



The Impact of Acute Stress on Emotional Experiences and Histamine Reactivity

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Introduction

- Stress can lead to increases in inflammation and alter immune and emotional responses.
- The Trier Social Stress Task (TSST), produces a stress-like scenario which presents participants with a surprise public speech task.
- To assess the impacts of this social acute stress task on one's immunity, a histamine scratch can be used to measure the body's reactivity.
- The PANAS Circumplex of Emotion divides emotions into four basic categories based on valence and arousal (i.e. pos/pos, pos/neg, neg/neg, neg, pos).
- By investigating the influence of an acute social stressor on emotional and inflammatory responses, we are better able to understand the relationship between the nervous and immune system.

Methods

Baseline Assessment	Trier Social Stress Task	Post-Stress Assessment
25 min	45 min	70 min

- Data shown is preliminary analysis based on 11 participants, but the target sample size is 40.
- Baseline Assessment: Participants are exposed to a histamine scratch, blood and saliva samples are collected, multiple questionnaires are answered, and participants are connected to an ECG machine.
- Trier Social Stress Task: Participants undergo a social stress task involving a 10 minute speech and 5 minute mental math task in front of a panel of interviewers.
- Post- Stress Assessment: Participants' response to the histamine is measured again, blood and saliva samples are drawn, and they answer multiple questionnaires again.

Results

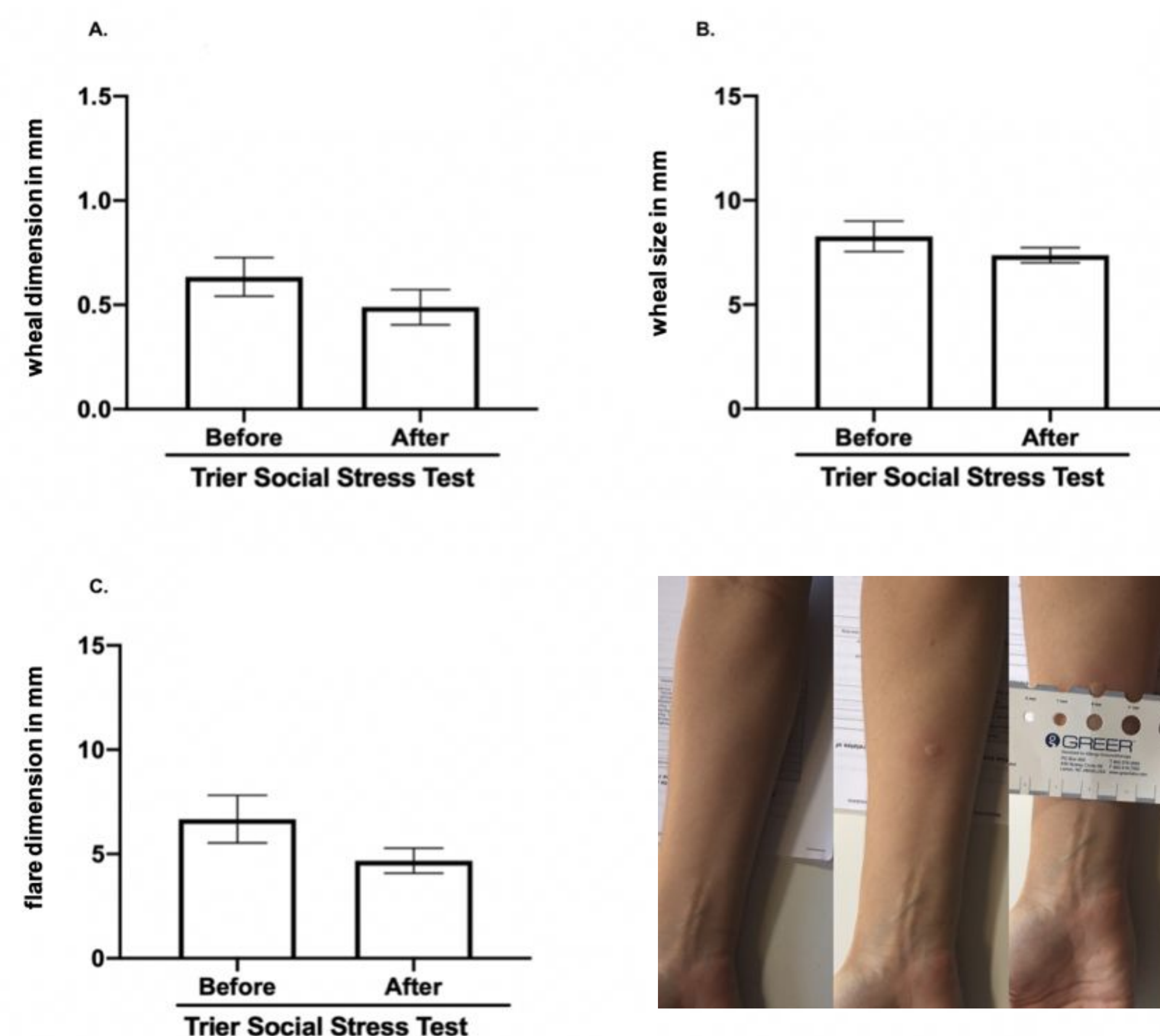


Figure 1. The impact of the Trier Social Stress Test (TSST) on various histamine reactivity measures.

