Prospection, well-being and memory

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**Abstract**

Prospection (mental representation of the future) is an aspect of imagination that has recently become a focus of attention for researchers on memory. Evidence from a variety of sources points to episodic memory and future-thinking as being very closely linked and both are connected to well-being and mental health. This paper provides an overview of some key findings linking episodic memory, future-thinking and well-being. Similarities and differences between episodic memories for the past and thoughts about the future are reviewed. It is suggested that the uncertainty inherent in future thinking implies a greater role for semantic memory in how people think about the future compared to how they remember the past. Understanding how semantic and episodic knowledge combine to create representations about the future has the potential to help elucidate ways in which people experiencing psychological distress think about the future.

Research in memory has a long history. By comparison, how people think about the future has attracted relatively little attention, although the mental representations that people hold about the future are increasingly being recognised as playing an important role in behaviour and emotional well-being. Two key questions are: to what extent are representations about future events dependent on memory and, if memories are influential, what are the processes by which they exert their influence? These questions have prompted a growing literature, both on basic process and mechanisms and on their application to emotional disorders and well-being. The aim of the current paper is to provide a brief overview of this literature. First, research linking different aspects of future-directed thinking to various aspects of well-being will be discussed, with a focus on how these processes are involved in people suffering from psychological distress. An overview of similarities and differences between past and future-thinking will be followed by a discussion of the involvement of episodic and semantic memory in future-thinking and their relationship to psychological disturbance.

 **Number of past and future events**

Thoughts about the future are strongly implicated in mental health and well-being. Perhaps the most striking, and serious, example of this connection is the way that hopelessness about the future is the active ingredient in depression that links to suicidality The correlation between depression and suicidal intent largely disappears if self-reported hopelessness is partialled out (Salter and Platt, 1990) and hopelessness predicts repetition of deliberate self-harm six months later (Petrie et al., 1988) as well as completed suicides up to ten years later (Beck et al., 1990). The measurement of hopelessness has relied predominantly on simple self-report, and in an attempt to understand more about the elements of hopelessness, MacLeod, Rose and Williams (1993) developed two ways of looking at future-thinking. The second of these tasks was an extension of the autobiographical memory test used by Williams and Broadbent (1986) and is discussed in the next section. The first task borrowed its methodology from measurement of verbal fluency and asked participants to generate things they were looking forward to or not looking forward to for various time frames in the future (the next week, the next year, the next 5-10 years). In this task, each condition (e.g. number of things looked forward to in the next week) is time-limited, typically one minute in each case, and the main measure is how many events participants are able to think of for each condition in the available time.

Findings in relation to sucidality on the Future-thinking Task have been very clear, with those who are suicidal showing reduced ability to think of future positive events alongside levels of negative future events that are comparable to controls (e.g. Hunter and O’Connor, 2003; MacLeod et al., 1993). People who have recently taken an overdose are less able than matched controls to think of things that they would enjoy or were looking forward to in the future, but were no different from controls in the number of negative events they were anticipating. Depressed participants also show reduced positive anticipation, with no increase in negative anticipation (MacLeod et al., 1997) although if they are also anxious they are likely to show both reduced positive anticipation and increased negative anticipation (MacLeod and Byrne, 1996). In contrast, anxious participants show only an increased number of anticipated negative events; the number of positive events they generate in the future is comparable to controls (MacLeod et al., 1997; MacLeod and Byrne, 1996). Somewhat surprisingly, any group differences that are found are almost always consistent across the different time periods, from the next day through to the next 5-10 years. The ability to think of positive future experiences does not appear to be linked to verbal fluency (which it does not correlate with) and participants who show reduced numbers of positive events for themselves do not show difficulty thinking of positive events for others (MacLeod and Conway, 2007).

