

Subjective Sleepiness and Microsleep in Driving Simulation

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Abstract

In a driving simulation it was studied whether the amount of subjective sleepiness can predict microsleep events. Subjective sleepiness was assessed by the Karolinska sleepiness scale with scores ranging from 1 (extremely alert) to 10 (extremely sleepy, can't keep awake). Twelve healthy volunteers (9 male, 3 female, mean age 24.4 ± 3.1 years) performed the driving simulator task in five sessions separated by breaks of approximately 10 minutes. Occurrences of microsleep events and their strengths (weak, medium, strong) were subjectively assessed based on the duration of eye closures and other behavioral sleep indicators (rolling eye movements, head nodding, startle reactions, driving performance). Frequency and strength of microsleep events significantly increased through the night (both $p < 0.0001$). Binary logistic regression analyses revealed that the occurrence of microsleep is significantly related to higher scores on the Karolinska sleepiness scale ($p < 0.0001$). Calculations of specificities and sensitivities suggested that Karolinska scores of 7 prior to and of 8 after the drive properly differentiate between occurrence and non-occurrence of microsleep. The results suggest that the score on the Karolinska sleepiness scale is a valid measure to predict microsleep.

Keywords: Prediction, Microsleep, Karolinska, Sleepiness