Is “sleepy supervision” the new “drowsy driving”?

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Drowsy driving & sleepy supervision

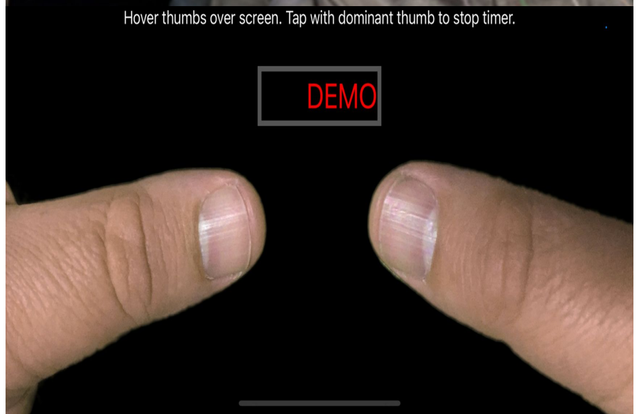
- 1-in-3 Americans sleep less than 6h/night
- 1-in-5 motor vehicle accidents are due to drowsy driving
- Automated vehicle features can help mitigate risk
- Self-driving vehicles switch the human role from active engagement to passive monitoring
- Sleepiness makes passive monitoring difficult

Is sleepiness worse when supervising an autonomous vehicle vs. manual control?

Measuring sleepiness during a simulated drive





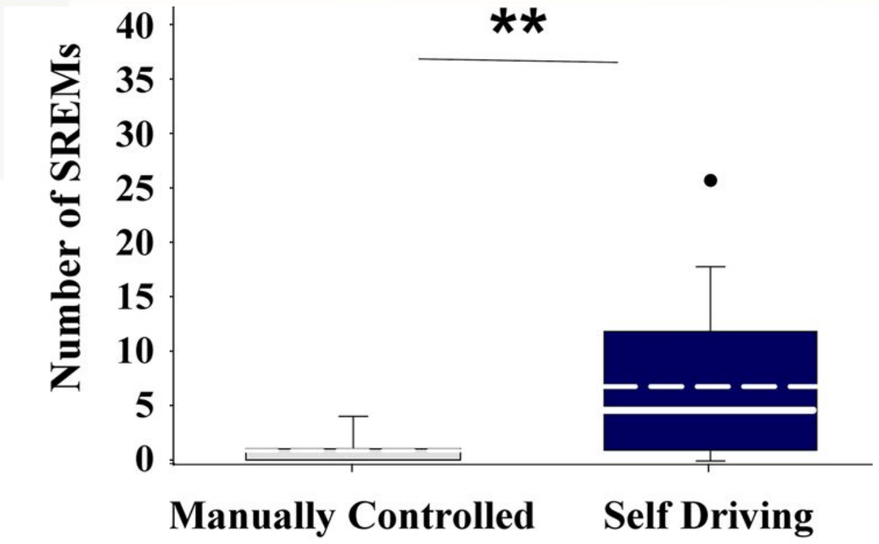


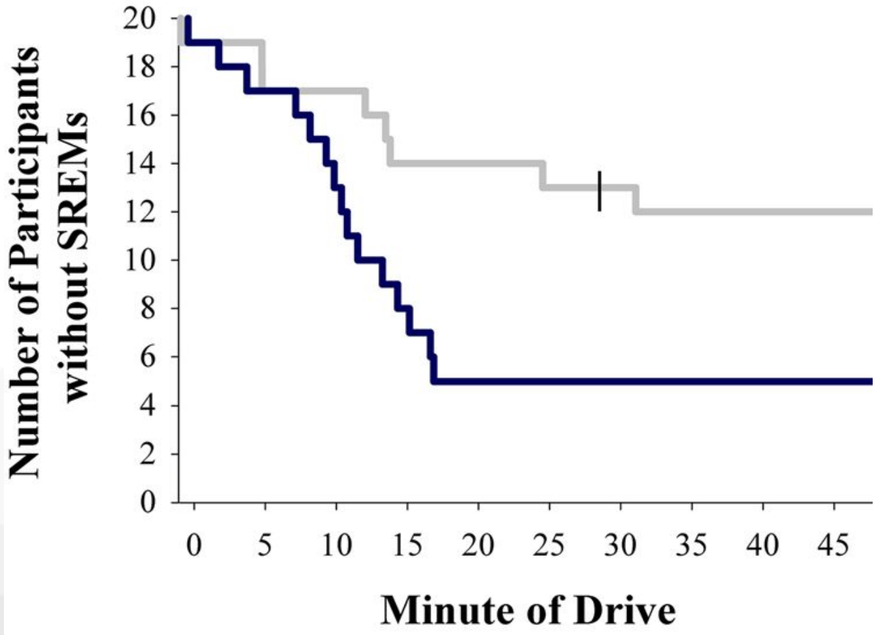
- 2-weeks normal sleep with actigraphy
- In-lab driving simulator
  - Manual & autonomous drive (counterbalanced order)
  - Rural highway setting; ~45-min drive
- Brain activity (EEG), eye movements (EOG)
  - Measure of objective sleepiness, transition to sleep
- Self-rated sleepiness scale
  - Measure of subjective sleepiness
- Reaction time test
  - Measure of vigilant attention

