

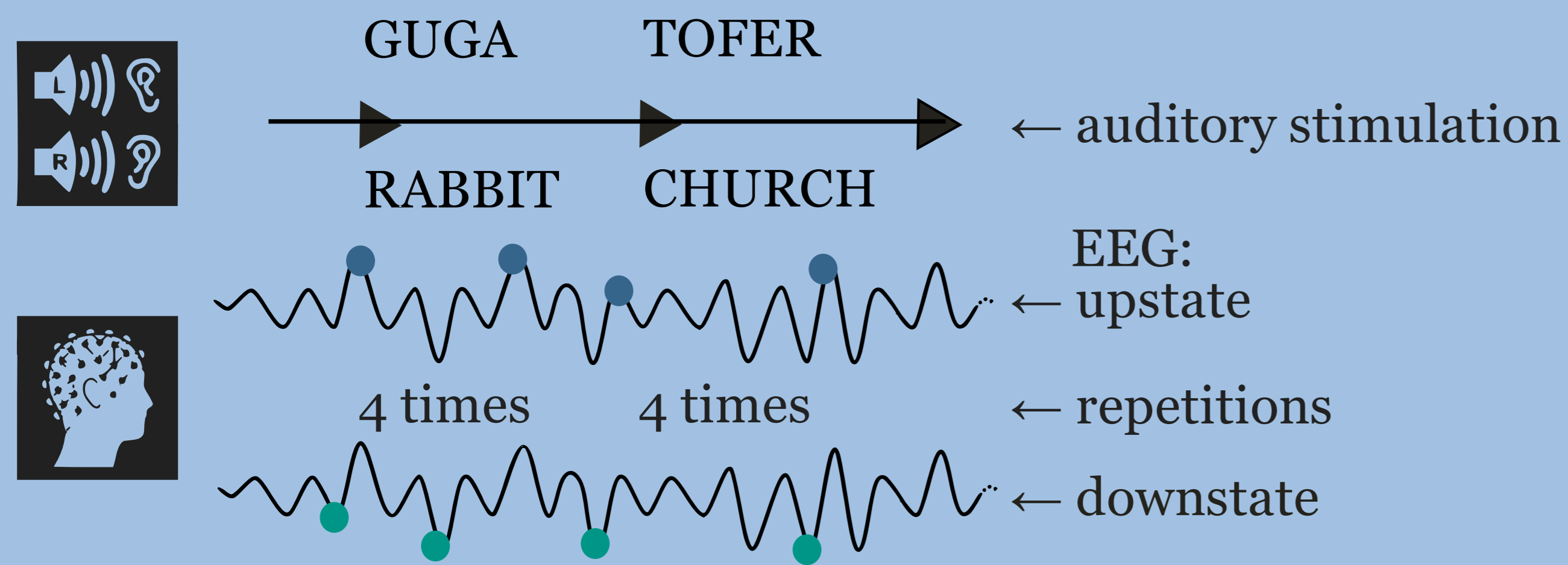
## Background

> Vocabulary learning is feasible during deep sleep and somehow depends on the SW up-state (Züst et al., 2019)

