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Regulating Under Stress: The Impact of State Anxiety on Instructed Emotion Regulation

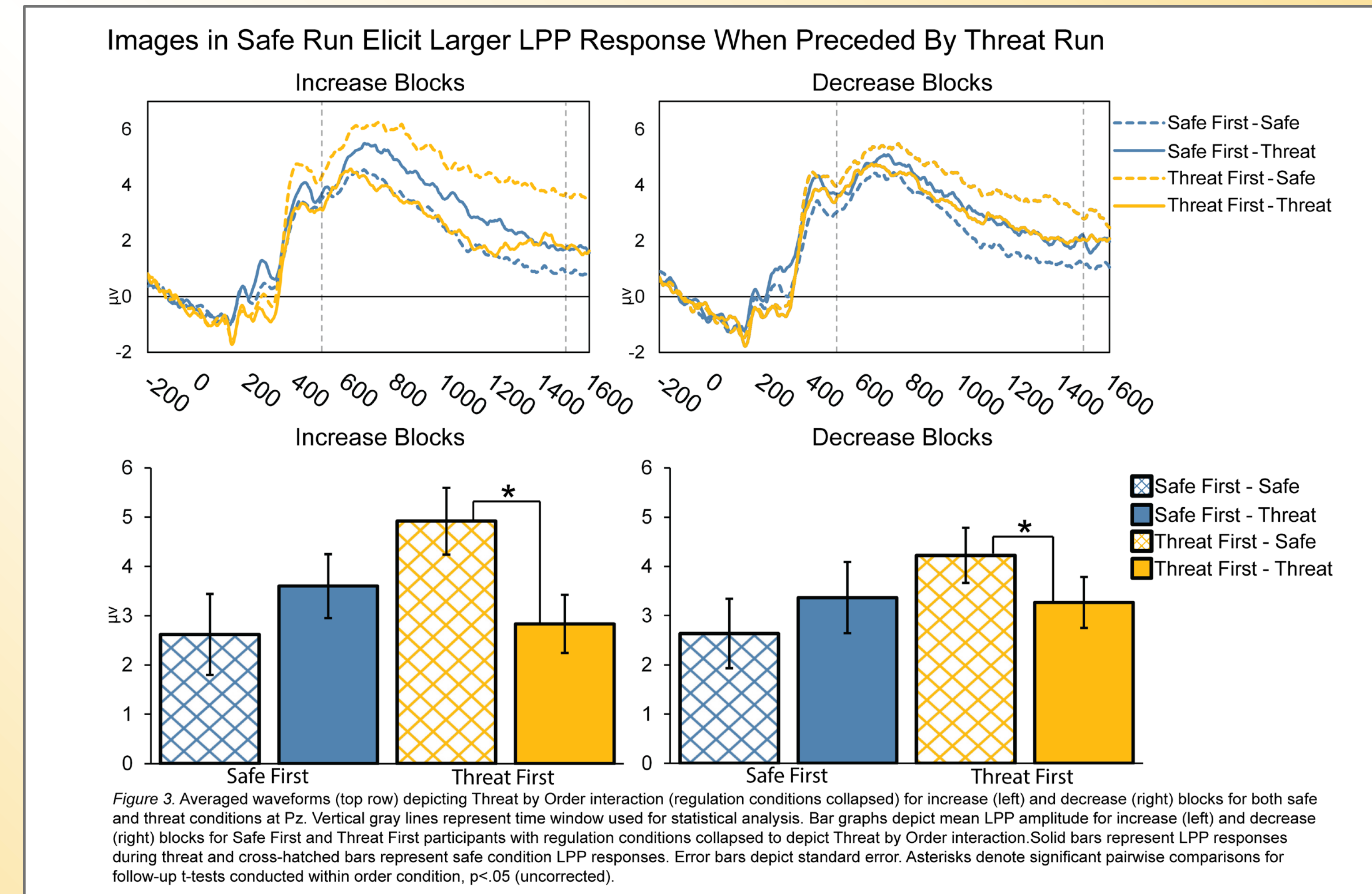
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Introduction

