

Mirror Tracing Task

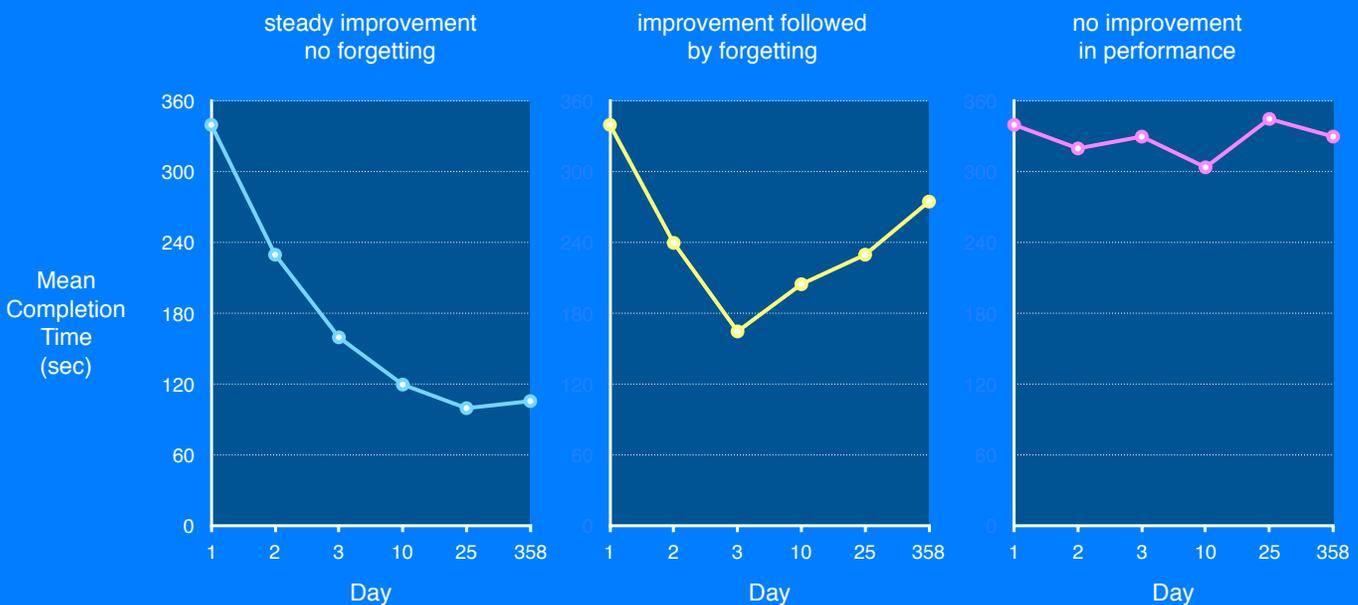
create a new
procedural memory

Henry's Story

"For decades, **Henry Molaison** was known to the world only as "Patient H.M.," the man who could not form new memories. In 1953, surgeon William Beecher Scoville had performed an experimental surgery to cure Molaison's epilepsy, removing, among other things, a large part of his hippocampus and surrounding structures. The surgery left Molaison a persistent amnesiac, unable to form new memories." (www.sciencefriday.com)

Mirror tracing was one of the skills that Henry practiced after he became amnesiac. For one study, he did 7 practice trials a day for 3 days. Then he did more practice after delays of 7 days, 2 weeks, and one year. How well do you think Henry was able to do on the mirror tracing task?

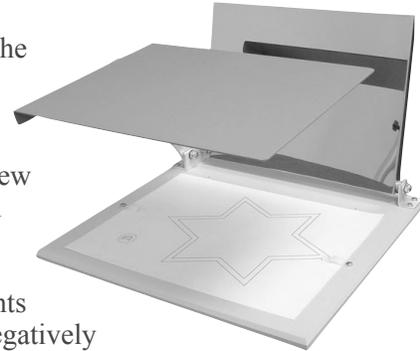
Which graph shows Henry's actual mirror tracing performance?



Mirror Tracing Task

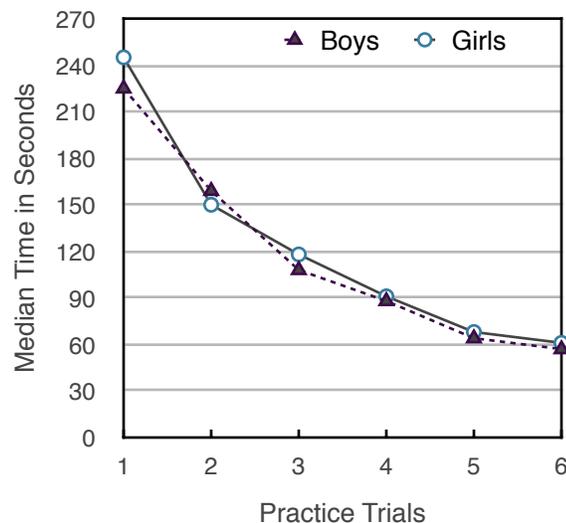
The mirror tracing task attracted the attention of early psychologists such as Starch (1910) as a convenient way to study the impact of various factors on learning and skill acquisition. It is now a standard laboratory task that has been used in hundreds of psychology studies.

Modern researchers such as Prehn-Kristensen et al. (2009) employ the mirror tracing task as a measure of procedural memory (memory for skills, such as riding a bike or typing). Ground-breaking research by Canadian neuropsychologist Brenda Milner (1965) showed that some people with amnesia—although unable to learn new facts and information—are still able to learn and retain a motor skill such as mirror tracing.



The graph below summarizes the performance of high school students studied by Balinsky and Stone (1940). The graph shows a typical negatively accelerated learning curve, with early rapid improvement followed by continued but slower improvement with additional practice. Notice that there is an improvement of about 90 seconds from the 1st to the 2nd trial, but only slight improvement between the 5th and 6th trials.

This graph shows the average time taken to trace the star on each practice trial. There are large individual differences, with some people taking more or less time to trace the star.



References and additional reading

- Balinsky, B., & Stone, I. R. (1940). High school norms for the mirror-drawing test of the six-pointed star. *Journal of Genetic Psychology*, *56*, 207-210.
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- Prehn-Kristensen, A., et al. (2009). Sleep in children enhances preferentially emotional declarative but not procedural memories. *Journal of Experimental Child Psychology*, *104*, 132-139.
- Seeck-Hirschner, M., et al. (2010). Effects of daytime naps on procedural and declarative memory in patients with schizophrenia. *Journal of Psychiatric Research*, *44*, 42-47.
- Starch, D. (1910). A demonstration of the trial and error method of learning. *Psychological Bulletin*, *7*, 20-23.