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Introduction

- **Social anxiety disorder (SAD)** has one of the highest lifetime prevalence rates of all psychological disorders, affecting approximately 12% of the general population. SAD, left untreated, follows a chronic and debilitating course.
- Research to understand anxiety disorders like SAD has relied heavily on the **fear conditioning paradigm**, in which a neutral stimulus becomes associated with an aversive stimulus after repeated pairings. Altering this paradigm can diminish learned fear responses in a process called **extinction**.
- **Exposure Therapy**, a key component of SAD treatments, uses this extinction process to reduce symptoms. However, the re-emergence of fear responses to conditioned stimuli following extinction is common, suggesting that current protocols can be refined to improve the duration and strength of extinction, and efficacy of exposure therapy.
- The purpose of the current study is to determine the efficacy of a novelty-based extinction model in reducing acquired fear in individuals with moderate to severe social anxiety.

Design

80 undergraduate students who meet the criteria for **moderate to severe social anxiety** were recruited from UConn for this study.

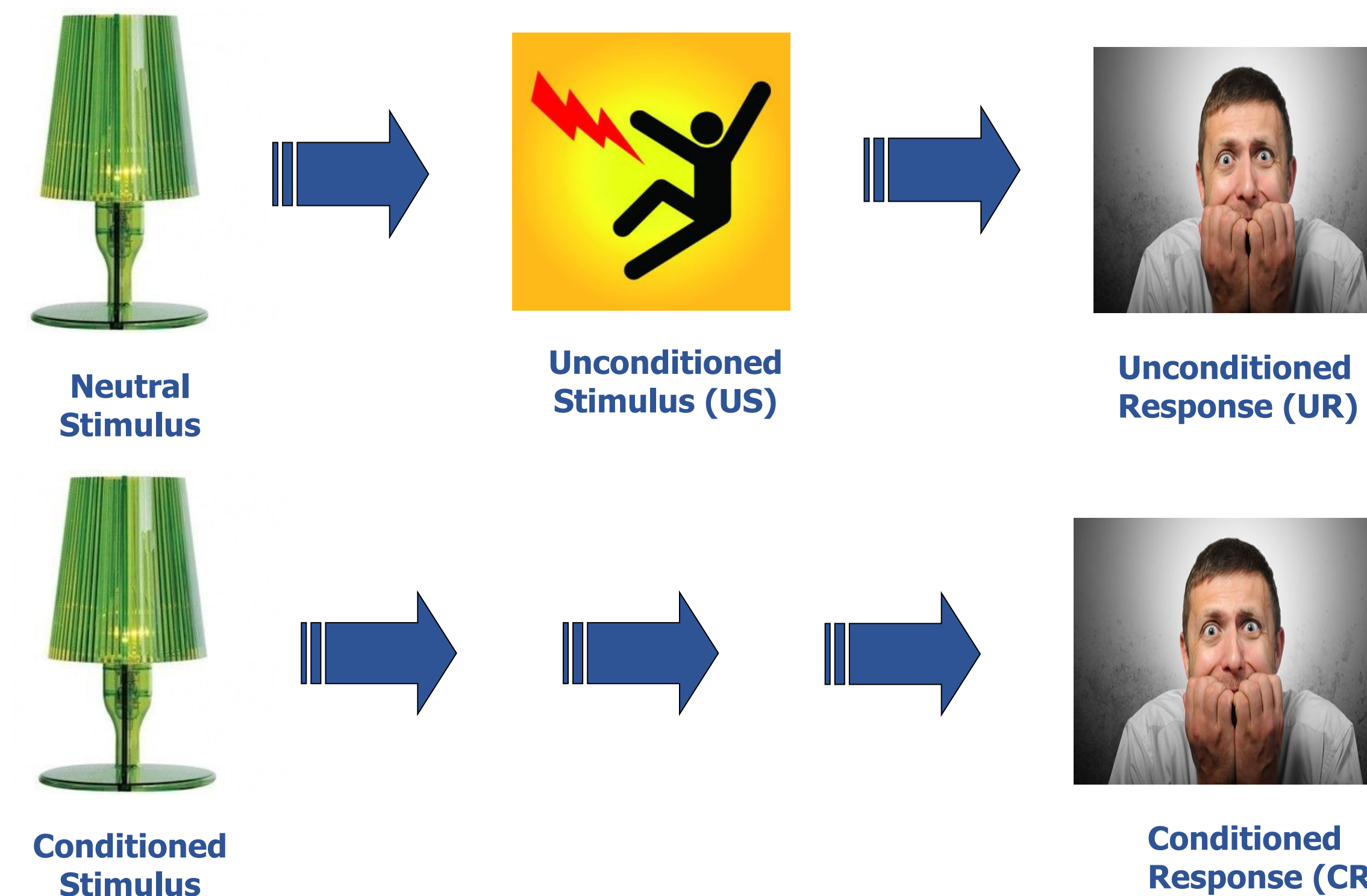
A variety of standard social anxiety measures were taken prior to the computer tasks.