The Future-thinking Task, which was designed specifically to examine how people think about the future, has also been adapted to measure how well people are able to think of past positive and negative memories. The memory version simply asks people to generate events from the past. Findings show strong parallels between memory and future thinking. MacLeod et al. (1997) administered the standard future version of the task asking depressed patients, panic disorder patients and controls to think of things they were looking forward to and things they were not looking forward to in different time periods in the future (next week, next year, next 5-10 years) alongside the memory version, asking people to generate as many positive and negative memories as they could for different time periods in the past week, the past year and the past 5-10 years. As indicated earlier, the anxious and depressed groups showed very distinctive profiles of future-thinking, with increased negative thoughts in anxiety and decreased positive thoughts in depression. Importantly, these profiles were almost identical for the memory version of the task. Similar parallel memory and future thinking effects have been found in dysphoric compared to non-dysphoric adolescents (Miles et al., 2004), and Hill and Emery (2013) reported very high correlations between number of past and future events generated in an unselected student sample, an effect that was not explained by variations in general verbal fluency. Number of positive future-thoughts and memories each correlate significantly with positive affect but not with negative affect whereas the reverse is true for negative memories and future thoughts (MacLeod and Conway, 2007; Miles et al., 2004). Self-reported experience of positive affect (e.g. interested, energetic) and negative affect (e.g. tense, worried) are typically uncorrelated and are thought to represent distinct affective systems (Watson et al., 1988).

Two conclusions can be drawn from the Future-thinking Task results. First, there is evidence for two broad groupings, with positive cognitions, depression, sucidality and (low) positive affect clustering together and negative cognitions, anxiety and negative affect forming a second cluster. Second, future-thinking and memory seem to be very closely enmeshed, with positive memories and future-thoughts linking to the first cluster and negative memories and future thoughts being part of the second.

**Specificity of past and future personal events**

The Future-thinking Task allows people to define and describe their own events. Other than excluding repetitions, all the events that people generate are counted. It measures a range of thoughts about the future, from more script-like elements of future-thinking (e.g, getting married, buying a house) to more specific episodes (going to France at the weekend, meeting up with my friends in New York in July), often connected to how far into the future the responses extend. A second task developed in the attempt to understand future-thinking in suicidal patients was an extension of the autobiographical memory test, where people are presented with a cue word and asked to use the cue to help them think of a specific episodic memory. This task is strictly concerned with the ability of people to think about specific episodes, those relating to a discrete event happening in a particular place and time, covering a period of no longer than one day. Williams and Broadbent (1986) had earlier reported that although their suicidal patients were able to think of memories to cue words, the memories they did produce appeared to be qualitatively different in that they tended to be lacking in specificity (Williams and Broadbent, 1986). Presented with a cue word like “hurt”, a suicidal participant might say “all the times people have ignored me“ rather than “when Nadia just walked past last Saturday as if I wasn’t there”. This overgenerality was largely the result of giving responses that described a repeated class of events, as in the example just given, instead of any one specific example.

Extending this method to asking people to think of future thoughts, the results, again, showed striking similarities to asking people for memories. Suicidal patients produced more overly general future thoughts in just the same way that they did for memories (Williams et al., 1996). A lack of specificity of future episodic thinking alongside a lack of specificity for past experiences has now been found in a range of clinical groups, including schizophrenia (D’Argembeau et al., 2008) depression (Belcher and Kangas, 2014), war veterans with post-traumatic stress disorder (Brown et al., 2013) bereaved partners experiencing complicated grief (Robinaugh and McNally, 2013) and autistic spectrum disorder (Lind and Bowler, 2010). Some studies have used just neutral cue words but when positive and negatively valenced cue words are used participants generally show memory and future overgenerality to both, but with a tendency to show stronger effects to positive cues. Furthermore, in these studies there is typically a very strong correlation between how specific people are for the past and for the future, further reinforcing the link between past- and future-thinking. Interestingly, although this style of greater general responding tends to be associated with psychological problems there is evidence of cultural influence. Wang, submitted for publication, has shown that compared to Western Europeans, Asians show less specificity for both past and future, which she interprets as resulting from a less individualised cultural context. It would be interesting to know whether the same relationship between emotional difficulties and overgenerality are shown within an Asian cultural context.

