Jason R. Finley, Farah Naaz, and Francine W. Goh. *Memory and Technology: How We Use Information in the Brain and the World.* Springer, 2018, xvii + 217 pp. ISBN: 978-3-319-99169-6, 119.99 USD

Reviewed by: Kourken Michaelian
             Université Grenoble Alpes, France

Email: kourken.michaelian@univ-grenoble-alpes.fr
Address: Center for Philosophy of Memory
              Laboratoire « Philosophie, Pratiques & Langages »
              Université Grenoble-Alpes
              Bâtiment ARSH
              CS 40700
              38058 GRENOBLE CEDEX FRANCE

In this highly stimulating book, Finley, Naaz, and Goh are concerned with two interrelated questions. How do internal and external memory interact? And what impact are new external memory technologies having on their interaction? The book reports the results of an investigation of these questions by means of online surveys, results that are both interesting in their own right and suggestive of promising avenues for further research. Due to the authors' decision to conjoin their empirical report with extensive theoretical discussion, the book will be of interest to readers not only in psychology but also in a range of other disciplines. Readers in philosophy, in particular, will appreciate the authors' willingness to address a number of highly general conceptual questions.

This willingness is on display from the outset of the book, as chapter 1 describes the authors' method—based on surveys conducted using Mechanical Turk—and introduces their general theoretical framework. As far as method is concerned, a fine-grained methodological assessment will have to be left to others, but it is worth noting that this sort of survey-based research has—as Finley, Naaz, and Goh readily acknowledge—an obvious limitation, namely, that, while surveys might be able to get at what subjects believe about how they make use of internal and external memory, they cannot get directly at how subjects do in fact make use of them. The importance of this limitation should not, however, be overstated: it is plausible that subjects have some insight into their own use of internal and external memory, and survey-based research is thus a legitimate means of furthering our understanding of the consequences of widespread and increasing reliance on novel external memory technologies.

As far as the theoretical framework is concerned, Finley, Naaz, and Goh are to be commended for offering clear, explicit definitions of their key concepts. Memory, they tell us, is "information transmitted from the past that may be recovered in the present. Memory is information transmitted across time" (p. 6). Given this extremely undemanding definition of memory, they are bound to recognize the existence not only of internal memory but also of a variety of forms of external memory: "[i]nternal memory", they write, "is information stored in an individual's brain. External memory is information stored outside of an individual's brain" (p. 5). The intent behind this very broad definition is no doubt to accommodate a wide range of forms of external memory, but it is arguably overly broad. In essence, the authors equate the category of stored information with that of memory and then treat any information that is stored externally to an individual as being external memory "relative to" that individual. The consequence, as the authors acknowledge, is that even information in a book that one has never read or on a website that one has never visited counts as external memory. While the authors do not appear to be troubled by this consequence, there is a real methodological worry here: the particular kinds of high-tech external memory with which the book is primarily concerned may constitute a reasonably unified category, but it seems

unlikely that we will be able to produce useful generalizations about phenomena as varied as those grouped together by their broad definition. (Finley, Naaz, and Goh invoke examples ranging from "songs and legends of oral tradition" through cuneiform clay tablets and ink on paper to the internet and smartphones.) Consider the three basic forms of external memory acknowledged by the authors: social external memory ("information stored in other people"), low-tech technological external memory ("information stored in the external environment" that "does not require a power source to operate"), and high-tech technological external memory ("information stored in the external environment" that "does require a power source to operate"). The differences among these forms of external memory—which go far beyond whether one needs to plug them in—may well be sufficiently deep for it to be misleading to apply a single term to all three. While it is natural to begin the search for a definition of memory with the notion of stored information, it is unfortunate that the authors opted not to refine their definition any further.

There are other worries about Finley, Naaz, and Goh's definition of memory that one might have—e.g., it seems not to take into account the possibility that remembering involves the generation of new information—but readers with reservations about the definition will nonetheless find chapters 2-4—which report the results of their surveys and thus constitute the heart of the book—to be rewarding. Some of the results are unsurprising. For example, suggesting that external memory plays—or at least seems to play—an increasingly prominent role in our cognitive lives, 36% of subjects judge that they use low-tech external memory to help them remember things often or always, while 53% judge that they use high-tech external memory to help them remember things often or always; 69% judge that they use high tech external memory more often or much more often than they did five years ago. Others are much more surprising, even outright puzzling. For example, while it may not be surprising that 53% of subjects agree or strongly agree that they "use external memory to store and retrieve factual knowledge", it is quite intriguing that 25% agree or strongly agree that they "use external memory to store and retrieve personal experiences", despite the fact that subjects tend to see internal memory as "working better for" episodic memory and external memory as "working better for" semantic memory. No attempt will be made here to provide an overall summary of Finley, Naaz, and Goh's results, but perhaps the most interesting lesson to emerge from their analysis is that subjects perceive high-tech forms of technological external memory as playing an increasingly central role in remembering but are relatively optimistic about the consequences of this development for human memory. The obvious next question is whether these perceptions are right. Answering this question will require methods that go beyond surveys, and the authors discuss a number of different potential methods in chapter 7.

Chapters 1-4 make up part 1 of the book. Part 2 is devoted to a reviewing relevant theoretical literature from psychology (chapter 5) and a variety of other disciplines (chapter 6). On the one hand, the scope of the literature review is impressive. Philosophers, for example, will be interested in seeing what the authors have to say about the extended cognition hypothesis, and they will also be rewarded by discussion not only of literatures from other disciplines with which they are likely already familiar (e.g., the transactive memory framework in psychology) but also of literatures from a number of other disciplines—including dynamic systems, personal information management, library and information science, media and cultural studies, research on photography, collective memory research, and anthropology and archaeology—with which they may be less familiar. On the other hand, the literature review has a pair of important limitations. First, the sheer scope of the review means that the discussion is sometimes necessarily superficial. Second, there is—perhaps because the authors' method focuses on people's beliefs about external memory, whereas the theories reviewed focus on people's use of external memory—relatively limited interaction between chapters 5 and 6 and the book's empirical chapters. These limitations notwithstanding, Finley, Naaz, and Goh have put a wide range of approaches to external

memory together into a coherent and accessible package, an accomplishment already sufficient to ensure that the book will constitute a valuable resource for memory researchers in multiple disciplines.

Part 3 of the book provides a general summary (chapter 7) and discusses directions for future research (chapter 8). In addition to summarizing the authors' conclusions, chapter 7 considers alternatives to survey-based methods, including experiments, developmental methods, content analysis, ethnography, and experience sampling. The challenges involved in applying these methods would, in certain cases, no doubt be considerable, but it is to be hoped that we will see more work done using some or all of them. It is likewise to be hoped that we will see more work done on some of the research directions outlined in chapter 8. For example, while there is a growing body of work on the metacognitive monitoring and control of external memory, there is certainly a need for additional research in this area.

Overall, the interest of the book may lie more in the questions that it raises than it does in the answers that it proposes. This is by no means intended as a criticism. New forms of high-tech external memory can be expected to have important cognitive, epistemic, and ethical consequences, and we have yet to come to grips with these. Getting clear on the basic questions that need answering is a necessary first step towards doing so, and the book represents a valuable contribution, in part due to Finley, Naaz, and Goh's willingness to reflect on these questions. While the book speaks most directly to psychologists, and while this review has emphasized aspects of the book that are likely to be of interest to philosophers, it can thus be read with profit by researchers based in all disciplines that contribute to memory studies.