memories is determined not by encoding, but rather one's "current state of mind" during retrieval. Studies show that following cognitive behavioral therapy (CBT), an intervention aimed in part at changing maladaptive views of one's self, individuals with depression and PTSD exhibit increased autobiographical memory specificity (McBride, Segal, Kennedy, & Gemar, 2007; Sutherland & Bryant, 2007; Williams et al., 2000). In addition, the three mechanisms that Williams (2006) posits underlie overgeneralized autobiographical memory are likely to be influenced by current self views. For example, he suggests that depressed individuals are susceptible to overgeneralized autobiographical memories, in part, because they terminate their retrieval search at intermediate levels as a means of avoiding recalling negative episodic details that are at odds with current self-views and may cause distress. Further, ruminating on negative abstract statements impairs specificity (Nolen-Hoeksema, 1991). In addition, depressed patients characterized by their negative self-views are less cognitively motivated (Hertel, 2000), which may also limit the executive functions underlying the capacity to successfully retrieve specific autobiographical memories. Interestingly, the reduced accessibility of specific personal events observed in these psychiatric disorders may offer a partial explanation for some autobiographical memory deficits observed in disorders characterized by depression or posttraumatic stress (e.g. Hermans, Raes, Iberico, & Williams, 2006).

Given the close link between self-identity and autobiographical memory, Williams (2006) predicted that interventions that reduce negative self-schemas would correspond with an increase in autobiographical memory specificity. The current study tested whether experimentally manipulating self-identity can impact (a) MTT and (b) social problem solving. We manipulated participants' perception of self-efficacy because this feature of one's working self has been shown to shape one's sense of agency and planning (Bandura, 2001). One could hypothesize that a working self that is characterized by greater self-efficacy will correspond with increased accessibility for autobiographical memories and imagined future events that are consistent with an efficacious self, which in turn would lead to an increased performance in social problem solving. Further, this efficacious self should retrieve more specific memories because there should be reduced rumination and avoidance tendencies disrupting the retrieval search (Williams, 2006).

## 2. Methods

### 2.1. Participants

Thirty-three undergraduate students (23 females and 10 males) with a mean age of 19.66 ( $SD = 2.84$ ) from the University of New South Wales (UNSW) who had previously completed a battery of questionnaires in an introductory psychology course participated in this study. Participants either received course credit or \$20AUD for their participation.

### 2.2. Materials

#### 2.2.1. Demographics

Participants provided self-report information on their age, gender, years of education, whether they were currently receiving mental health treatment, or had a present or past diagnosis of mental illness.

#### 2.2.2. Visual Analogue Scales (VAS) for mood and self-efficacy

Visual analogue scales were used to measure mood (*Distraction, Excitement, Positive Mood, Negative Mood*) and perceived self-efficacy (*Self-Confident*) before and after the experimental induction. Each VAS had anchors ranging from 1 to 10 (e.g. 1 = *not at all self-confident*, 10 = *extremely self-confident*).

#### 2.2.3. Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995)

Participants completed the 21-item self-report DASS to assess current levels of depression and anxiety symptoms prior to the experimental induction.

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