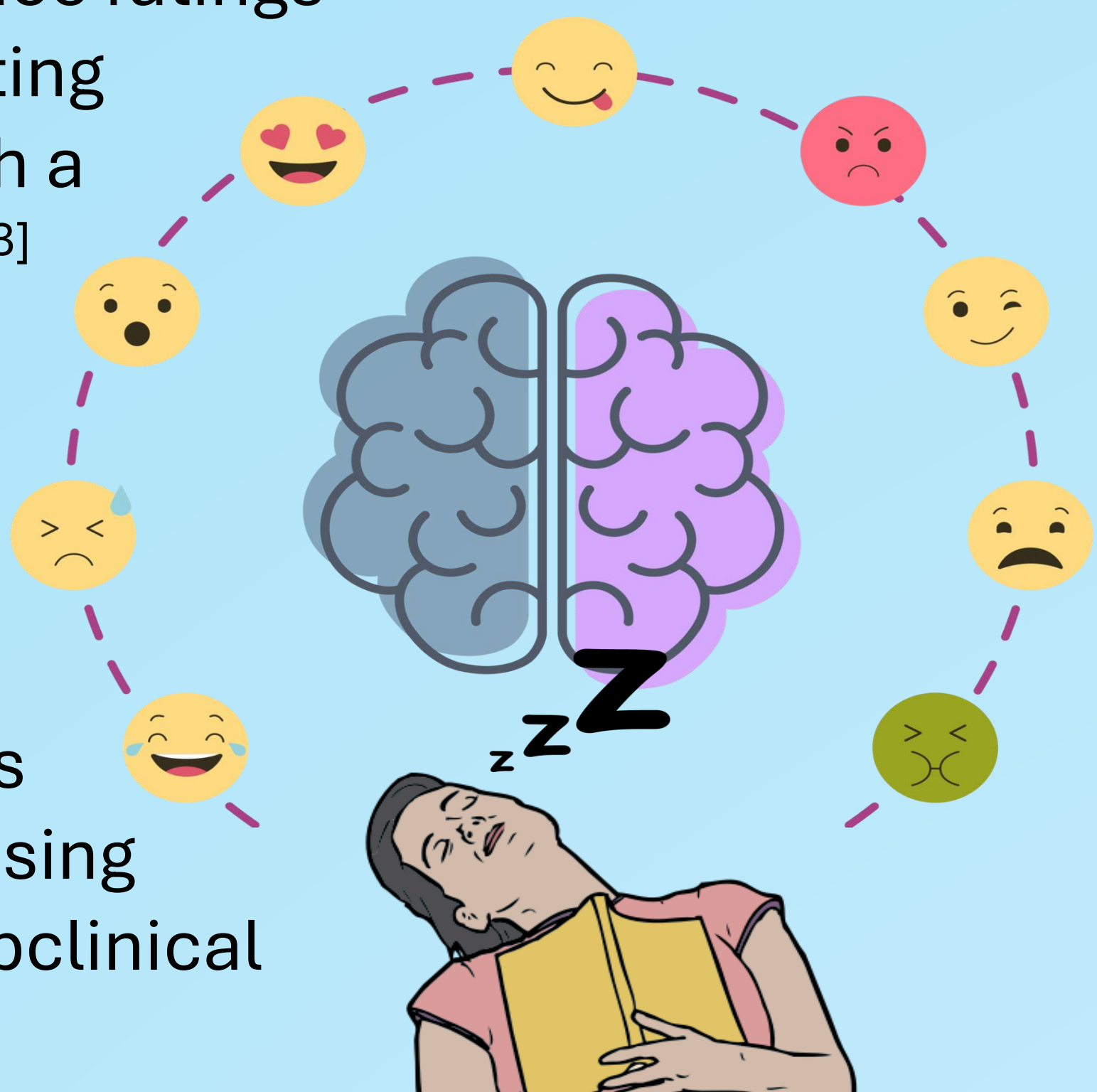


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Background

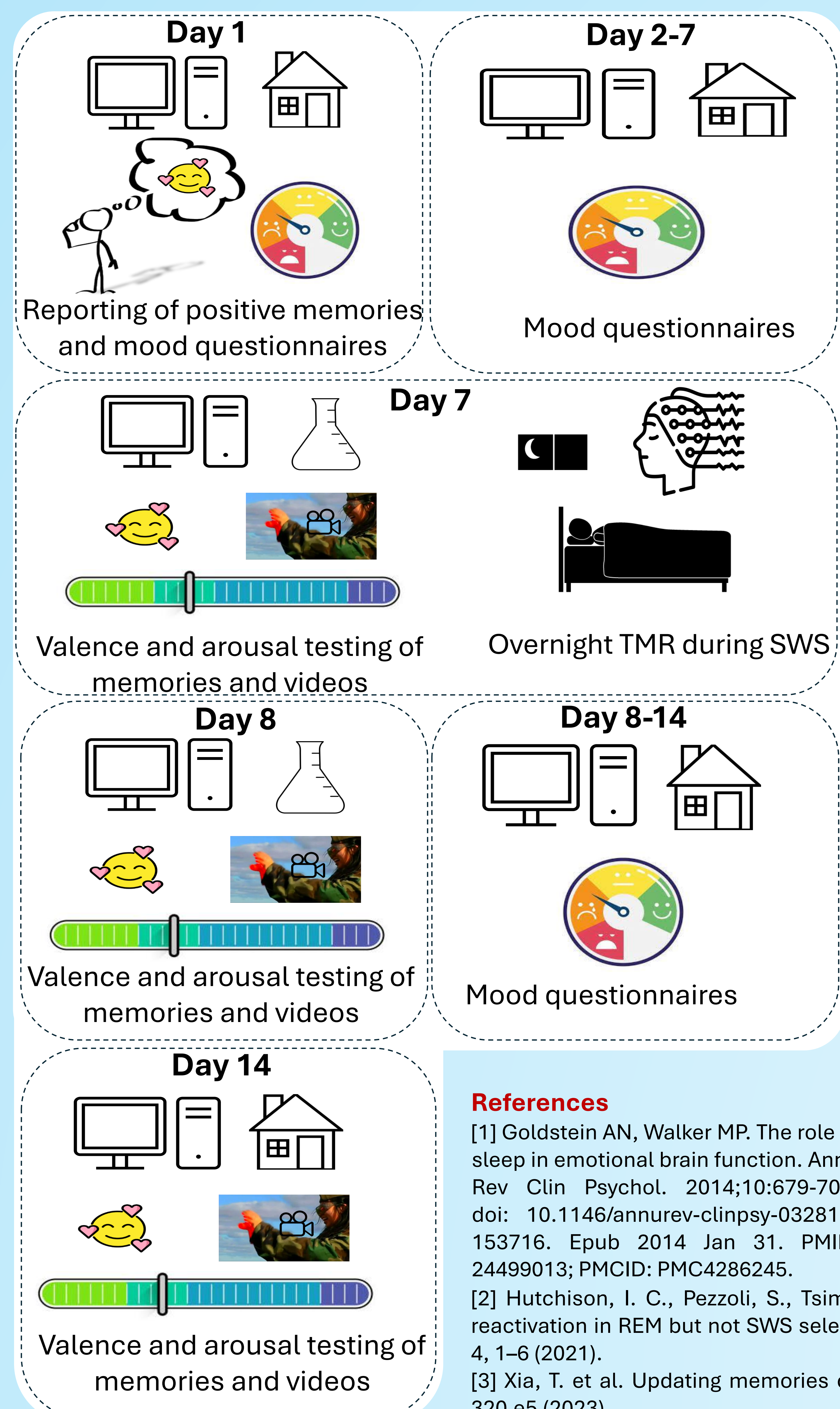
- ❖ Emotions are processed during sleep.^[1] Targeted Memory Reactivation (TMR) in REM may decrease arousal, particularly for emotionally negative images.^[2]
- ❖ TMR during NREM can also update valence ratings when a positive updating word is combined with a negative picture cue.^[3]
- ❖ Here we ask how reactivating positive memories via SWS TMR impacts mood, depressive symptoms and emotional processing in individuals with subclinical depression.



Hypotheses

- ❖ Reactivating positive memories in SWS for one night will improve depressive symptoms.
- ❖ Positive memories that have been reactivated in SWS will be remembered better than positive memories that have not been reactivated during sleep.

