

Accentuating the positive memories for sleep

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Sleep plays a powerful role in preserving our memories. But while recent research shows that wakefulness may cloud memories of negative or traumatic events, a new study has found that wakefulness also degrades positive memories. Sleep, it seems, protects positive memories just as it does negative ones, and that has important implications for the treatment of post-traumatic stress disorder.

"The study of how [sleep](#) helps us remember and process emotional information is still young," says Alexis Chambers of the University of Notre Dame. Past work has focused on the role of negative memories for sleep, in particular how [insomnia](#) is a healthy [biological response](#) for people to reduce negative memories and emotions associated with a traumatic event.

Two new studies presented this week at a meeting of cognitive [neuroscientists](#) in Chicago are exploring the flip side: how sleep treats the positive. "Only if we investigate all the possibilities within this field will we ever fully understand the processes underlying our sleep, memory, and emotions," Chambers says.

Protecting the positive

To test how sleep affects positive memories, Rebecca Spencer of the University of Massachusetts, Amherst, and her colleagues split 70 [young adults](#) into two groups, one that got to sleep overnight and one that had to stay awake. Both groups viewed images of positive items, such as puppies and flowers, and neutral items, such as furniture or dinner

plates. The researchers then tested the participants' memories of and [emotional reactions](#) to the images 12 hours later, after either the period of sleep or wake.

They found that "sleep enhances our emotionally positive memories while these memories decay over wake," Spencer says. "Positive memories may even be prioritized for processing during sleep." But while people remembered the positive images more than the neutral ones, their [emotional response](#) to the positive images did not change over sleep versus wake. "It doesn't matter if you went to sleep or stayed awake – what you thought was a '9' – really great – you still think is a '9'," she says.

The results, she says, could have significant implications for treating post-traumatic stress disorder, as using [wakefulness](#) could have the unintended effect of degrading of positive memories in addition to negative memories. "It suggests that insomnia should be treated at some point after a traumatic event – perhaps a few days/weeks depending on the level of trauma – so that these positive memories can be strengthened and eventually outweigh the negative," Spencer says.

The study also reinforces the idea that with the standard ups and downs of our days, we should sleep to enhance our memories. "For mildly negative memories, we can learn something from them and we should remember them," she says. "Moreover, sleep enhances memories for the positive events that we are exposed to and want to remember."

From an evolutionary perspective, sleep's role in protecting both positive and negative memories helps us to analyze and predict future events, Spencer says. People need to remember both the people and events that gave them bad experiences, as well as those that helped them and gave them good experiences.

Make Them Laugh

In another study, Chambers of the University of Notre Dame and colleagues, working under her adviser Jessica Payne, wanted to test if they could enhance positive memories over sleep by adding the element of humor. Chambers' team took Farside cartoons and showed both the originals and altered non-humorous versions to 66 participants before and after a period of wake or sleep. While participants more easily recalled the humorous versions of the cartoons, sleep had no effect on the type of cartoon recalled.

The fact that sleep did not impact such memories suggests something important about humor as a memory aid, Chambers says. "Sleep may be thought of as a way of aiding most memories since a period of sleep after learning is typically better for subsequent memory than a period of wake," she says "Similarly, humor may serve as a different, but possibly equal, aid for subsequent memory. Both methods help us remember things better in the future, but it appears that they work in independent ways."

Because there was an overall enhancement of memory for humorous over non-humorous cartoons, Chambers says, "it does appear that there is something about positive experiences that is worth remembering." Echoing Spencer's comments: "It could be that preserving such memories is adaptive to us, similar to the suggested survival value of preserving memories of negative experiences, such as a deadly snake to be avoided in the future."

Both studies – "Effects of Sleep on Memory and Reactivity for Positive Emotional Pictures," by Rebecca Spencer et al., and "Laugh Yourself to Sleep: The Role of Humor in the Investigation of Sleep's effects on Positive Memory" by Alexis Chambers et al. – will be presented in posters at the 19th annual meeting of the Cognitive Neuroscience

Society (CNS). More than 1400 scientists are in attendance at the meeting in Chicago, IL, from March 31 to April 4, 2012.

Provided by Cognitive Neuroscience Society

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