Coding for specific or general memories produced in response to single cue words has strong overlap with the autobiographical interview (AI; Levine et al., 2002). In the AI, memories are elicited to cue words, participants are then encourage to elaborate on these memories, providing as much detail as possible, and these details are later coded by independent raters as internal or external. Internal details are those that relate to the actual episodic experience, where by providing details about time, place, sensations and emotions the person conveys a sense of re-experiencing the event (e.g. “I felt really great that morning at Achmelvich beach. I was standing with my back to the water feeling the wind pushing me”). External details can be related in a general sort of way to the event but do not convey a sense of re-experiencing any particular episode, for example, they may be general knowledge statements or descriptions of extended or ongoing events, or a commentary (e.g. “we often go to the seaside”). The autobiographical interview method has also been applied to future-thinking and, again, there are strong parallels with memory. Addis, Wong, Schacter (2008) replicated Levine et al.’s finding of older adults, compared to younger adults providing less internal and more external detail on memories of past events, and also found parallel effects when episodic future thoughts were elicited. Furthermore, there was a strong correlation between how internal or external participants were for the past and future. A similar study conducted with patients suffering from Alzheimer’s disease showed fewer internal details for both past and future conditions in the patient group compared to non Alzheimer-disease controls. As before, there was a strong correlation between internality on past and future conditions (Addis et al., 2009). This AI-based method has been used less in clinical groups, in comparison to the extended autobiographical memory test, but Brown et al. (2014) in their sample of combat veterans found that those suffering from post-traumatic stress disorder provided fewer internal and more external details in both memories and future thoughts and, again, the correlation between memory and future scores was very high. The literature on specificity of retrieval and generation of future episodes has been usefully applied to understanding emotional disorders, but there is a range of other findings on memory and prospection that might in future be usefully applied to understanding more about the sorts of difficulties experienced by clinical groups.

**Other past- and future-thinking similarities**

When memories and future-thoughts are elicited and subsequently rated by participants on a range of dimensions there is often strong overlap. In one of the early studies to examine both past and future in this way, D’Argembeau and Van der Linden (2004) elicited near (past year, next year) and distant (last 5-10 years; next 5-10 years) positive and negative events and asked participants to rate them in various ways. Near events compared to distant events, and positive as opposed to negative events, were rated as having more sensory details and a stronger feeling of being experienced. Importantly for the discussion here, this was the case for both memories and episodic future thoughts. When participants are also asked to date the events that they produce, the temporal distribution of past and future thoughts is very similar, with a comparable tapering of numbers of events the further away the time frame is from the present (Spreng and Levine, 2006). In addition to the age related decline in specificity of responses discussed earlier, at the other end of the developmental spectrum the capacity for retrieving episodic memories and generating future episodic appears to emerge around the same time, at around three and five years of age (Busby and Suddendorf, 2005), as does the later progressive development of self-narrative ability (Bohn and Berntsen, 2013). Bohn & Berntson (2013) asked children ranging from nine to fifteen years old to write a story about their lives up to that point (important things that happened to them, changes that had taken place, etc.) and also to do the same looking ahead to the rest of their lives. The older the children were, the more coherent the narratives they produced, and this developmental progression was comparable for past and future accounts. Beyond an individual level, the link between past and future has also been extended to collective, as well as personal, knowledge (Merck et al, submitted for publication). Finally, fMRI studies have shown that similar brain structures are activated when people think about past and future (Addis et al., 2007; Schacter et al., 2012).

