Modifying Bodily Self-Representation via combined exteroceptive and interoceptive Interpersonal Multisensory Stimulation procedures

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Bodily self-consciousness arises from the integration of exteroceptive and interoceptive signals, which together shape the brain's probabilistic representation of the body as "self." Exteroceptive visuo-tactile Interpersonal Multisensory Stimulation (IMS) can induce illusory ownership (embodiment) of avatar's body and changes into self representation. We showed that embodying an (ideal, attractive, self-dissimilar) underweight avatar induces the subjective experience of being thinner than usual in AN. Conversely, embodying the (undesired, unattractive, self-similar) normal weight body avatar induces increased overestimation of body size (as indexed by implicit measures). Thus, it seems that AN patients might only accommodate changes to implicit body size due to a gain (instead of a loss) of weight, and this might prevent a correct representation of their actual body size. In the present project we aimed to test whether integrating interoceptive feedback with exteroceptive visuo-tactile IMS more effectively reduces body image/schema distortions in patients with AN. In Study 1, healthy participants and AN patients underwent immersive virtual reality embodiment of underweight and normal-weight avatars from a first-person perspective. Interoceptive signals were manipulated via visual feedback of the avatar's breathing (synchronous vs. asynchronous with participants' breathing), combined with synchronous or asynchronous visuo-tactile stimulation. Embodiment strength (ownership, agency, location), body image/schema distortions (Body Image Task, Body Schema Task, subjective body size), affective responses, and avatar perception (self-similarity, attractiveness, implicit disgust, perceived body weight) were assessed. Results in neurotypicals show that synchronous IMS significantly increased embodiment strength, pleasantness, and positive affect, independent of avatar body size. Also, replicating previous study, avatar body size significantly influenced embodiment and perceptual scores, with the normal-weight avatar rated as more self-similar and attractive, and the underweight avatar perceived as thinner than participants' actual body. Relative to baseline, embodiment of the underweight avatar shifted real and ideal body selections toward thinner figures. In Study 2, an interoceptive–exteroceptive conditioning paradigm increased perceived similarity between the underweight avatar and participants' real body. While data collection and analysis for the AN sample is being completed, results on neurotypical suggest that interoceptive–exteroceptive integration may recalibrate distorted body representations, and inform novel multisensory-based interventions for AN.