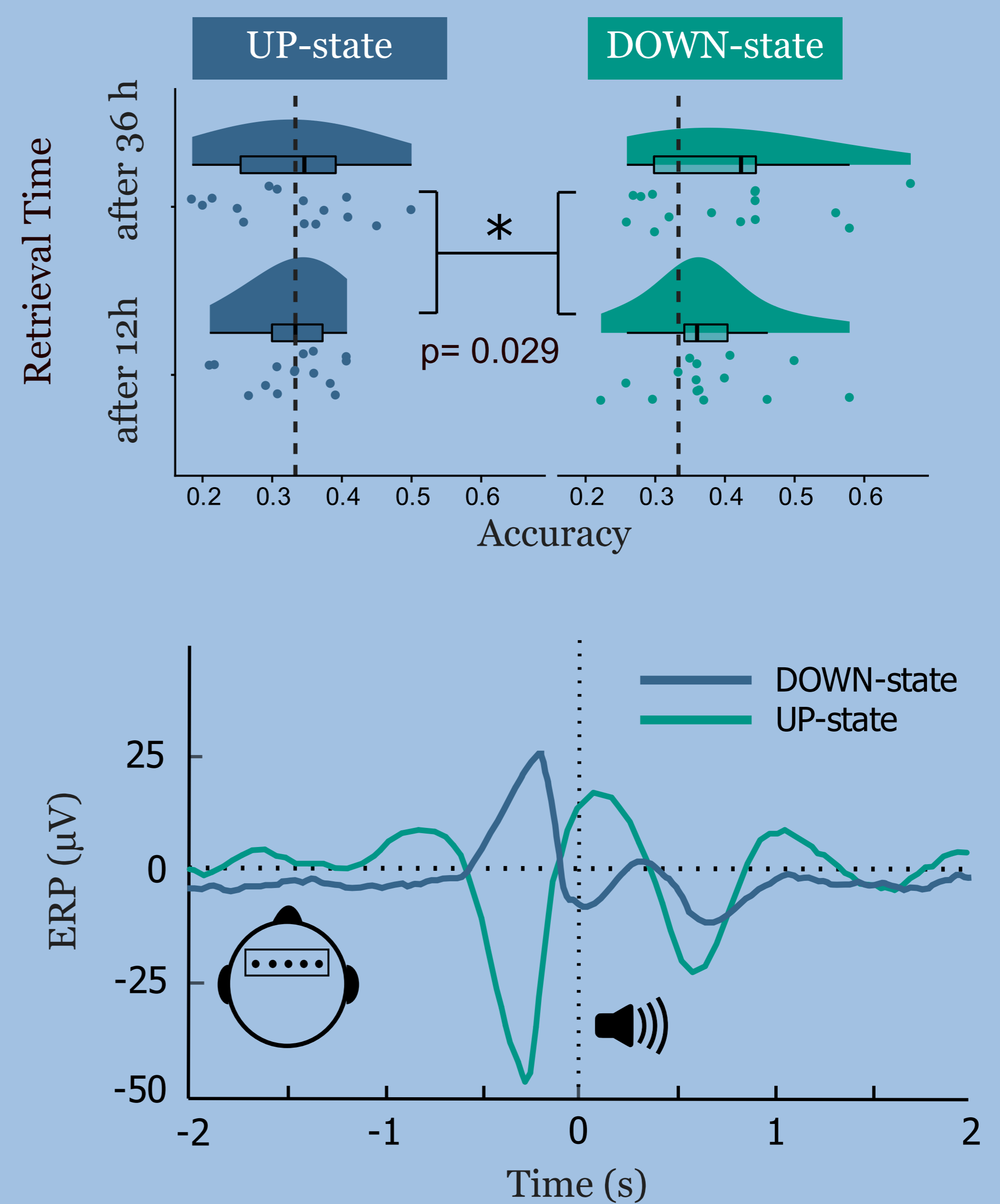
## Research goal

- > Establish long-term auditory vocabulary learning during deep sleep
- > Compare memory formation during the UP- and DOWN-phase of SO

