



Decreases in autonomic reactivity and interoceptive ability predict increases in self-reported emotion regulation across the lifespan

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Introduction

- Interoception refers to the ongoing transmission of sensory input from the visceromotor systems of the body [1]
- It is well established that interoception is critical for diverse kinds of mental experience, including that of emotion [2-4]
- The purpose of this research is to use Magnetic Resonance Imaging (MRI) and physiological devices to observe the neural and physiological activity that occurs while people have certain kinds of emotional experiences.
- Interoceptive ability is as measured on the body awareness questionnaire, the interoceptive sensation questionnaire, and using a gold-standard behavioral task, the heartbeat detection task.

The present study

- In the past, emotions were thought to be fundamental biological states, characterized by specific patterns of physiological and neural activity [7,8]
- As people get older they have less strong emotional experiences and become worse at sensing emotions within their body
- This is associated with easier emotion regulation

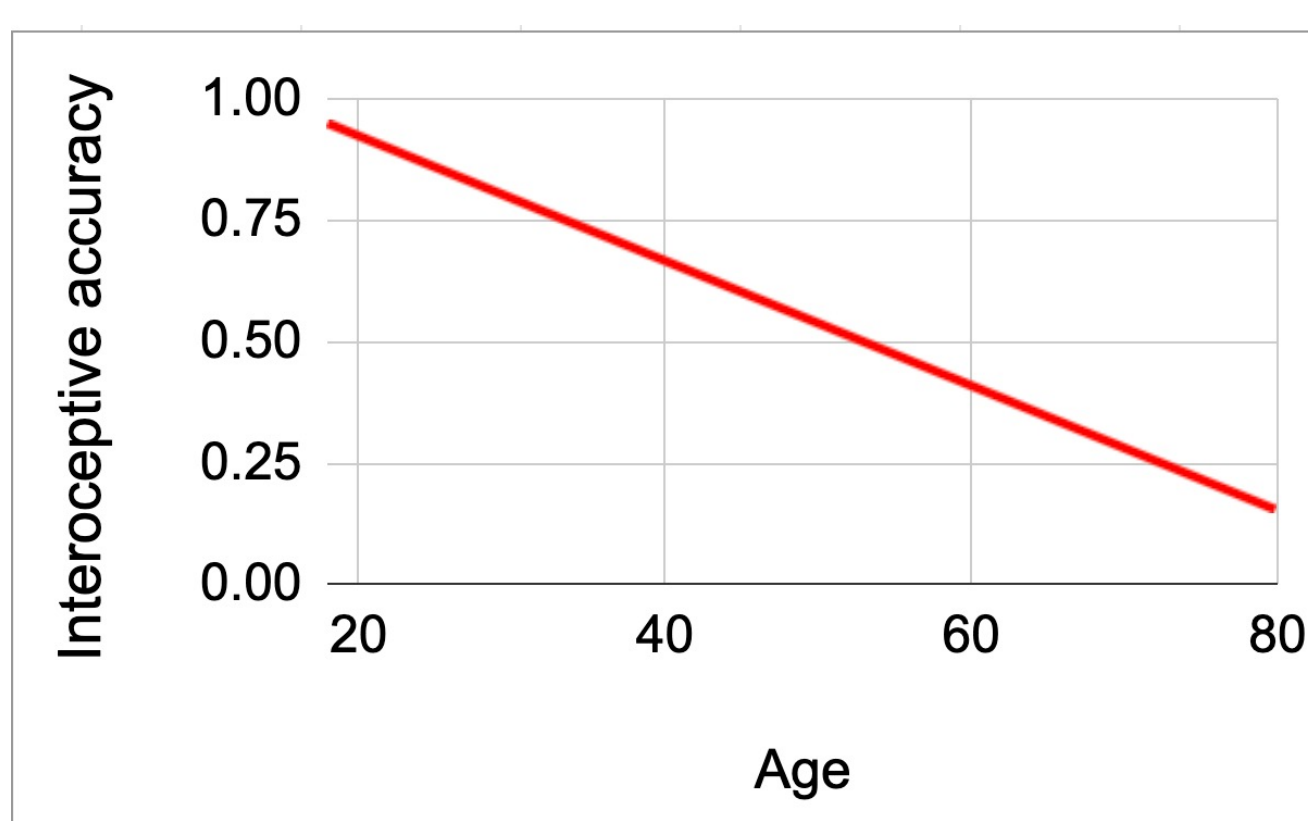


Fig. 3: Expected results for trend in age v interoceptive accuracy (similar for autonomic reactivity)

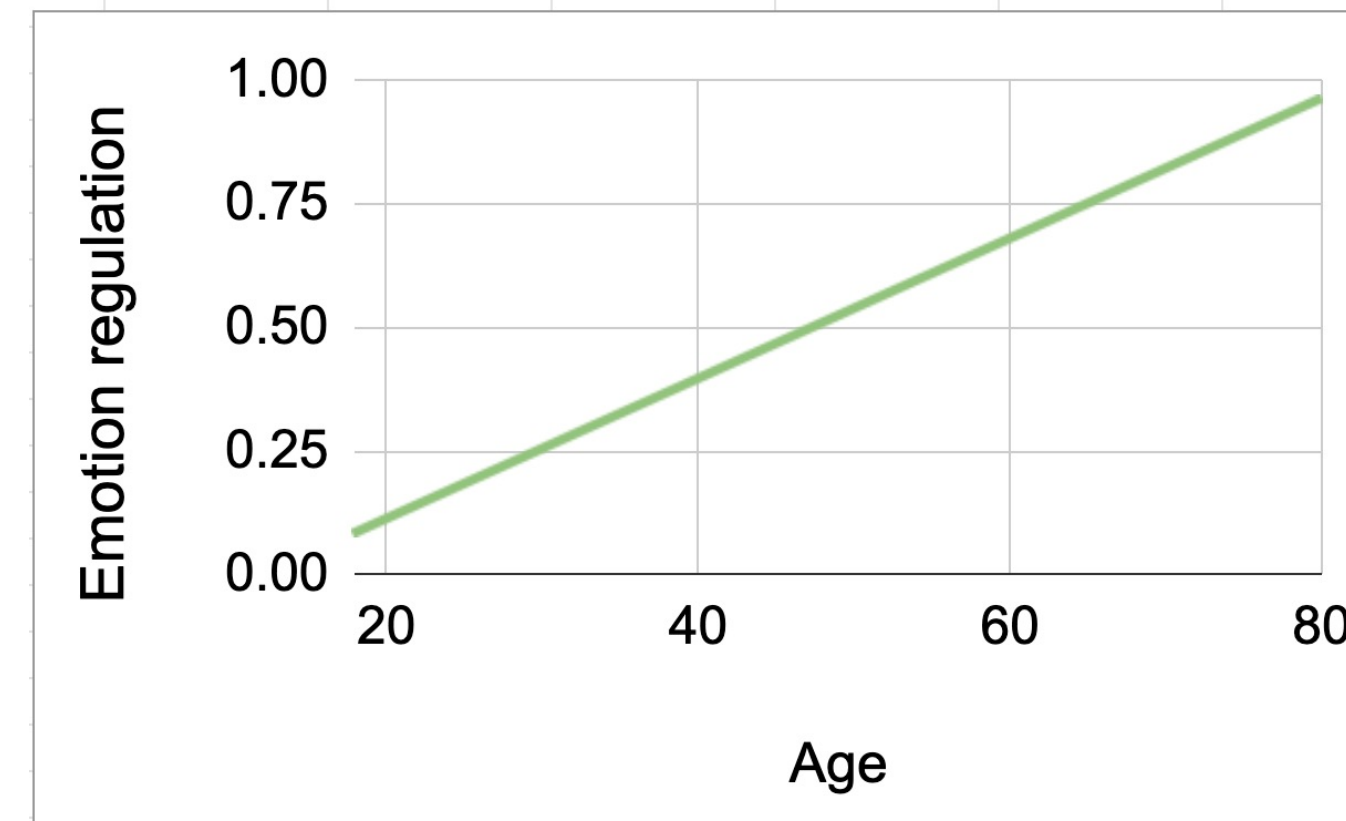


Fig. 4: Expected results for trend in age v emotion regulation ability

Methods

Basic eligibility criteria:

- Adults aged 18-80
- Right-handed persons
- Non-color blind individuals
- People with normal vision (or 20-20 corrected with glasses)
- Not cognitively impaired
- Not taking medications that would impact autonomic reactivity

Heart Beat Detection [e.g., 5, 6]:

- For each of 60 trials, participants hear 10 tones (triggered by their own heartbeat; see Fig. 1 for physiology hook-up).
- On 30 trials, tones are presented at a 200ms delay following each R-spike in the participants ECG (typically perceived as concurrent with felt heartbeats).
- On 30 trials, tones are presented at a 500ms delay (typically perceived as non-concurrent with felt heartbeats).
- For each trial, participants judge whether tones were concurrent or non-concurrent with their perceived heartbeats.
- Percent accuracy is used as a measure of cardiac interoceptive sensitivity.
- Sensitivity is computed by subtracting the z-score of individuals' false alarms from the z-score of their hits

Autonomic reactivity:

- Physiological measurements of participants' heart, lung, and skin activity are collected while participants view emotionally salient images in an MRI scanner
- The way participants' bodies reacts to these images will tell us about their level of autonomic reactivity
- Higher heart and lung activity and greater skin conductance in response to emotionally salient images will indicate that participants are more autonomically reactive

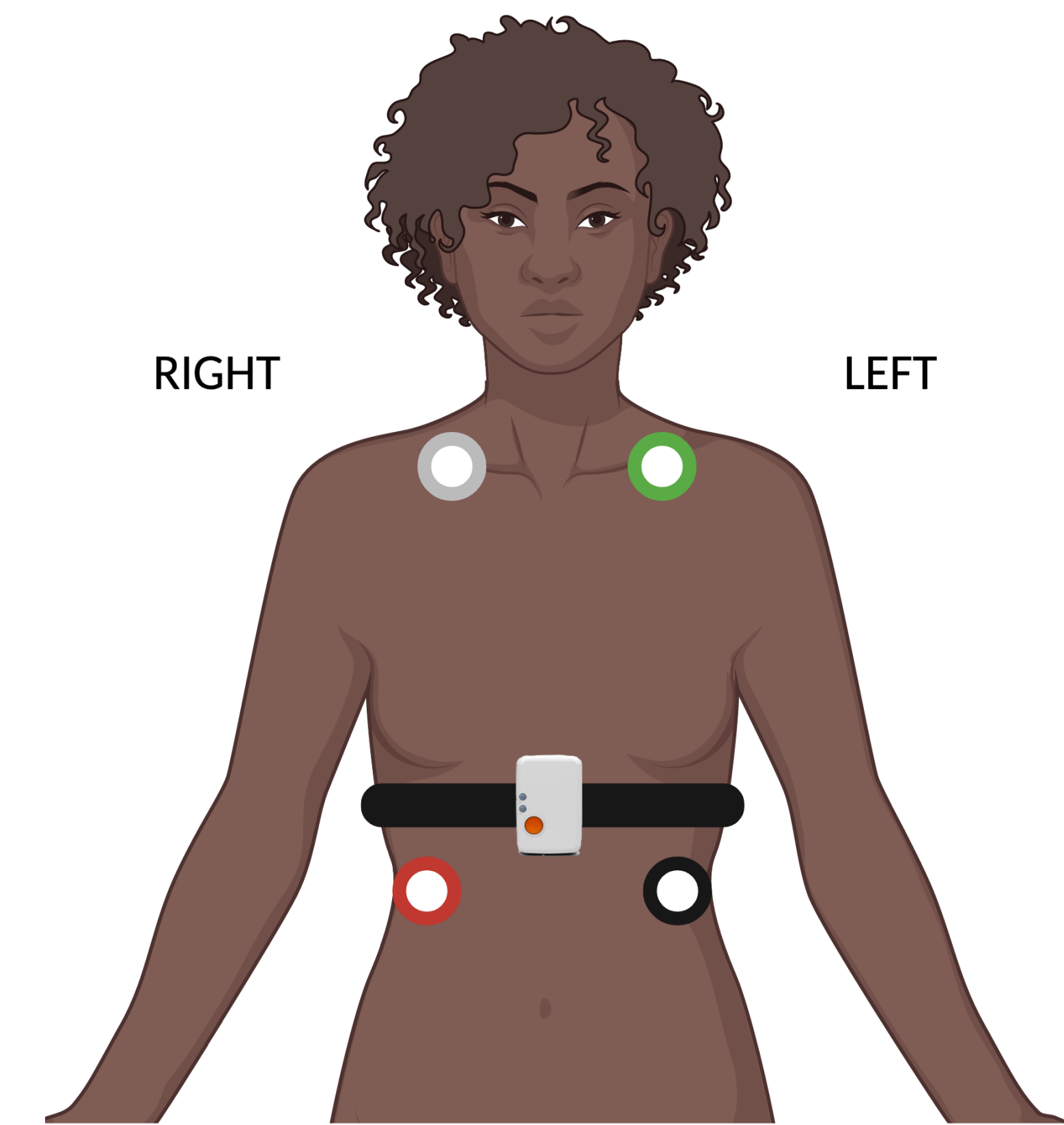


Fig. 1: Physiology hook-up diagram example

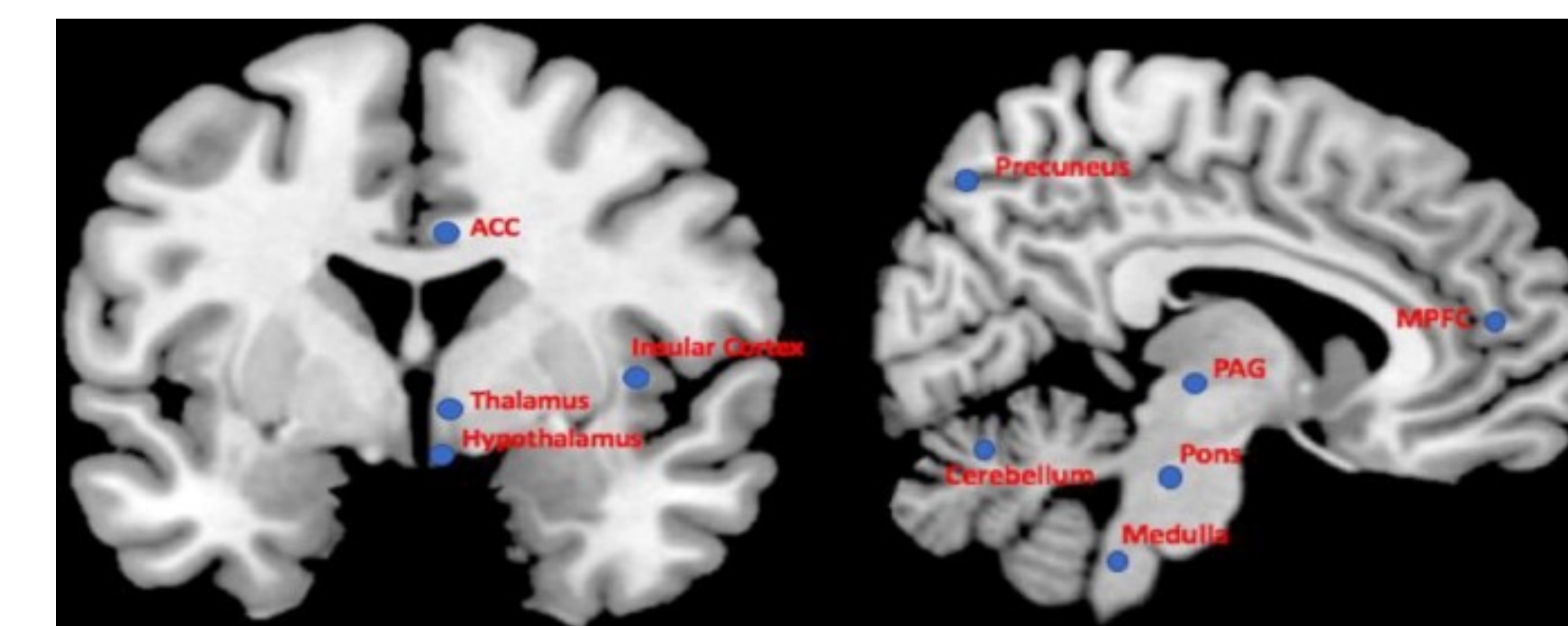


Fig. 2: Central autonomic reactivity

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