
The effects of skin hydration levels on local skin wetness perception at the underarm

Jade Ward^{*1}, Emilio Verucchi¹, Dave Swaile², Peter Worsley^{†1}, and Davide Filingeri^{*‡1}

¹University of Southampton – United Kingdom

²Proctor Gamble – United States

Abstract

Changes in skin hydration could alter skin properties leading to a change in wetness sensitivity. However, how the biophysical status of the skin impacts local wetness perception (WP) remains unclear. This study aimed to investigate the effect of skin hydration levels on local WP.

Ten participants (5M/5F; 29±7y) took part in two trials, where they underwent a quantitative sensory test of WP at baseline and following localised overhydration (OVH;+22%) or dehydration (DEH;-44%) of the underarm' skin. Participants reported on a visual analogue scale the perceived magnitude of WP (anchor points: 0=dry; 100=completely wet) from the short-duration static application of a cold-wet (i.e. 5°C below local skin temperature, Tsk), neutral-wet (i.e. equal to Tsk) and warm-wet (i.e. 5°C above Tsk). Pearson's chi-squared tests of independence were used to examine the association between changes in WP from baseline and skin hydration status for each temperature stimulus.

A statistically significant association ($X^2(2)=6.9$, $p=0.03$) was found between skin hydration status and changes in WP during neutral-wet stimulation. Specifically, 60% of participants reported an increase in WP following OVH, whilst 30% reported a decrease following DEH. A similar trend was observed during cold-wet stimulation ($X^2(2)=5.4$, $p=0.07$). No significant association was found between changes in WP and skin hydration status during warm-wet stimulation ($X^2(2)=0.3$, $p=0.865$).

We conclude that skin hydration levels may influence WP, although this effect is dependent on stimulus temperature. Furthermore, inter-subject variability may modify the effect of skin hydration levels on WP, which requires further investigation.

Keywords: Wetness perception, Skin hydration, Overhydration, Dehydration, Thermal sensitivity

*Speaker

†Corresponding author: p.r.worsley@soton.ac.uk

‡Corresponding author: D.filingeri@soton.ac.uk