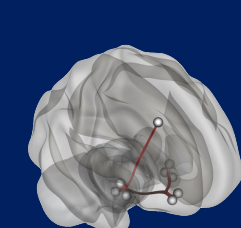


Anxiously Waiting: Development of a Physiology-Based Biomarker of Pathological Anxiety

Alethia Ya'ira Somerville, Elisheva Parkoff, Omer Dayan, Shelly Cohen, Shir Ben-Zvi Feldman, Rany Abend.

Baruch Ivcher School of Psychology, Reichman University, Herzliya



Neuroscience of Psychopathology

INTRODUCTION

Identification of a **potential threat** → Cascade of physiological and cognitive **fear responses** → facilitate **defensive behaviors**.

- If responses are *excessively* expressed, may underpin anxiety disorders.
- Translational research highlights the impact of **threat imminence** on defensive responses.
- Yet, research in humans often aggregates psychophysiological responses, overlooking **response dynamics** within the window of **anticipation**.

AIMS AND OBJECTIVES

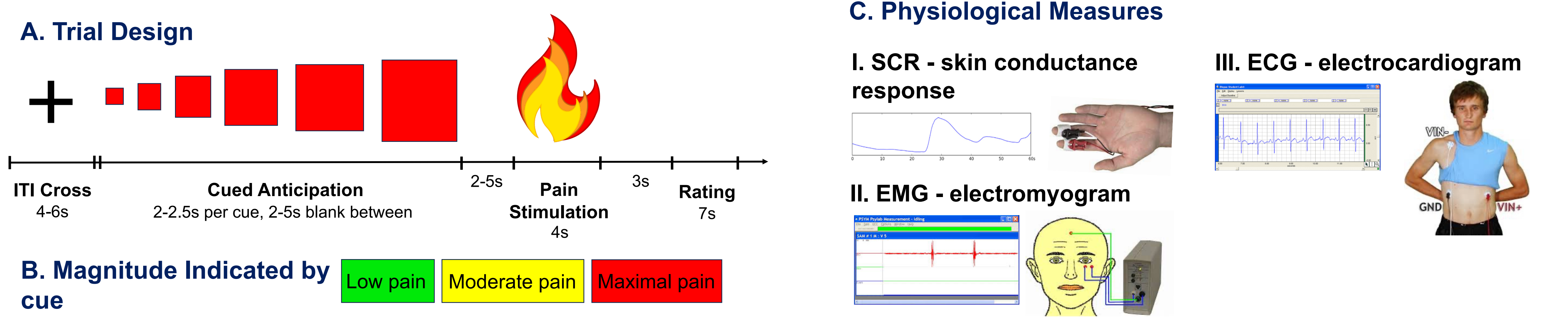
Objectives: To manipulate threat proximity and magnitude → quantify anxiety-dependent physiological response patterns → identify anxiety biomarker

- Hypotheses**
1. Cues indicating a **higher** magnitude threat will induce **increased** anticipatory physiological response (SCR)
 2. As threat **proximity** increases, SCR will **increase**
 3. Higher symptoms of **anxiety** and **depression** will be associated with **higher SCR**