The similarities between memory and future-thinking have led to the idea that a person’s ability to think about future personal episodes is dependent on their episodic memory. Early support for this view is to be found in Williams et al. (1996) who manipulated specificity of memory and observed effects on how specific people were in the way they thought about the future. In an attempt to make sense of the wide ranging findings on overlap between memory and future episodic thinking, Schacter and Addis (2007) proposed the *constructive episodic simulation hypothesis*. This hypothesis proposes that the main function of episodic memory is to help people navigate the future successfully through facilitating the construction of internal representations of future states of affairs. Being able to imagine future events and episodes that have not yet been experienced is crucial to being able to function, for example, forming goals, planning, anticipating obstacles, and so on. According to the hypothesis, the way that episodic future thoughts are generated is through accessing and recombining elements from episodic memory. When people have difficulties with retrieving specific episodic details, as is the case with older adults, those suffering from degenerative neurological disorders or those experiencing psychological distress, then their ability to generate episodic future thoughts is also compromised. This is what would explain the parallel findings for memory and future-thinking that have already been described. Recognising the shared nature of the system for past- and future-thinking, Conway, Loveday and Cole, submitted for publication, proposed the *remembering-imagining system,* which coordinates and integrates past, current and future thinking based on the person’s goals.

One of the challenges to the hypothesis is that the symmetry between past and future responses on tasks may reflect more general factors, such as ability to describe details *per se*. In the case of older adults, and possibly other groups, such a difference might reflect a more general narrative style that pervades any account that they give. Schacter and colleagues have addressed this possibility through experimentally manipulating specificity and observing discrete effects on memory and future-thinking (Schacter, submitted for publication). Nevertheless, there remain a number of challenges for the constructive episodic simulation hypothesis arising from the fact that although there are similarities between past and future thinking there are also substantial differences between them.

**Differences between past and future thinking**

Perhaps the clearest, and also least surprising, of these differences is that people think about the future in a more abstract and less detailed way than they do the past. Word-cuing studies that have measured past and future specificity in the same way within the same study, invariably show episodic memories to be more specific than episodic future events (e.g. Hill and Emery, 2013). Other measures show similar effects. Anderson and Dewhurst (2009) asked participants to complete sentences like “Last year I ...”, and “When I think back to ...” as well as their future-oriented equivalents (“Next year I will...”, ”When I look forward to...“). The memory condition produced 39% of specific responses compared to 23% in the future condition. Similar lack of specific episodic detail in future compared to past responses has also been found using the extended AI (Addis et al., 2008). Consistent with independent raters’ judgements, participants rate their own memories as more vivid and containing more sensory detail than their future thoughts, (Berntsen and Bohn, 2010; D’Argembeau et al., 2010). This difference in vividness and sensory detail is true was even more marked when people were simply asked to think of important things in the past or the future (Berntsen and Bohn, 2010) rather than being cued by single words.

Despite future episodes being more abstract and vague, people consistently rate them as more positive and more personally important or significant than past episodes (Berntsen and Bohn, 2010). Bohn and Berntson (2013) found that future events were more script-like in that they contained common themes whereas memories were more idiosyncratic. Interestingly, de Vito et al. (2015) asked participants to think of desirable and undesirable future episodes separately, and found that desirable events contained more specific information (internal details) but also corresponded more to common themes or life scripts, whereas negative future thoughts were more idiosyncratic and participants were more likely to report them as being linked to a particular negative memory. These differences reinforce the view proposed earlier of positive and negative future-thinking being distinct. It was indicated earlier that the temporal pattern of generated past and future events follows a broadly similar pattern, with a tapering of events with increasing distance from the present. However, within that broad pattern people generally think less far into the future than they think back to the past (Anderson et al., 2012; Berntsen and Bohn, 2010). Finally, as already indicated, neuroimaging studies have shown common patterns of neural activity when people are asked to think about the future and remember the past but alongside that commonality there is also evidence that future-thinking appears to involve a wider neural network than does recalling memories, probably due to the greater degree of cognitive processing involved in thinking about events that have not yet occurred (Addis et al., 2007). There is, however, also some evidence of a specific neural substrate to memories. Areas that are involved in contextual and visual information (e.g. parahippocampal cortex and posterior visual cortex) show greater activation during memory than imagining (Addis et al., 2009; Gilmore et al., 2014).