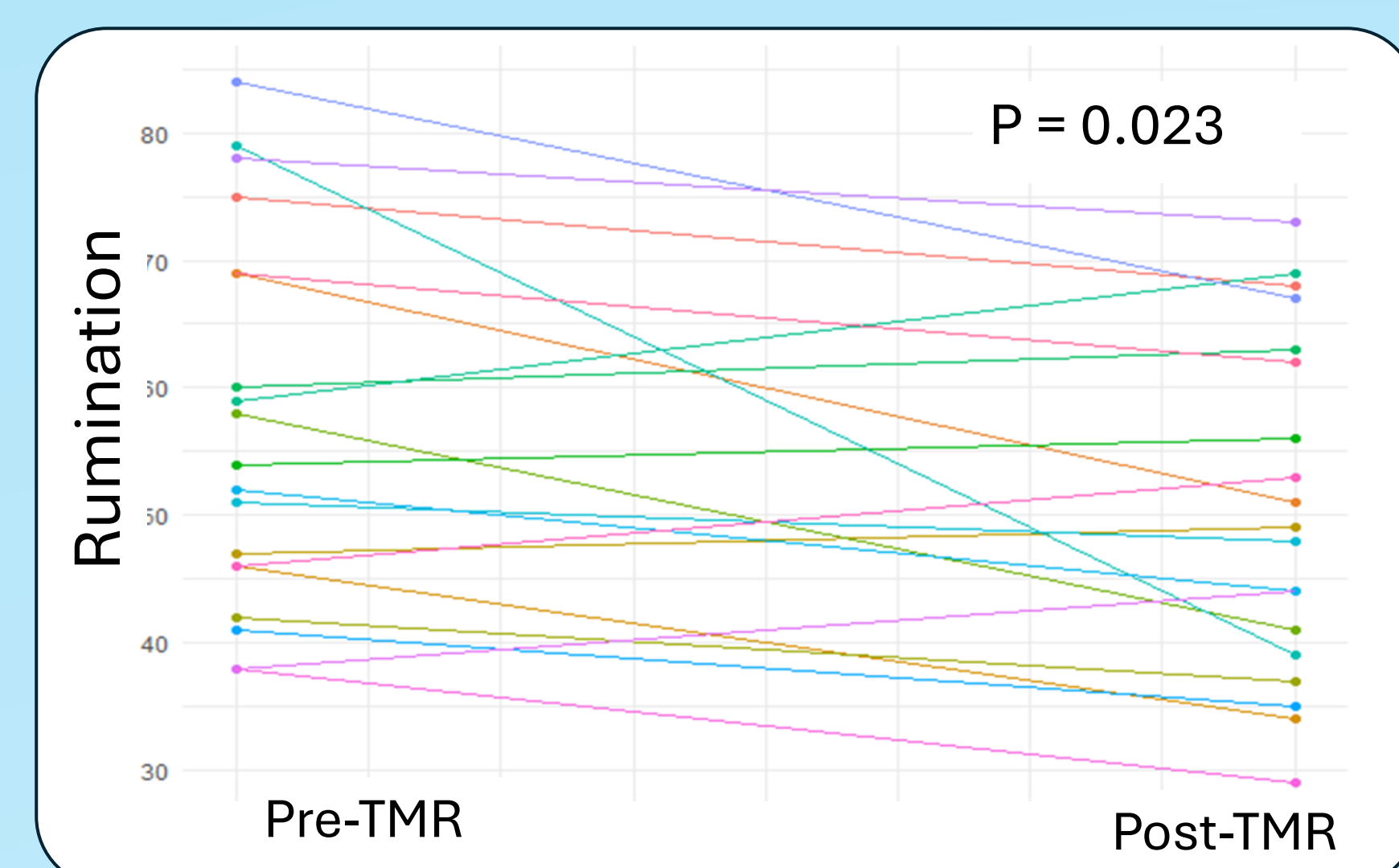
Methods



Preliminary Results

Rumination:

