Influence on False Memories: Biology, Society, or Both?

Mark Kardash

WRTG391: Advanced Research Writing

University of Maryland Global Campus

Professor Garcia

April 5th, 2022

Of all the structures of the human body, the brain can perhaps be called the most mysterious. Concepts like memories, dreams, and the subconscious have been the subject of endless research and received many cultural interpretations. Various civilizations have strived to understand the mind, and unlock its deepest secrets, seeking everything from internal peace to immortality. Descendants have been taught to remember the great deeds of their ancestors, and the horrific deeds of their enemies. The very understanding of human lives is built on memory. But while recalling the past may be part of human nature, things are much less clear when it comes to remembering what never was. This bizarre phenomenon, commonly known as a false memory, is still a subject of debate in the scientific community, fueling much scholarly research and experiments. Though their exact causes are still to be determined, false memories have been proven to be influenced by things like gender, semantic meaning, age, and the ability to plan future tasks.

To unlock the secret behind false memories, their nature, including biological connections, must first be understood. According to Dang et al (2020), a team of researchers writing for the *Journal of Pacific Rim Psychology*, “False memory refers to the phenomenon that people recall or recognize things that did not actually happen” (para.1). The researchers divide false memory into suggestive, which is caused by incorrect information from outside sources, and spontaneous, occurring due to internal factors of the individual person (Brainerd & Pool, 1997, as cited in Dang et al, 2020). The study they conducted was aimed at determining the connection between a person’s age, and their rate of false memories. After having participants from diverse age groups complete several visual memory tasks, and be tested on them, Dang et al (2020) concluded that age did have a significant impact on misremembering. Their results showed a lower tendency in children to develop false memories, and a bigger such tendency in adults (Dang et al, 2020). While not necessarily contradicting this outcome, Spets et al (2021) argue that another major influence on false memories is gender, documenting their findings in an article for the journal *Neuroimage: Reports*. Citing prior studies and experiment results, they claim that “the brain regions mediating true and false memories are not completely overlapping” (Spets et al, 2021, para.2), and that they differ between females and males. Instructing representatives from the two genders to memorize shapes, and testing their memory, the scientists concluded that “Males produced greater activity than females in the [precuneus](https://www.sciencedirect.com/topics/neuroscience/precuneus), posterior [cingulate cortex](https://www.sciencedirect.com/topics/neuroscience/cingulate-cortex), parietooccipital sulcus, and [fusiform gyrus](https://www.sciencedirect.com/topics/neuroscience/fusiform-gyrus).” (Spets et al, 2021, Abstract). More intense female activity was noted in other areas of the brain as well, such as the hippocampus (Spets et al, 2021). The findings of both Dang et al (2020) and Spets et al (2021) are tied by an intriguing common thread, as both studies indicate that false memories are influenced by two biological, non-environmental factors. Their implications are massive, as seeing the biology of false memories can open doors to understanding their causes, and even potentially aid in their prevention.

In contrast, or, rather, in addition to the above, some research suggests that the triggers for false memories come from one’s immediate surroundings. For instance, Alakbarova et al (2021), writing for *Memory & Cognition*, hypothesized that the presence of a specific meaning (semantic context) in objects or sentences increases the likelihood of incorrect identification, resulting in false memories. Their theory was tested by using a themed list, and showing participants sentences created using words from that list. Some of the sentences had significant meaning, and some did not. The experiment results confirmed the hypothesis, as reading a meaningful sentence made the subject more likely to focus on the meaning itself, rather than the images that the sentence may conjure (Alakbarova et al, 2021). Consequently, this would mean that human memory functions to store meaningful, valuable information, and explains the tendency of people to best remember important moments of their lives.

Links between everyday human surroundings and memory errors, like the one above, are further explored in another study, albeit with a different approach. While Alakbarova et al (2021) focused more on connecting memory and meaning, the experiments by research team Cohen et al (2020), described in the *Journal of Applied Research in Memory and Cognition*, shed light on the relationship between memories and tasks. By letting their subjects play the board game *Taboo*, they discovered that individuals have less of a chance to develop false memories about a future task that they still need to complete, than a future task which has been cancelled (Cohen et al, 2020). Therefore, unlike the research by Alakbarova et al (2021), where focusing on the meaning of something created false memories, the project by Cohen et al (2020) showed an increase in memory clarity with a “meaningful” future task, perhaps enhanced by the feeling of responsibility for completing it. The discoveries of these two studies contribute to a significant general conclusion: Whether influenced by biology or society, the human brain focuses on what is deemed more important, and stores information selectively. This, in turn, implies that increased attention focus during a significant task can reduce the chance of undesired false memories.

Despite being conducted for the common purpose of determining the mechanisms behind false memories, the studies of the people above have some significant differences between them. More precisely, they each focus on a different *category* of memory. Spets et al (2021), for example, conducted their gender-related research with emphasis on long-term and spatial memories. Dang et al (2020), on the other hand, divide the concept of false memories into spontaneous and suggestive (Dang et al, 2020). Cohen et al (2020) discuss the concept of prospective memory, while Alakbarova et al (2021) do not seem to have a specific focus. Because of such differences in their approach, the results of their research cannot be collectively taken as evidence for the explanation or origin of the false memory phenomenon but can rather be viewed as four different perspectives on the same topic. Furthermore, there isn’t even a clear-cut border between the biological and social influences on false memories. For instance, while examining age as a factor, Dang et al (2020) still touched on concepts like misinformation (suggestive memory), and employed visuals in their experiments, both of which are immediate part of the society a person lives in. Spets et al (2021) used shapes (a common everyday concept) in their gender research, and the disregard for biological factors could have been a potential bias to the two social-focused studies. Therefore, however different the four studies might be, it was impossible for them to completely avoid common elements, proving that one factor never works without the other.

Just like about any scientific topic, false memories have not yet been completely understood. And just like with so many other things, humanity keeps on trying. Unlike chemistry or biology, where it is possible to touch, view, and visually observe results, studying memory only allows to make conclusions based on frequencies of the unseen. What’s more, invisible factors must constantly be considered for the data to remain accurate. The strength of studies like these seems to lie in their ability to continue. As long as teams like Alakbarova et al (2021) keep digging into the intricate details of the mind, the drive will exist to learn more. As research continues, perspectives grow, and with them, knowledge grows as well. It is this growing knowledge, and increasingly diverse perspectives, that can one day allow scientists to come to a better, more focused understanding of what is known as a false memory.

References

Alakbarova, D., Hicks, J. L., & Ball, B. H. (2021). The influence of semantic context on false memories. Memory & Cognition, 49(8), 1555-1567. <https://doi.org/10.3758/s13421-021-01182-1>

Cohen, A., Silverstein, M. J., Derksen, D. G., Hamzagic, Z. I., Bernstein, D. M., & Stephen Lindsay, D. (2020). Future planning may promote prospective false memories. Journal of Applied Research in Memory and Cognition, 9(2), 242-253. <https://doi.org/10.1016/j.jarmac.2020.02.004>

Dang, X., Zhu, B., Chen, C., & Li, X. (2020). Age differences in false memories for visual scenes and the effect of prior recall. Journal of Pacific Rim Psychology, 14, e4. <https://doi.org/10.1017/prp.2019.26>

Spets, D. S., Karanian, J. M., & Slotnick, S. D. (2021). False memories activate distinct brain regions in females and males. Neuroimage: Reports, 1(4), 100043. <https://doi.org/10.1016/j.ynirp.2021.100043>