The unconditioned stimulus (CS+) was an electrical shock to the dominant wrist. Participants chose an intensity level that was aversive, but not painful.

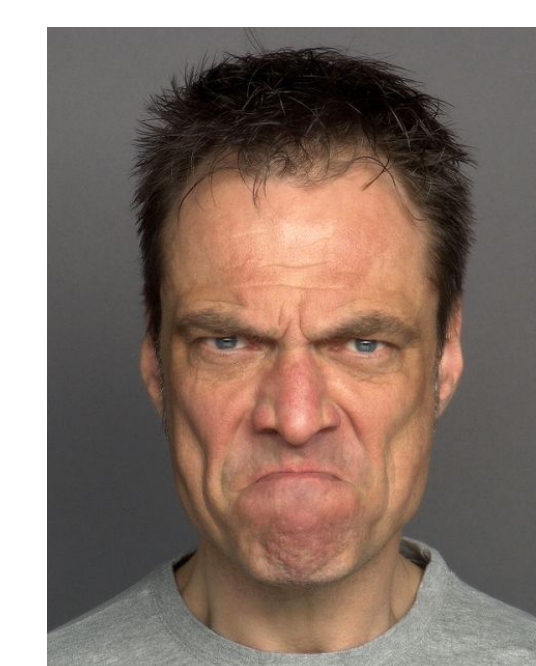
The computer task was conducted in four phases. In each phase, each face was presented for 8 seconds with 20 seconds in between.

- **Habituation (8 Trials):** CS+ and CS- were presented with no stimulus.
- **Acquisition (16 Trials):** CS+ was paired with a shock stimulus in a VR3 schedule. CS- presentation received no shock stimulus.
- **Extinction (8 Trials):** Shock stimulus pairing was removed.
 - Novel Extinction: an innocuous tone was played upon the presentation of CS+.
 - Standard Extinction: shock-omission
- **Reinstatement (2 Trials):** Shock stimulus was presented with a blank screen.
 - Following the stimulus, each face was presented once with no stimulation

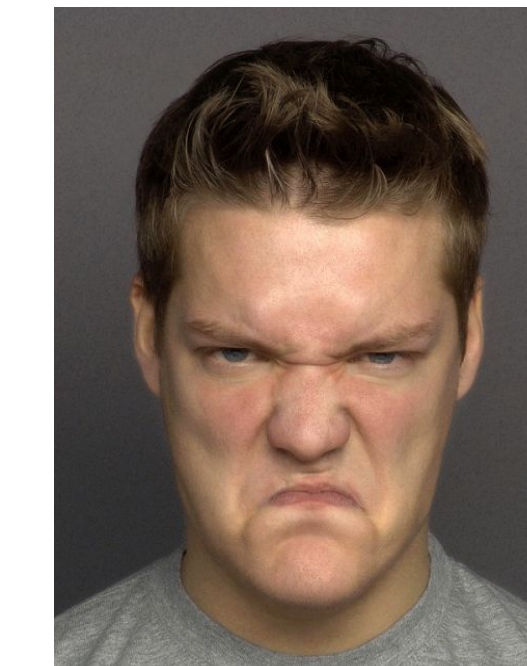
Fear Conditioning Paradigm



Face Stimuli



Two angry male faces were used as stimuli.