**Non-episodic involvement in future-thinking**

The differences between memory and future conditions are not necessarily problematic for the constructive episodic simulation hypothesis, because arguing that episodic memories are used to create episodic future representations recognises that these are not identical phenomena. Therefore, there are bound to be natural differences between them despite their close connection. However, there are a number of other sources of evidence that suggest non-episodic information is important in the construction of future personal representations.

Irish et al. (2012) compared semantic dementia patients (where semantic memory is severely impaired but episodic memory is largely spared), alzheimer’s disease patients (severe episodic impairment but largely intact semantic memory) and controls on past and future episodic thinking using the autobiographical interview method already outlined. The Alzheimer group showed the expected lack of internal details in both memory and future conditions. The key finding was that the semantic dementia group, despite relatively intact episodic memory, showed equivalent lack of internal details to the Alzheimer group on future episodes. The findings point to the importance of semantic information in future-thinking, possibly as providing a framework within which stored episodic information can be used to construct representations of the future. Further evidence of the role of semantic information comes from links between measures of executive processes and specific episodic recall and future-thinking. Measures of working memory, which can be inferred to be involved in generative search involving semantic memory, correlate with specificity of future episodes but not with memory specificity (D’Argembeau et al., 2010; Hill and Emery, 2013). Compared to retrieval, where episodes may come to mind directly with little effort, generating future episodes appears to require more input from executive processes. Some direct evidence on this question was provided by D’Argembeau and Mathy (2011) who gave participants standard word cues to generate specific memories or future events but asked them to think aloud while doing the tasks. Responses were then broken down into units and coded as semantic information, general events, or specific thoughts. For example, in response to being asked to think of a future episode using the cue word “friend” someone might say “Tom is probably my best friend” (semantic), “we are planning to go to Rome together this summer” (general event), “I can imagine driving in from the airport trying to catch sight of the coliseum” (specific). Often, as in the example just given, people moved from semantic and general event knowledge being more prominent in the early steps, becoming more specific as their thoughts progressed. Importantly, the memory and future conditions differed, with memory responses being more specific at the earlier steps compared to future thoughts which were more likely to start with semantic or general event knowledge. Cuing people with words related to their personal goals produced more specific memories and future episodes at an earlier stage but the difference between the memory and future conditions remained.

**Summary and conclusion**

Semantic and episodic knowledge systems are both involved in thinking about the past and the future. But the vagueness about what will happen in the future, compared to the relative certainty of what has happened in the past, means that there is a stronger role for semantic memory in constructing the future. Psychological distress is associated with disturbances in both episodic and more script-like, semantic future-thinking. Szpunar et al. (2014) have outlined a taxonomy of future-thinking with domains of simulation, prediction, intention (goal setting) and planning, and suggested that many cognitions in these domains will involve hybrid representations of semantic information and episodic details. Clinical groups or those generally low in well-being are known to have problems in future-thinking, but not necessarily all aspects. Even suicidal individuals are able to describe personal goals (Danchin et al., 2010; Vincent et al., 2004) but they struggle to generate plans to achieve those goals and cannot see them being achieved, leading to a state that MacLeod and Conway (2007) have called *painful engagement* where someone remains attached to a future goal that they cannot envisage being realized. Future-research could usefully understand how semantic and episodic memory combine in creating future representations in these different domains and how they might become disrupted in emotional disorders, such as in states of painful engagement.

**Author Biography**

Andrew MacLeod is Professor of Clinical Psychology at Royal Holloway University of London, where he is also Director of Clinical Psychology Training. He received his PhD from the University of Cambridge, where he also trained as a clinician. His longstanding interest is in how people think about the future and how such thinking is disrupted in different forms of psychological distress, an area in which he has published widely and received support from the Medical Research Council, the Economic Research Council and the Wellcome Trust (all UK). He is the author of a forthcoming book, *Prospection, well-being and mental health*, to be published by Oxford University Press.