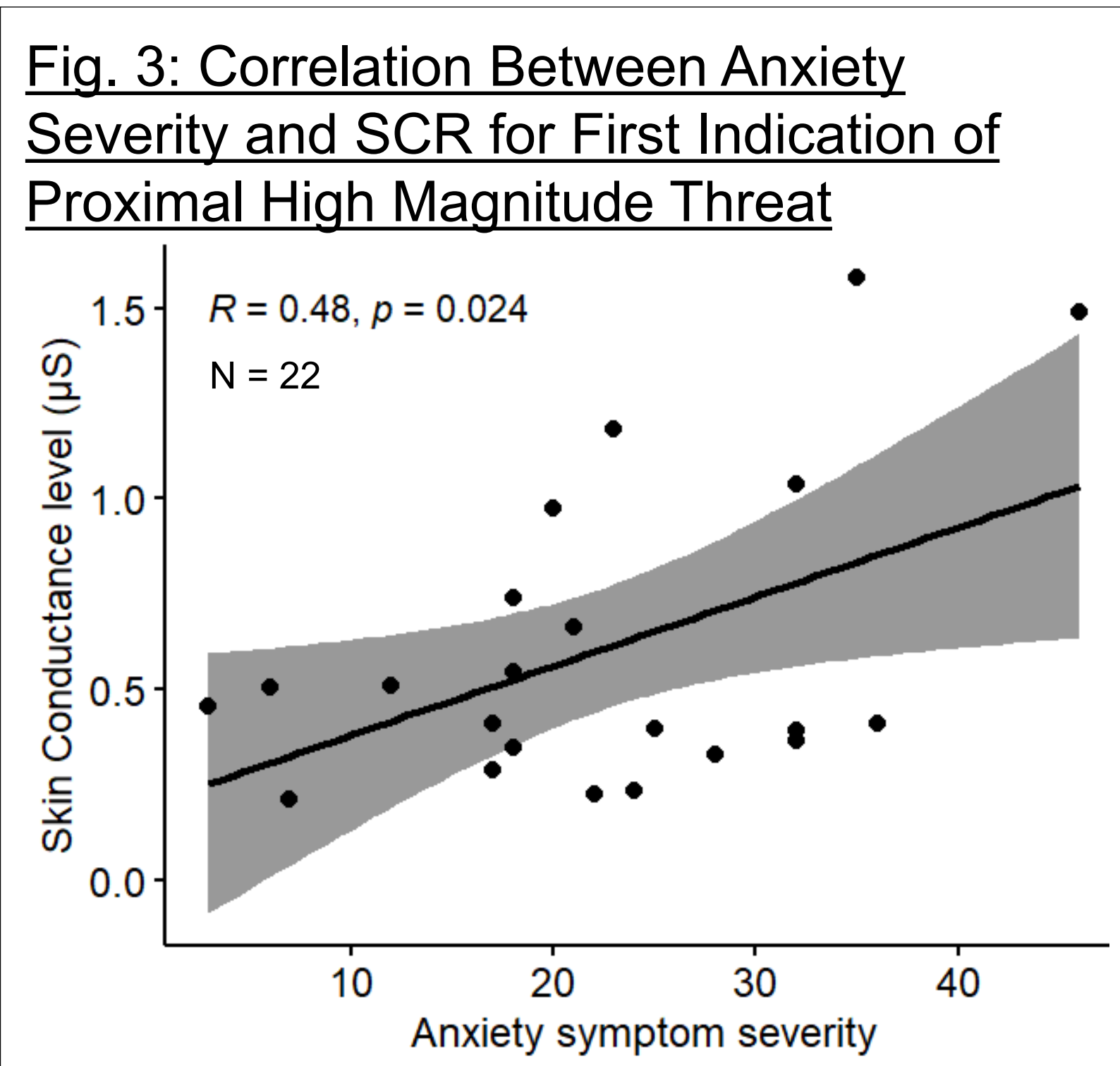
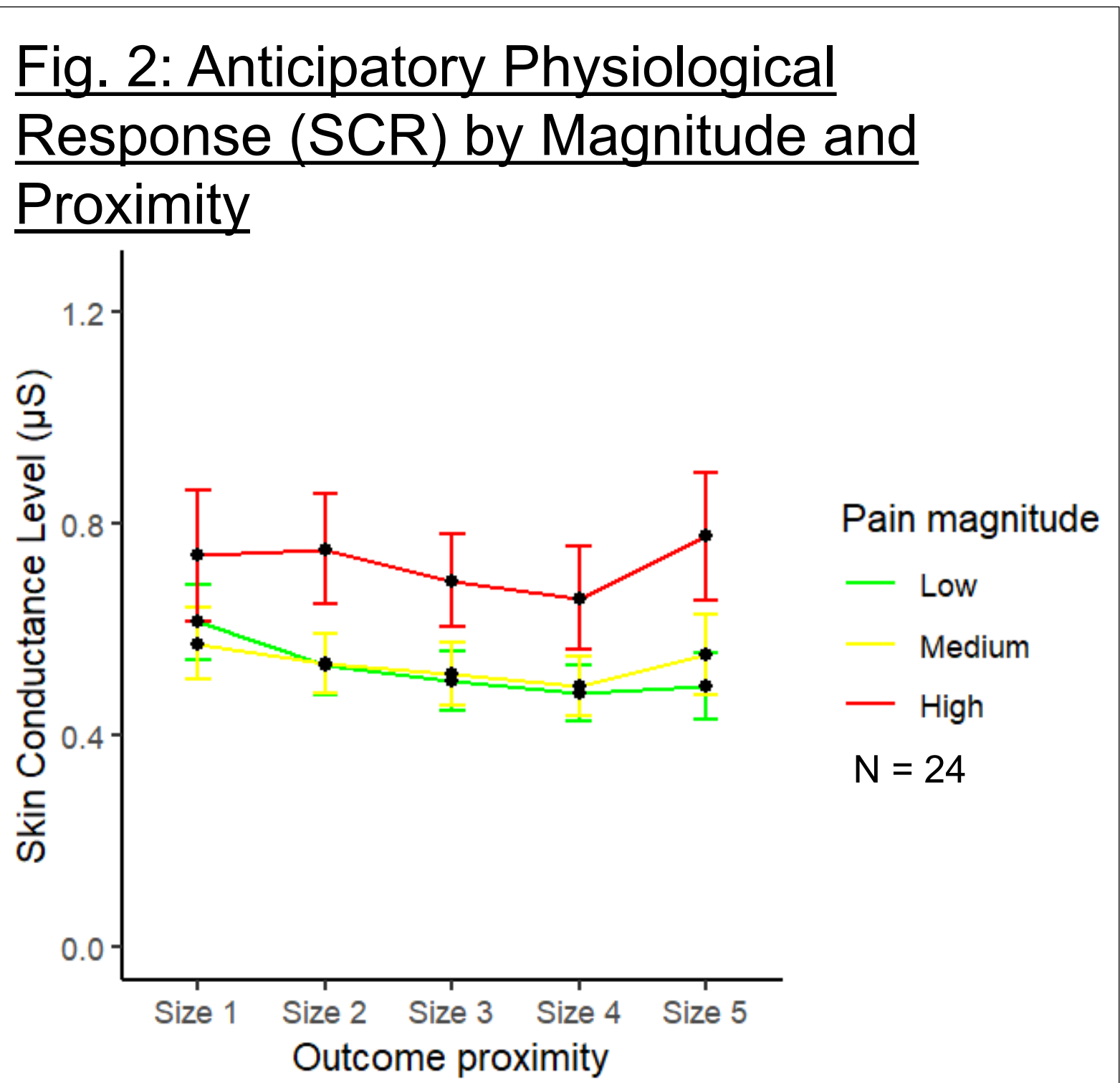
MATERIALS AND METHODS

