

BOOK REVIEW

Connecting Dots Between Psychiatry, Neuroscience, and Memory: A Review of *A Sense of Self: Memory, The Brain, and Who We Are* By Veronica O'Keane

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In *A Sense of Self: Memory, The Brain, and Who We Are* (2021), Veronica O'Keane, professor of psychiatry and consultant psychiatrist at Trinity College Dublin, takes us on a journey that explores how scientists are building knowledge about the human brain's workings. From schizophrenia to anorexia nervosa to borderline personality disorders, O'Keane primarily draws on cases of her own patients and the neuroscientific underpinnings of the illnesses. By doing so, the author makes a strong case for the intricate connection between psychiatry and memory, or, as O'Keane herself puts it, "the medium through which we filter present conscious and non-conscious experience" (p. 10). General audience readers will be greatly impressed with O'Keane's spotlight on the magnificence of the human brain. Readers with expertise in memory, neuroscience, and/or psychiatry will easily locate the cited sources via the careful notes, making this book valuable for a range of readers.

The book's forward includes an argument that Proust's famous novel was mistranslated in 1954 to connote the past is captured in a repository, *Remembrance of Things Past*, and was better translated in 1992 to connote that experiences are ephemeral, *In Search of Lost Time*. This challenge to conventional references to Proust (e.g., Chu and Downes, 2002; Herz and Schooler, 2002) continues in the first chapter. O'Keane describes Edith, a patient with postpartum psychosis, having a Proust-like experience reconnecting to lost memories but in response to a visual cue, "a small tilted gravestone", rather than odor (and taste), as with Proust's tea-soaked madeleine cookie. The author reflects, "Edith's Proust-like ability to communicate her memory as unreconstructed sensory experience—visual and emotional and seemingly time-independent initiated a process in me of unlearning learned constructs." O'Keane lays out the questions Edith's case inspired, including, "How does a visual image trigger a lived memory? How do we re-experience and feel through a memory? What is the difference between a memory that is experienced with emotion and one that is not felt but 'thought', as it were?". As the book explores these questions, we also wonder what the memory literature would look like if writers highlighted by O'Keane, including novelist Modiano (2014) and memoirist Thomas Kilroy (2018), who focus on visual cues, become as prominent as Proust with his focus on odor (and taste). Indeed, this emphasis on visual information in autobiographical memory has been emphasized by Rubin (2005).

The book is broadly organized into two parts, *How We Make Memories* and *How Memories Make Us*. This bidirectional relationship is the heart of the book which emphasizes the inextricable link between structure and function, that "brain and mind are one indivisible whole". O'Keane discusses how sensory information acts as the "fundamental raw ingredient that feeds the brain" and later emphasizes that, "Vision, like all sensation, cannot be separated from memory, and the two interweave to form perception". The author reviews how the hippocampus serves as the memory factory, the cortex is involved in memory storage, the amygdala is responsible for emotions, and the lesser-talked-about insula acts as the interpreter of emotional experiences. Memories, according to O'Keane, provide us with a "time-place-person" orientation, or event memory, that forms the bedrock of our sense of self in the world. The book offers a breadth of scientific information, with thought-provoking connections to literary works. Readers looking for a cohesive focus, however, might find themselves being lost at times.

O'Keane cites William James saying, "to study the abnormal is the best way to understand the normal," and the line clearly resonates with the author. As a psychiatrist for over 30 years, O'Keane offers multiple fascinating cases of psychotic disorders, each shedding light on the neurophysiology of memory and the human brain in general. We return to the case of Edith, a woman diagnosed with postpartum psychosis after insisting that her spouse and new-born baby were both "imposters." What strikes the author, and possibly the reader, is the fact that even after her discharge, Edith still had *memory* of the lived experience ("flashbacks"), regardless of her acquired knowledge of the psychosis. Sensory information is "subjectively real," whether it comes from the outside world or inside the brain with pathological neurons firing. Indeed, this point was made by John Nash as he reflected on his schizophrenia-induced hallucinations coming from the same place that his mathematical ideas did: "the ideas I had about supernatural beings came to me the same way that my mathematical ideas did. So I took them seriously" (Nasar, 2001). O'Keane notes, "the experience of either an auditory hallucination or of a real person speaking are both grounded in the neural matter of memory". We applaud the way O'Keane puts an emphasis on the subjective experiences of her patients and how they inform us about the fundamental matters of memory and the human brain. Such stories could be incorporated into courses with existing pedagogical models

(e.g., Gunther, 2011; McFarlane and Richeimer, 2015; Pollack, 2015).

Given O'Keane's focus on subjective experiences and the fact that she highlights, "remembering and imagining involve the same circuits in the brain", we are puzzled by the book's failure to discuss the body of research on reality monitoring begun by Johnson and Raye (1981) and continued by many other teams (e.g., Leclerc et al., 2019; Metzack et al., 2015; Subramaniam et al., 2017). "*Reality monitoring* refers to discriminating memories of internally generated information from memories of externally derived information, such as distinguishing memories for thoughts and imaginations from memories for perceived events" (Johnson et al., 1993). Indeed, O'Keane's description of schizophrenia as, "an illness in which the affected individual frequently feels that their sensations, emotions, and even actions are not their own" can be understood as a misattribution of source from internal to external (e.g., Mondino et al., 2019; Subramaniam et al., 2017), a connection missing in the book.