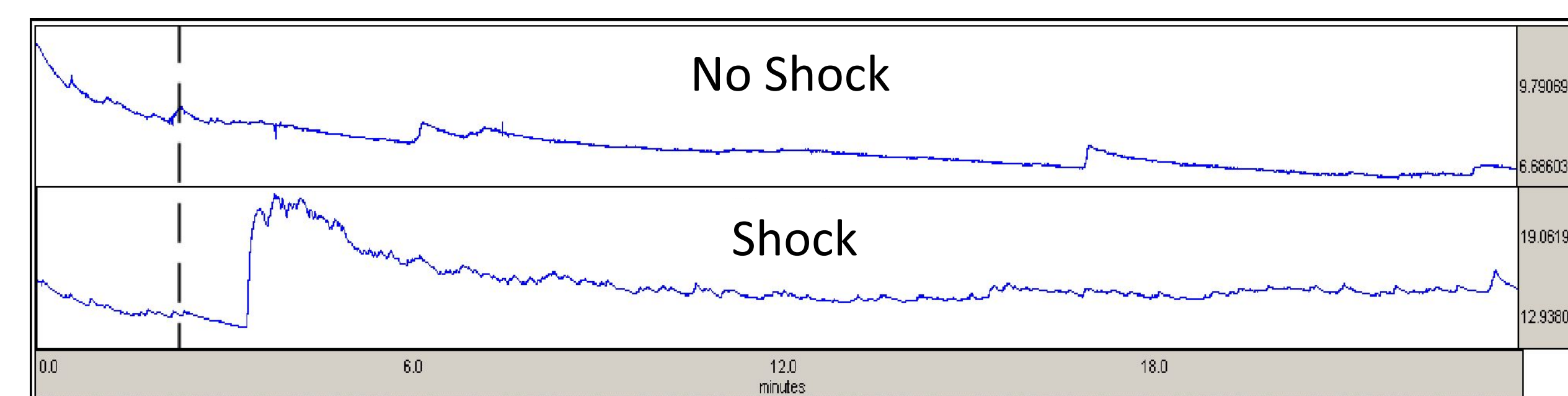
CS+ was counterbalanced to account for differences between face stimuli

Electrodermal Activity (EDA)