- Participants:** n = 100 healthy young adults, preliminary results displayed for n = 24.
- Calibration:** Participant and experimenter test different pain stimulus intensities using the Medoc TSA-2 device to select a range of temperatures for the task.
- Task:** In each trial, a square appears and gradually increases in size.
- **Square size** indicates increasing **proximity** of pain stimulation: Stimulus delivered when square fills the screen
 - **Square color** indicates **magnitude** of pain stimulation: **low**, **moderate**, or **high**.
 - Physiological measures (SCR, heart rate, and muscle tension) are recorded throughout the task.
 - Questionnaires assessing **anxiety**, depression, stress, and demographic data completed before and after the task.

Fig. 1: Task Design



PRELIMINARY RESULTS



1. Increase in anticipatory physiological response (SCR) as threat **proximity** increases (Fig. 2).
2. Greater surge in SCR for proximity indication of a **high magnitude threat** (Fig. 2).
3. Significant correlation between **anxiety severity** (GAD-7) and SCR to initial proximity indication of a **high magnitude threat** (Fig. 3; n = 2 outliers removed).

IMPLICATIONS

Pathological anxiety may reflect the **exaggerated expression** of otherwise **normative defensive responses** to a **proximal threat**.

Anticipatory physiological responses to which are influenced by both **proximity** and **magnitude**.

Understanding the **temporal dynamics** of symptom expression → anticipation and **targeted treatment of specific symptoms**

Specific symptoms may be predicted based on the **proximity** and **magnitude** of a relevant, identified threat.

REFERENCES

Abend, R. (2023). Understanding anxiety symptoms as aberrant defensive responding along the threat imminence continuum. *Neuroscience and Biobehavioral Reviews*, 152, 105305. <https://doi.org/10.1016/j.neubiorev.2023.105305>