## Design



> 15 up-state targeted subjects, 15 down-state targeted subject



Msc. Flavio Schmidig, Dr. Simon Ruch, Prof. Dr. Katharina Henke

# Vocabulary memory formed during deep sleep persists at least for 36 hours...



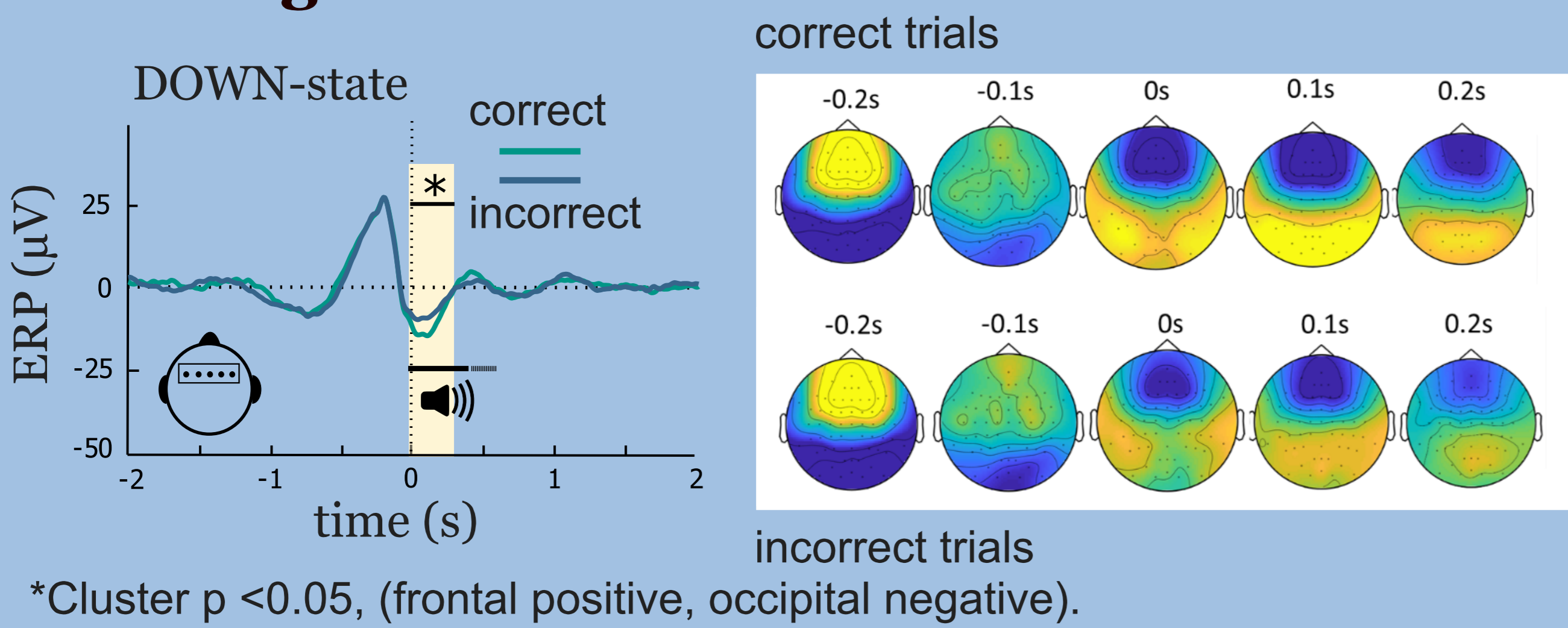
# ...if word pairs are encoded during a slow-wave DOWN-state