The field's advancing understanding of the neuroscientific underpinnings of mental disorders should contribute to the de-stigmatization of mental illnesses. The brain and the mind are inseparable, and the new insights have transformed schizophrenia, for instance, from a psychiatric disorder to a neurological disorder. Studies have shown, however, that the "biogenetic" explanation of mental illnesses might be a double-edged sword: while reducing the blame placed on individuals, it inadvertently increases the perceived dangerousness, desire for social distance, and pessimism about recovery (Loughman and Haslam, 2018).

When O'Keane cites cases that are not her own we recommend checking the original work. We were surprised by the story that, "HM fell off his bicycle when he was seven years old and damaged his hippocampus. . . led to formation of scar tissue. . . Epilepsy, which HM subsequently developed, is often caused by scar tissue in the hippocampus" so we reread the paper cited about this case. The original work on HM contradicts O'Keane's summary:

The aetiology of this patient's attacks [seizures] is not clear. He was knocked down by a bicycle at the age of 9 and was unconscious for five minutes afterwards, sustaining a laceration of the left supra-orbital region. Later radiological studies, however, including two pneumo-encephalograms, have been completely normal, and the physical examination has always been negative (Scoville and Milner, 1957).

Similarly, O'Keane asserts that HM, "could remember events from his childhood for up to about three years prior to the removal of his hippocampi." It is unclear where this information comes from (we could not locate it in the footnoted sources near this assertion). Scoville and Milner (1957) noted, "In conversation, he reverted constantly to boyhood events" (Scoville and Milner, 1957), but the three-year timeframe is not discussed. Corkin (2013), in her book summarizing her career's work with H.M., contradicts O'Keane's claim. Corkin argues that HM had only two autobiographical memories: "The two memories he could

elicit—the first cigarette and the plane ride—were startling exceptions that revealed two outstanding moments in his life". Without evidence that HM could, in fact, recall his childhood, O'Keane's argument that, "HM had an intact prefrontal cortex and was able to access biographical memories that had woven their way to this higher part of the brain," is unfounded. These examples surrounding O'Keane's discussion of HM could be used pedagogically to highlight the importance of checking primary sources, as well as a cautionary tale about the importance of checking one's work.

In the second part of the book, O'Keane delves into the question of "how memory makes us," introducing how the events we experience constantly reconstruct our memory and sense of self in the world. We find the author's discussion of "false memory" particularly interesting. Psychological studies have consistently demonstrated that memories are susceptible to manipulations (Schwartz, 2018), while O'Keane takes this idea a step further and boldly claims that all biographical memories might be "false" to some extent, as ongoing experiences inevitably reconstruct the neural networks of existing memories. She writes, "False memory is generally understood to be remembering events different from how they happened, or remembering things that may not have occurred at all. The main problem with this framework is that 'true' event memory is a contradiction in terms".

Additionally, the author takes a more philosophical approach to discussing what memory means to us with the example of MM, a patient suffering with complete event-memory loss. O'Keane comments:

I never saw MM again, but the tragic sense of her being an empty shell, a daughter lost to her mother, a wife lost to her husband, a mother lost to her children, and most of all, a person lost to herself, has stayed with me. With her total event-memory loss she seemed to have lost her personhood. . . She also taught me that you cannot make a past without first making a present. The hippocampus makes a present because it integrates the sensory inputs from the cortex into a story of the present."

The narrative reminds us of the novel *Still Alice*, a story of a Harvard linguistic professor navigating through her drastically altered life after a diagnosis of early-onset Alzheimer's disease. In a heartfelt speech at the end, Lisa Genova, the author, writes:

My yesterdays are disappearing, and my tomorrows are uncertain, so what do I live for? I live for each day. I live in the moment...Just because I'll forget it some tomorrow doesn't mean that I didn't live every second of it today. I will forget today, but it doesn't mean that today didn't matter.

Although both authors highlight the importance of the present, ultimately, these contrasting views that having a sense of self requires memory of the past (O'Keane) and that it does not (Genova) offers an opportunity for readers to

reflect on what they believe underlies the sense of being a person.

As noted throughout the review, this book could be used for several pedagogical purposes. First, an example that stands out to us is the contrasting stories about H.M. provided by the book and the original paper (Scoville and Milner, 1957). Students could be assigned to read both sources to discover the contradiction themselves, and then, through written work and/or discussion, to reflect on questions such as “what are the implications of such mistakes, particularly in light of people’s insufficient adjustments for corrections?” (e.g., Greitmeyer, 2014; Rich and Zaragoza, 2020). To emphasize the importance of careful scholarship for the next generation of scientists, additional assignments may include comparing other published accounts about H.M. to the original articles. Second, in a course that focuses on experimental design, the case of Edith and O’Keane’s subsequent questions could be paired with an excerpt from Proust’s work (e.g., in Chu and Downes, 2000) and students could be assigned to design an experiment to assess the relative effectiveness of odor and visual cues in eliciting “unreconstructed sensory experience” (O’Keane, 2021.). Third, in a course that aims to cultivate critical thinking in scholarship, students could debate whether a “‘true’ event memory is a contradiction in terms,” or what underlies the sense of being a person as noted in the discussion of Genova (2008) above.

In sum, *A Sense of Self* abandons “even the basic classifications of memory, to follow the journey of memory from sensory experiences of the world and inner feeling states to neural memory lattices”. As a practicing psychiatrist, O’Keane effectively connects the dots between memory, neuroscience, and psychiatry. Thought-provoking, rich in details, and ambitious in scope, *A Sense of Self* looks at memory and the human brain from a multidisciplinary perspective.

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