

## Comparison Of The Effects Of Acute Total Sleep Deprivation, Chronic Sleep Restriction And Recovery Sleep On Positive Affect

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*Abstract:*

**Introduction:** Positive affect helps people in coping with difficult situations. People with high positive affect have been shown to be happier, have more success in life and better relationships than people scoring low. Positive affect is reduced during chronic and acute sleep loss. The aims of the present study were 1) to establish the adverse effect of 5 days of sleep restriction on positive affect, 2) to test whether one night of recovery sleep reverses this effect, and 3) to test whether the combined effects of prior sleep restriction and acute sleep deprivation are cumulative.

**Methods:** In an ongoing investigation, 27 healthy volunteers completed two baseline nights (8h TIB) and either five nights of sleep restriction (experimental group: 5h TIB, N=18, mean age 26±3 years, 9 females) or regular sleep (control group: 8h TIB, N=9, mean age 25±5 years, 3 females). Thereafter, all participants had 8h of recovery sleep and 38h of total sleep deprivation. Participants filled out the mood scale PANAS at 9 a.m. on all days. Differences in the positive affect subscale between experimental days and the second baseline day were calculated.

**Results:** Wilcoxon signed-rank tests with Bonferroni-adjusted alpha-level showed a decrease in positive affect after one night of sleep restriction ( $\Delta 5.06 \pm 3.78$ ;  $p < .001$ ). Positive affect scores of the last day of chronic sleep restriction and of the day after recovery sleep did not differ ( $\Delta 1.33 \pm 4.67$ ;  $p = .18$ ). Positive affect decreased from the last day of chronic sleep restriction to acute sleep deprivation ( $\Delta 4.11 \pm 4.27$ ;  $p = .001$ ) for the experimental group. No significant difference was found between chronic sleep restriction (last day) in the experimental group and total sleep deprivation in the control group (Mann-Whitney-U-Test,  $z(26) = -1.24$ ;  $p = .5$ ).

**Conclusion:** Chronic sleep loss for five days exhibited long-lasting effects on the reduction of positive affect which were not reset by one recovery night. Positive affect decreased further following acute sleep deprivation, indicating that people's sleep curtailing lifestyles make them more vulnerable to additional acute sleep loss. Five days of chronically reduced sleep exhibited a comparable reduction in positive affect as a sleepless night.