u<sup>b</sup>

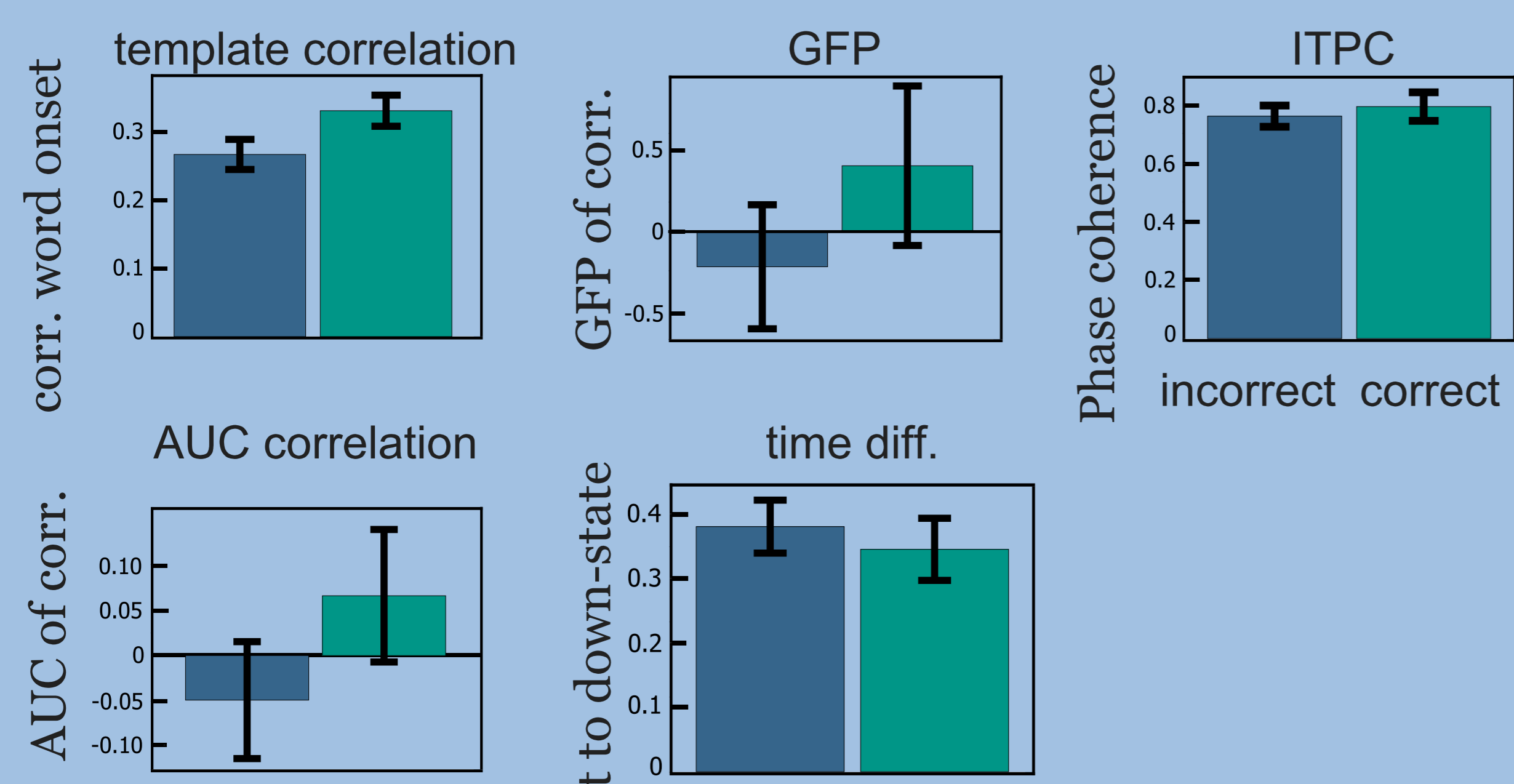
UNIVERSITÄT BERN

Project Of The Interfaculty Research Cooperation "Decoding Sleep" (WP2: "Sleep & Brain")

