

The role of heart rate variability and interoceptive awareness in the emotional experience after traumatic brain injury

Lisa Santoro¹, BSc., Alice Bodart¹, MSc., Laurent Lefebvre¹, PhD., Mandy Rossignol¹ PhD.

¹Cognitive Psychology and Neuropsychology department, Institute of Health Sciences and Technologies, University of Mons, Belgium

1. Introduction

Bodily changes and their perception, which refer to the interoception, are central to many theories of emotion. Both help to constitute emotional experiences and behaviours¹. After a traumatic brain injury (TBI), a decrease in emotional experience is often self-reported². Moreover, physiological reactivity and interoceptive awareness can be reduced after a TBI and can contribute to the emotional experience decreasing^{3,4}. In this study, the heart rate variability (HVR) will be employed as an index of physiological reactivity and heartbeat detection task for interoceptive accuracy. On the one hand, the HRV, which refers to the variation between heartbeats, is known as an index of emotional regulation. On the other hand, interoceptive accuracy plays a mediating role between the physiological emotional response and its subjective awareness.

2. Objectives

Investigate whether reduction of HVR, and alteration of interoceptive awareness are involved in the alteration of subjective emotional experience in people with TBI.

3. Participants

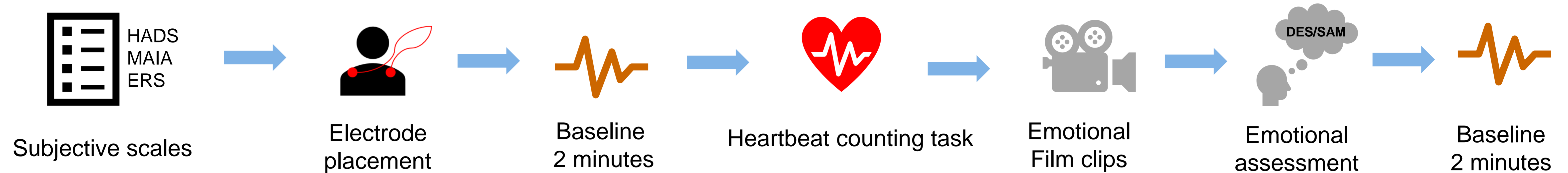


Experimental group :
13 subjects with TBI
(Mean age = 37,77; SD = 11,26).



Control group :
16 healthy subjects
(Mean age = 37,88; SD = 15,81).

