

Sleep deprivation negatively affects split-second decision making, study shows

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Sleep deprivation adversely affects automatic, accurate responses and can lead to potentially devastating errors, a finding of particular concern among firefighters, police officers, soldiers and others who work in a sleep-deprived state, University of Texas at Austin researchers say.

Psychology professors Todd Maddox and David Schnyer found moderate sleep deprivation causes some people to shift from a faster and more accurate process of information categorization (information-integration) to a more controlled, explicit process (rule-based), resulting in negative effects on performance.

The researchers examined sleep deprivation effects on information-integration, a cognitive operation that relies heavily on implicit split-second, gut-feeling decisions.

"It's important to understand this domain of procedural learning because information-integration - the fast and accurate strategy - is critical in situations when soldiers need to make split-second decisions about whether a potential target is an enemy soldier, a civilian or one of their own," Maddox said.

The study examined information-integration tasks performed by 49 cadets at the United States Military Academy at West Point over the course of two days. The participants performed the task twice, separated by a 24-hour period, with or without sleep between sessions. Twenty-one cadets were placed in a sleep deprivation group and 28 well-rested

participants were designated as controls. It revealed that moderate sleep deprivation can lead to an overall immediate short-term loss of information-integration thought processes.

Performance improved in the control group by 4.3 percent from the end of day one to the beginning of day two (accuracy increased from 74 percent to 78.3 percent); performance in the sleep-deprived group declined by 2.4 percent (accuracy decreased from 73.1 percent to 70.7 percent) from the end of day one to the beginning of day two. This decline was much larger for those participants who shifted from an information-integration to a rule-based approach.

According to the findings, people who rely more on rule-based (overthinking) strategies are more vulnerable to the ill effects of sleep deprivation. This is the first study that has explored this domain of procedural learning, Schnyer said.

Maddox and Schnyer were surprised to find the adverse effects of [sleep deprivation](#) on information processing varied among individuals. Schnyer believes this finding has implications for training purposes for high-pressure, life-and-death jobs, particularly the Army.

More information: The study was published in the November issue of *Sleep*.

Source: University of Texas at Austin ([news](#) : [web](#))

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