

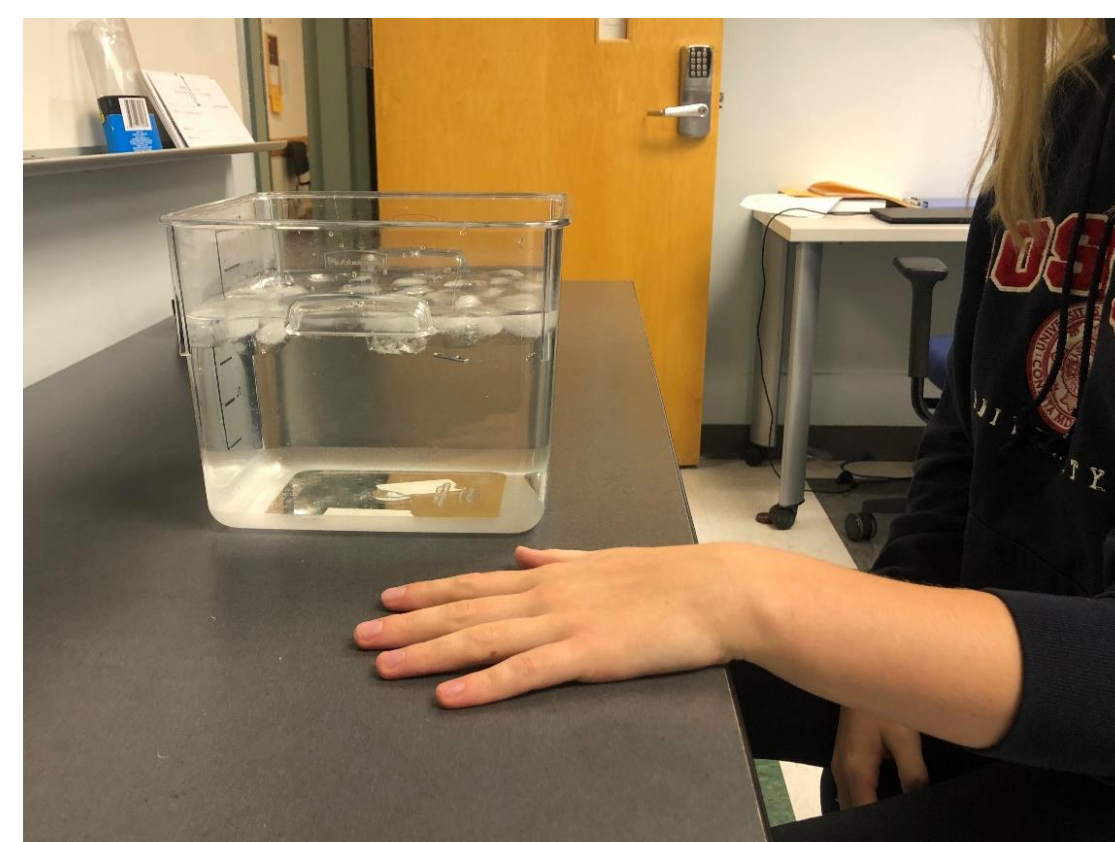
Introduction

When we don't get enough sleep, our health is negatively impacted. Our sleep quality predicts how we experience and cope with stress and its impact on health (Barber, Munz, Bagsby, & Powell, 2010). Poor sleep quality has been associated with increased levels of stress and suicide risk (Mullan, 2014; Nadorff et al, 2013). One way to effectively elicit a stress response in the lab is with the Cold Pressor Task (McRae et al, 2006). Higher levels of stress have been correlated to lower pain thresholds. Pain sensitivity has also been linked to high anxiety symptoms (Keogh et al, 2006).

The purpose of this study is to understand the association between sleep quality, anxiety, and acute stress reactivity. Anxiety is defined, in this study, by a score of 22 or higher on the Beck Anxiety Inventory. Insomnia is defined by a score of 15 or higher on the Insomnia Severity Index.