4. Method



5. Results

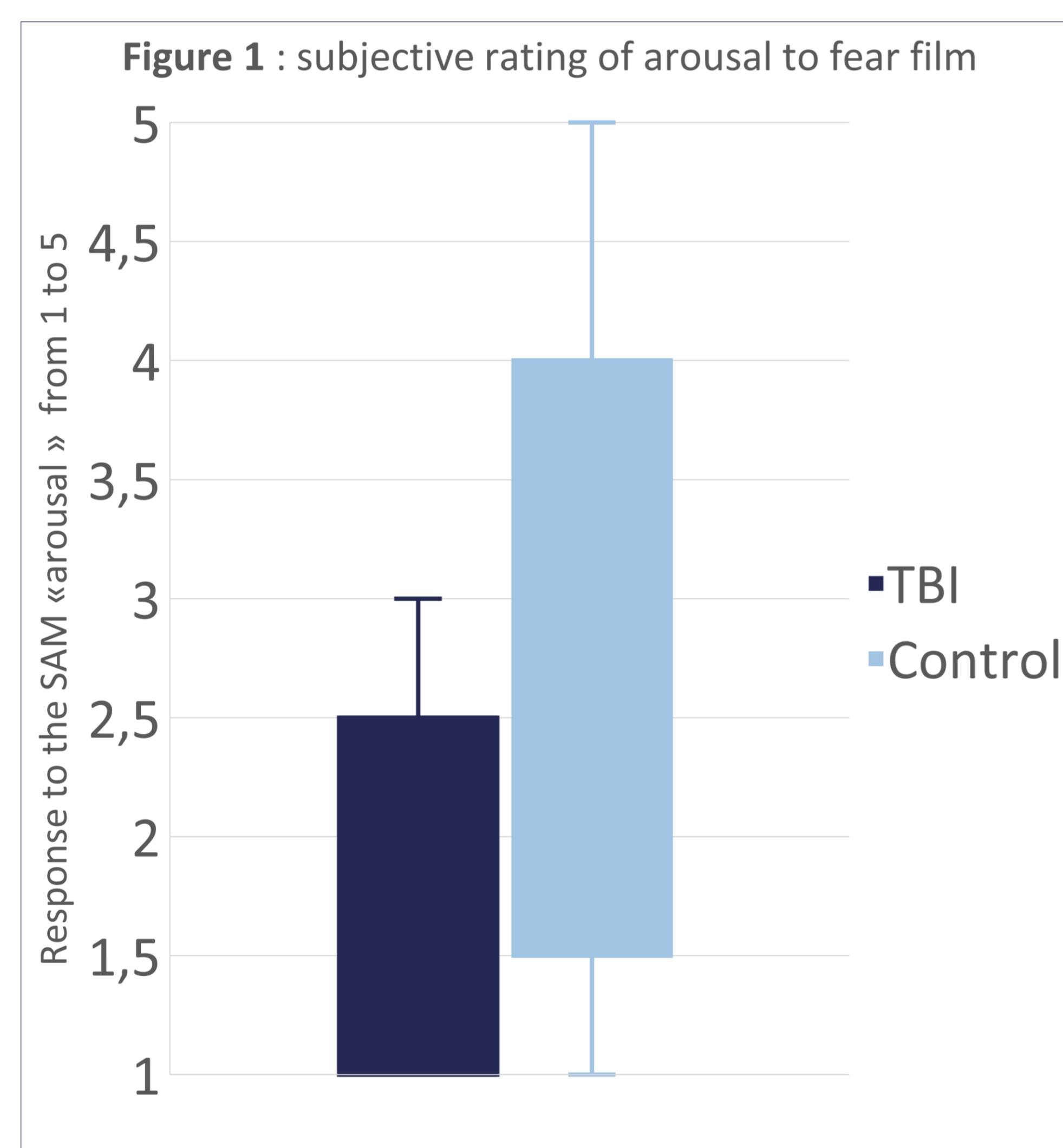
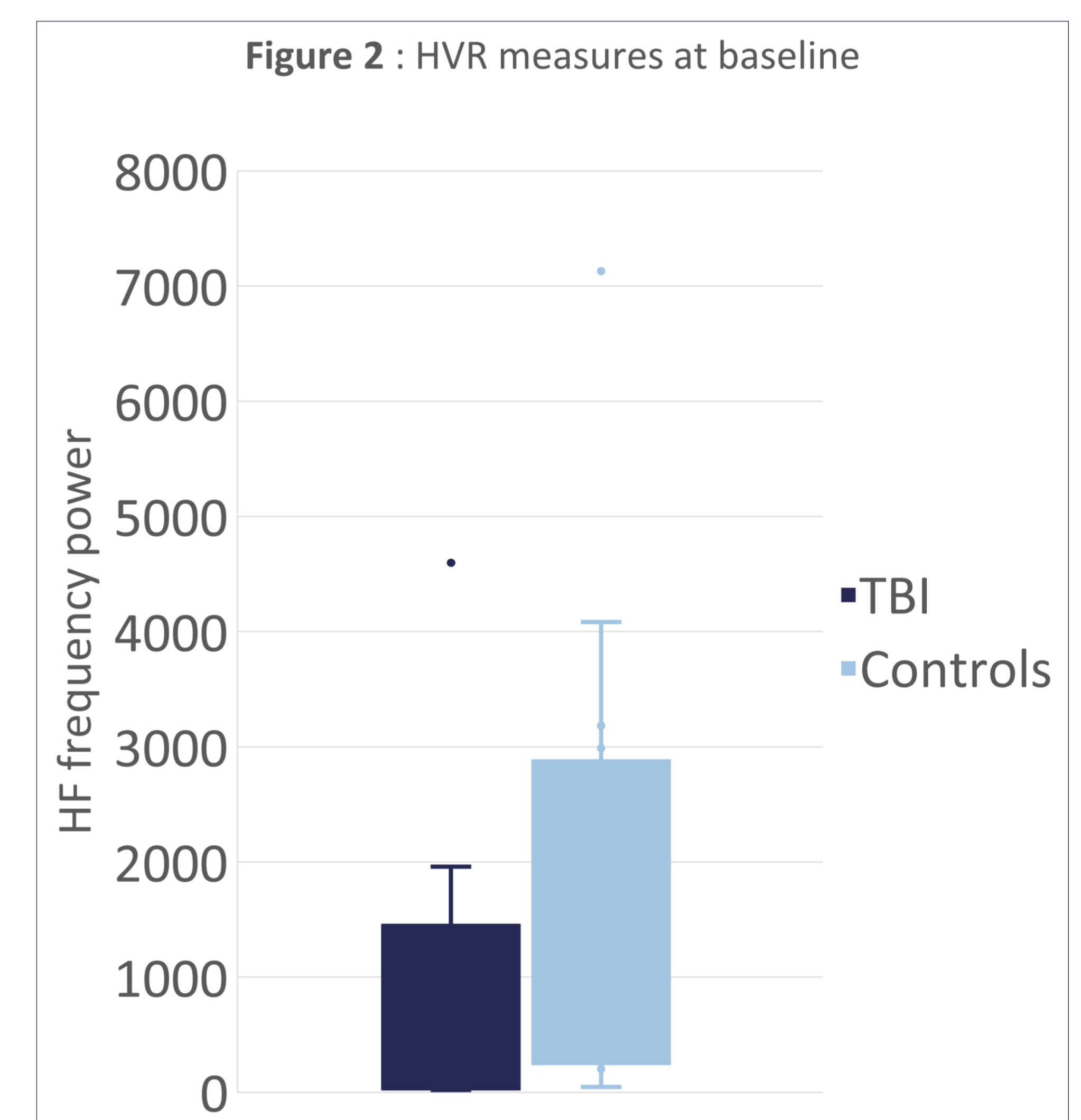


Figure 1 : The result showed differences in subjective ratings of arousal for the fear film clip. Subjects with TBI reported significantly lower arousal rating on the SAM than the control group ($U=62,5$, $p=.037$). For other emotions, no difference has been observed.

Figure 2 : The two groups showed significantly differences in parasympathetic responses as represented by the areas of high frequency in the frequency domain analysis of HRV for the first baseline ($U=35$, $p=.005$).

However, no correlation was found between HVR measures, subjective emotional assessment (SAM/DES) and the interoceptive accuracy (measured by heartbeat counting task).



6. Discussion

- TBI group reported lower arousal after watching the fear film than control group, but not for the other emotions. The results support the literature showing that TBI reported some subjective emotional experience changes⁵
- Compared to controls, subjects with TBI showed significantly decrease of parasympathetic activity at rest. These results are in keeping with previous studies showing HVR dysregulation after a TBI⁶

- This research needed more analysis, including measuring HVR during the different emotional movies and comparing it to emotional assessment.
- Disorders in emotional processing can lead to social behavioural disorders, frequently reported after a TBI⁵. As physiological reactivity is related to emotional experience, improving it could be an avenue for the management of TBI.

7. References

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