The processing of interoceptive states in oneself and others

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Background

Interoceptive accuracy: The ability to perceive internal bodily signals (e.g., heartbeat, respiration, fatigue, and temperature) accurately.

Interoceptive attention: One's tendency to pay attention to internal bodily signals (e.g., heartbeat, respiration, fatigue, and temperature).

The emotion recognition literature has demonstrated that difficulties recognising one's **own** emotions (alexithymia) are closely associated with difficulties processing **others'** emotions across a range of cognitive domains, including attention, memory, and appraisals (Luminet et al., 2021).

Very little research has investigated how we process **non-emotional** internal states in others (e.g., temperature , breathlessness, fatigue, nausea), and if this is related to the processing of our own interoceptive states.

This study investigated interpretation of others' non-emotional state displays, assessing whether participants assigned interoceptive or action labels to images of others posing interoceptive states.
Hypothesis: Propensity to use interoceptive labels will be positively associated with self-reported interoceptive accuracy and self-reported interoceptive attention.

- **Propensity to assign an interoceptive label to others was significantly positively correlated with self –reported interoceptive accuracy. If an individual reports that they are more accurate at perceiving their own internal signals, they are more likely to assign interoceptive labels to others.**
- **Propensity to assign an interoceptive label to others was significantly negatively correlated with age. The older an individual, the less likely they were to assign an interoceptive label.**

Method

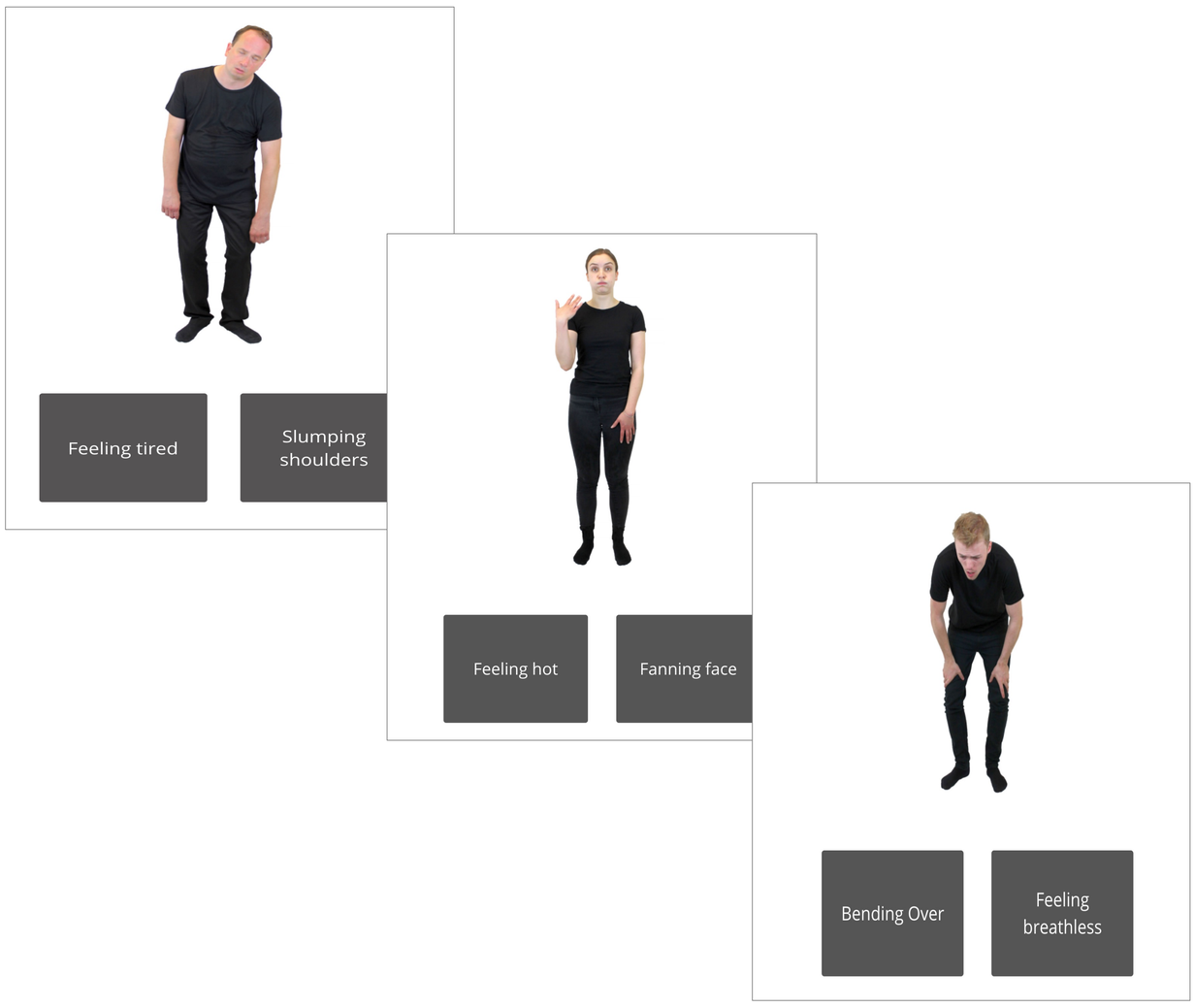
330 participants (82male, 248 female) , ranging in age from 16.16 to 90.3 years (mean = 36.56, S.D = 19.84).

