Culture modulates the visual representation of pain facial expressions

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Context.
Although facial expressions of emotions have long been considered culturally universal (Ekman & Friesen, 1971), some studies revealed cultural differences in the perceptual mechanisms underlying their recognition (e.g. Jack et al., 2012a; 2012b). The present study aims to verify the impact of culture on the facial features that are stored by individuals in their mental representation of pain facial expressions.

Methods.
• Reverse correlation (Mangin & Biederman, 2004).
• Participants: 30 Chinese (15 males), 30 Canadians (15 males).
• Number of trials: 500 per participant.

Classification images (CIs) were produced separately for each participant by averaging the noise patterns chosen during the task.

Results and analysis.

Figure 3. Average classification images added to the base face.

- Presented to 15 independent judges.
- 100% of them judged the pain expression on the average Chinese’s CI as more intense.
- $\chi^2$ (1) = 15.0, $p<0.001$.

Figure 4. Areas significantly associated with the percept of pain. Red: Luminance increase; Green: Luminance decrease.

Which of these two faces expresses the most pain?

Base face: Morph of an asian and a caucasian face

Base face + noise

Figure 1. Task

Figure 2. Illustration of the procedure to create the stimuli.

References

• Results indicate that the mental representation of pain expressions is more intense for Chinese than for Canadian participants.

• If mental representations reflect expectations about the world based on past experiences (Jack et al., 2012), the results suggest that Chinese participants may have previously been exposed to facial expressions displaying greater pain intensities.