- Emotion regulation is important for emotional and mental health.
- Cognitive control is positively correlated with emotion regulation (McRae et al., 2012; Schmeichel et al., 2008) and is disrupted by state anxiety (Robinson et al., 2013).
- It is predicted that state anxiety may also disrupt emotion regulation.
- To test how state anxiety impacts emotion regulation, participants were instructed to regulate their emotional responses to images while under the threat of shock or while safe.
- The late positive potential (LPP) component of the event related potential is larger in response to emotional images (Gable et al., 2014) and instructing participants to up-regulate or down-regulate emotional responses, respectively, increase or decrease this effect (Hajcak & Nieuwenhuis, 2006; Moser et al., 2009).
- It is predicted that state anxiety will disrupt emotion regulation, and as a result, will prevent this effect.
- We hypothesize a difference in LPP magnitude between trials which instruct participants to down-regulate emotional responses vs. viewing a negative image during safe conditions, but no difference in LPP magnitude while under threat of shock.

Methods

- Data from 53 UWM students (32 female) were analyzed.
- Participants viewed neutral images on some trials (view-neutral trials) or negatively valenced images and were asked to down regulate their emotions (decrease trials) or simply view the image (view-negative trials).
- Participants did this task twice, once with an infrequent, unpredictable shock (threat block), and one without any shock (safe block).
- Threat condition was counterbalanced so that some participants received safe block first while others received threat block first.
- EEG data was recorded using a DC amplifier and a 32-channel cap.
- Data was subjected to standard preprocessing and amplitude for 500-1500 ms following image onset at Pz was averaged for each trial type



Results

Manipulation Check

- Safe-First participants reported less anxiety during safe vs. threat, but Threat-First participants had equivalent anxiety during safe vs. threat runs.
- This indicates that that anxiety from the threat run carried over into the safe run.

ERP Findings

Increase Condition:

- Significant Condition x Order interaction ($p = .001$) showed Threat-First participants had a higher mean LPP amplitude for safe vs. threat run while Safe-First participants did not.

Decrease Condition:

- Significant Condition x Order interaction ($p = .03$) similar to increase condition but did not survive Bonferroni correction

Order of Threat and Safe Conditions Influences State Anxiety

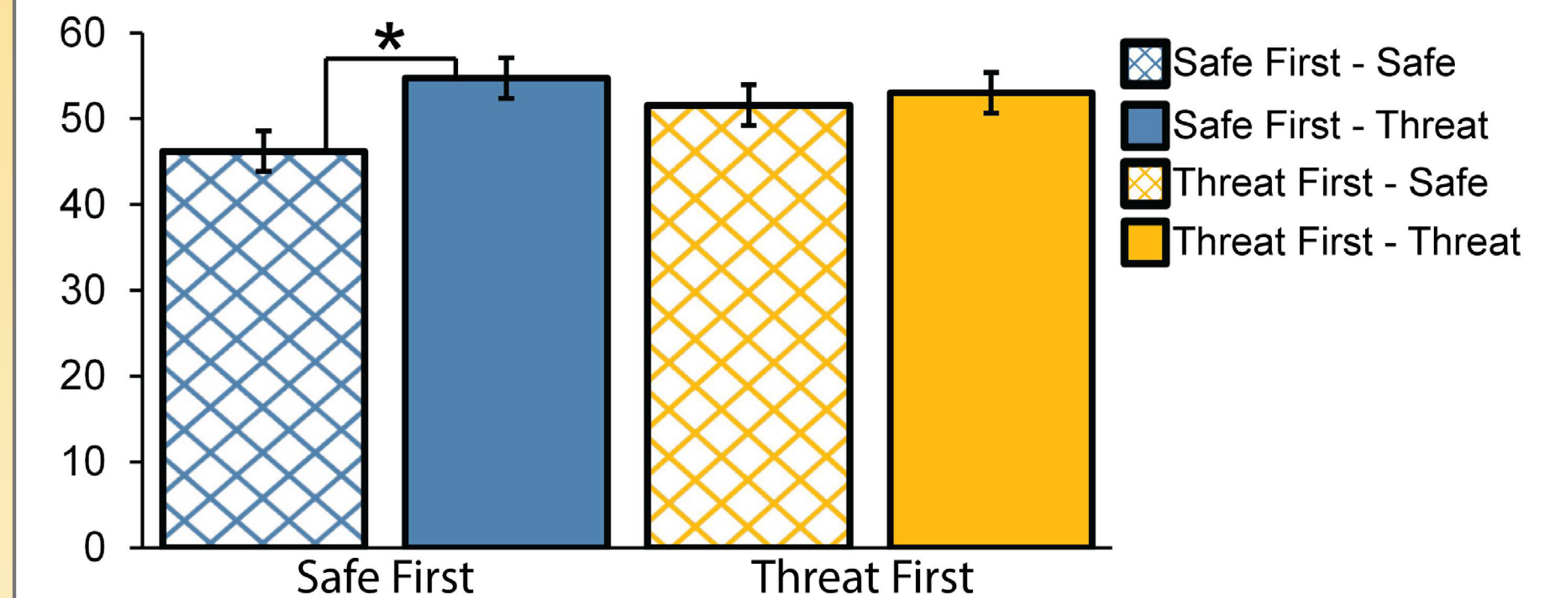
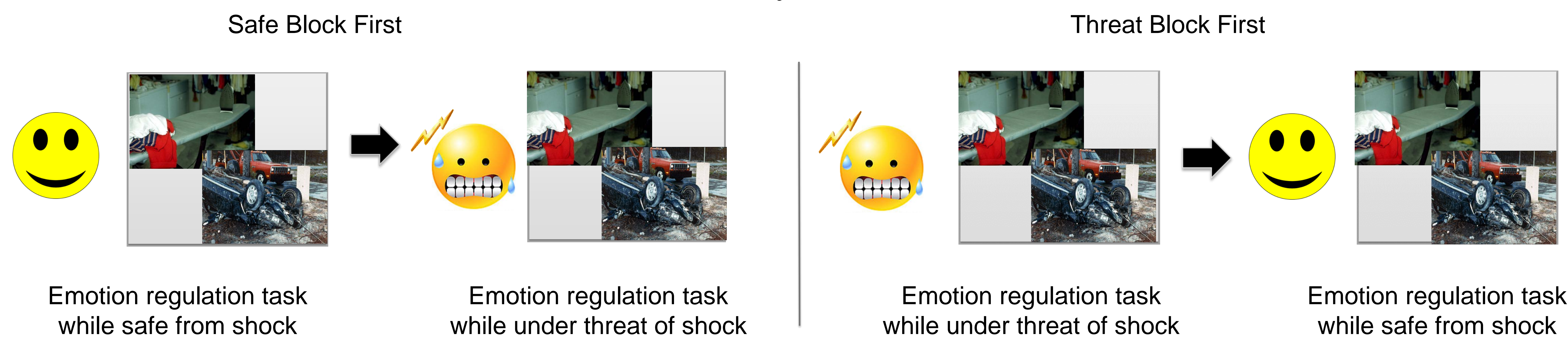


Figure 1. Mean self-reported anxiety (STAI-State) following safe and threat runs for Safe First Participants (left) and Threat First Participants (right). Safe First participants reported less anxiety during safe (vs. threat) trials, with no mean anxiety difference for safe vs. threat trials for Threat First participants. Error bars depict standard error. Asterisk denotes significant differences revealed by follow-up t-tests, $p < .05$.

Conclusions

- Instructions to regulate did not affect LPP amplitude
 - Anticipation of shock may have contributed in failure to replicate changes in LPP magnitude
- Safe-First participants showed no LPP amplitude differences between threat and safe trials.
- Threat-First participants had greater LPP responses in all safe trials versus the threat condition.
 - This indicates a carry-over of potentiated LPP responses to all images, regardless of valence or regulation instructions.
- This effect may have been a result of misattribution of arousal caused by the earlier threat of shock (Dutton & Aron, 1974).
 - Misattribution of arousal may result in exaggerated neural response toward target of misattribution.

Study Flow



Literature cited

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