Questionnaires measured self – reported interoceptive accuracy (IAS; Murphy et al., 2019), and interoceptive attention (IATS; Gabriele et al., 2021). Higher scores indicate greater accuracy and attention.

Interpretation of non-emotional state displays in others was assessed with a novel task. Participants viewed randomly presented stimuli, taken from the Interoceptive States Static Images (ISSI) database (Biotti et al., 2021), depicting six actors (3 male, 3 female) portraying eight interoceptive states (hot, cold, pain, nausea, fatigue, breathlessness, hunger, and satiety). Participants were presented with two labels, and required to select the label that **best fits the image**.

Each trial presented one internal state label (e.g., feeling cold) and one action label (e.g., rubbing arms). Both labels were valid descriptions of the image.

Procedure



Analysis

Responses on the propensity to label images task were coded as 1 when an internal state label was selected, and 0 when an action label was selected. These scores were summed across all trials and divided by the number of trials (46), yielding the propensity score. A score of 1 indicate exclusive selection of interoceptive labels, and scores of 0 indicate the exclusive selection of action labels.

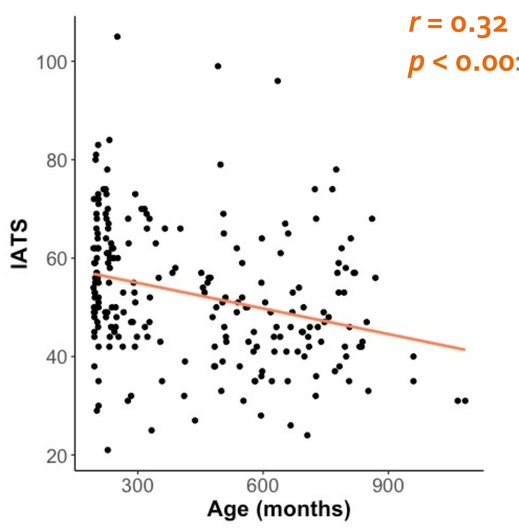
Correlation analyses were used to investigate the relationship between one's own self-reported interoceptive abilities and the propensity to assign interoceptive labels, rather than non-interoceptive action labels, to others.

References

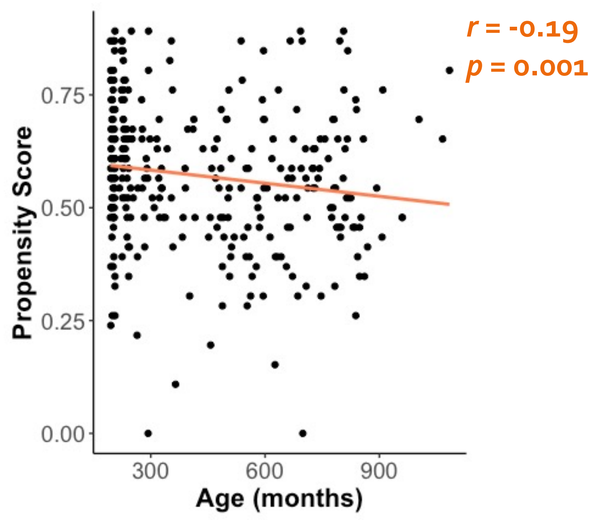
Biotti, F., Ahmad, S., Quinn, R., & Brewer, R. (2021). Development and validation of the Interoceptive States Static Images (ISSI) database. *Behavior Research Methods*, 1-22.
Gabriele, E., Spooner, R., Brewer, R., & Murphy, J. (2021). Dissociations between self-reported interoceptive accuracy and attention: evidence from the interoceptive attention scale. *Biological Psychology*, 108243.
Luminet, O., Nielson, K. A., & Ridout, N. (2021). Cognitive-emotional processing in alexithymia: an integrative review. *Cognition and Emotion*, *35*(3), 449-487.
Murphy, J., Brewer, R., Plans, D., Khalsa, S. S., Catmur, C., & Bird, G. (2020). Testing the independence of self-reported interoceptive accuracy and attention. *Quarterly Journal of Experimental Psychology*, *73*(1), 115-133

Results

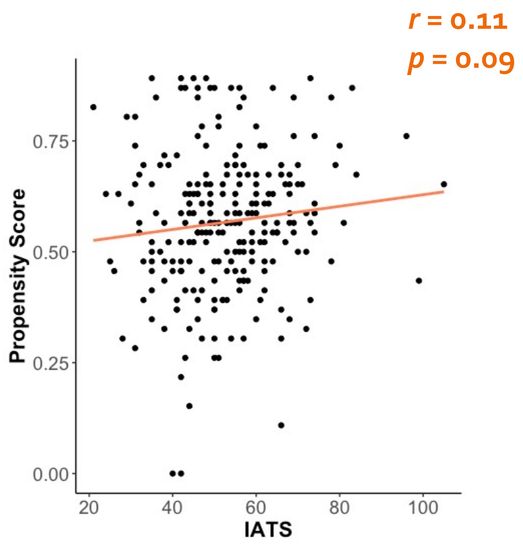
Age and self-reported interoceptive accuracy (IAS) were not related (r = 0.09, p = 0.13).



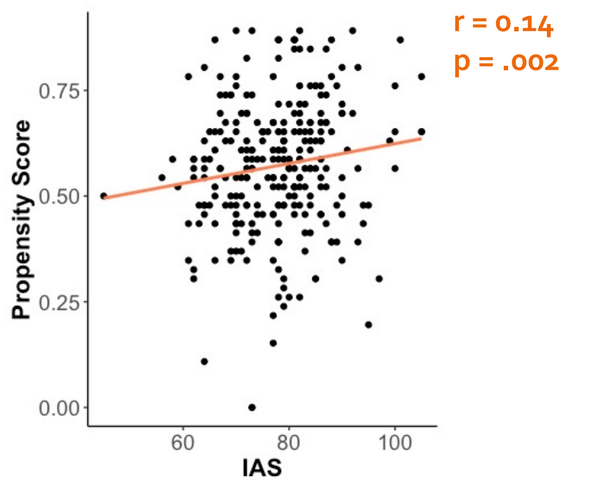
Significant **negative correlation** between age and self-reported interoceptive attention (IATS). The older an individual, the less attention they reported paying to their internal bodily signals.



Significant **negative correlation** between propensity score and age. The older an individual, the less likely they were to assign an interoceptive label.



Trend towards a positive relationship between self-reported interoceptive attention and propensity score. The greater an individual's attention to their own internal bodily signals, the more likely they were to assign an interoceptive label to others.



Significant **positive correlation** between self-reported **interoceptive accuracy** and **propensity score.** The more accurate an individual believes they are at monitoring their own internal bodily signals, the more likely they were to assign an interoceptive label to others.

Linear regression analyses were conducted to assess whether there was an interaction effect whereby, age x IAS or age x IATS predicted a significant change in propensity score. The addition of the interaction terms did not significantly increase the variance in propensity score explained.

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