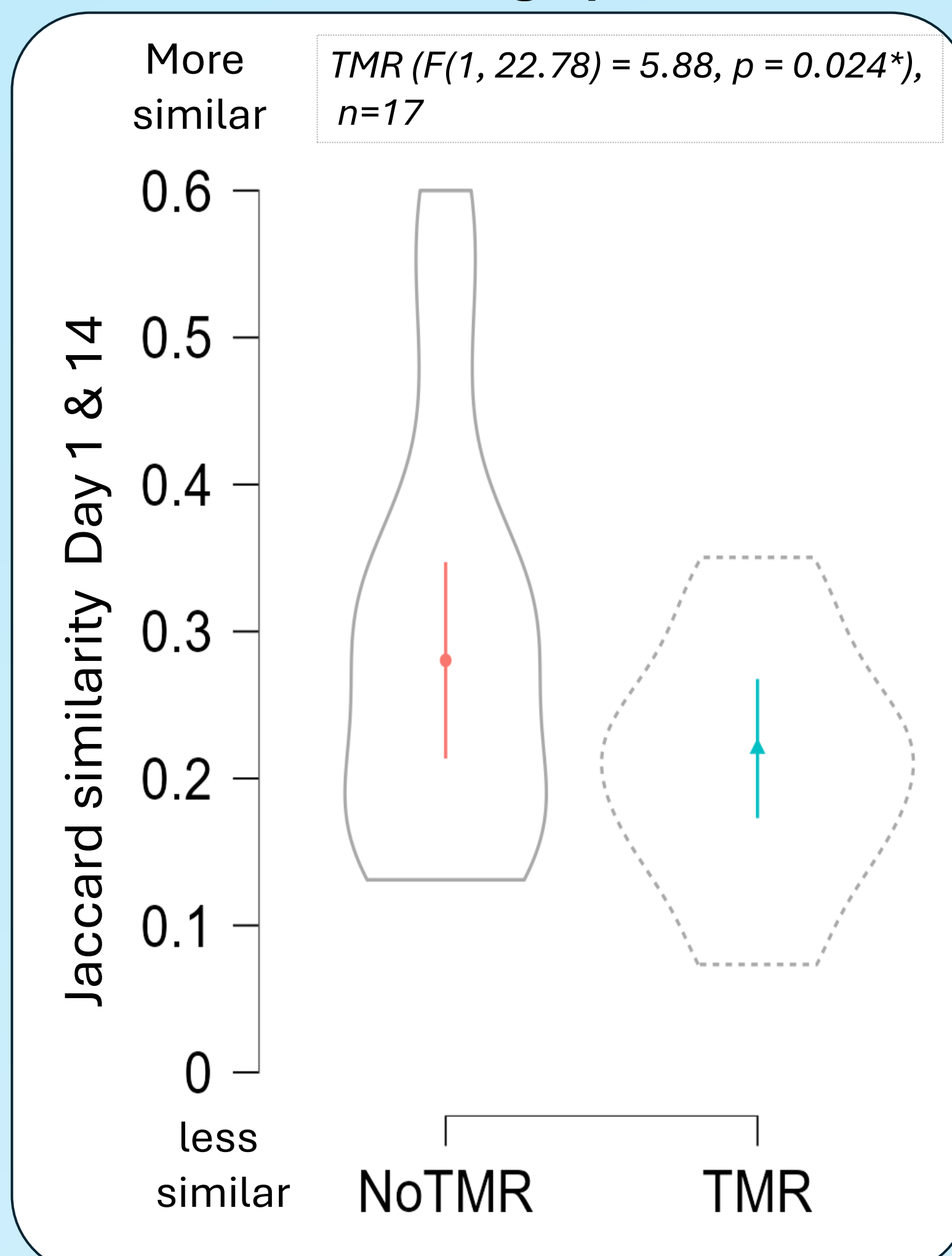
- ❖ Rumination decreased from baseline to day 14 with an effect size of 0.527 (n=19), although this may not be due to TMR since everyone had the same manipulation.



