Perceptual factors underlie the underestimation bias in pain perception of black and white faces

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Context.

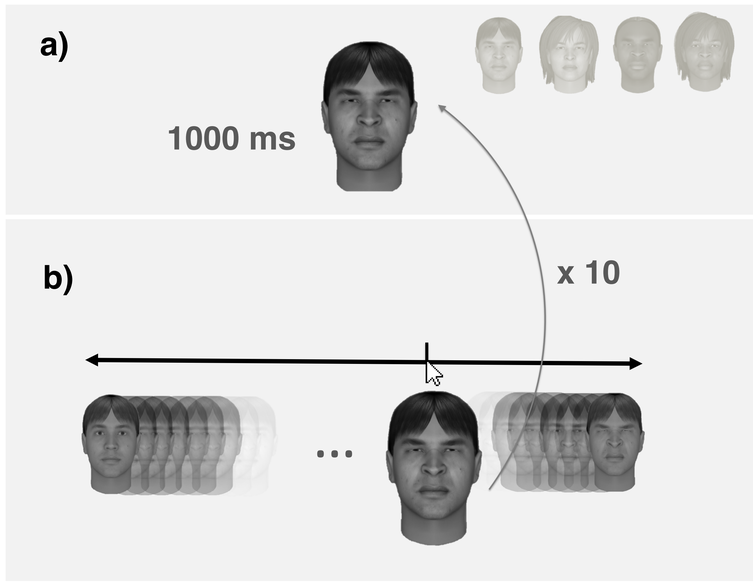
Communication of pain has been tied to the evolution of the human race, as efficient communication may increase chances of survival. Interestingly, underestimation biases in pain judgments are often observed and even worse for ethnic/racial minority groups (Cintron & Morrison, 2006). It has been suggested that this form of racial biases in pain recognition could be due to the perceptual processes underlying the detection of the facial expression of pain (Mende-Siedlecki et al., 2019). However, others' pain must not only be detected, but also evaluated in terms of intensity for one to exhibit the appropriate behavior.

Methods.

This study compared the pain intensity perceived in ethnic ingroup (white) versus outgroup (black) faces using the method of serial reproduction, known as "*Teleface*" (Uddenberg & Scholl, 2018).

Participants:
20 chains of 10 White participants were created (100 men).

Figure 1
The Procedure of the Teleface Method



Note: a) Example of one of the four stimuli briefly presented to participants (1000 ms). b) The slider used by participants to match the perceived pain intensity.

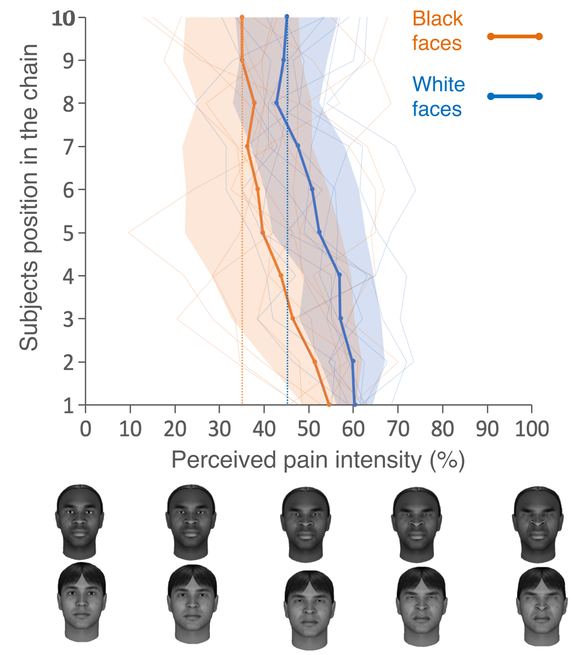
Procedure:

- One by one, 4 face avatars (2 gender x 2 ethnicities) displaying a medium intensity of pain (61%) were briefly presented to the first participant of each chain (Fig 1. a)
- The participant reproduced the perceived intensity using a slider along continuums of the same faces presenting different levels of pain intensity (from 0% to 100%; Fig 1. b).
- Its response was used as the pain intensity for the next participant and so on down the line in each *Teleface* chain.

Results

Results show that chains generally tend to converge toward a lower level of pain for black faces in comparison to white faces (Figure 2).

Figure 2
Perceived Pain Intensities for Black Versus White Faces



Note: Results are depicted in orange for the black faces and in blue for the white faces. Thicker lines represent the average across the 20 chains. Shaded areas represent the standard deviations.

Analysis on the intensity selected by the last participant of each chain revealed a significant underestimation of pain in black faces (M=35.10%, SD=12.68%) in comparison to white faces (M=45.03%, SD=11.49%) [$t(19) = 2.52$, $p = .02$, d=0.82].

These results suggest that viewers are influenced by face ethnicity when evaluating the intensity of the facial expression of pain in others.

References

Cintron, A., & Morrison, R. S. (2006). Pain and ethnicity in the United States: A systematic review. *Journal of palliative medicine*, *9*(6), 1454-1473.

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