Using multisensory body illusions to modulate judgements of body size
Anna Crossland and Dr Catherine Preston
ae581@york.ac.uk

Background

Anorexia Nervosa (AN) patients are thought to overestimate their own body size, which has been implicated in development and maintenance of symptoms.

Allocentric lock hypothesis suggests patients with AN base their body experience on inaccurate allocentric body representations. New egocentric representations (seeing the body from one's own eyes whilst looking down at one's body) and tactile input (e.g. bones protruding etc) fail to update the allocentric perception. Establishing methods to directly access and update these allocentric body representations in AN may be an effective strategy for therapy.

Body illusions can modulate the perceptual and emotional experience of the body. Synchronous visual and tactile feedback can alter perception of the body in eating disorder patients because they elicit ownership over new body parts. Egocentric body illusions suggest therapeutic benefits for eating disorder patients a year later. Allocentric body illusions, however, may access these inaccurate memories more directly.

Current study

Feasibility and pilot study on a non-clinical sample before testing on clinical patients.

Assessing the implementation of augmented reality to target body experience in AN. First use of full body illusions involving viewing the participants’ own body from an allocentric visual perspective.

Aims

Pilot the use of a multisensory body-swap illusion to adjust allocentric body memories by using allocentric body illusions that allow you to view your own body from an observer perspective.

Measure changes in body size perception using self-report and behavioural measures.

Use the results to develop and adjust the procedures for clinical patients.

Participants

Demographic details:
Age M = 24 (20-38)
BMI M = 22.9 (18.3-32)

Exclusion criteria:
Under 18
Current, history or self-identification of eating disorder

Recruitment:
Social media, lab contacts, posters

Results

Quantitative data:
Illusion:
Scores on illusion questions were higher than on control questions, suggesting participants did experience the illusion. This is supported further by qualitative comments (see Qualitative data box 1)

Body Size Judgments:
Overall size estimations using VAS increased after the illusion experience.

Participants with low BMI estimated smaller waist size post-illusion than pre-illusion, and participants with higher BMI estimated larger waist size post-illusion.

Measures and Procedure

Illusion Procedure:
Participants stand opposite the experimenter whilst wearing a virtual reality (VR) headset, connected to a camera strapped to the forehead of the experimenter (figure 1).

The headset participants see images from the camera capturing a stereoscopic image of the experimenter’s perspective of the participant’s own body (figure 2).

Participants take hold of the experimenter’s right hand, as if to shake it, and repeatedly squeeze each other’s hands for two minutes to gain multisensory experience.

Conclusions

Participants quantitatively and qualitatively reported a genuine experience of the illusion, which did affect their body size perception.

Overall size estimations increased after the illusion, suggesting that the illusion did influence the participants allocentric view of themselves.

When results were considered according to BMI they suggest size estimations were different for lower vs. higher BMI - participants may have developed a more realistic view of their body size. Correlation between change in waist size estimate and overall size estimate shows waist size is a prominent element in subjective experience of body size. The illusion uses allocentric perception to update memories of body size.

Future implications

Currently the paradigm is being tested on a bigger sample of non-clinical participants, with a measure of actual body size (shoulder and waist), to be able to assess whether changes in judgments of body size are related to accuracy (participants becoming more accurate). Following further piloting, will test on AN patients.

References: