

Brain activity can explain the causes of prejudice

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An international team of scientists, led from Karolinska Institutet, has investigated the neural basis of racial biases. The results, published in the scientific journal *NeuroImage*, show that after an aversive experience, differences in brain activity are seen, depending on whether the experience is associated with a member of the person's own ethnic group or another.

People are good at putting people and items into categories. From an evolutionary perspective, it has always been advantageous to be able to quickly determine if something is a danger or an asset. This can however be a problem today since it can lead to unfounded biases. Psychologists use the terms ingroup and outgroup to differentiate between the group you belong to versus all other groups.

Scientists have previously shown that we acquire and express fear differently based on the racial identity of a person we learn something about. However, the brain mechanism of these biases has not been studied previously.

"Based on what we already know about fear learning, we expected differential <u>brain responses</u> to racial ingroups and outgroups" says Tanaz Molapour, doctoral student at the Department of Clinical Neuroscience, and lead author of the study. "As expected, our results show that there are differences in <u>brain activity</u> after aversive experiences, depending on whether the experience was associated with the ingroup or outgroup."



In the study, 20 white participants were presented with images of two black and two white faces each. One face of each racial group was paired with a mildly unpleasant electrical stimulation, representing an aversive experience. Next, participants watched all the faces again without any shocks being administered, so that the participants learned that the faces were safe. Two days later, the participants took part in a social interactive ball-tossing task, with images of faces of new black and white individuals.

Learning responses were measured through physiological arousal, brain responses and behaviour. The researchers found two brain areas in particular, the amygdala and the anterior insula, that played key roles in differentiating between ingroup and outgroup faces. The results show that some of the participants had exaggerated memories of aversive experiences associated with outgroup faces. The brain responses predicted later expressions of discriminatory behaviour towards new outgroup members.

According to Associate Professor Andreas Olsson, the principle investigator behind the study, these findings may help us to better understand the brain mechanisms by which small biases based on an aversive experience with a member of another social or ethnic group may turn into a xenophobic response.

More information: "Neural correlates of biased social fear learning and interaction in an intergroup context," *NeuroImage*, Available online 10 July 2015, ISSN 1053-8119, <u>DOI:</u> <u>10.1016/j.neuroimage.2015.07.015</u>

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