**References**

Addis DR, Wong AT and Schacter DL (2007) Remembering the past and imagining the future: Common and distinct neural substrates during event construction and elaboration. *Neuropsychologia*, 45(7), 1363–1377.

Addis DR, Wong AT and Schacter DL (2008) Age-related changes in the episodic simulation of future events. *Psychological Science*, 19(1), 33–41.

Addis DR, Sacchetti DC, Ally BA, et al. (2009) Episodic simulation of future events is impaired in mild Alzheimer’s disease. *Neuropsychologia*, 47(12), 2660–2671.

Addis DR, Pan L, Vu M-A, et al. (2009) Constructive episodic simulation of the future and the past: Distinct subsystems of a core brain network mediate imagining and remembering. *Neuropsychologia*, 47(11), 2222–2238.

Anderson RJ and Dewhurst SA (2009) Remembering the past and imagining the future: Differences in event specificity of spontaneously generated thought. *Memory*, 17(4), 367–373.

Anderson RJ, Dewhurst SA and Nash RA (2012) Shared cognitive processes underlying past and future thinking: The impact of imagery and concurrent task demands on event specificity. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 38(2), 356–365.

Beck AT, Brown G, Berchick RJ, et al. (1990) Relationship between hopelessness and ultimate suicide: A replication with psychiatric outpatients. *The American Journal of Psychiatry*, 147(2), 190–195.

Belcher J and Kangas M (2014) Reduced goal specificity is associated with reduced memory specificity in depressed adults. *Cognition and Emotion*, 28(1), 163–171.

Berntsen D and Bohn A (2010) Remembering and forecasting: The relation between autobiographical memory and episodic future thinking. *Memory & Cognition*, 38(3), 265–278.

Bohn A and Berntsen D (2013) The future is bright and predictable: The development of prospective life stories across childhood and adolescence. *Developmental Psychology*, 49(7), 1232–1241.

Brown AD, Root JC, Romano TA, et al. (2013) Overgeneralized autobiographical memory and future thinking in combat veterans with posttraumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 44(1), 129–134.

Brown AD, Addis DR, Romano TA, et al. (2014) Episodic and semantic components of autobiographical memories and imagined future events in post-traumatic stress disorder. *Memory*, 22(6), 595–604.

Busby J and Suddendorf T (2005) Recalling yesterday and predicting tomorrow. *Cognitive Development*, 20(3), 362–372.

Conway MA, Loveday C, Cole SN (submitted for publication) The remembering-imagining system.

Danchin CL, MacLeod AK and Tata P (2010) Painful engagement in deliberate self-harm: The role of conditional goal setting. *Behaviour Research and Therapy*, 48(9), 915–920.

D’Argembeau A and Mathy A (2011) Tracking the Construction of Episodic Future Thoughts. *Journal of Experimental Psychology: General*, 140(2), 258–271.

D’Argembeau A and Van der Linden M (2004) Phenomenal characteristics associated with projecting oneself back into the past and forward into the future: Influence of valence and temporal distance. *Consciousness and Cognition*, 13(4), 844–858.

D’Argembeau A, Raffard S and Van der Linden M (2008) Remembering the past and imagining the future in schizophrenia. *Journal of Abnormal Psychology*, 117(1), 247–251.

D’Argembeau A, Ortoleva C, Jumentier S, et al. (2010) Component processes underlying future thinking. *Memory and Cognition*, 38(6), 809–819.

De Vito S, Neroni MA, Gamboz N, et al. (2015) Desirable and undesirable future thoughts call for different scene construction processes. *The Quarterly Journal of Experimental Psychology*, 68(1), 75–82.

Gilmore AW, Nelson SM and McDermott KB (2014) The Contextual Association Network Activates More for Remembered than for Imagined Events. *Cerebral Cortex*, Available from: http://www.cercor.oxfordjournals.org/cgi/doi/10.1093/cercor/bhu223 (accessed 25 June 2015).

