Looking into myself: changes in interoceptive sensitivity during mirror self-observation

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http://www.pc.rhul.ac.uk/sites/lab/

Abstract

Interoception is key to “the self” and emotion. Sensitivity to one’s body is thought to be a robust trait variable, however, increased self-focus can enhance self-processing. We examined whether self-observation in a mirror enhances interoceptive sensitivity. Participants performed a heartbeat detection task while looking at their own face in a mirror and also at a black screen. Interoceptive sensitivity rose significantly in the mirror condition for participants who had lower interoceptive sensitivity at baseline, independently of a range of potential confounds. Our results suggest that self-observation may be a viable way to manipulate interoceptive sensitivity, in order to directly test for causal relations with other aspects of self-processing.

I. Introduction

- Interoception = sensory signals arising from the body
- Individuals differ in their ‘Interoceptive Sensitivity’ i.e. their responsiveness to these body signals
- Interoceptive Sensitivity affects many aspects of self-processing
  - Objective vs. subjective measures of emotional arousal
  - Structural decision-making
  - Implicit memory
  - Body ownership
  - Links to clinical conditions e.g. anxiety, anorexia

II. Experimental Design

Interoceptive Sensitivity measured by heartbeat detection

Methods & Materials

- Participants gazed at a mirror and at a blank screen. Order of conditions randomised.
- Heartbeat detection measured by the Mental Tracking method (Schandry, 1981) randomised trials (25s, 35s, 45s) in each condition. True number of heartbeats recorded with a pulse transducer.
- Potential confounds measured = gender, age, level of regular exercise, body mass index, order of conditions and change in heart rate between conditions.

III. Results & Analysis

- Interoceptive Sensitivity = \(1 - \frac{\Sigma (\text{recorded heartbeats} - \text{recorded heartbeats})}{\text{recorded heartbeats}}\)
- Median split (Figure 1a)
  - ANOVA with baseline/mirror as within-subjects factor and Interoceptive Group as between-subjects factor (as well as order of conditions and gender) with change in heart rate as a covariate. Significant interaction (\(F(1,120)=7.376, MSE=0.033, p=0.008, \eta^2=0.008\)). Participants with below-median Interoceptive Sensitivity improved significantly in heartbeat detection when gazing at their own faces in a mirror.

- Multiple Regression (Figure 1b)
  - The only significant predictor of the change in Interoceptive Sensitivity between conditions was Interoceptive Sensitivity at baseline (\(F(2,126)=3.75, MSE=0.044, p=0.026\), predicting 5% of the variance (adjusted \(R^2=0.041\)).

IV. Discussion

- Interoceptive Sensitivity can be manipulated by increasing self-focus
- The effect is concentrated in people with low baseline Interoceptive Sensitivity, who have been neglected in previous research.

Interoception and the ‘Self’

- ‘Self’ is a function of multisensory integration
- Exteroception interacts with interoception
- In body ownership (Tsakiris et al., 2011)
- In somatoparaphrenia (Fotopoulou et al., 2012)
- People with low Interoceptive Sensitivity may have a more malleable sense of self.

V. Conclusions

- It may be possible to manipulate Interoceptive Sensitivity to test for causal links with other measures of self-processing.
- Further research is necessary to show whether this improvement in Interoceptive Sensitivity is elicited by other self-relevant stimuli.

References

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