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Hand Posture Alters Perceived Finger Numerosity

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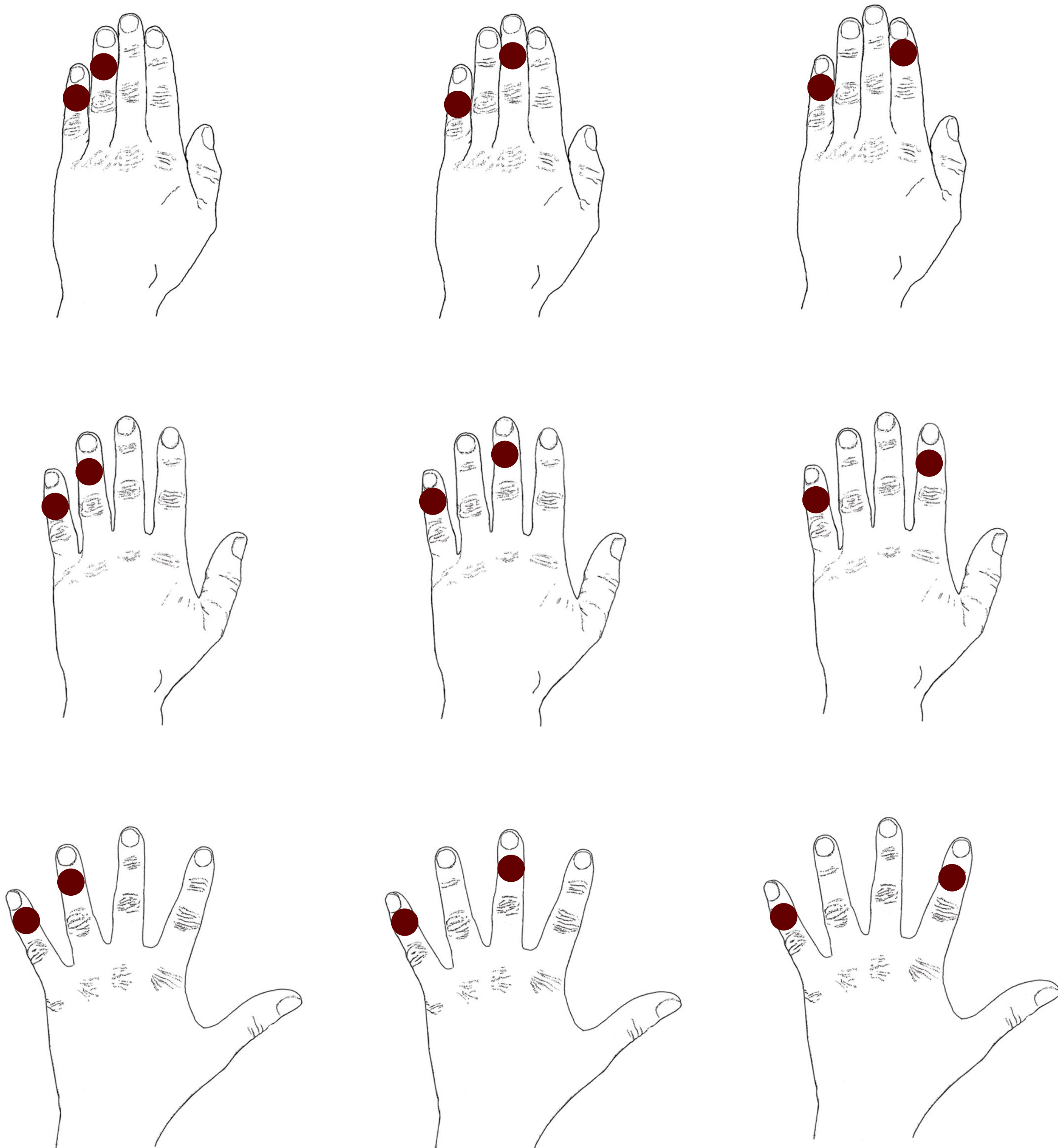
The existence of distinct representations of **body structure** has classically been supported by neuropsychological evidence of patients with conditions such as autotopoagnosia and finger agnosia (Ogden, 1985; Kinsbourne & Warrington, 1962; Sirigu et al, 1991). Such patients fail to point to body parts on verbal command (autotopoagnosia) or to identify their fingers (finger agnosia), yet are relatively unimpaired in skilled action (Buxbaum & Coslett, 2001).

