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IN YOUR SKIN? SOMATOSENSORY CORTEX IS PURPOSELY RECRUITED TO SITUATE BUT NOT SIMULATE OBSERVED TOUCH

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Background: Previous studies of touch observation suggest that we automatically simulate observed touch experiences in our own body representation including primary and secondary somatosensory cortex (SCx). This suggests a reflexive mirroring of other's sensory experiences through activation of early sensory areas.

Aims: Here we investigated whether (a) task instructions and the engagement with the overserved touch (i.e. ignoring vs feeling) modulate the activation of early sensory areas, and whether (b) the quality of the texture of the observed touch (i.e. soft vs hard) modulates such early sensory SCx activations.

Method: We measured ERPs of SCx's hierarchical processing stages which map onto successive somatosensory ERP components to investigate the timing of touch observation effects. In the first experiment, participants (n=43) merely observed touch or no-touch to a hand; in the second, participants saw different touch textures (foam and rubber) either touching a hand (other-directed touch) or they engage with observed texture (self-directed). We probed SCx activity and isolated SCx touch observation activations from visual carry over effects.

Results: We found evidence of absence of early sensory SCx modulations (e.g. P50, N80) in both experiments. We only found touch observation effects on a later processing stage (i.e. Late Positive Complex) and on behavioural responses to an imperative stimulus presented after each touch observation sequence consistent with post-perceptual effects. Importantly, early and mid-latency components were only modulated in the self-directed touch condition, when participants were instructed to feel the (visual) touch, consistent with early sensory SCx activations. Furthermore, these early sensory SCx activations were not modulated by observed touch texture.

Conclusions: Therefore, SCx is purposely recruited when engaging with observed touch. Such activations situate the perceptual experience in the relevant sensory cortex rather than fully simulate the sensory experience.

Keywords: Touch observation, Somatosensory, ERPs

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