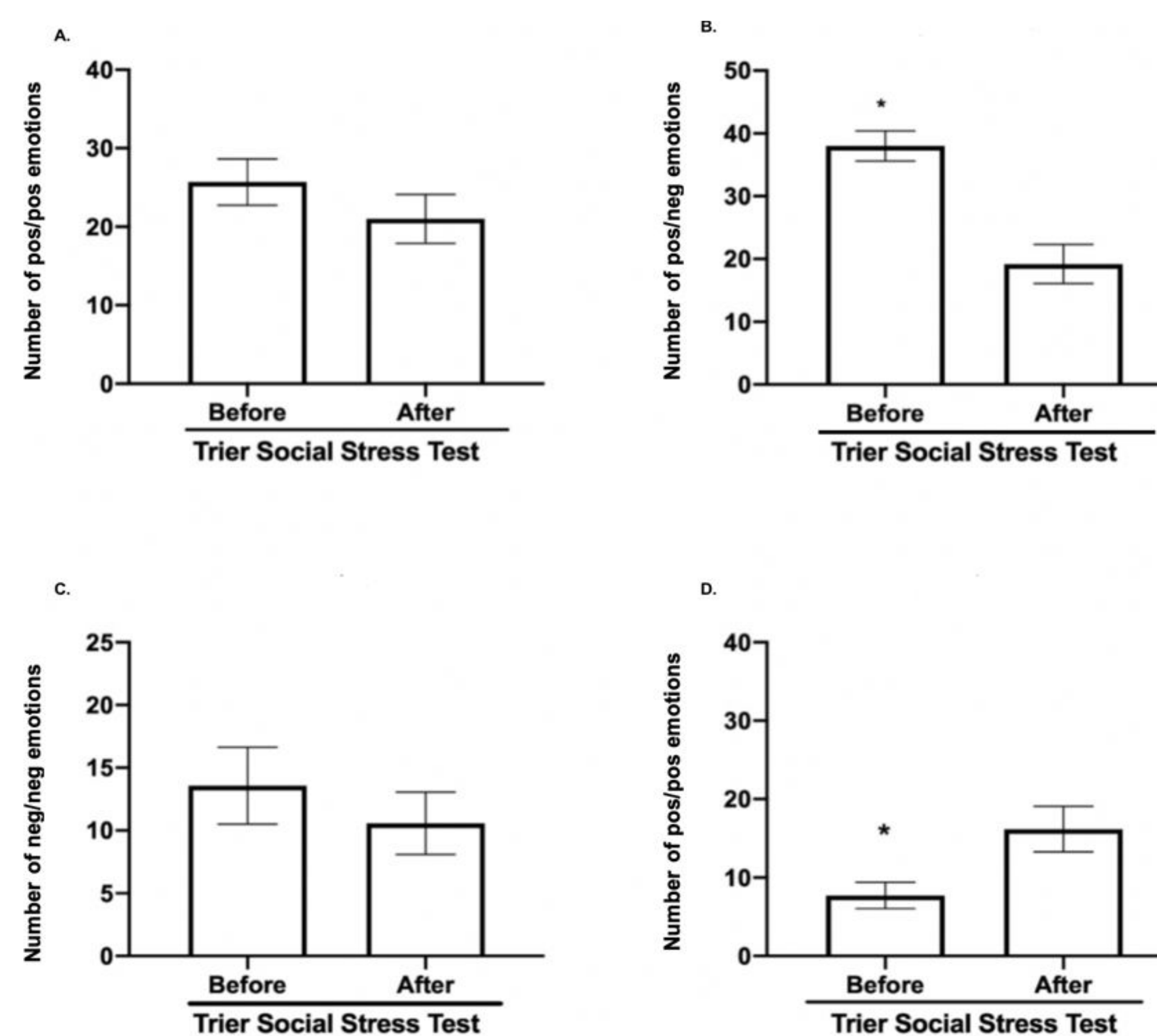


Figure 2. The impact of the Trier Social Stress Test (TSST) on emotional experiences, quantified by the PANAS Circumplex of Emotion.

Analyses

- Figure 1 depicts Histamine reactivity results before and after the TSST analyzed with a t-test. The wheal dimensions, wheal size, and flare dimensions do not have a statistically significant difference before and after the stress exposure. The flare size has a significant trend to decrease in size, and it is expected that this will become statistically significant with further data collection.
- Figure 2 depicts emotional changes before and after the TSST from the PANAS Circumplex Questionnaire via a t-test. There is a statistically significant decrease in positive valence negative arousal emotions, $p=0.0042$, and increase in negative valence positive arousal emotions, $p=0.0034$, after exposure to a social stressor, the TSST.

Discussion

- Stressful social experiences in daily life can have an impact on subjective emotional states, supporting a link between social and psychological experiences. Since emotions have a significant impact on one's subjective experience of the world, increases in negative emotions and decreases in positive emotions over time could be harmful for one's mental and physical health. Future studies should analyze the impact of different types of acute and chronic stress on specific emotions (anger, sadness, joy, etc).
- Additional data collection is needed to determine if TSST exposure significantly reduces flare size. If so, acute stress may correspond with reduced immune responses, potentially linking social stress with health disparities more broadly. Future studies should collect more comprehensive data to determine the impact of the TSST on histamine reactivity.