The Neural Underlings of Unconscious Racial Biases and Its Effect on Police Behavior Hiab Teshome – Center for Neuroscience & Society – April 2019

<u>Abstract</u>

There has been an increase in the excessive use of police force, particularly towards African Americans, in the United States (Fryer, 2018). Despite the fact that many police forces have attempted to utilize programs to reduce racial stereotypes that might compel officers to act more aggressively towards individuals of color, there is still extreme violence. This paper will analyze research that has been conducted into the neuroscience behind unconscious racial biases. Unconscious biases are stereotypes that are placed on certain individuals of a particular identity without conscious awareness. In particular, this paper will be focused on understanding the unconscious biases police officers may have when racially profiling suspected criminals. We can understand and critic police training in order to truly understand if training is supporting and reaffirming these biases.

The Amygdala and its Role in Unconscious Biases

The first studies in this field were focused on connecting unconscious biases to specific cortical regions of the brain in order to understand what regions are associated with these biases. These tests were conducted using functional magnetic resonance imaging (fMRI) to measure changes in brain activity through detecting differences in blood flow. Previous research demonstrates that through fMRI studies, race related biases are correlated with greater amygdala activity. The amygdala is located in the medial temporal lobe and is typically associated with emotional responses including fear. Phelps showed that white participants demonstrated stronger amygdala activation in response to black faces compared to white faces. In addition, the study was able to show that these biases were implicit (the subjects were not aware of it) indicating that higher amygdala activity is associated with the recognition of a racially outcast groups, even if it is not a purposeful response by the subject (Phelps, 2000). Another study by Livingston and Brewer found more negative, automatic (without conscious control) responses to black faces showing that the amygdala is sensitive to variations in racial phenotypic features such as skin color (Livingston, Brewer, 2002).

Behavioral Evidence Demonstrating Unconscious Biases in the Brain

Once researchers had identified the amygdala as an important region of interest for unconscious biases pertaining to race, researchers wanted to then translate these findings to analyze the behavior of ordinary civilians who were being exposed to similar environments as police officers. Joshua Correll, a psychologist at the University of Chicago conducted studies to show that officers harbored the same unconscious biases as the public. First, he developed and tested a paradigm known as "the police officer's dilemma," using a first-person-shooter video game. Participants were presented with images of young men, white and black, holding either guns or innocuous objects. The goal of the game was to shoot armed targets but not unarmed targets. The researchers found that participants shot armed targets more often and more quickly if they were black rather than white, and refrain from shooting more often when the target is white (Correll, 2002). In addition, the researchers found that the most common mistakes involved participants shooting an unarmed black target and failing to shoot an armed white target (Correll, 2002). The researchers then applied their experiments to actual police officers. Officers showed evidence of bias in their reaction times during the game, and were seen to react more quickly to armed black targets and unarmed white targets.

Correll also found that police officers who regularly interacted with minorities were more likely to exhibit racial bias in their decision to shoot (Correll, 2002). This serves as a major issue because most police officers are assigned communities for long periods of time in order to better understand the community that they are in charge of regulating. The researchers also confirmed that white participants showed stronger biases towards blacks through event related brain potential waveforms (Correll, 2002). These brain potential waveforms are changes in voltage generated by brain regions due to specific events. The researchers showed that white shooter generated much stronger and more frequent waveforms towards black targets and were much quicker to shoot black targets. These results indicated that there are actual changes to entire brain signaling networks beyond the amygdala. This raised questions about how entire brain networks were communicating with one another during these implicit bias tasks, and whether these networks could be suppressed.

Brain Connectivity Network of Unconscious Racial Biases

The previously described research demonstrated how researchers began to focus more heavily on amygdala activity during racially influenced tasks. However, research began to move towards bridging the connection between neural pathways and racially biased responses. To understand the nature of unconscious racial biases investigators wanted to focus on whole neural pathways instead of specific regions of the brain. The researchers were now focused in particular on detecting how the control network affected race biased responses. The control network which is mostly localized to the frontal and parietal cortex modulates cognitive control. Researchers wanted to evaluate if it was possible to

suppress unconscious biases and these global waveforms detected in the previous study through activating an individual's control networks. In particular, studies were driven to study the control network located at the dorsal anterior cingulate cortex (DACC) and the dorsal lateral prefrontal cortex (DLPFC). These regions are highly involved in autonomic function and decision making as well as reasoning. Participants with greater implicit racial biases showed greater activity of the brain regions previously mentioned when presented with black faces (Lieberman, 2005).

The activation of these control networks were believed to be a result of activation due to conflict from individuals trying to suppress their implicit racial biases and maintain composure. Studies have also shown that the DLPFC which is directly connected to the amygdala plays a role in managing amygdala activity during instances of racial bias. Individuals with greater executive ability (the ability to consciously manage their biases) showed greater synchronous activity in the amygdala and DFLPC (Yu, 2010). This implies that the DLPFC can help reduce amygdala activity which is associated with less bias. The next step in research is to analyze how individuals such as police officers who do not necessarily control their implicit bias perhaps demonstrate altered connectivity networks. Studies are currently underway in order to determine if individuals who act on their biases demonstrate problematic control networks that results in individuals being unable to regulate and manage their racial biases.



Images Displayed for Participants (From left to right: White man with gun, white man without gun, black man with gun, black man without gun)

Policies Today on Police Officer Violence and Racial Biases

As more and more instances of racially charged interactions between police and civilians become more publicized, this has pushed many police departments around the country to put in place anti-bias training for their officers. In 2015, a training program known as the Fair and Impartial Policing program was put in place in order to train officers to recognize their own implicit biases. The course was developed by Lorie Fridell, an associate professor of criminology at the University of South Florida. The training consists mostly of role playing and group discussions. This training has been incorporated in hundreds of police departments in the United States. As stated, this test was developed by a professor of criminology not sociologists, psychologists, or neuroscientists. There has been no

clear evidence that the training reduced amygdala activity in implicit bias situations or increased control network connections. Many neuroscientists such as Dr. Correll, who was previously stated in this paper, claims that the programs may, "...work to reduce biased violence, they may do nothing, and they may cause harm," he said. "We don't know, because we haven't really tested them in a rigorous way (New York Times)." As a result, it cannot be claimed that the training has helped manage the racial biases of police officers despite the fact that the program has received verbal praise from police officers who underwent the training. The neuroscience that has been currently underway in this field supports this lack of evidence that the current racial biases trainings put in place have had an effect on police officer behavior toward black people. However, it is very clear that policy makers are not utilizing the discoveries made by neuroscientists in order to understand how to minimize police officer violence towards minorities.

Future Directions and Gaps in the Field

The main holes in the field are due to the lack of connecting the data collected by neuroscientists with training protocols for police officers. Neuroscience have identified cortical regions that have demonstrated significant activity in police officers that show implicit bias, however the recently formed Fair and Impartial Policing program does not use this research in order to make judgements on how to best regulate implicit bias. Moreover, this program does not show concrete changes in behavior. The neuroscience is helping support that the current program is not necessarily working because the training is not focusing on psychological and neural components of racial biases. Perhaps, the best step is to continue research demonstrating that suppression of the amygdala through various regions of the frontal cortex can help to control racial implicit biases and then use this research in order to create trainings that are focused on strengthening signals between the frontal cortex and amygdala.







Figure 2. Hypothetical normal distributions representing unarmed and armed targets for signal detection analyses: White (top panel) and African Americans (bottom panel) targets.

Results from Correll 2002 Study

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