SLEEP

Naps for Better Recall

Even a six-minute snooze boosts memory BY JOHN WHITFIELD

If during that soporific hour after lunch, you succumb to the temptation of a quick nap, you are liable to earn your boss's displeasure. But judging by the latest results from sleep research, you should be getting a pat on the back.

Mountains of evidence reveal that sleep enhances memory. Now Olaf Lahl of the University of Düsseldorf in Germany and his colleagues have struck a blow for power-napping by showing that falling asleep for only six minutes is enough to significantly enhance memory. This is the shortest period of sleep found to affect mental functioning. It suggests, Lahl says, that something happens at the point of losing consciousness that solidifies memories.

YOU SNOOZE, YOU DON'T LOSE: In fact, you stand to gain, in terms of an improved short-term memory.

The subjects in Lahl's study reported to the university's sleep lab at 1 P.M. They were given two minutes to memorize a list of 30 words and tested on their recall an hour later. In the interim, they either stayed awake, took a six-minute nap or a longer snooze averaging 35 minutes. On no sleep, subjects recalled an average of just under seven words. A short nap raised performance to more than eight. A longer nap, including some time in deeper sleep, boosted recall to more than nine words.

Lahl previously thought the benefits of sleep for memory were mainly passive—that unconsciousness slows the rate at which new experience erodes old memories but that the sleeping brain does nothing special to help store waking experience. But this latest finding, appearing in the *Journal of Sleep Research*, has changed his mind, because six minutes does not seem long enough to forget much.

But sleep researcher Jim Horne of Loughborough University in England suspects that you need deep sleep to get a memory benefit and that the nappers might just have been a bit fresher than their continuously awake counterparts. In Lahl's study, he says, "it's more likely sleepiness is impairing memory than sleep enhancing it."

Robert Stickgold, who studies sleep at Harvard Medical School, disagrees. "It's hard to believe that six minutes' sleep could make you less sleepy," he says. Instead Stickgold suspects that the experiment reveals a process of memory consolidation that begins even before sleep and that could continue after waking from a very brief sleep. "In the last couple of minutes of waking, the brain could be putting stickers on topics for later processing," he speculates.

A sleeping brain is not merely on standby; it runs through a suite of complex and orderly activities. One of these is a flow of neural activity from the hippocampus, where short-term memories are formed, to the cortex, where they are stored in more durable forms—a possible reason people can remember things better on awakening. Nor is this process simply a matter of scribing data into neural tissue. Several recent studies of sleep and sleeplessness show that slumber is especially important for doing clever stuff with information, such as extracting the gist of what has been learned, combining facts in interesting ways and dealing with the day's emotions.

"Executive thinking is particularly impaired by sleep loss," Horne says. "You become much more blinkered in your thinking, less able to deal with novelty and less able to evaluate risk." This is bad news for medics, shift workers and military commanders, he observes, and perhaps explains why casinos stay open all night.

"The most important processing of information during sleep is to add meaning to information and fit it into a larger context," Stickgold explains, adding that such processing seems most likely to have driven sleep's evolution. "Of all the functions of sleep, memory is the only one that explains why you'd have to go through the dangerous phenomenon of losing consciousness, as opposed to having quiet rest."

Lahl, in contrast, thinks that sleep is primarily about repairing and detoxifying the brain—he points out that there is no correlation between how much you learn in a day and how much you need to sleep at night. Nevertheless, he is now looking for an effect of two-minute naps. "We're trying to put it at the extreme, to find the critical period of time where memory enhancement might happen. But in such short periods it's difficult to decide if the subject is asleep."

John Whitfield is based in London.

Napping Is Natural

Until recently, sleep researchers overlooked naps, perhaps because their societies frown on afternoon snoozes. But short sleeps are the norm in animals, says psychologist Olaf Lahl of the University of Düsseldorf in Germany. "Getting all your sleep in a monolithic block is quite unusual," he adds. And people with looser schedules—infants and the elderly—are much more likely to nap, he notes.

MOODBOARD/CORBIS