

## **I am where I believe my body is**

### **ABSTRACT:**

#### **Background**

The sense of body ownership relies on integrating visual, tactile, and proprioceptive cues. Previous research suggests this perception may depend on predicting the body's spatial location.

#### **Aims**

This project aimed to test whether spatial prediction causally influences body ownership and disownership, and whether manipulating spatial expectations can alter embodiment experiences.

#### **Method**

Three studies were conducted using immersive virtual reality. Study 1 ( $N = 80$ ) tested body ownership and localization during virtual Rubber Hand Illusion (vRHI) and first-person Full-Body Illusion (1pp-FBI) under aligned and misaligned conditions. Study 2 ( $N = 81$ ) investigated verbal conditioning's effect on spatial prediction and embodiment during vRHI. Study 3 ( $N = 50$ ) tested verbal conditioning and visual feedback on implicit and explicit body localisation. Measures included proprioceptive drift, skin conductance response, and embodiment questionnaires.

#### **Results**

Embodiment increased across illusions, though disownership occurred only with explicit misalignment in 1pp-FBI. Proprioceptive drift indicated spatial recalibration toward virtual bodies in misaligned conditions. The correlation between predicted body location and embodiment was observed only in 1pp-FBI when recalibration was necessary. Verbal conditioning and visual information shifted perceived body position but did not increase embodiment.

#### **Conclusions**

The predicted body's location may contribute to ownership and disownership when there is an explicit recognition of the incongruence between the two bodies' positions. Verbal and visual cues bias spatial perception, but multisensory congruence is necessary to elicit embodiment.

#### **Keywords**

Embodiment, Disembodiment, Body's location, Verbal conditioning

**Published Work:**

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Frisco, F., Bruno, V., Romano, D., & Tosi, G. (under review). Trust me, you are there: The role of verbal conditioning on embodiment and body localization. *British Journal of Psychology*.

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