Methods

- N = 36 (Mean age 19.88 years, SD 1.55 years) completed assessments of sleep quality (PSQI: overall sleep quality, insomnia), anxiety, and depression.
- Participants then completed the Cold Pressor task
 - 2-minute Baseline
 - 2-minute Stress Induction
 - left hand in ice water
 - 2-minute Recovery
- ECG was recorded during all phases from the Lead II position
 - Inter-beat interval (time between heart beats, IBI) and heart-rate variability (HRV) measures were calculated from the ECG signal.

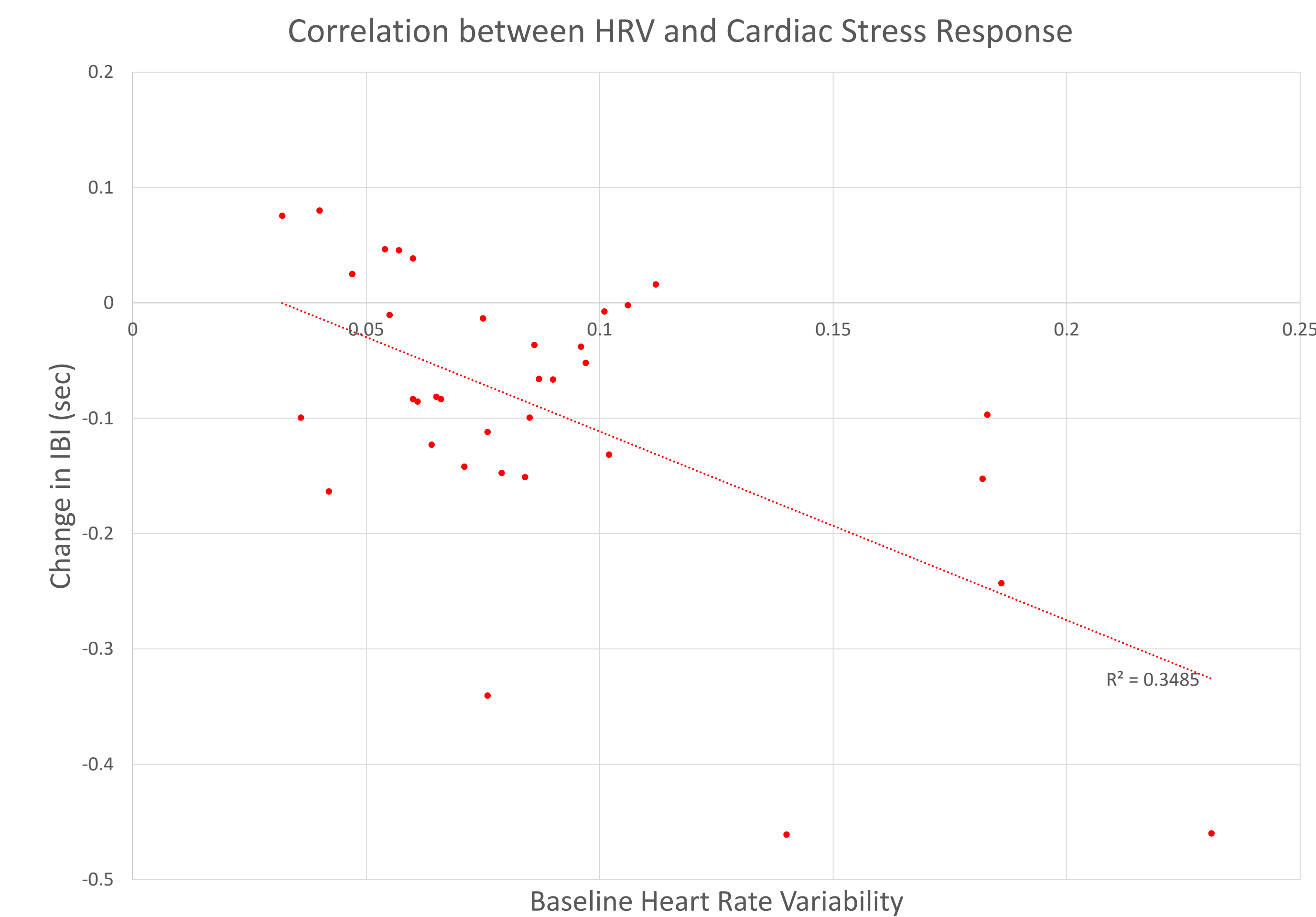
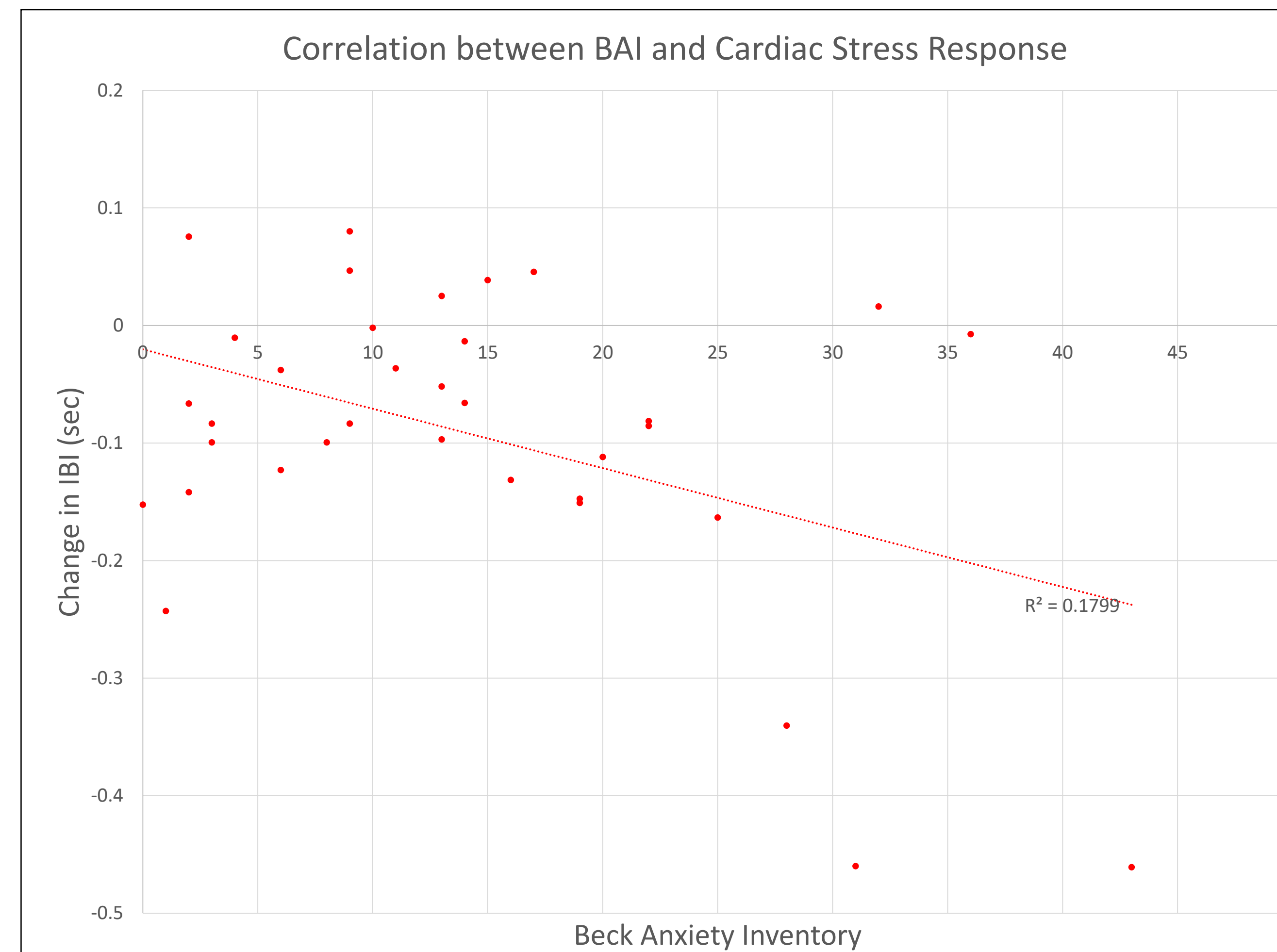
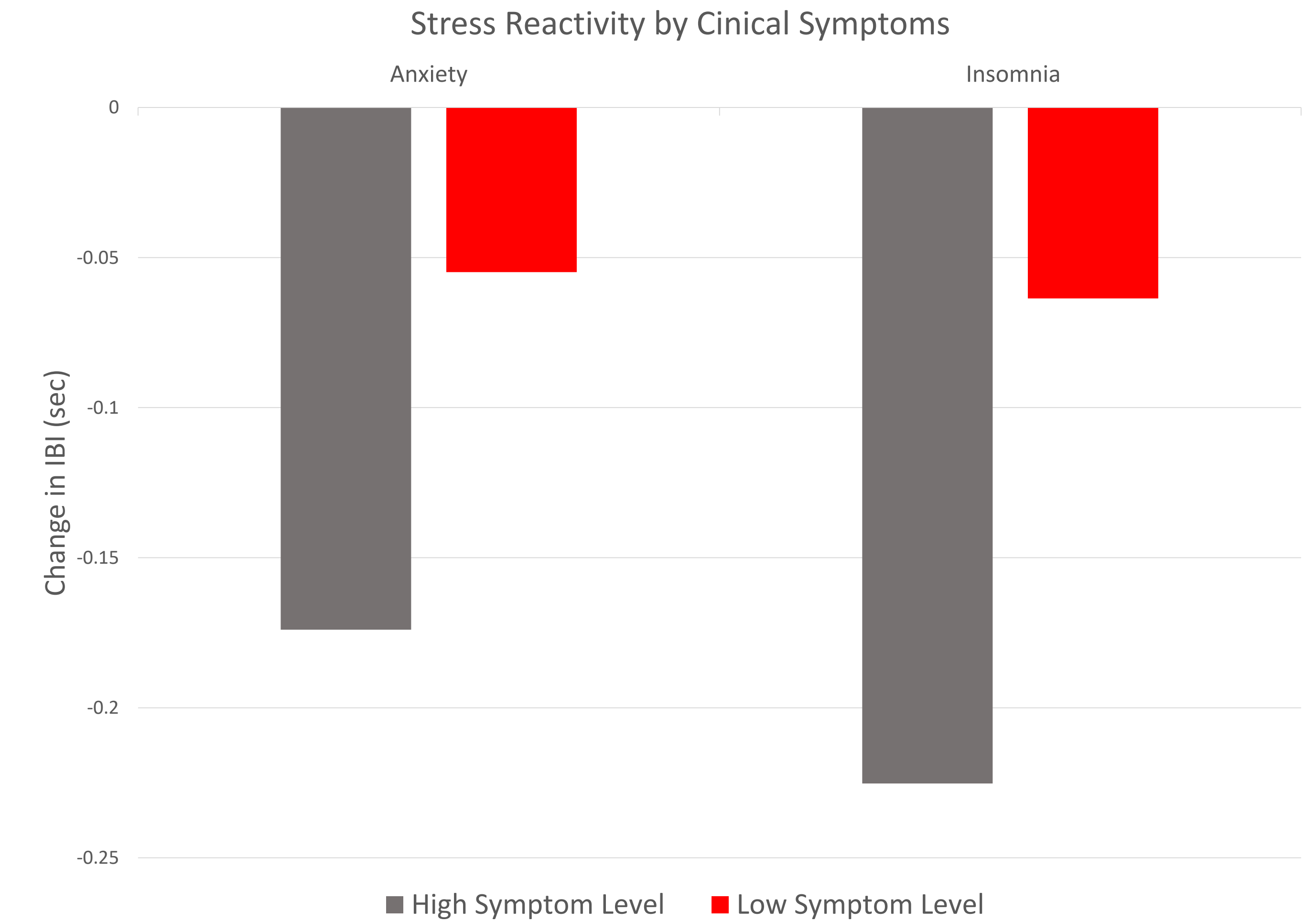
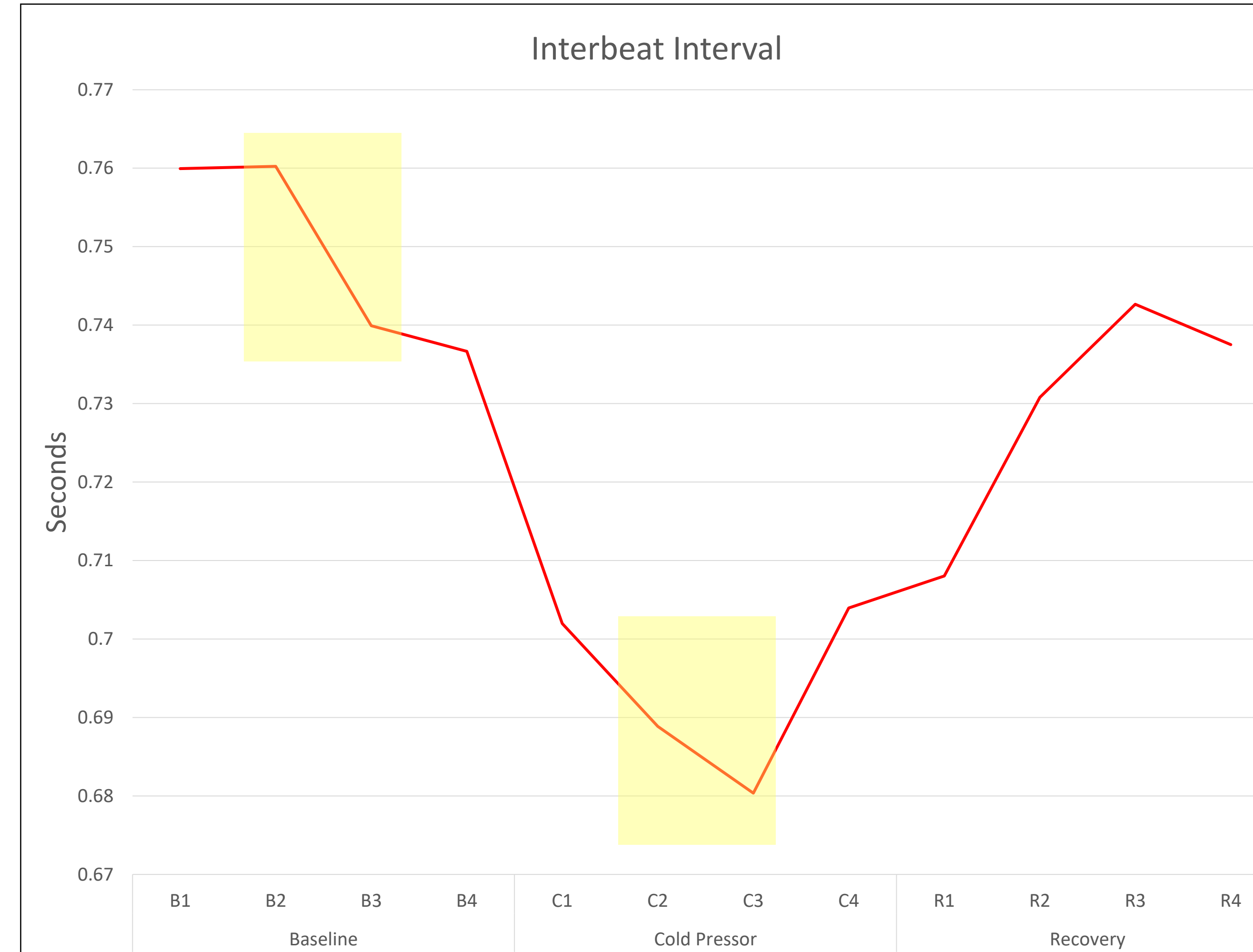


Baseline and Recovery Position



Cold Pressor Task Position

Results



Discussion

This study suggests that sleep quality and anxiety both play a role in an individuals' cardiac response during an acutely stressful situation. IBI data showed that individuals with lower quality sleep had a larger response to the stress of the cold pressor task from baseline compared to individuals with higher sleep quality. As sleep quality decreased the participants reactivity to stress increased. A similar pattern is seen in the analysis of the individuals who score in the moderate-severe range on the assessments of anxiety symptoms. There was a significant correlation between baseline HRV and change in IBI, as well as anxiety and change in IBI.

References

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