

Facial and bodily temperature maps of emotions

ABSTRACT:

James (1884) argued that emotions are the feelings of bodily change. According to this view, different emotions are associated with distinct bodily changes or physiological responses. For the past 100 years, however, the question of whether the physiological responses that accompany emotions are specific for each emotion or are instead generalized arousal responses has remained unsettled. Most studies have focused on overall physiological responses (such as heart rate) or physiological changes in single points in the body (such as temperature changes in a finger). It is possible, however, that we need much richer datasets to characterize physiological responses in the body and only spatial and temporal patterns of responses will distinguish between emotional states. In our project, we aimed to do that by investigating the spatial distribution of temperature changes to different emotions across the face and body. We used thermal imaging to capture temperature changes in the face in response to each of six emotions (happiness, fear, surprise, anger, disgust, and sadness), compared to a baseline. We conducted three experiments, each with a different stimulus set. We developed novel methods to analyze these face maps and determine their overlap. Our results so far showed that there are some regions of the face that consistently increased or decreased in temperature in response to emotions across participants. However, these face temperature change maps were not consistent for the same emotion across the three experiments. In addition, we have not yet found support for the distinctiveness of these maps across different emotions. Further testing and analyses will allow us to determine the reliability of these findings.

Keywords

Emotion processing, Thermal imaging, Temperature change maps

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