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## Mental time travel in dysphoria: Differences in the content and subjective experience of past and future episodes

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### ABSTRACT

Previous research has shown that depressed individuals demonstrate a number of biases in their ability to retrieve past events and simulate future events. The current study investigated the content and phenomenological experience of past and future events in dysphoric and non-dysphoric individuals. Results indicated that dysphoric, compared with non-dysphoric, individuals reported fewer positive events across both temporal directions. Furthermore, phenomenological characteristics ratings suggested that dysphoric individuals saw future, but not past, events as less vivid, coherent, sensorially detailed, bodily experienced, emotionally intense and important with respect to their life story and identity. These findings are discussed with reference to theories regarding the functions of 'mental time travel', in particular how the muted subjective experience of future episodes in depression may impair future planning, problem-solving and self regulation.

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### 1. Introduction

Cognitive theories of depression (e.g. Beck, 1987) place emphasis on biases in thinking, with a triad of negativity centred on the self, the world, and the future. One area of cognition within which this model has been investigated is autobiographical thinking, which includes both the individual's concept of the self and their interpretation of events that have, or might yet, happen within their lives. Autobiographical thinking incorporates the ability to vividly mentally 'time travel' into both one's personal past and future. These processes require an individual to recall and manipulate episodic information held within autobiographical memory to reconstruct past experiences or simulate potential future experiences.

Depressed individuals have been shown to demonstrate biases in the extent to which they can successfully retrieve and simulate specific events (lasting less than one day and containing episodic information). Individuals with clinical depression evidence difficulty detailing specific memories, instead providing more general, categoric, descriptions (Williams & Broadbent, 1986; Williams & Scott, 1988). Such overgeneral thinking is evident for both past and future events and extends to non-clinical depression (e.g. Dickson & Bates, 2006; Williams et al., 1996). Williams and colleagues' (Williams, 2006; Williams et al., 2007) Car-FA-X model suggests three cognitive mechanisms that may each individually, or in combination, lead an individual to engage in overgeneral thought. Research has suggested that retrieval of specific memories often involves supervisory executive processes (e.g. Conway & Pleydell-Pearce, 2000), thus a truncated search within the retrieval process may result from reduced executive capacity (X). Furthermore, retrieval cues may capture attention and engage ruminative thought processes (Car). Finally, overgeneral thinking may also constitute a form of functional avoidance (FA)

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that aims to regulate emotion. Arguably, however, in the long term overgenerality represents a maladaptive thinking style that impairs problem-solving because the individual struggles to access specific experiences that can be used as analogies (Williams, 2006). This, in turn, may predispose an individual to emotional distress, a notion supported by findings that reduced recall specificity and poor problem-solving act as vulnerability factors for future depressive symptoms (e.g. Anderson, Goddard, & Powell, 2010; Anderson, Goddard, & Powell, 2011).

Evidence also suggests that even when individuals with depression are able to generate specific past and/or future events then further biases are present within the content of such events. This is particular pertinent with respect to the emotional valence of events. For instance, they demonstrate a negativity bias within autobiographical memory, with a reversal of the usual tendency to retrieve positive events more rapidly than negative events (e.g. Lloyd & Lishman, 1975). In an investigation of future episodic thinking, MacLeod, Tata, Kentish, and Jacobsen (1997) evidenced reduced fluency in the simulation of positive, but not negative, events. Other work suggests that depression disrupts the fading affect bias, where the usual pattern is for affective fading to be quicker for negative, compared with positive, past events (Walker, Skowronski, Gibbons, Vogl, & Thompson, 2003). Such biases, arguably, serve to maintain depressed mood by validating negative self-beliefs.

In addition to studying the content and specificity of events, researchers have also become interested in how individuals' subjectively experience their memories and simulations. Episodes, both past and future, can take a number of forms within the mind's eye. For instance, they can vary in how vividly they are perceived, the extent to which they involve sensory detail and the extent to which the order of events within them are coherent and ordered. Tulving (1985) argued that for a truly episodic experience then the individual needs to be able to mentally place themselves within the past or future episode, a process he termed *autonoetic consciousness*.