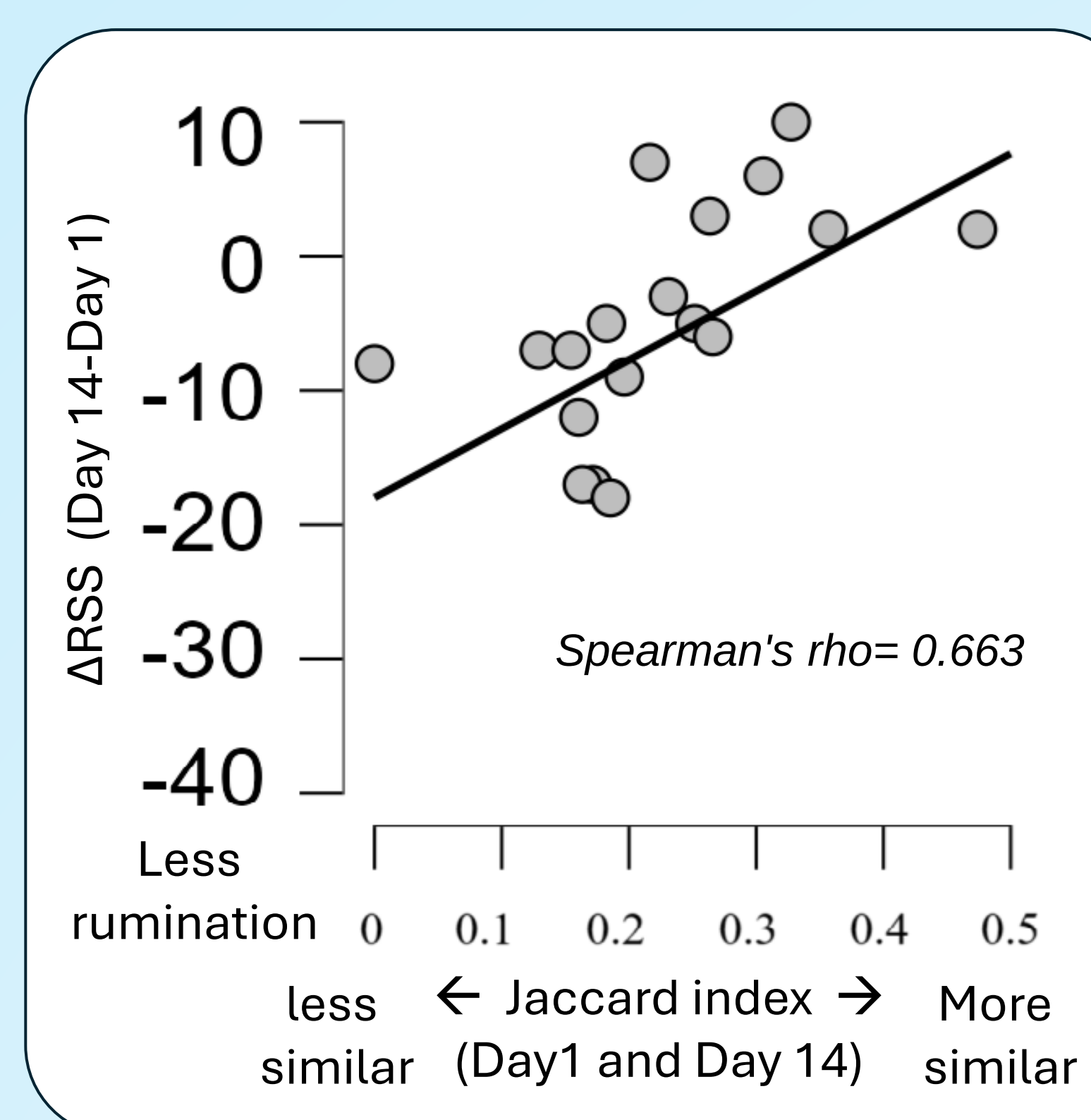
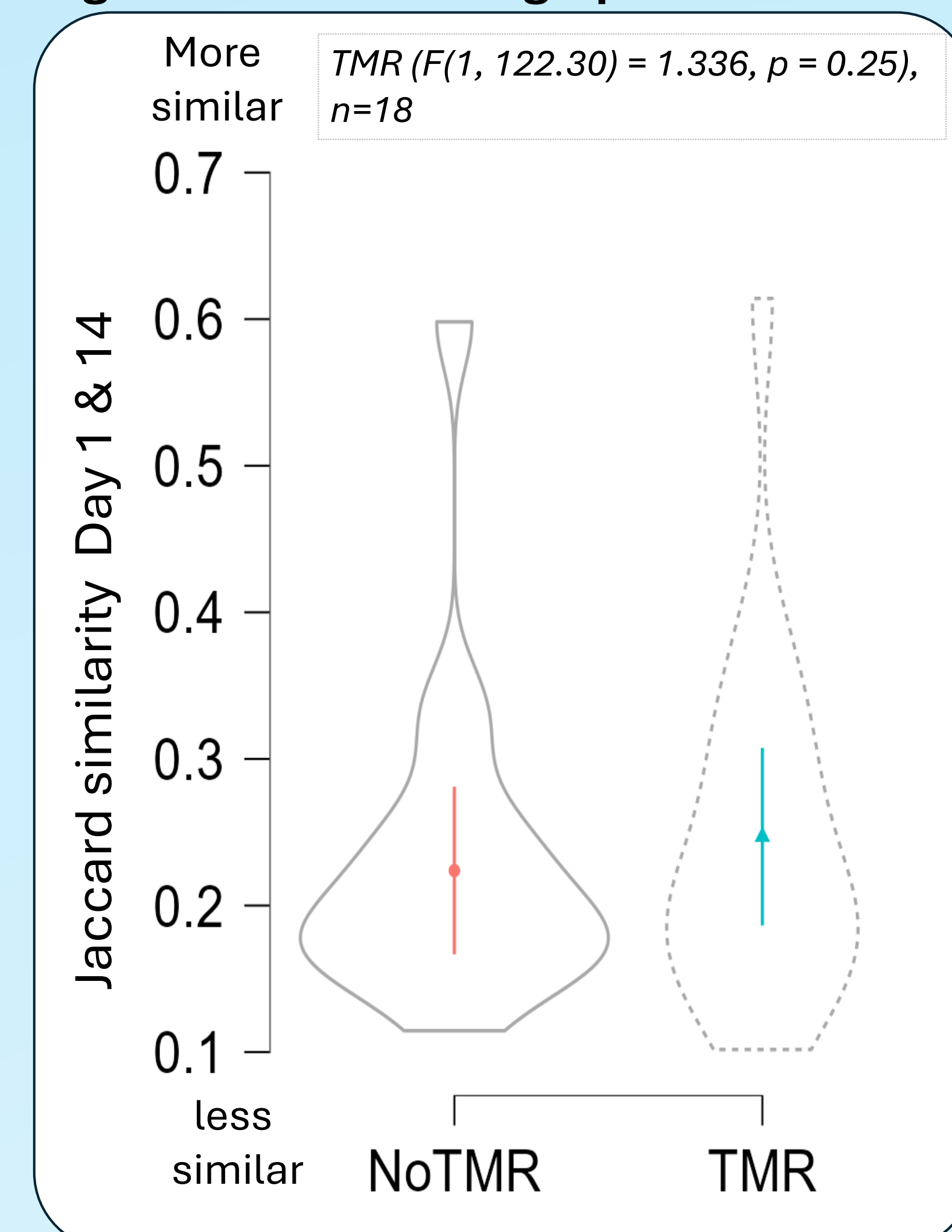
Autobiographical Memories