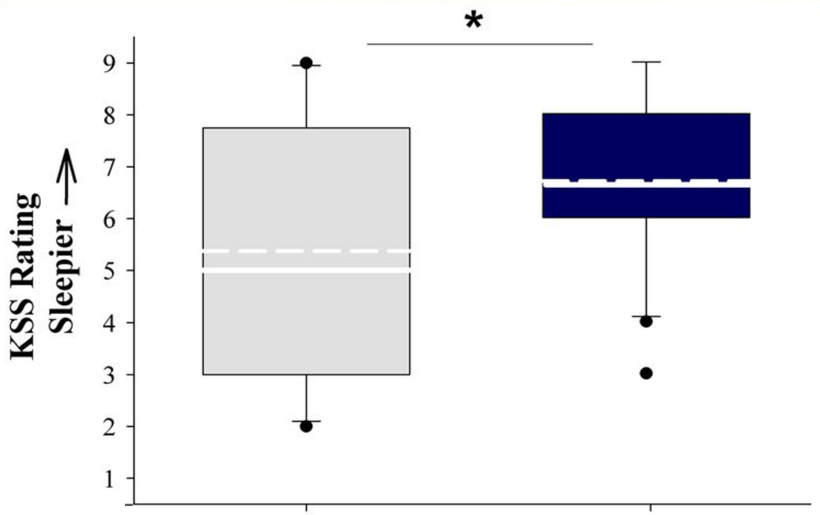
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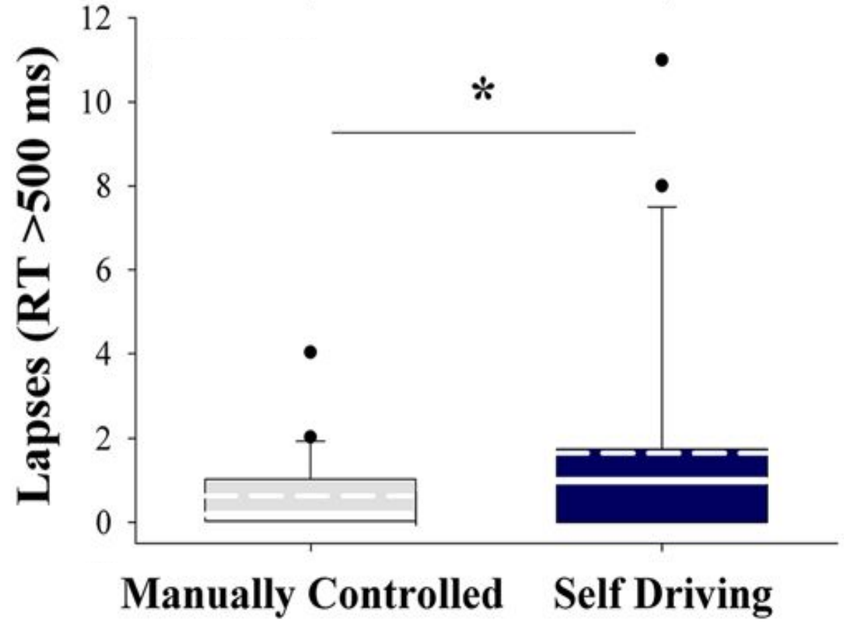
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Supervision of a self-driving vehicle unmasks latent sleepiness









Flynn-Evans et al., 2021

Time to wake up!

- Compared to manual control, in a self-driving vehicle, drivers:
  - Felt sleepier
  - Had more transitions into sleep
  - Transitioned into sleep sooner
  - Had slower reaction times
- Future directions
  - Assess hand-offs
  - Replicate in aviation settings
  - In-vehicle monitoring



Thank you

Erin E. Flynn-Evans
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Read the full paper here!

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