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'Other-race effect': Clues to why 'they' all look alike

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Northwestern University researchers have provided new biological evidence suggesting that the brain works differently when memorizing the face of a person from one's own race than when memorizing a face from another race.

Their study -- which used EEG recordings to measure brain activity -- sheds light on a well-documented phenomenon known as the "other-race effect." One of the most replicated psychology findings, the other-race effect finds that people are less likely to remember a face from a racial group different from their own.

"Scientists have put forward numerous ideas about why people do not recognize other-race faces as well as same-race faces," says Northwestern psychology professor Ken Paller, who with psychology professor Joan Chiao and Heather Lucas co-authored "Why some faces won't be remembered: Brain potentials illuminate successful versus unsuccessful encoding for same-race and other-race faces."

The discovery of a neural marker of successful encoding of other-race faces will help put these ideas to the test, according to Paller, who directs the Cognitive Neuroscience Laboratory in the Weinberg College of Arts and Sciences.

"The ability to accurately remember faces is an important social skill with potentially serious consequences," says doctoral student Lucas, lead author of the recently published study in *Frontiers in Human*

Neuroscience. "It's merely embarrassing to forget your spouse's boss, but when an eyewitness incorrectly remembers a face, the consequence can be a wrongful criminal conviction," she adds.

The Northwestern team found that brain activity increases in the very first 200 to 250 milliseconds upon seeing both same-race and other-race faces. To their surprise, however, they found that the amplitude of that increased brain activity only predicts whether an other-race face (not a same-race face) is later remembered.

"There appears to be a critical phase shortly after an other-race face appears that determines whether or not that face will be remembered or forgotten," Lucas says. "In other words, the process of laying down a memory begins almost immediately after one first sees the face."

Previous research has associated this very early phase -- what is known as the N200 brain potential -- with the perceptual process of individuation. That process involves identifying personally unique facial features such as the shape of the eyes and nose and the spatial configuration of various facial features.

When the researchers asked the 18 white study participants to view same-race faces and to commit them to memory, the individuation process indexed by N200 appeared "almost automatic -- so robust and reliable that it actually was irrelevant as to whether a face was remembered or not," says Lucas.

Minutes later, the participants were given a recognition test that included new faces along with some that were previously viewed. The researchers analyzed brain activity during initial face viewing as a function of whether or not each face was ultimately remembered or forgotten on the recognition test.

The N200 waves were large for all same-race faces, regardless of whether or not they later were successfully remembered. In contrast, N200 waves were larger for other-race faces that were remembered than for other-race faces that were forgotten.

Of course, not all same-race faces were successfully recognized, the researchers say. Accordingly, their study also identified brain activity that predicted whether or not a same-race face would be remembered. A specific brain wave starting at about 300 milliseconds and lasting for several hundred milliseconds was associated with what the psychologists call "elaborative encoding."

In contrast to individuation (which involves rapidly identifying unique physical attributes from faces), elaborative encoding is a more deliberate process of inferring attributes. For example, you might note that a face reminds you of someone you know, that its expression appears friendly or shy, or it looks like the face of a scientist or police officer.

Making these types of social inferences increases the likelihood that a face will be remembered.

"However, this strategy only works if the process of individuation also occurred successfully -- that is, if the physical attributes unique to a particular face already have been committed to memory," Lucas says. "And our study found that individuation is not always engaged with other-race faces."

Why is individuation so fragile for other-race faces? One possibility, the researchers say, is that many people simply have less practice seeing and remembering other-race faces.

"People tend to have more frequent and extensive interactions with same-race than with other-race individuals, particularly racial majority

members," Lucas says. As a result, their brains may be less adept at finding the facial information that distinguishes other-race faces from one another compared to distinguishing among faces of their own racial group.

Another possible explanation involves "social categorization," or the tendency to group others into social categories by race. "Prior research has found that when we label and group others according to race we end up focusing more on attributes that group members tend to have in common -- such as skin color -- and less on attributes that individuate one group member from others," Lucas says.

As a result, smaller N200 brain potentials for other-race faces -- particularly those that were not remembered later -- could indicate that race-specifying features of these faces were given more attention.

The Northwestern researchers expect future research to build on their findings in the continuing effort to better understand the other-race effect. "That research also will need to focus more on face recognition in minorities, given that the bulk of research to date has examined majority-white populations," Lucas says.

Provided by Northwestern University