

A mind at rest strengthens memories, researchers find

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Our memories are strengthened during periods of rest while we are awake, researchers at New York University have found. The findings, which appear in the latest issue of the journal *Neuron*, expand our understanding of how memories are boosted—previous studies had shown this process occurs during sleep, but not during times of awake rest.

"Taking a coffee break after class can actually help you retain that information you just learned," explained Lila Davachi, an assistant professor in NYU's Department of Psychology and Center for Neural Science, in whose laboratory the study was conducted. "Your brain wants you to tune out other tasks so you can tune in to what you just learned."

The study, whose lead author was Arielle Tambini, a doctoral candidate in NYU's Graduate School of Arts and Science, focused on [memory consolidation](#)—the period when a memory is stabilized after it is initially created, or encoded. To determine if [memory consolidation](#) occurred during periods of awake rest, the researchers imaged the hippocampus, a brain structure known to play a significant role in memory, and cortical regions during periods of awake rest. Previous studies have demonstrated regions of the brain more active during periods of rest, but their function at these times had been unclear.

The NYU experiment tested subjects' associative memory by showing them pairs of images containing a human face and an object (e.g., a beach ball) or a human face and a scene (e.g., a beach) followed by

periods of awake rest. Subjects were not informed their memory for these images would later be tested, but, rather, were instructed to rest and simply think about anything that they wanted, but to remain awake during the resting periods. The researchers used [functional magnetic resonance imaging](#) (fMRI) to gauge activity in the hippocampus and cortical regions during the task and during the ensuing rest period.

The experiment yielded two noteworthy results. First, the researchers found that during rest after the study experience (after the visuals were shown), there was a significant correlation between brain activity in the subjects' hippocampus and cortical regions that were active during the initial encoding of each stimulus pair. However, this boost in brain correlations was only seen following experiences that were later memorable suggesting these parts of the brain act in tandem for a purpose—to consolidate memories during rest. Second, when examining each subject individually, it was found that subjects who had greater resting correlations between the hippocampus and cortex, also exhibited better performance on a subsequent associative memory test and those whose brain correlations were weaker, had worse memory—in other words, the greater the activity in [hippocampus](#) and cortical regions, the stronger the memory.

"Your [brain](#) is working for you when you're resting, so rest is important for memory and cognitive function," Davachi observed. "This is something we don't appreciate much, especially when today's information technologies keep us working round-the-clock."

Provided by New York University

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