

Memories Past

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I remember first hearing the name Kandel in my high school psychology class. For one of our exams, I made a flashcard with his name on the front and solely the word "memory" on the back. While Eric Kandel's research with memory is what he is most known for, winning a Nobel Prize in Physiology and Medicine for it in 2000, there is much more to his life and work that needs to be remembered, things that could fill up many, many flashcards.

As outlined in the book *In Search of Memory*, Eric Kandel was born in Vienna, Austria in 1929, growing up amidst World War II. Growing up Jewish, he and his family faced discrimination and hardships from the Nazi police. His fascination with memory began during this time, with memory serving as a form of time travel to allow himself to be somewhere else and free of time and space (21). He remembers his father telling him when he was only nine years old that he had seen Jewish men "rounded up, together with hundreds of other Jewish men, and incarcerated in army barracks" (23). His father was barely able to escape this fate by showing proof of serving on the side of Germany in World War I. Kandel himself also faced anti-semitism from a young age. When Hitler marched into Vienna, he was shunned by all of his classmates, besides one girl, the only other Jew in his class (36). Besides being outcast, he was also bullied, taunted, and then expelled along with all the other Jewish children (36). At the University of Vienna the Jewish students were also dismissed, totalling more than 40% of the student body and 50% of the faculty (37). As a young child, these memories hold lasting impacts into the rest of your life, in Kandel's case, serving as the foundation for his life's work.

Moving to the United States, Kandel kept his interest in what it is that enables humans to remember even the most horrific of events, such as the holocaust. While his initial focus in school was history, specifically Austrian and German history, again relating to memory and his childhood, he later caught wind of psychoanalysis, and from then on decided to explore the roots of human motivation, thoughts, and behavior. His real connection and interest came from the fact that Freud, like him, was also Jewish and came from Vienna, memories that he held near and close to his heart (60). Kandel realized that while one could practice introspection and creative insight, in order to acquire knowledge to study the science of the mind, experimentation was necessary. While he didn't know it yet, his interest in memory would soon turn into a biological model that he could use to study the lasting impact childhood takes on the brain. After entering medical school in 1952, around the same time in which the structure of DNA was being discovered, he asked himself how the brain could enable itself to sear such lasting memories into one's mind, enabling individuals to relive moments over and over again in their heads, without moving or seeing anything actually in front of them, but seeing the images just as clearly in their minds as if they were watching in unfold in real time (24).

Kandel then set out to biologically understand memories, as understanding this would help us understand who we are as humans. Thinking back to yourself, the reason you are the way you are today is probably due to the memories you hold with you. If you witnessed someone bully you or others as a child, you will remember that moment well into your future. Your future actions will also reflect your feelings and how you remember that moment to be. For example, you may decide to be kinder to others or conversely become angry and in turn bully others because they bullied you. Either way, that memory taught you a lesson about how you want to live your life from then on. We are essentially all just a collection of past memories, guiding our behavior and decisions into the future, a realization Kandel understood early on. There is a reason why humans fear growing old, other than the idea of death. Humans fear losing their memories, because once this is gone, so is their sense of self. Who are you without your memories?

Once Kandel understood the research he wanted to pursue, he then needed to find a model for which to study its relation with memory. At first, he worked with mammals, shortly after switching routes for a simpler and less complicated study. This led him then to invertebrates, finally concentrating solely on the sea slug *Aplysia*. This decision did not come fully supported with praise, however, as many of his colleagues and scientists

in the field believed invertebrates to be so inferior to mammal's that no comparisons could be made between the two, especially to that of humans. Kandel did not let other's opinions sway his mindset, and remained persistent. He reasoned that simple animals behaved in the way they learned; as nothing was yet known about learning, any information gathered would be revolutionary and beneficial to the larger picture and to science as a whole. His persistence proved to be a success, as he was able to show how cells communicate with each other through changes in the synapse and how these communications ultimately relate to memory and learning.

The reason we should remember Kandel today is due to the fact that he was able to incorporate his life into his work, keeping the two close together, and using the two to search to find an answer to an at-the-time unsolved question. Many scientists push to find an untapped niche in science, wanting to be the first find a new phenomenon or discovery, however, none for as clear a reason as Kandel. His past shaped the entirety of his work. His life made him into the great scientist he is, enabling him to use his hardships and curiosities of the world, ever since he was nine-years-old in Vienna, to motivate his research. The focus on his early life is purposeful, as this is what created the lasting impact and the desire for knowledge that enabled him to ultimately create great advances in science. He set out wanting to discover how memory works, and by using an animal many never put any thought into, a sea slug, he uncovered the basis of short and long-term memory, showing how neurons change during learning, a contribution science will forever be grateful for.

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References

Kandel, E. R. (2006). *In search of memory. The Emergence of a New Science of Mind.* WW Norton & Company.



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