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Anna-Lisa Cohen  
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# Prospective Memory

Remembering  
to Remember,  
Remembering to  
Forget



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Remembering to Remember,  
Remembering to Forget

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*From Anna-Lisa:*

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*From Jason:*

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## Contribution

Dr. Cohen was the primary author for Chapters 1, 4, 5, and 6 of the book. Dr. Hicks was the primary author for Chapters 2 and 3.

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# About the Authors

**Anna-Lisa Cohen** is an associate professor of psychology at Yeshiva University in New York, New York. Her research is guided by an interest in the influence that future goals and intentions have on behavior. She earned her PhD in psychology from the University of Victoria, Canada. Her research informs the development of theoretical orientations for understanding the cognitive processes that support prospective memory. For example, her research on the intention interference effect shows that cues related to a delayed intention are difficult to ignore when encountered in an unexpected context and this is true for both young and older adults. An enduring theme in much of her research is the flexibility with which participants are able to engage and disengage monitoring processes depending on the nature of task demands.

**Jason L. Hicks** is a professor of psychology at Louisiana State University in Baton Rouge, Louisiana. In 1998, he earned his PhD in cognitive/experimental psychology from the University of Georgia. His research interests include source memory, recognition memory, false memory, and prospective memory (PM). He has published over 30 articles or book chapters on PM. His work focuses on encoding, retrieval, and contextual factors that predict successful intention retrieval. Perhaps the most programmatic contribution in this area is a specification of the cognitive resources demanded by prospective memory retrieval. His early work highlighted the degrees to which prospective memory retrieval requires executive resources, but more recent work demonstrates that people can flexibly allocate attention depending on their appreciation of the demands governing anticipated retrieval contexts.

# Chapter 1

## Selected Topics in Prospective Memory

*“Life can only be understood backwards; but it must be lived forwards.”*

Søren Kierkegaard

### 1.1 The Challenge of Defining Prospective Memory

In this book, we aim to provide an up-to-date overview of selected topics in the field of prospective memory (i.e., memory for delayed intentions). Prospective memory involves an intention to perform a future action being established in memory. Then later, some aspect of the environment eventually triggers remembering to fulfill the intention (Einstein & McDaniel, 1990; Harris, 1984; Harris & Wilkins, 1982; Meacham & Leiman, 1975). Prospective memory is also referred to as “remembering to remember” (Schonfield & Stones, 1979) or “remembering to recall” (Wilkins & Baddeley, 1978). More than a century ago, Baldwin (1897) defined intentional action as “the emergence of desire, deliberation, and effort: the conscious representation of a goal, the active consideration of alternative means and ends, and the feeling accompanying the selection and execution of a plan” (p. 2; as cited in Olson, Astington, & Zelazo, 1999). If an intention has to be delayed due to situational constraints, then that intention must be postponed until it can be retrieved at a later point in time. As mentioned, for logistical reasons, intentions often cannot be carried out immediately; therefore, a critical component is the retrieval of the intention at an appropriate moment in time or in response to a prespecified event. Whereas externally prompted retrieval is typically a critical feature of retrospective memory (memory for past events), prospective memory is more often characterized by self-initiated retrieval processes which can make them more vulnerable to forgetting (Craig, 1986). Ellis (1996) described prospective memory as consisting of several phases: (a) encoding an intention, (b) maintaining the intention in memory while engaged in other ongoing activities, (c) initiating the intention at the appropriate moment, and (d) evaluating the outcome. At the level of neural systems, there is much evidence that prospective memory is heavily reliant upon both prefrontal

systems (notably Brodmann's Area 10; Burgess, Quayle, & Frith, 2001) and the medial temporal lobe (Gordon, Shelton, Bugg, McDaniel, & Head, 2011).

There are numerous examples in daily life of the potentially harmful consequences of forgetting to carry out an intention. In fact, Kvavilashvili, Messer, and Ebdon (2001) report that prospective memory failures represent 50–70% of everyday memory problems (see also Crovitz & Daniel, 1984; Terry, 1988). Examples of particularly serious prospective memory lapses include forgetting to take one's heart medication, a surgeon forgetting to remove an instrument before closing an incision, or a pilot forgetting to adjust the position of wing flaps before takeoff.

Prospective memory tasks are thought to be supported by both a prospective and a retrospective component (Einstein, Holland, McDaniel, & Guynn, 1992; McDaniel & Einstein, 1992). The prospective component supports the realization that some prospective action is to be performed once an appropriate cue is encountered. The retrospective component, on the other hand, supports the ability to recall an intention when that prospective cue is detected. Therefore, the prospective component involves remembering that *something* needs to be done; and the retrospective component supports remembering what it is that has to be done. Although the prospective and retrospective components of prospective memory are interconnected, they are functionally distinct (Cohen, Dixon, Lindsay, & Masson, 2003; Cohen, West, & Craik, 2001; Jones et al., 2006; Wesslein, Rummel, & Boywitt, 2014).

Despite the collective acknowledgment of prospective memory in everyday life, historically, researchers argued whether this emerging field of research was actually a distinct form of memory. As Crowder (1996) famously argued in his chapter "The Trouble with Prospective Memory: A Provocation," the loss of the term *prospective memory* would leave the field better off. Graf and Utzl (2001) rightly pointed out that Crowder took issue with the idea that prospective memory was a distinct form of episodic memory; however, he did not doubt that memory can indeed be oriented to the future. As a cognitive construct, prospective memory is complex, with many sub-domains. This may contribute to the difficulty with defining it. For example, a number of cognitive abilities have been implicated in prospective memory, including working memory, executive functioning, time perception, and retrospective memory, to name a few. Perhaps Ellis and Kvavilashvili (2000) offered the most comprehensive definition of prospective memory: "Successful prospective remembering enables us to shape and direct our cognitive resources in the pursuit of future actions and plans. As such, it is a critical element in the coordination and control of cognitive skills that underlie our ability to complete many real-world activities. It should, therefore, no longer be regarded as an aspect of memory that lies on the fringes of cognitive psychology but as one that is central to developing our understanding of how intentions are translated into action" (p. 1). This quote effectively captures the expansive scope of prospective memory and acknowledges the role it plays in the formation of future actions and plans. Pink and Dodson (2013) suggest a broader definition of prospective memory that includes the necessity of remembering to not perform an intention, if it has already been completed. For example, as we review in more depth in Chap. 4, a common prospective memory failure is