

Day-time naps help us acquire information not consciously perceived, study finds

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The age-old adage "I'll sleep on it" has proven to be scientifically sound advice, according to a new study which measured changes in people's brain activity and responses before and after a nap. The findings,

published in the *Journal of Sleep Research*, support the advice which suggests that a period of sleep may help weighing up pros and cons or gain insight before making a challenging decision.

The Medical Research Council-funded study, led by University of Bristol researchers, aimed to understand whether a short period of sleep can help us process unconscious information and how this might affect behaviour and reaction time.

The findings further reveal the benefits of a short bout of sleep on cognitive brain function and found that even during short bouts of sleep we process information that we are not consciously aware of.

While previous evidence demonstrates that sleep helps problem solving, resulting in enhanced cognition upon awaking; it was not clear whether some form of conscious mental process was required before or during sleep to aid problem solving. In this study, researchers hid information by presenting it very briefly and "masking" it—so it was never consciously perceived—the masked prime [task](#). The hidden information, however, was processed at a subliminal level within the brain and the extent to which it interferes with responses to consciously perceived information was measured.

Sixteen healthy participants across a range of ages were recruited to take part in an experiment. Participants carried out two tasks—the masked prime task and a control task where participants simply responded when they saw a red or blue square on a screen. Participants practiced the tasks and then either stayed awake or took a 90-minute nap before doing the tasks again.

Using an EEG, which records the electrical activity naturally produced in the brain, researchers measured the change in [brain activity](#) and response pre-and-post nap.

Sleep (but not wake) improved processing speed in the masked prime task—but not in the control task—suggesting sleep-specific improvements in processing of subconsciously presented primes.

The findings suggest that even a short bout of sleep may help improve our responses and process information. Therefore, the results here suggest a potentially sleep-dependent, task-specific enhancement of [brain](#) processing that could optimise human goal-directed behaviour.

Importantly, while it is already known that the process of acquiring knowledge and information recall, memory, is strengthened during sleep. This study suggests that information acquired during wakefulness may potentially be processed in some deeper, qualitative way during sleep

Dr. Liz Coulthard, Consultant Senior Lecturer in Dementia Neurology at the University of Bristol Medical School: Translational Health Sciences, said: "The findings are remarkable in that they can occur in the absence of initial intentional, conscious awareness, by processing of implicitly presented cues beneath participants' conscious awareness.

"Further research in a larger sample size is needed to compare if and how the findings differ between ages, and investigation of underlying neural mechanisms."

More information: 'Nap-Mediated Benefit to Implicit Information Processing Across Age Using an Affective Priming Paradigm' by E Coulthard et al in the *Journal of Sleep Research* [open access]

Provided by University of Bristol

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