

An ERP Investigation of the Effect of Touch on Empathy in Adults

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There are numerous direct and indirect links between *touch* and *empathy*, many of which are regulated by inter-individual differences. Combining ERP and questionnaire measures, this study explores the role of touch preferences in the relation between touch and empathy.

Introduction & Background

Touch, especially *interpersonal touch with positive affect*, plays an important role in communicating emotions (e.g. empathy), and is beneficial to the recipient's physical and psychological wellbeing. This study focuses on the influence of touch on empathy.

Previous evidence suggests that:

- 1) Touch correlates positively with emotion regulation and pro-social behavior, both of which are key to empathy performance:
 - Hand-holding, by partners and strangers, helps to regulate responses to threat (Coan & Davidson, 2006)
 - Individuals reporting being touched relatively infrequently by parents in childhood are at higher risk of developing depression
- 2) The release of oxytocin (OT) is related to both touch and empathy:
 - Touch can help release OT
 - OT intake increases empathy responses (Ditzen et al., 2007; Hurlmann et al., 2010; Domes et al., 2007)
- 3) People's preference for touch might also moderate the influence of touch on their empathy performance
 - People from different cultures which have different attitude to touch, show various empathy-related performances

RESEARCH QUESTIONS:

- 1) Does being touched increase a person's empathic response to someone else's pain?
- 2) Will this effect be moderated by a person's preference for being touched?

References

- Coan, J. A., Schaefer, H. S., & Davidson, R. J. (2006). Lending a hand social regulation of the neural response to threat. *Psychological Science*, 17(12), 1032-1039
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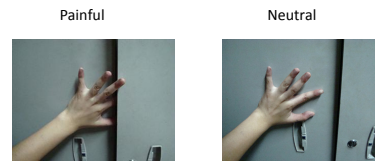
Methodology

PARTICIPANTS:

Adult participants (N = 30, Male=16, Female=14, M = 23.97 years, SD = 3.19) paired either with their partner or their best friend.

STIMULI:

Photographs of painful and non-painful events presented for 200ms

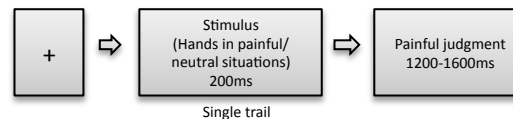


(Fan & Han, 2008)

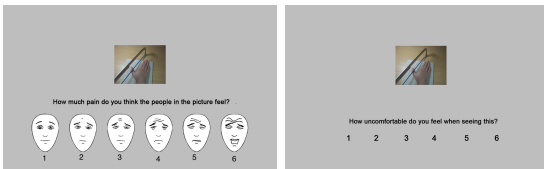
METHOD :

Phase 1: Participants filled in a modified Interpersonal Reactivity Index (IRI, Davis, 1980) measuring the levels of their empathy and touch preference .

Phase 2: Continuous EEG recording while participants viewed painful and neutral stimuli, with and without their friend touching their left front arm.



Phase 3: Participants evaluated subjectively the painfulness of the events depicted in the stimuli from their own perspective and from the perspective of another person using the Face Pain Scale-Revised (FPS-R, Hicks, et al., 2001)



Analysis & Results

ANALYSIS:

16 electrodes were selected. The ROIs are REF,55 (Middle line); 31,37,42, 80,87,93 (Central); 7, 13, 29, 24, 106, 111, 112, 124 (Frontal).

The ERP time locked to the stimuli onset was calculated.

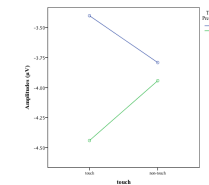
RESULTS:

N2 Frontal (200-350 ms)

Results suggested that, when being touched, people with high touch preference tended to show higher amplitudes than in non-touch condition; however, people with low touch preference showed an opposite pattern of results.

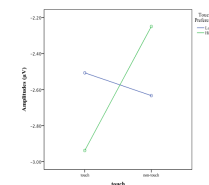
N2 Central (230-380 ms)

Findings suggested that, when being touched, people with higher touch preference showed higher average amplitudes of the N2 than in non-touch condition; while people in low touch preference group showed an opposite pattern of results.



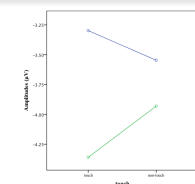
N2 Frontal

Touch × Touch Preference:
 $F(1, 28) = 4.53, p < .05, t = .025$



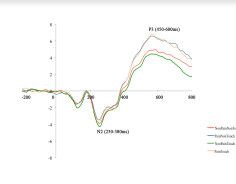
N2 Central

Touch × Touch Preference :
 $F(1, 28) = 8.52, p < .01$



N2 Frontal-right

Touch × Touch Preference:
 $F(1, 28) = 6.78, p < .05,$
touch: $M = -4.44, SD = .78$; non-touch: $M = -3.94, SD = .69$



Middle line

Touch: $F(1, 28) = 4.05, p < .05, \mu_p^2 = .126$
 $M = -2.94, SD = .66$; Non-touch: $M = -2.25, SD = .56; p < .01$

Conclusions

Touch influenced the early processes of empathy-related neural responses on people with a high touch preference, but no influence was found in people with a low touch preference; plus, little effect of touch was found in the late process of empathy-related neural response.