- ❖ No effect of TMR on subjective valence or arousal ratings.
- ❖ For memories rated as low in arousal at baseline, there was an effect of TMR ($F(1, 22.78) = 5.88, p = 0.024$) (n=17) on the consistency of reported memory descriptions between day 1 and day 14, as measured by Jaccard similarity index. This was not observed for memories rated as high in arousal at baseline.

Low-arousal autobiographical memories



High-arousal autobiographical memories



- ❖ The reduction in rumination between day 1 and day 14 (indicated by negative value of Δ RSS) was associated with less consistency in autobiographical memory descriptions between day 1 and day 14 (n=18).

Discussion/Conclusions:

- ❖ Preliminary analyses suggest that TMR may reduce the consistency with which cued positive memories are described over time, compared to uncued memories.
- ❖ The inconsistency in positive memory descriptions over time may be associated with a reduction in negative rumination.

References

- [1] Goldstein AN, Walker MP. The role of sleep in emotional brain function. *Annu Rev Clin Psychol.* 2014;10:679-708. doi: 10.1146/annurev-clinpsy-032813-153716. Epub 2014 Jan 31. PMID: 24499013; PMCID: PMC4286245.
- [2] Hutchison, I. C., Pezzoli, S., Tsimpanouli, M. E., Abdellahi, M. E. A. & Lewis, P. A. Targeted memory reactivation in REM but not SWS selectively reduces arousal responses. *Communications Biology* 2021 4:1 4, 1-6 (2021).
- [3] Xia, T. et al. Updating memories of unwanted emotions during human sleep. *Current Biology* 33, 309-320.e5 (2023).