

The Effect of Acute Stress on Time Based Prospective Memory

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BACKGROUND: Situational stress is an unavoidable thing, especially given the state of current events, therefore it is important to uncover the effect upon prospective memory (PM).

Methods

- Participants were given questionnaires to rule out previously standing anxiety markers (BDI, BAI, IES-R, DSI-II).
- The socially evaluated cold pressor test (SECPT) (Schwabe & Schächinger, 2018) was administered and three saliva samples were collected (prior, 15 minutes after, & 45 minutes after).
- The behavioral task, modeled after (Cona et al., 2012) contained an ongoing task and a time based PM (TBPM) task (6-5 minute delays & 4-2 minute delays) was coupled with an electrophysiological recording.

Data Analysis

- Electrophysiological data was entered into EEGLAB and filtered, cleaned, and plotted. Automagic, a toolbox within EEGLAB, was used to complete ICA, EOG regression, and channel reinterpolation (Pedroni et al., 2019).
- A one-way ANOVA was completed to rule out anxiety markers among participants.
- A simple t-test was conducted to determine statistical difference within the behavioral task.

Results

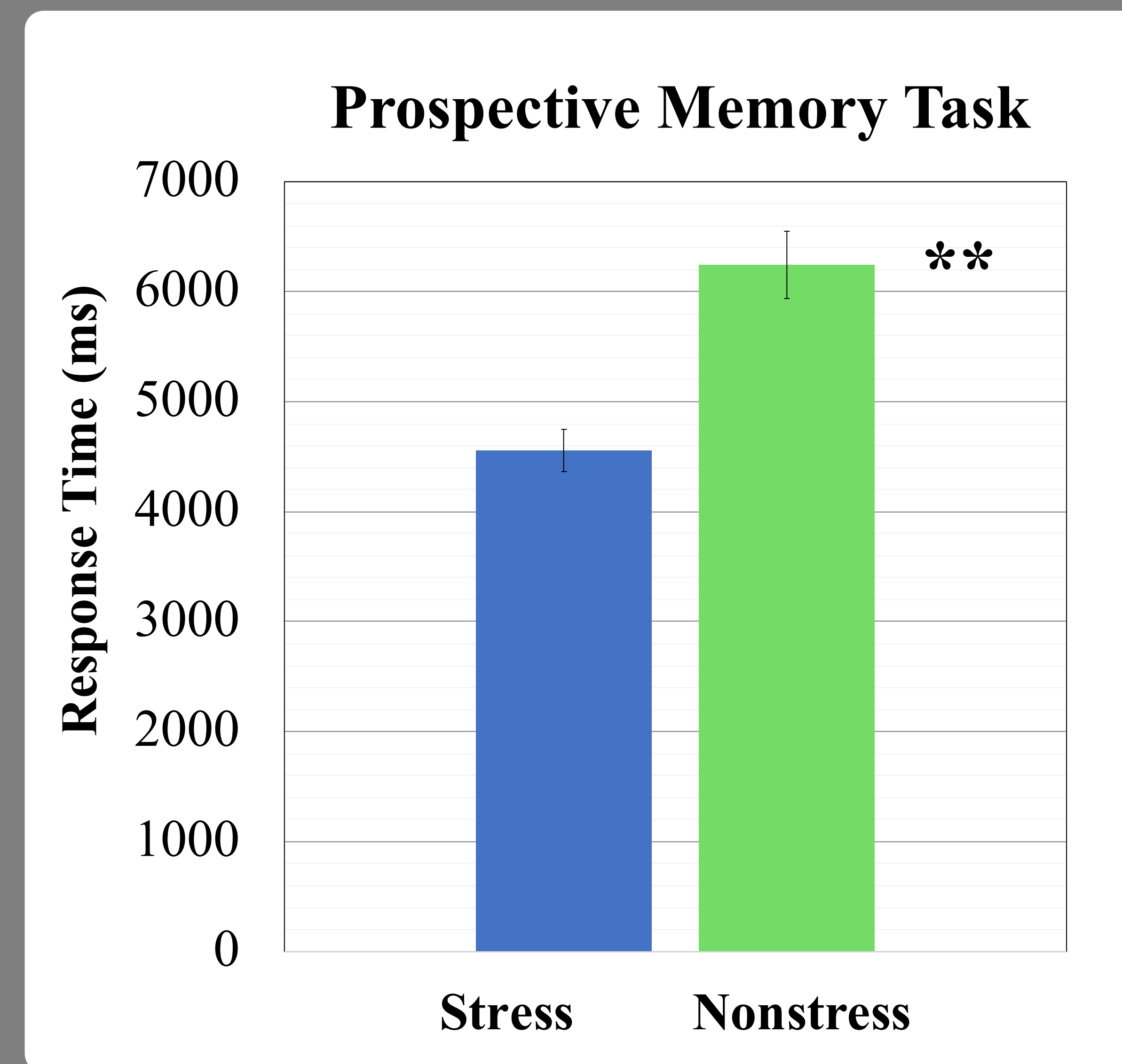
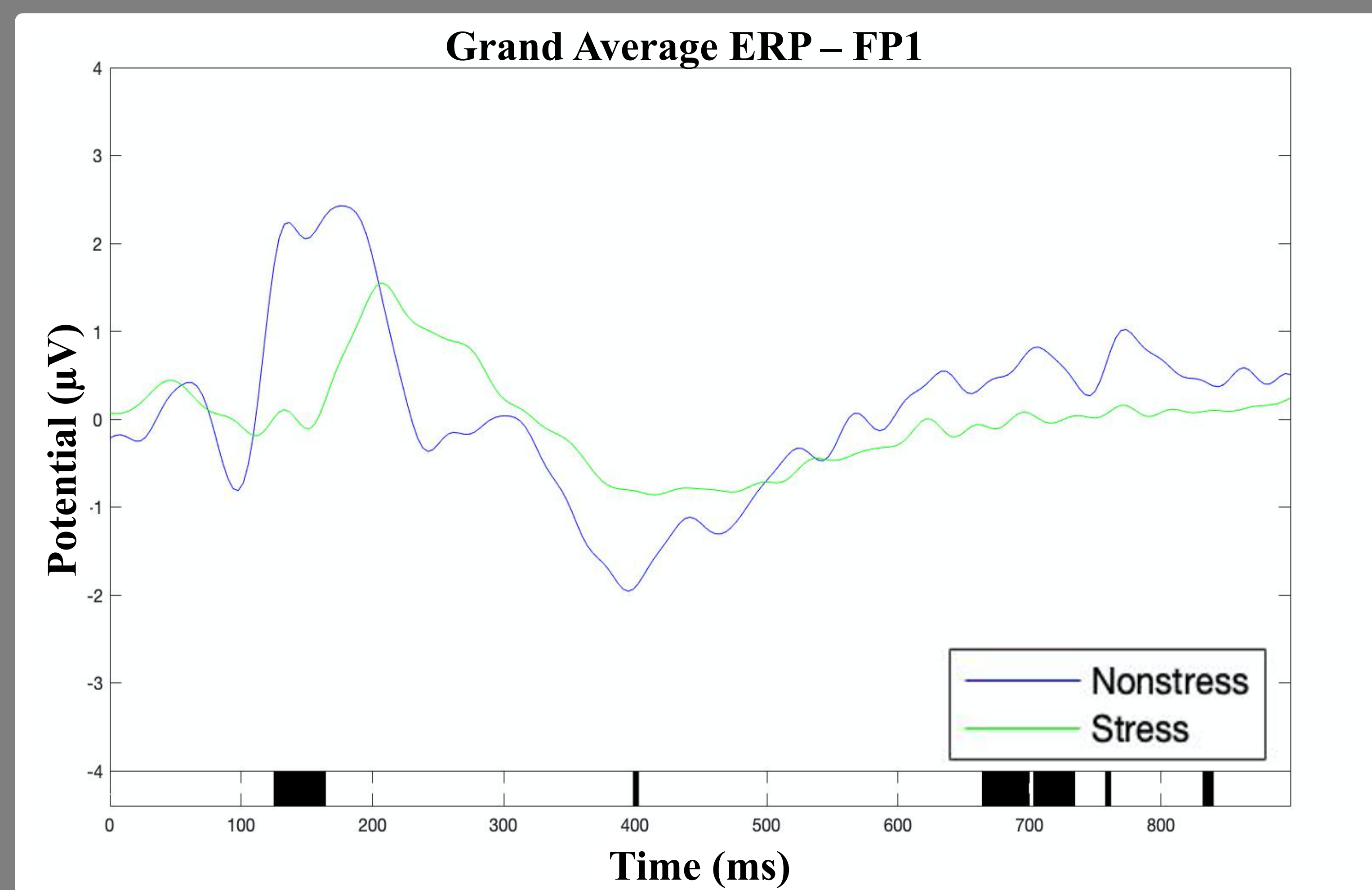
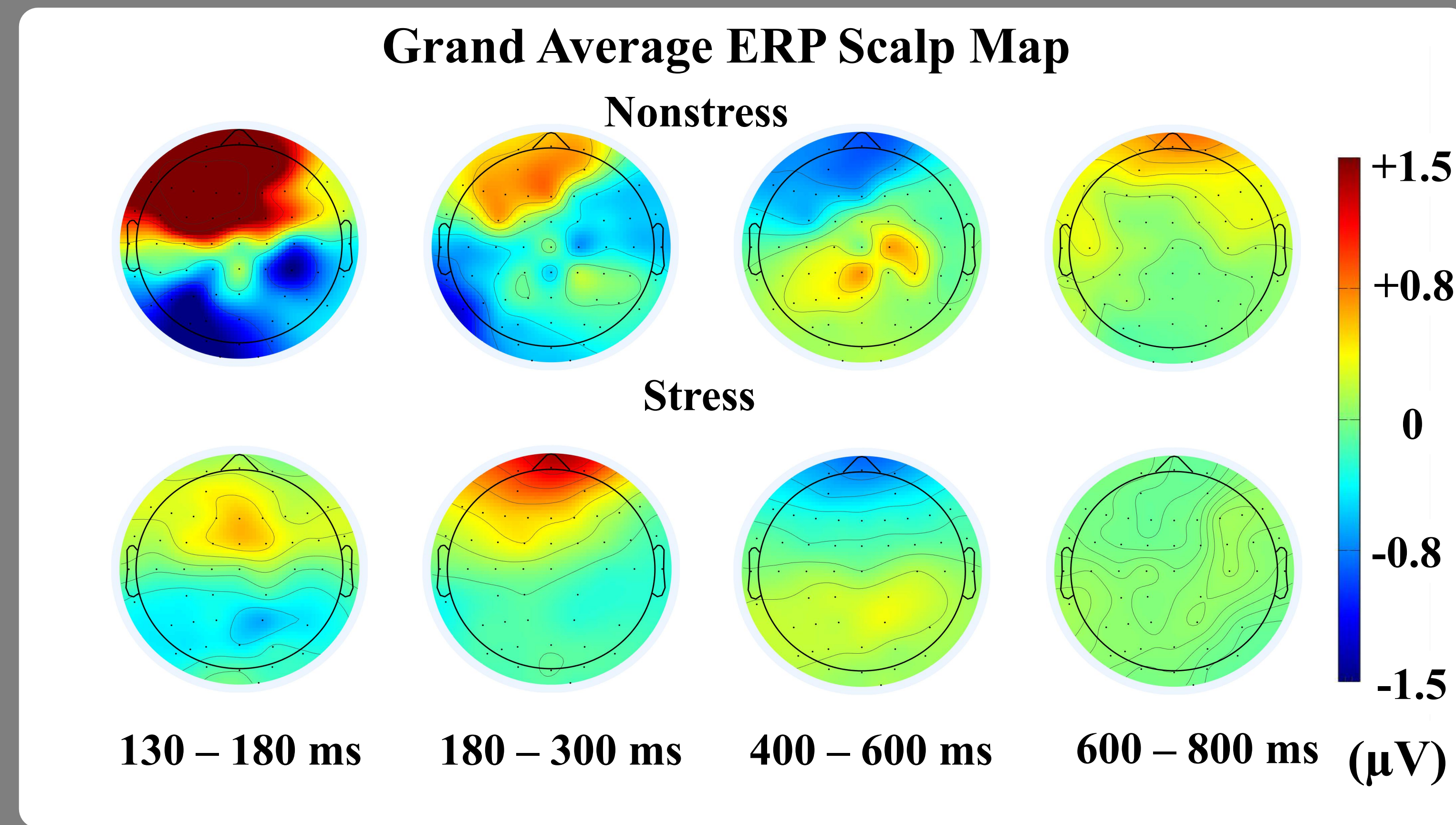
- It was found that there was no difference in prospective memory response accuracy ($p=0.679$), ongoing task accuracy ($p=0.548$), or previously standing stress markers.
- However, it was found that the nonstress group had a significantly faster TBPM response time.
- Additionally, the physiological data from the stress group revealed lower activation ($p<0.05$) in electrophysiological correlates speculated to be related to PM processes (i.e. retrieval mode) (Cona et al., 2012).

