Interpersonal problems are a cardinal symptom of Borderline Personality Disorder (BPD) that deplete patients of health benefits associated with social connections(1). These health benefits can result from interpersonal touch, a powerful mechanism for social communication and maintaining social bonds across cultures worldwide(2).

Unmyelinated C-tactile (CT) afferents in the non-glabrous skin provide information about the emotional-motivational properties of touch. These fibers respond best to slow, gentle stroking at 1-10 cm/s and project to the posterior insula cortex, a key region for interoceptive processing(3,4). CT-optimal touch is considered a form of interoception with preliminary evidence suggesting that BPD patients show an altered perception of touch and inner bodily sensations(5,6). However, the neural substrates of these alterations and their role in the complex social dysfunctions of BPD remain unclear. Therefore, we aim to investigate:

1) **Touch aversion** in BPD patients compared to healthy controls (HC) and changes after four weeks of Residential Dialectical Behavior Therapy (DBT).

2) **Interoceptive processing** in BPD patients compared to HC.

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**Results**

BPD patients compared to HC showed significantly reduced responses to CT-optimal touch in the right posterior insula cortex (A, B: MNI: 40, 42, 2). Insula activity for CT-optimal touch correlated negatively with severity of interpersonal problems in BPD patients (r~MNI: 0.34) and across both groups (r~wholebrain: 0.39) (C).

Despite a significant improvement in symptom load, there were no changes in touch aversion after four weeks of inpatient DBT.

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**Discussion**

- The negative attitude towards social touch is a widespread and stable factor of BPD(7), not solely attributable to childhood trauma.
- An altered processing of affective somatosensory stimuli in BPD is not specific to pain(8) but also applies to positive touch.
- A disrupted insula-mediated integration of emotional-motivational and sensory touch components likely represents a protective mechanism (a psychological thickening of the skin) and constitutes a biological signature of interpersonal problems in BPD(9).
- The disturbed perception of touch in BPD is thus clinically relevant and persists even after four weeks of residential DBT.
- Therefore, BPD patients cannot benefit from the physical and mental health-promoting benefits of interpersonal touch.
- First evidence indicates lower interoceptive sensibility in BPD patients and highlights the role of interpersonal touch impairment in the altered interpersonal attention towards the stomach in BPD patients.

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**References**


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**Visuals**

A subpopulation of 25 BPD patients showed a significantly lower interoceptive sensibility (A) and significantly reduced responses in the right posterior insula cortex (B: MNI: 42, 16, 12) while focusing on their stomach compared to a subpopulation of 25 HC.