
The impact of acute hydration & dehydration on skin sensation: from transduction to perception

Adarsh Makdani*^{†1}, Aurélie Porcheron*², Julie Latreille², Warren Moore³, Andrew Marshall³, Marie-Héloïse Bardel², and Francis Mcglone³

¹Research Centre For Brain Behaviour, School of Psychology, Liverpool John Moores University – United Kingdom

²Neurosciences Department – CHANEL Parfums Beauté – France

³University of Liverpool – United Kingdom

Abstract

There is a close, two-way relationship between the dermatological properties of skin, and cutaneous innervation and sensitivity. Previous research has considered the impact of skin hydration on tactile perception but has focused primarily on glabrous skin, and discriminatory touch mediated by $A\text{-}\beta$ afferents.

This study aims to expand on this work, using microneurography (an electrophysiological technique) and psychophysics (subjective ratings), to explore the impact of both acute *hydration* and *dehydration* on cutaneous afferents in hairy skin (i.e. the majority of the human body), with a particular focus on gentle dynamic touch, chosen to optimally activate unmyelinated C- low threshold mechanoreceptors (C-LTMRs), which have previously been linked to social and affective touch.

The results compare stimulus-evoked responses before and after treatment of the receptive field, in a range of cutaneous afferents, and relate those responses to subjective ratings showing that soft slow brushing was more pleasant when applied to hydrated, moisturised skin, than to dehydrated skin. Taken together, these findings suggest that mechanical changes in skin affecting afferent activity are key parts to the perceptual reward mechanisms that underpin grooming behaviour.

Keywords: Microneurography, Hydration, Dehydration, Affective Touch

*Speaker

[†]Corresponding author: a.makdani@ljmu.ac.uk