Conclusion

- Lower activation in TBPM correlates in combination with decreased reaction time within the stress group reflect a sort of mental screen for the ongoing task (i.e. inhibition), allowing for greater allotment of cognitive resources toward the TBPM task.



Participants exposed to stress had faster time based prospective memory response times and exhibited lesser frontal activation than participants not exposed to stress.



Stressor: The SECPT

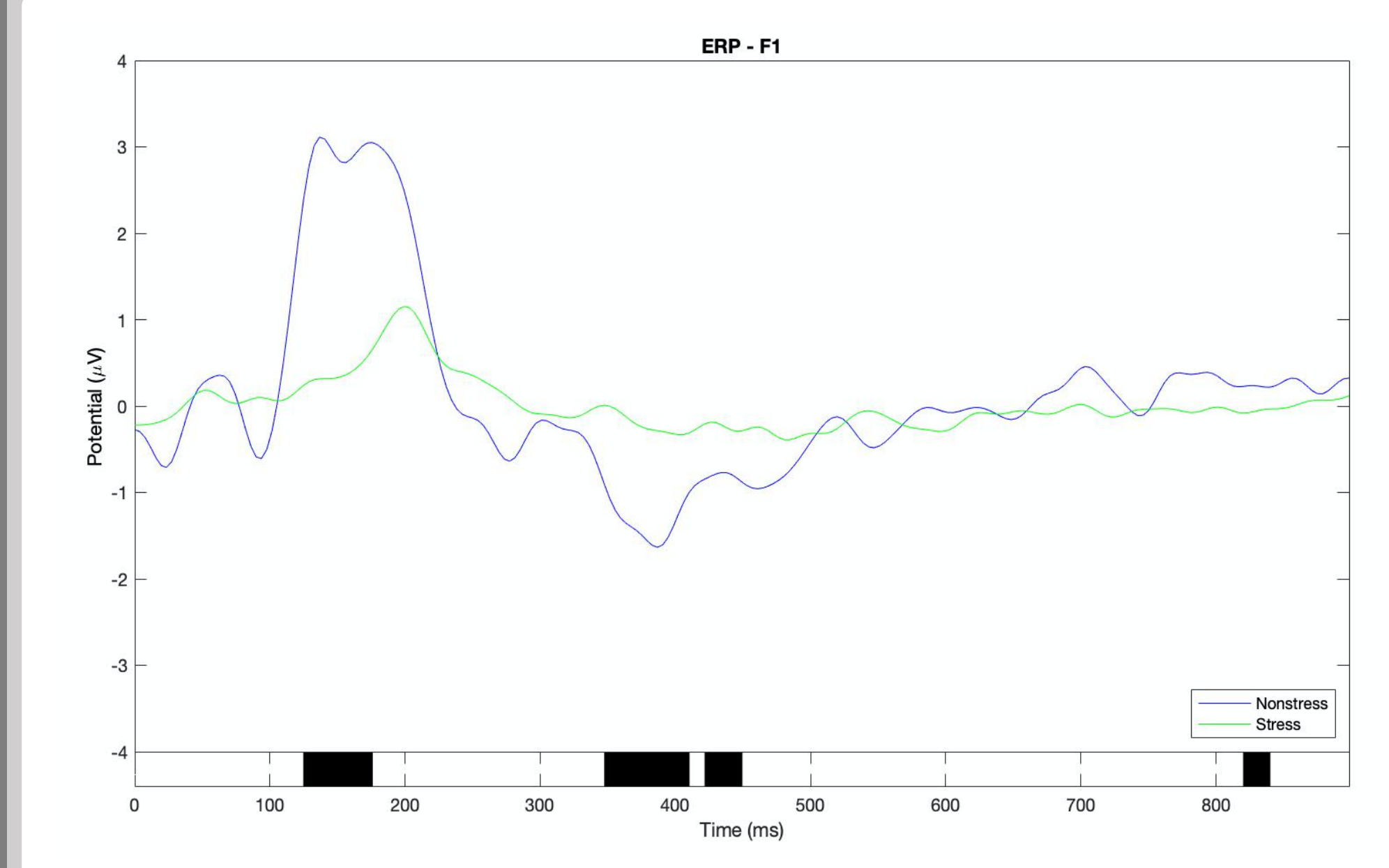


(Schwabe & Schächinger, 2018)

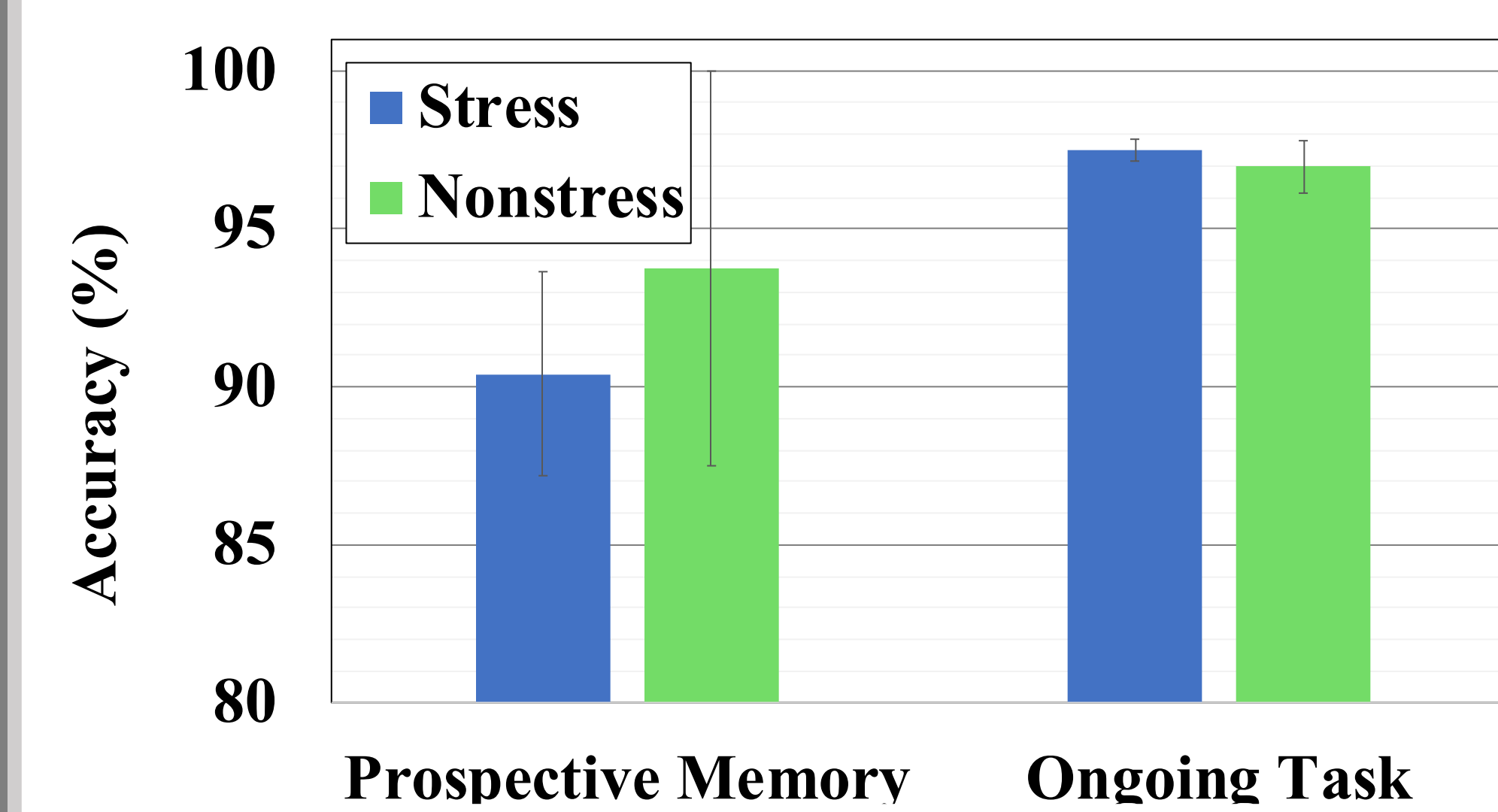
Questionnaire ANOVA

Condition	Measure	BAI	BDI	IES-R	DSI-E	DSI-I
Stress	Mean Score	8.200	5.000	26.200	20.800	61.400
	Standard Deviation	5.770	3.590	15.718	8.917	33.224
	Mean Score	7.500	6.500	24.000	10.000	24.500
Nonstress	Standard Deviation	3.536	4.950	8.485	7.071	17.678
	Significance	0.875	0.617	0.855	0.142	0.168

Grand Average ERP - F1



Behavioral Task Accuracy



References

- Cona G, Areara G, Tarantino V, Bisiacchi PS (2012) Electrophysiological Correlates of Strategic Monitoring in Event-Based and Time-Based Prospective Memory. PLOS ONE 7(2): e31659.
- Pedroni, Andreas & Bahreini, Amirreza & Langer, Nicolas. (2019). Automagic: Standardized preprocessing of big EEG data. NeuroImage. 200. 10.1016/j.neuroimage.2019.06.046.
- Schwabe, L., & Schächinger, H. (2018). Ten years of research with the Socially Evaluated Cold Pressor Test: Data from the past and guidelines for the future. Psychoneuroendocrinology, 92, 155-161.