(Right). EDA responses were recorded from the fingertips of the nondominant hand

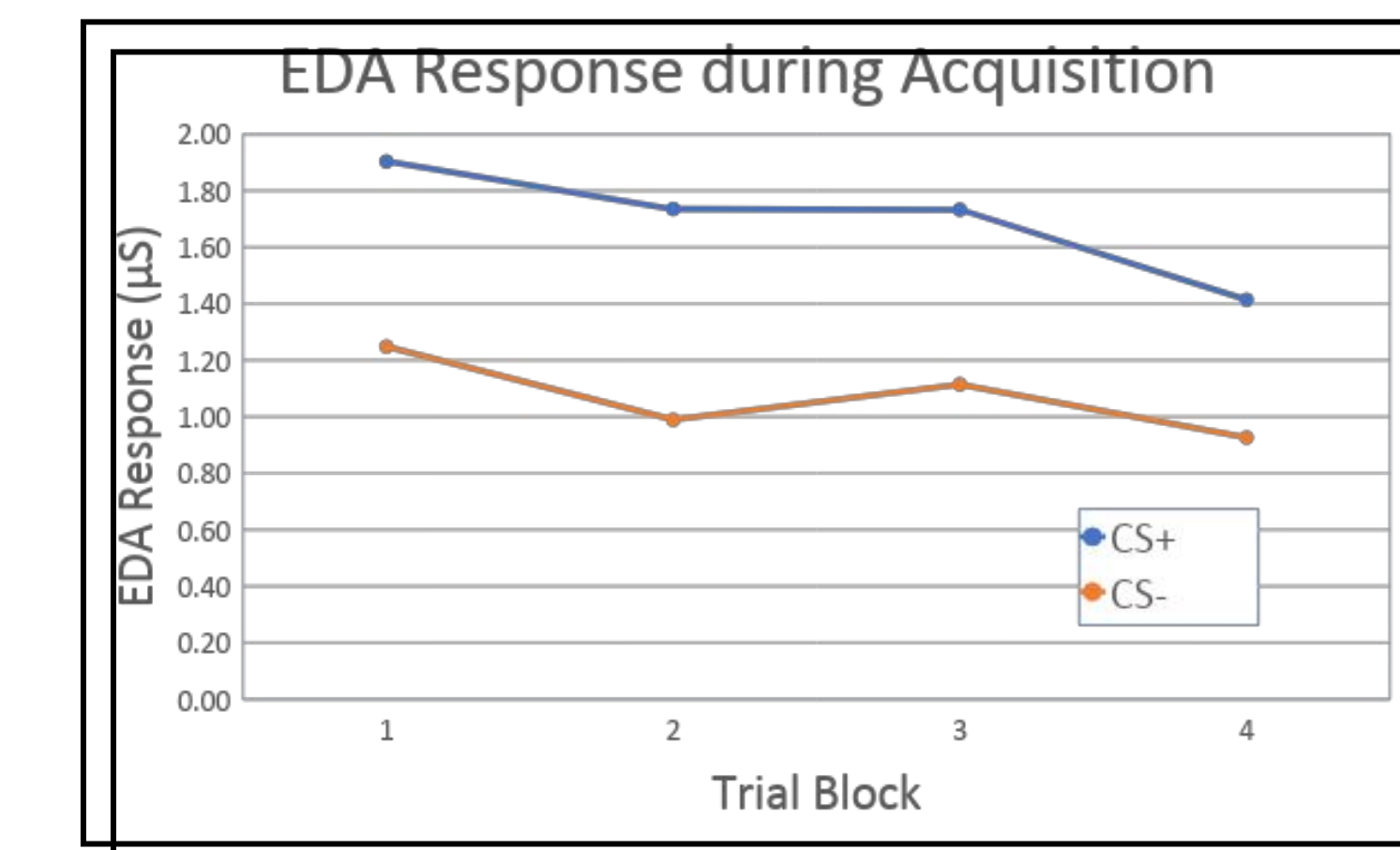


(Below). A typical EDA response with no shock present vs. a EDA response to a shock

