It's Burning Cold! Visual and Tactile Events Become Thermal Concepts

Yael Salzer*†[1] and Tal Oron-Gilad*[1]

[1]Ben-Gurion University of the Negev (BGU) – Ben Gurion University – Beer Sheva, Israel

Abstract

Following the theory of the Perceptual Symbol System (Barsalou, 1999), the present study examined the role of visual and tactile modalities in the creation of conceptual thermal schemas. Hot, cold and thermal grill illusion (TGI) tactile sensations were examined, in addition to visuals conveying hot and cold scenes. TGI sensations (e.g., burning cold) are produced by alternating hot and cold tactile stimuli. Tactile sensations were presented via a thermoelectric tactile display (TTD; Oron-Gilad, Salzer, & Ronen, 2008; patent pending PCT/IL2008/000928), mounted on participants' left forearm. Two experiments were conducted. In the first, participants were asked to attend to the visual modality while ignoring the tactile stimulations. Participants were instructed to press, using their right hand fingers, keyboard keys labeled with thermal sensations (e.g., hot, cold). In the second, instructions were the opposite. Two asymmetries were found: only cold tactile stimuli affected responses to visuals, and visuals did not affect tactile conceptions. In light of these results, we suggested that tactile experiences are required for the creation of thermal concepts, whereas visual experiences are not. Moreover, direct touch is mandatory for the creation of cold but not for hot thermal concepts (heat transfer account).

*Speaker

†Corresponding author: yaelsa@bgu.ac.il