Number of fingers “in-between”

Aim

Is the **body structural representation** fixed or it can be **modulated** by the real-time **posture** of the body?

Hands posture



Method

N=30

Tactile stimuli: suprathreshold, 5 ms (solenoid tappers)

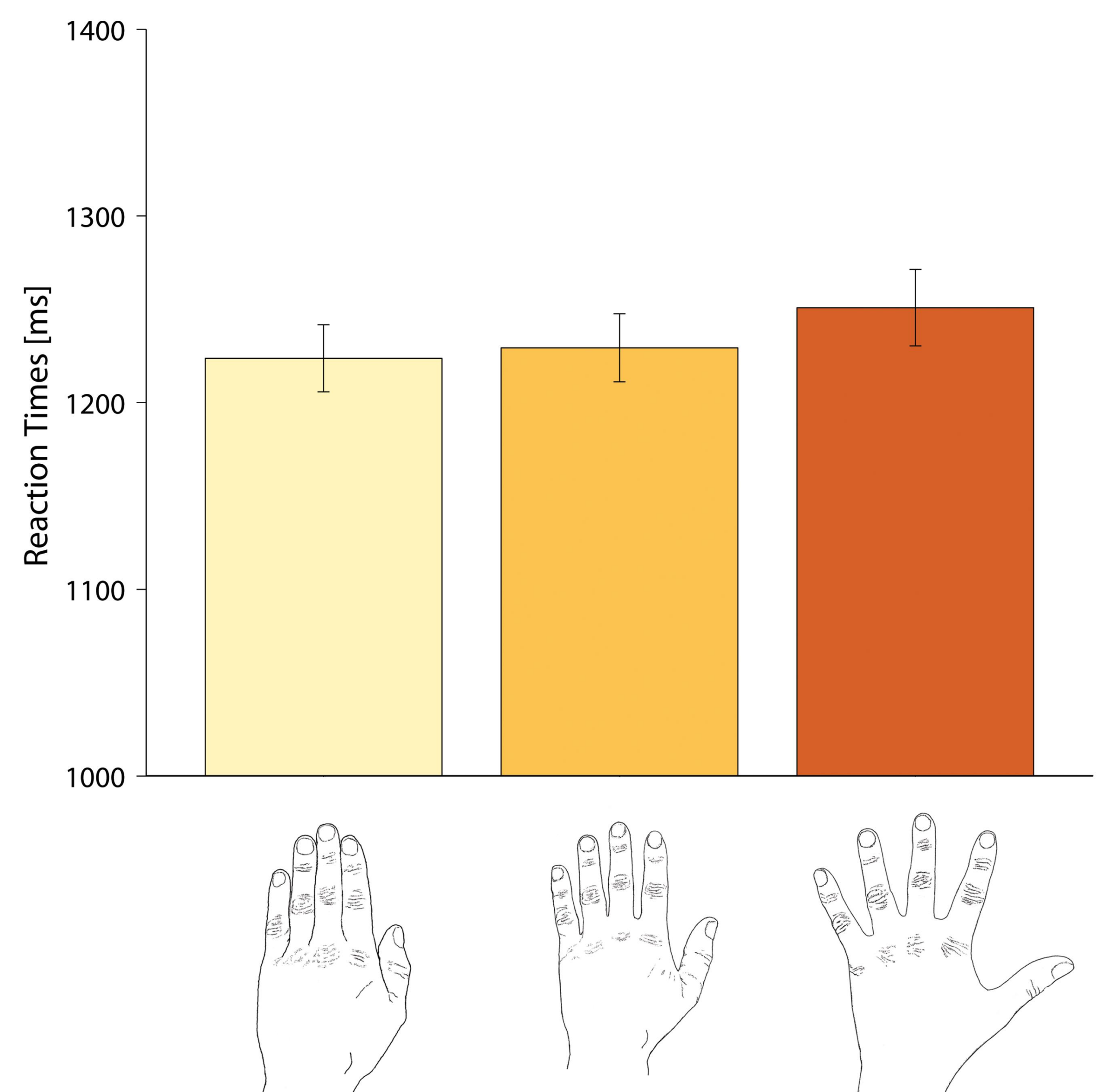
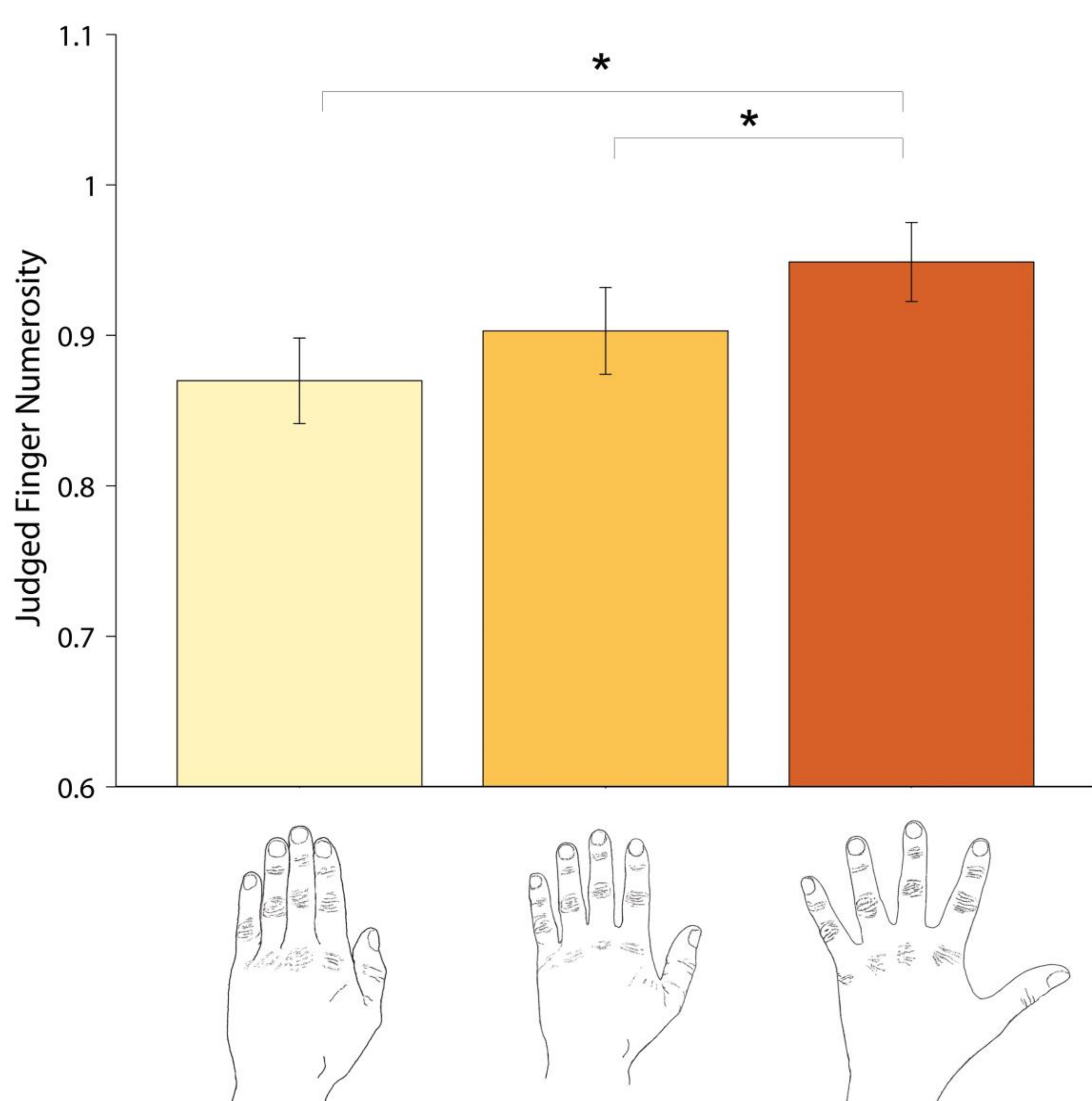
72 trials x 6 blocks (ABCCBA)

Different posture for each block

Participants judged the numbers of unstimulated fingers “in between” the two touches (vocal response).

- (1) Fingers touching each other
- (2) Fingertips close (1 cm)
- (3) Fingers spread at max comfortable splay

Results



Posture: $F(2,58) = 6.23, p < 0.004$ * Denotes $p < 0.05$. Error bars represent the $\pm 95\%$ Confident Interval of the within participants variability.

Conclusions

Participants gave larger numerosity estimates when the fingers were positioned far apart compared to when they were close together or touching. **Structural body representations are not as fixed as suggested by previous research, but are modulated by the relative positions of body parts.** This indicates that “online” and “offline” representations of the body are not fully distinct, but interact in important ways.