



Do your troubles today seem further away than yesterday?

On sleep's role in mitigating the blushing response to a reactivated embarrassing episode

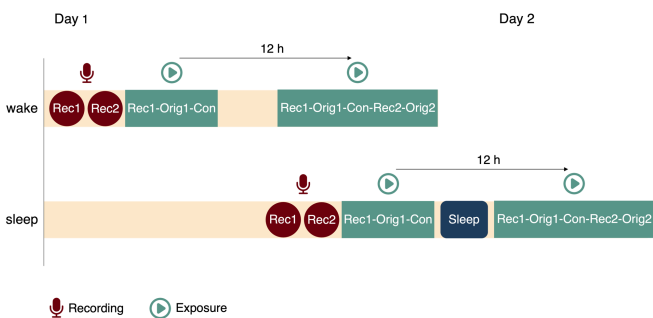
Faya Reinhold, Anna Gerlicher, Eus van Someren, Merel Kindt

RATIONALE

- The 'sleep to forget and sleep to remember hypothesis'¹ proposes that sleep weakens the emotional tone of an experience while preserving/enhancing its content.
- Prior experimental research shows contradictory findings on how emotional reactivity changes after a period of sleep, likely explained by methodological variations.
- By addressing these inconsistencies, we investigated the mitigating effect of overnight sleep on emotional reactivity triggered by memory reactivation.

METHODS

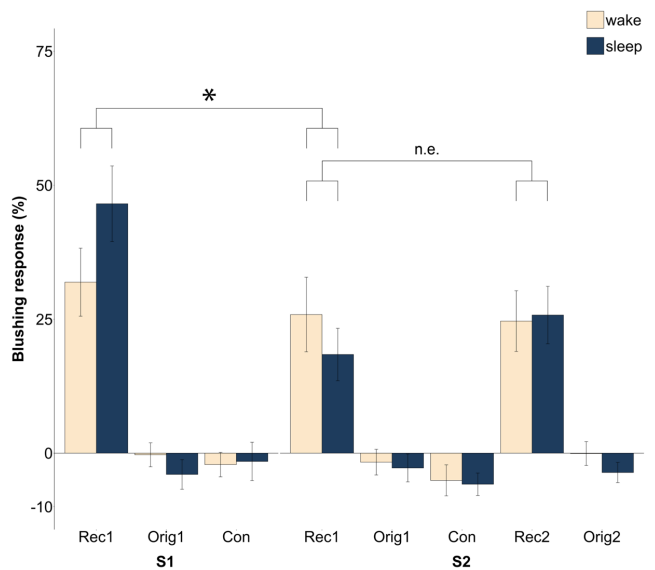
- **Session 1:** Using a karaoke paradigm, we recorded participants' singing of two songs (Recording), followed by exposing them to one of the recordings (Rec1) in the presence of an audience to induce an embarrassing episode. We additionally exposed participants to the original song of that recording (Orig1) and the control song (Con).
- **Session 2:** Participants were re-exposed to these songs (Rec1, Orig1, Con) as well as newly exposed to their other recording (Rec2) and the original song of that recording (Orig2).
- The sessions were 12 h apart during which one group stayed awake during the day (wake group), while the other group slept during the night (sleep group).



- **Sample:** Healthy participants (age range 18-59; N = 20 wake group, N = 20 sleep group).
- **DVs:** Emotional reactivity was assessed with a physiological measure of facial blushing as main outcome and subjective ratings of embarrassment and valence.
- **Hypothesis:** If sleep indeed reduces the emotional tone of an embarrassing memory, we expected to observe decreased facial blushing in response to Rec1 compared to Rec2 after sleep but not wakefulness.

RESULTS

Decreased blushing response to a reactivated and a new embarrassing episode after one night of sleep



- The embarrassing episode was successfully induced during session 1 as indicated by objective and subjective measures (Song: $BF_{incl} \geq 1.59e+14$).
- Blushing response to the reactivated recording (Rec1) decreased from session 1 to session 2 in the sleep group only (Group* Session: $\beta = -25.51\%$, HDI [-48.56, -0.40], $P(\delta > 0) = 0.98$).
- Emotional reactivity to the reactivated recording (Rec1) and the new recording (Rec2) during session 2 did not differ after sleep and wakefulness (Group* Exposure: HDIs include zero).

CONCLUSION

- In this paradigm, the induction of an embarrassing autobiographical memory was successful as is evidenced by physiological (facial blushing) and subjective readouts.
- Facial blushing was reduced following overnight sleep, while subjective ratings were unaffected. Whether the beneficial effect of sleep is due to changes in memory representation or rather emotion regulation remains elusive.

References

¹Walker, M. P., & van Der Helm, E. (2009). Overnight therapy? The role of sleep in emotional brain processing. *Psychological bulletin*, 135(5), 731.