

**Performance in overnight driving simulation study
correlates with unstable tracking performance, but not reaction time**

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Running head: Correlation between driving and tracking performance

ABSTRACT

The main question addressed in the present study was whether performance in a ten-minute unstable tracking and in a reaction time task correlated with performance in a subsequent 35-minute driving simulation in an overnight testing session (1 to 6 a.m.). In addition, subjective sleepiness and fatigue and correlations between performance parameters and subjective scores were assessed. The experiment included five test runs separated by short breaks of approximately 10 minutes. Twelve healthy volunteers performed the driving simulation task in all five, the simple reaction time task in the 2nd and 4th, and the unstable tracking task in the 1st, 3rd, and 5th test run. Subjects were less able to stay on the right lane in successive test runs in the driving simulation task. Mean deviation and number of lapses in the unstable tracking task increased significantly, and reaction time slightly and non-significantly across the night. Sleepiness and fatigue ratings significantly increased both across the night and over the course of a test run. Reaction time was only weakly correlated with driving performance. Tracking performance was significantly associated with driving performance and the association grew stronger across the night. There were no significant correlations between performance parameters and sleepiness and fatigue scores. The results indicate that performance in a driving simulation may be estimated by means of performance in a preceding unstable tracking task.

Keywords: sleepiness, fatigue, alertness, model, time-on-task, driving