Experimental assessments of *autonoetic consciousness* in the recall of past events have used the remember/know procedure, whereby participants report whether they recollect subjective experiences from the encoding context (remember) or not (know) (e.g. Piolino et al., 2003). An alternative method, which can be used to assess the extent of *autonoetic consciousness* for both past and future events, requires participants to provide subjective ratings of phenomenological experience. Evidence suggests that subjectively experienced phenomenological characteristics differ according to both the event's temporal direction and distance from the present (e.g. Berntsen & Bohn, 2010; D'Argembeau and van der Linden, 2004). This work has demonstrated that people experience past events more vividly and with greater sensory detail than future events, yet rate future events as being more positive and pertinent to their sense of identity and life story. Furthermore, these studies show that distant, compared with near, events are experienced in significantly less sensory detail, yet are paradoxically rated as more related to the self-narrative. Temporal construal theory suggests that distant events consist of high-level construals which are represented in abstract and de-contextualised details, whereas near events are low-level construals, represented in concrete and contextualised details (Trope & Liberman, 2003).

Thus, in addition to the biases in content and specificity already outlined, the degree of *autonoetic consciousness* accompanying autobiographical memories and future thoughts constitutes a further area in which individuals with depression may experience biases. Using the remember/know procedure, Lemogne et al. (2006) found that depressed participants demonstrated an impairment in both specificity and *autonoetic consciousness* for recall of past events. Relative to controls, depressed patients reported fewer remember responses for positive, but not negative, events. Other research has made use of phenomenological characteristics ratings to explore levels of *autonoetic consciousness* associated with both past and future events in depression. Work investigating memories and simulations generated voluntarily, in response to emotional cues, suggests that both clinical and non-clinical depression are associated with lower vividness ratings for positive, but not negative, events (e.g. Holmes, Lang, Moulds, & Steele, 2008; Morina, Deeprose, Pusowski, Schmid, & Holmes, 2011; Werner-Seidler & Moulds, 2011). Arguably, these biases might serve to maintain depression through blunted processing of positively-valenced emotional stimuli (Holmes et al., 2008).

A large proportion of the previous work examining autobiographical memories and simulations within depression has focused on voluntary recall/simulation directed by emotional cues, with comparisons drawn between events produced in response to positive vs. negative cues. This method has proved useful in highlighting a specific difficulty with positive cognitions for individuals with depression (e.g. Holmes et al., 2008; Morina et al., 2011). However, the extent to which it reflects retrieval and simulation strategies in real life can be questioned. There are few occasions when individuals are required to recall/simulate with an explicitly positive or negative cue. Instead they look backwards and forwards in time and select events, as they come to mind, in response to a myriad of cue types, such as lifetime periods and environmental or contextual cues. The type of cue used to elicit memories and simulations may impact on the events retrieved and how the individual subjectively experiences them. For instance, one study using a diary methodology to compare the reactions of depressed and non-depressed individuals to memories, recalled both voluntarily and involuntarily, failed to find a difference in perceived vividness of events between the two groups. The depressed participants did, however, have stronger emotional reactions to memories and rated them as more important to their life story (Watson, Berntsen, Kuyken, & Watkins, 2012). Furthermore, research investigating involuntary memories, which by definition are not cued by the experimenter, have evidenced different results to the studies investigating voluntary recall. For instance, they have shown that involuntary recall does not evidence the same overgenerality in depression (Watson, Berntsen, Kuyken, & Watkins, 2013) and that involuntarily retrieved, intrusive, memories are characterised by higher levels of vividness in depressed, compared with recovered depressed and non-depressed, individuals (Newby & Moulds, 2011). These findings add further weight to the argument that the type of cues used to elicit retrieval and/or simulation impacts on the observed effects.

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