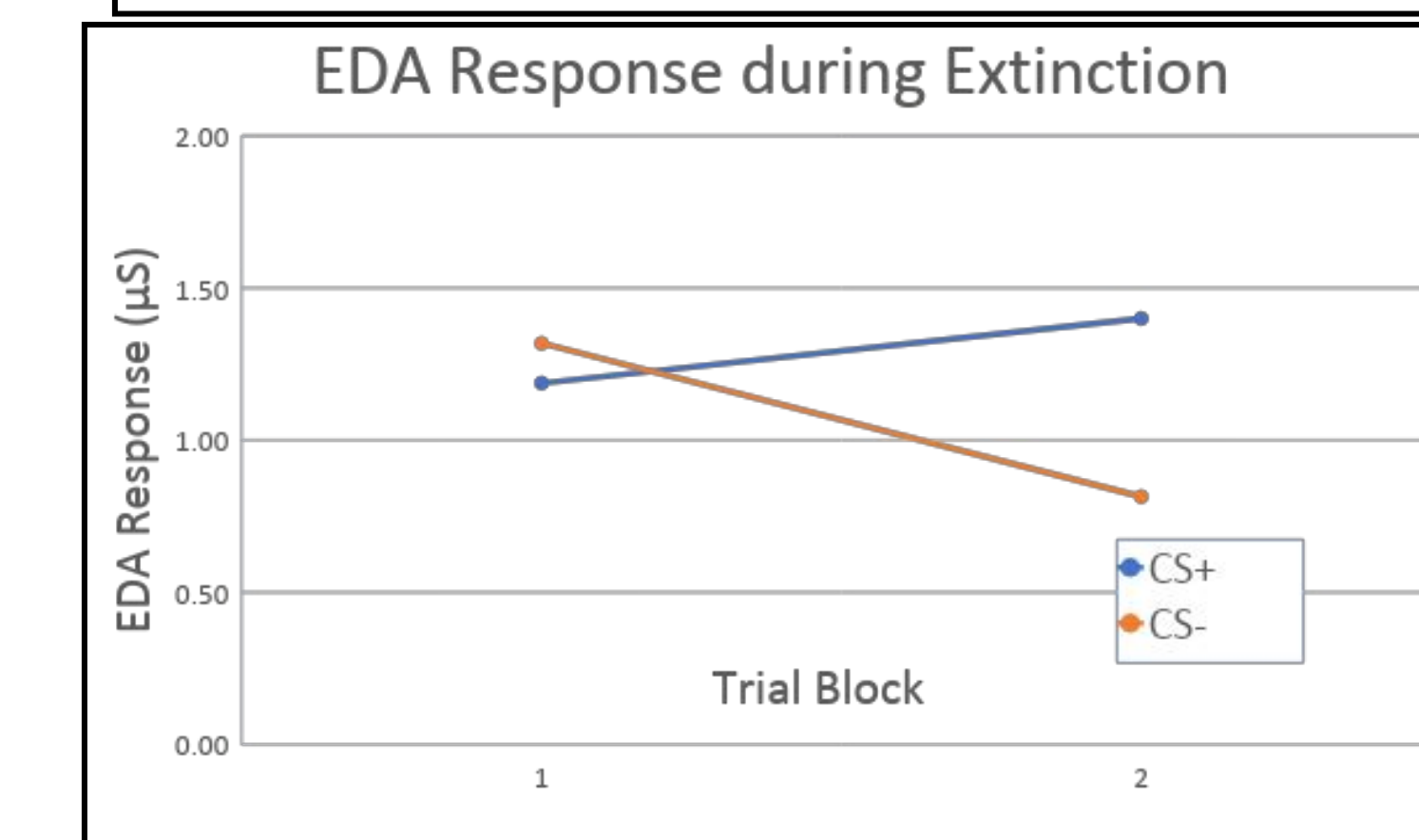


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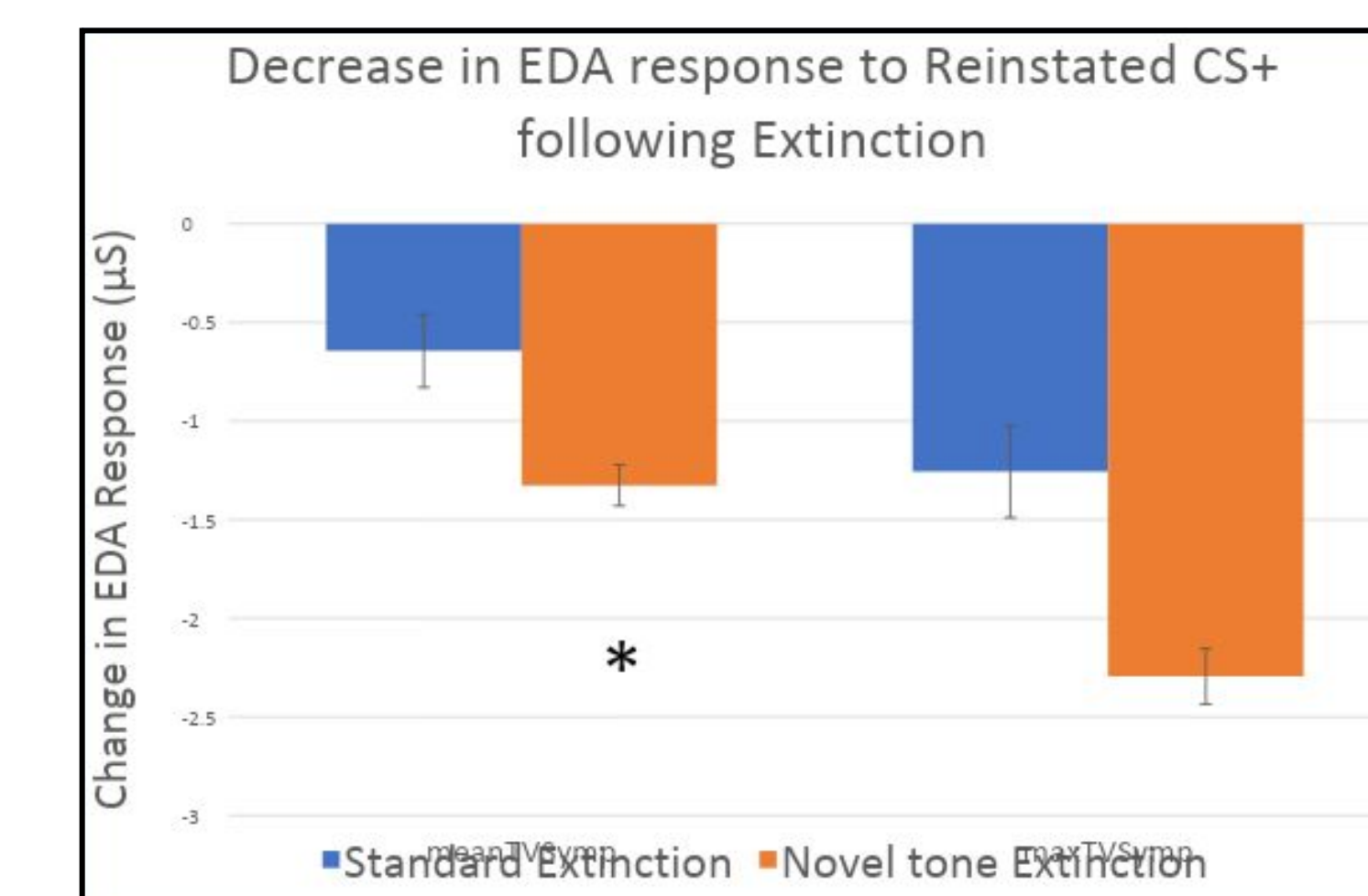
Results



Participants experienced elevated EDA response during the Acquisition phase to CS+. EDA response to the shock-paired CS+ was greater than that to CS-, with no shock pairing.



Participants experienced an increase in EDA response in the Extinction phase when the CS+ was presented. EDA response decreased to the CS-. The average CS+ EDA response was greater than the average CS- response.



Participants in the Novel Extinction group experienced significant ($p < 0.001$) reductions in EDA response to the Reinstated CS+.

Conclusion

- Both Novel Extinction and Standard Extinction groups were equally conditioned to be fearful and experienced extinction.
- Participants in the Novel Extinction group experienced superior extinction efficacy, as indicated by significantly lower GSR levels following the reinstatement phase.
- These results suggest that the Novel Extinction protocol may be beneficial in improving extinction efficiency. Increased extinction protocols, upon further testing, may be a good candidate for improving extinction-based therapies and thus SAD patient outcomes.