

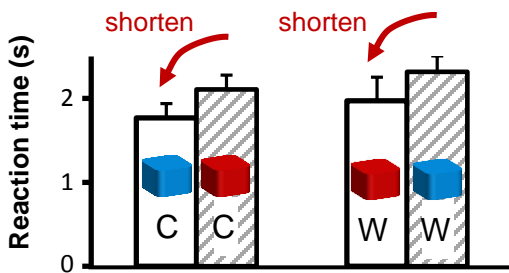
Abstract

The warmness or coldness that we perceive when touching an object does not merely depend on the object temperature; it's also affected by the visual information presented. We demonstrated that the color of an object can influence object temperature perception through the prevailing red-warm/blue-cold association. What we found is that while it takes less time for a blue object to be judged as cold than it takes for a red object, a blue object is surprisingly more likely to be judged as warm than a red object of the same temperature. As temperature information is essential for realistic simulations of material properties, our findings will contribute to the development of human interfaces aimed at providing a holistic experience in telecommunication.

Impact of color information on object temperature perception

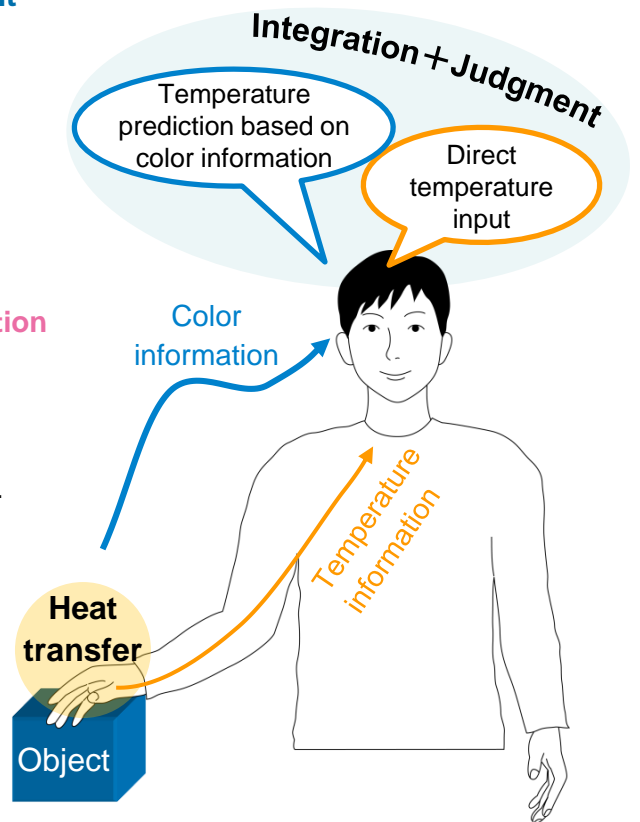
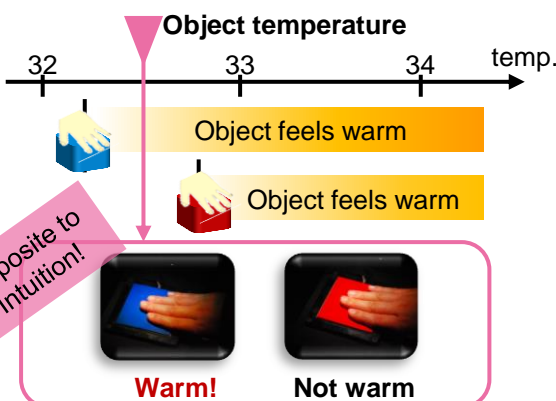
Color information modulates the expectation of the object temperature, which in turn affects the time required for temperature judgment and the temperature perceived upon contact.

Time required for temperature judgment



Consistent to red-warm/blue-cold association
→ processing time shortened

Temperature perceived upon contact



Related works

- [1] H.-N. Ho, D. Iwai, Y. Yoshikawa, J. Watanabe, S. Nishida, "Combining colour and temperature: A blue object is more likely to be judged as warm than a red object," *Scientific Reports*, Vol. 4, 2014.
- [2] H.-N. Ho, G.H. Van Doorn, T. Kawabe, J. Watanabe, C. Spence, "Colour-temperature correspondences: When reactions to thermal stimuli are influenced by colour," *PLoS One*, 2014.
- [3] H.-N. Ho, "Color-temperature correspondence: Its nature and its impact on object temperature perception," *NTT Technical Review*, Vol. 13, No. 1, 2014.

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