Modeling affective touch: Individual differences in the perception of tactile pleasantness

Laura Crucianelli*[1], Marie Chancel[2], and H. Henrik Ehrsson

[1]Karolinska Institutet, Department of Neuroscience – Sweden
[2]Laboratoire de Psychologie Neurocognition, Grenoble-Alpes University, Grenoble – Grenoble-Alpes University – France

Abstract

Touch is perceived most pleasant when delivered at velocities known to optimally activate the C-tactile afferent system. At the group level, pleasantness ratings of touch delivered at velocities in the range between 0.3 and 30 cm/s follow an inverted-U shape curve, with maximum pleasantness between 1 and 10 cm/s. However, the prevalence, reliability, and stability of this function at the individual level and across skin types based on hair density remains unknown. Here, we tested a range of seven velocities (0.3, 1, 3, 6, 9, 18, 27 cm/s) delivered with a soft brush, on both hairy (forearm and dorsal hand) and non-hairy skin (palm) in 123 participants. Our results suggest that the relationship between pleasantness and velocity of touch is significantly best described by a negative quadratic model at the individual level in the majority of participants both on hairy (67.1%) and non-hairy (62.6%) skin, a larger extent than previously reported. Higher interoceptive accuracy and self-reported depression were related to a better fit of the quadratic model and the steepness of the curve, respectively. The prevalence of the quadratic model at the individual level was stable across body sites (62.6%, *experiment 1*), across two experimental sessions (73%–78%, *experiment 2*), and regardless of the number of repetitions of each velocity (*experiment 3*). Thus, the individual perception of tactile pleasantness follows a characteristic velocity-dependent function across skin types and shows trait characteristics. Future studies can investigate further the possibility to use affective touch as a behavioral biomarker for mental health disorders.

Keywords: affective touch, CT afferents, interoception, mental health, tactile pleasantness

*Speaker