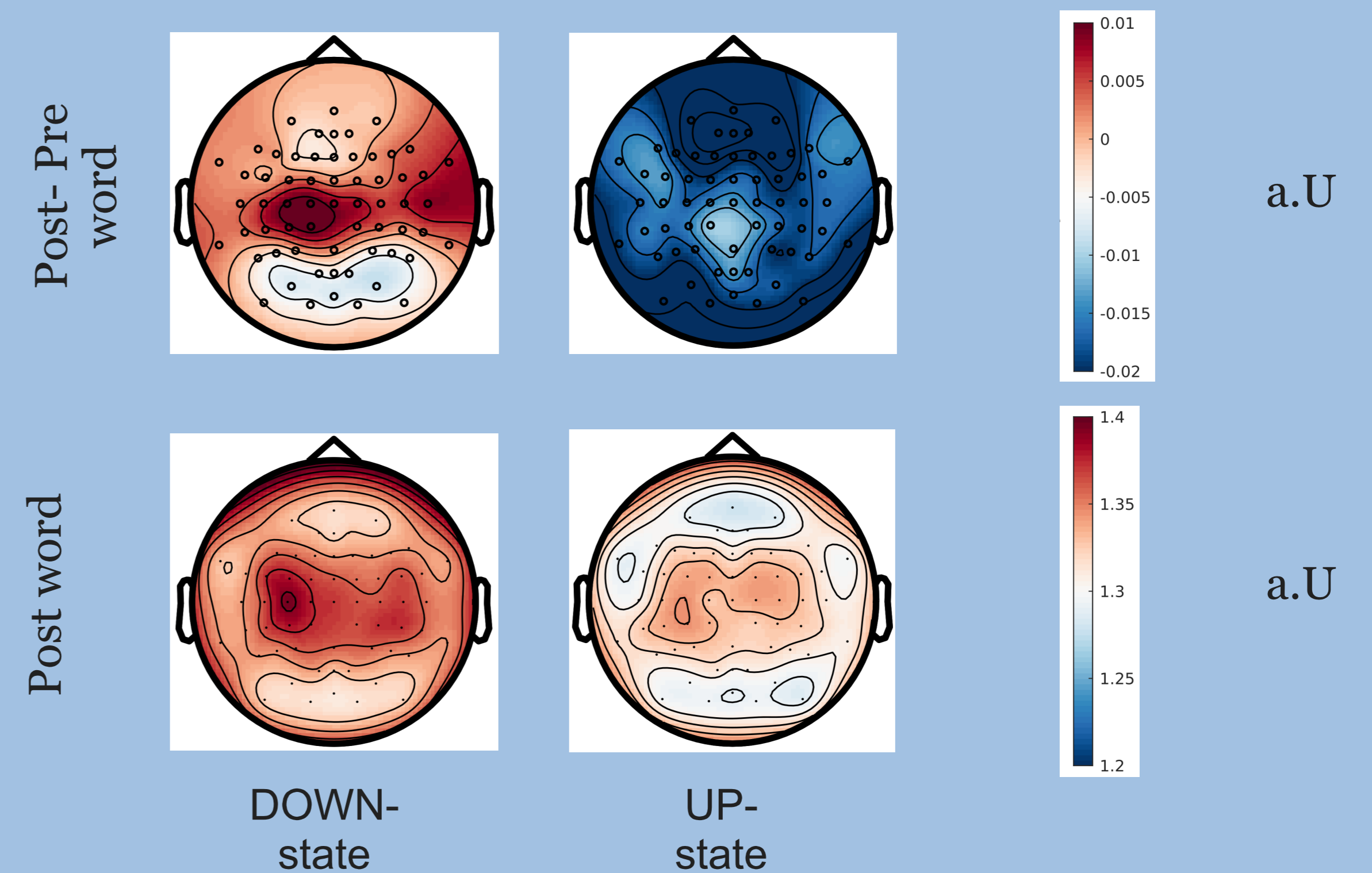
## Learning benefits from an enhanced DOWN-st.



## What Feature of a SW DOWN-state Enables Learning during Deep Sleep?



## Higher EEG Complexity (HFD) after Vocabulary Learning



## Conclusion

- > Vocabulary memory formed during deep sleep persists at least for 36 hours ...
- > ...if word pairs are encoded during a slow-wave DOWN-state

## References

Züst, M. A., Ruch, S., Wiest, R., & Henke, K. (2019). Implicit vocabulary learning during sleep is bound to slow-wave peaks. *Current biology*, 29(4), 541-553.

contact: flavio.schmidig@unibe.ch