

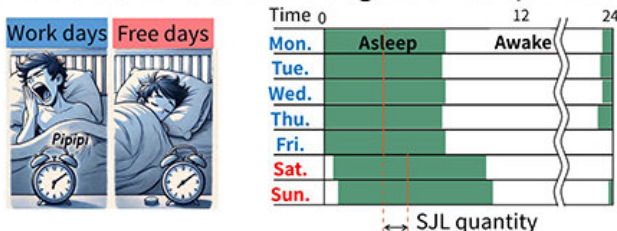
Abstract

Social jet lag—a shift in sleep patterns on weekends, such as staying up late or sleeping in—is thought to reflect chronic sleep debt accumulated during weekdays. In this study, we measured participants' sleep patterns and cognitive functions, including reaction time and inhibitory control, in their daily lives. We found that even mild social jet lag, previously considered recoverable on weekends, can impair basic cognitive performance. These effects are likely due to chronic sleep deprivation. Our findings may contribute to the development of personalized sleep recommendations, supporting healthier lifestyles and a more productive society. In the future, we aim to clarify the causes of cognitive decline by analyzing not only the timing but also the quality of sleep.

Social Jet Lag and Sleep Debt

Social Jet Lag (SJL): refers to shifts in sleep patterns on free days, quantified as the difference between the midpoints of sleep.

Sleep debt: refers to chronic sleep insufficiency (which cannot measure as total sleep time). SJL is considered to reflect the degree of sleep debt.



SJL has been associated with evening-type, but recently it is thought to reflect chronic sleep debt.

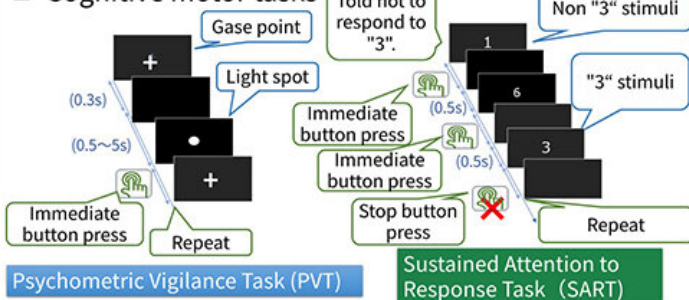
Long-Term Tracking of Simple Cognitive Skill

We continuously measured their cognitive and motor performance in daily life.

■ Test schedule (SJL monitor and 6 times tasks)

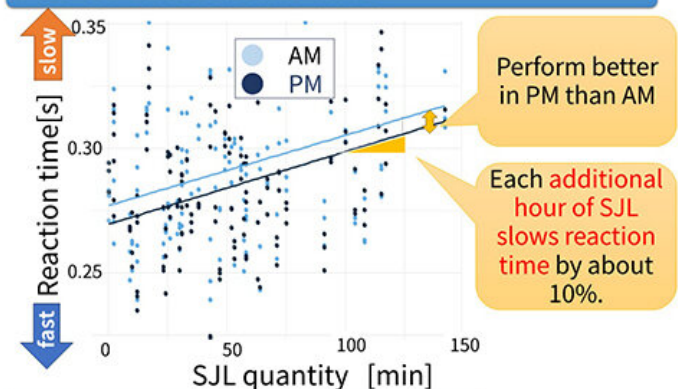


■ Cognitive motor tasks

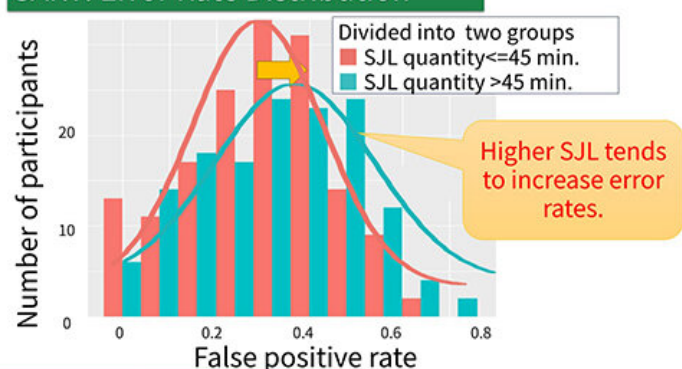


Results

PVT: SJL vs. Reaction Time



SART: Error Rate Distribution



Conclusions

- Increase in SJL quantity was associated with slower reaction times and reduced inhibitory control.
- No significant difference were found across the week.
- Even mild, chronic sleep debt impair cognitive performance was shown in real-world data.

In collaboration with Waseda Univ. and NTT Social Informatics Laboratories

References

[1] T.G. Sato, M. Takahashi, M. Nishida, "The relationship between social jetlag and cognitive tasks performance in everyday life, " *The 27th Conference of the European Sleep Research Society*, P387, 2024.

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