Hill PF and Emery LJ (2013) Episodic future thought: Contributions from working memory. *Consciousness and Cognition*, 22(3), 677–683.

Hunter EC and O’Connor RC (2003) Hopelessness and future thinking in parasuicide: The role of perfectionism. *British Journal of Clinical Psychology*, 42(4), 355–365.

Irish M, Addis DR, Hodges JR, et al. (2012) Considering the role of semantic memory in episodic future thinking: evidence from semantic dementia. *Brain*, 135(7), 2178–2191.

Levine B, Svoboda E, Hay JF, et al. (2002) Aging and autobiographical memory: Dissociating episodic from semantic retrieval. *Psychology and Aging*, 17(4), 677–689.

Lind SE and Bowler DM (2010) Episodic memory and episodic future thinking in adults with autism. *Journal of Abnormal Psychology*, 119(4), 896–905.

MacLeod A, Rose G and Williams JM (1993) Components of hopelessness about the future in parasuicide. *Cognitive Therapy and Research*, 17(5), 441–455.

MacLeod AK and Byrne A (1996) Anxiety, depression, and the anticipation of future positive and negative experiences. *Journal of Abnormal Psychology*, 105(2), 286–289.

MacLeod AK and Conway C (2007) Well-being and positive future thinking for the self versus others. *Cognition & Emotion*, 21(5), 1114–1124.

MacLeod AK, Tata P, Kentish J, et al. (1997) Retrospective and prospective cognitions in anxiety and depression. *Cognition and Emotion*, 11(4), 467–479.

Merck C, Topcu MN and Hirst W (Submitted for publication). Collective mental time travel: creating a shared future through our shared past.

Miles H, MacLeod AK and Pote H (2004) Retrospective and prospective cognitions in adolescents: anxiety, depression, and positive and negative affect. *Journal of Adolescence*, 27(6), 691–701.

Petrie K, Chamberlain K and Clarke D (1988) Psychological predictors of future suicidal behaviour in hospitalized suicide attempters. *British Journal of Clinical Psychology*, 27(3), 247–257.

Robinaugh DJ and McNally RJ (2013) Remembering the Past and Envisioning the Future in Bereaved Adults With and Without Complicated Grief. *Clinical Psychological Science*, 1(3), 290–300.

Salter D and Platt S (1990) Suicidal intent, hopelessness and depression in a parasuicide population: The influence of social desirability and elapsed time. *British Journal of Clinical Psychology*, 29(4), 361–371.

Schacter DL and Addis DR (2007) The cognitive neuroscience of constructive memory: Remembering the past and imagining the future. *Philosophical Transactions of the Royal Society of London (B)*, 362, 773–786.

Schacter DL, Addis DR, Hassabis D, et al. (2012) The Future of Memory: Remembering, Imagining, and the Brain. *Neuron*, 76(4), 677–694.

Schacter DL and Madore KP (submitted for publication) Remembering the past and imagining the future: Identifying and enhancing the contribution of episodic memory.

Spreng RN and Levine B (2006) The temporal distribution of past and future autobiographical events across the lifespan. *Memory & Cognition*, 34(8), 1644–1651.

Szpunar KK, Spreng RN and Schacter DL (2014) A taxonomy of prospection: Introducing an organizational framework for future-oriented cognition. *Proceedings of the National Academy of Sciences*, 201417144.

Vincent PJ, Boddana P and MacLeod AK (2004) Positive Life Goals and Plans in Parasuicide. *Clinical Psychology & Psychotherapy*, 11(2), 90–99.

Wang Q (submitted for publication) Remembering the self in cultural context.

Watson D, Clark LA and Tellegen A (1988) Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070.

Williams JM and Broadbent K (1986) Autobiographical memory in suicide attempters. *Journal of Abnormal Psychology*, 95(2), 144–149.

Williams JMG, Ellis NC, Tyers C, et al. (1996) The specificity of autobiographical memory and imageability of the future. *Memory & Cognition*, 24(1), 116–125.