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# Stress Research Institute

## The effects of stress and sleepiness on subsequent sleep duration - a prospective study of day-to-day variability across 42 days

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### Conclusion

Sleepiness extends TST and stress reduces it on a day-to-day basis (controlling for work) – through earlier bedtime and earlier time of awakening, respectively.

### Objective

To investigate how stress and sleepiness during the day affect subsequent sleep duration prospectively across 42 days of normal life.

### Results

**Sleep duration:** Mixed model regression showed that Weekend (day off) increased sleep duration by 35 minutes (CI=21-49) per unit (0-1) ( $p<.0001$ ). Having a fever, cold or consuming alcohol had no effects.

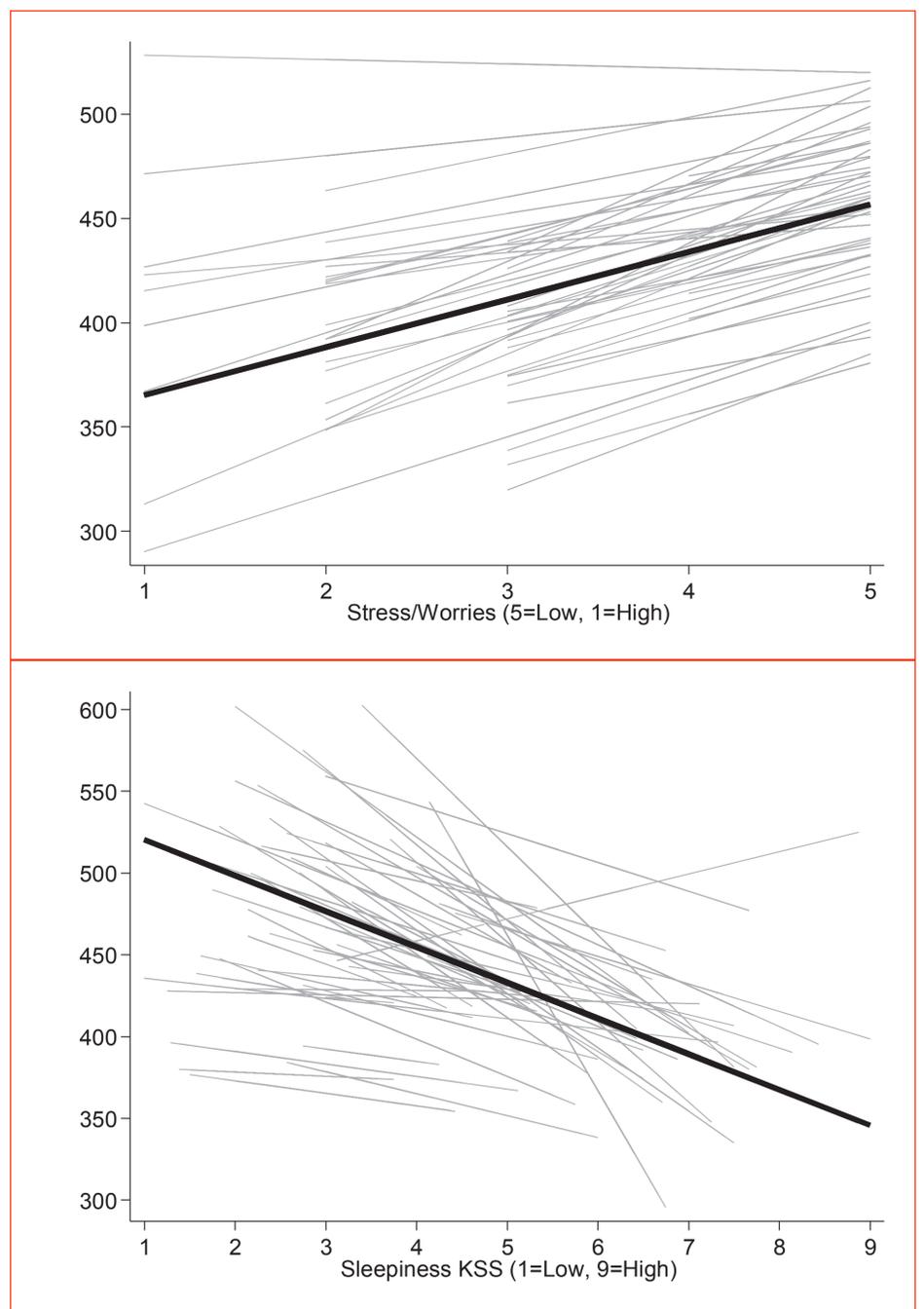
Beyond the weekend effect, each unit on the stress scale (1-5 low) reduced sleep duration by 19 minutes (95% CI = 14-24 min), while sleepiness increased TST by 11 minutes (CI=7-15min) per unit (scale: 1-9),  $p<.0001$  for all)

**Lights out** was predicted by weekend (70 min later on days off), sleepiness during the day (23 minutes earlier per unit of KSS) and by early awakening the same day (19 minutes earlier bedtime per hour of advance of the time of prior awakening). All  $p$ -values  $<.0001$

**Time of awakening** was predicted by Weekend (1.3h more on weekends), stress during the previous day (23 minutes shorter per unit) ( $p<.0001$  for both) and age (1.0h shorter in individuals  $\geq 42$  years ( $p<.01$ ))

### Objective

50 healthy participants maintained a sleep/wake diary and recorded actigraphy across 42 days (diary TST presented, similar results for actigraphy). The results were analyzed using a multilevel, mixed model approach which makes possible a day-to-day prospective correlative approach while accounting for individuals. In order to control for other factors that might serve as confounders also weekend/workday (next day) was used as a predictor (0/1), as was duration and time of termination of prior sleep, alcohol intake and, finally, subjective health.



**Figure 1.**

Upper = regression line for stress vs sleep duration. Bold line: group mean, thin line = individual estimates, permitting random effects.

Lower = corresponding results for sleepiness vs sleep duration.

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