Title: Description to Explanation: An Empirical Exploration of the African-American Pipeline Problem in STEM – Brown et al.  
Authors: Bryan A. Brown, J. Bryan Henderson, Salina Gray, Brian Donovan, Shayna Sullivan, Alexis Patterson, William Waggstaff  
DOI: DOI: https://doi.org/10.1002/tea.21249

This study examines the impact of social identity contingencies on African American science students. This study starts by explaining social identity contingencies, specifically focusing on how they can negatively influence academic experiences for students of color. Coming in with this assumption, the researchers create a survey for African American science students in college and Black scientists. This is a mixed methods study in which researchers analyze survey results given by participants. After identifying social identity contingencies, the authors then explain how they understand these contingencies. The authors share some statistics about how African Americans are currently performing worse than other races in science classes based on standardized test scores. Also, according to their stats, Black students are unlikely to participate in science (Biology, Physics, Chemistry) classes in high school. The authors share this data about Black students’ high school experiences because they believe it highly impacts whether they pursue science majors in college. Statistics are shared that support that students need positive experiences in high school to pursue science in college. Once in college, the authors share stats that most Black students are not pursuing science majors (only 3% are pursuing science majors). Next, they start explaining some of the possible reasons this could be happening. The authors in their explanation, share a stat that most Black science majors are attending HBCU’s (Historically Black College or University). The authors believe that this shows that Black students are more likely to pursue a degree in science when social identity contingency is not as strong. Social identity contingency will not be as strong for Black students attending HBCU’s compared to those attending PWI’s (predominately white institutions). Next, the researchers go over their theoretical framework which touches on a variety of articles that talk about African American experiences in science. They take on a few different lenses in this study which are: Microaggressions, Achievement Ideology, Communities of Practice, and Oppositional Identity. The researchers wanted to do a deep dive into the literature on this subject to help interpret the results of their study. They will use one of these lenses to help best explain the differences between African American science students and those who ended up with a career in a STEM field. Next in the methods section, the authors describe the survey they created. This study is considered mixed methods because the survey has Likert scale questions (quantitative analysis) and open-ended questions (qualitative analysis). For analysis quantitively researchers used Principal Component Analysis and qualitatively they used a 4-part process where they identified themes and checked them using peer review. In the findings section we discover that the quantitative analysis could not be done to the highest degree because the survey was still in its development stages. The authors admit that more work needs to be done on the survey after these initial results. When looking at ANOVA results, two measures had a statistically significant difference between our two groups (student vs scientists). The two measures were Alignment (alignment to your community) and Microaggressions. Scientists reported higher levels of microaggressions than students did. The students had a higher level of Alignment than the scientists. Researchers concluded that there maybe an inverse relationship between Alignment and Microaggressions. Next, the authors went through the open-ended responses and how participants responded to questions related to Alignment and Microaggressions. Often, in the Alignment questions, students and scientists explained some of there misalignments to the science community. For microaggressions, students and scientists talked about some of the racist comments they received through their science experiences. Even though the groups had different levels for each of these measures all expressed being adversely affected by both categories showing the prevalence of othering within the science community. Lastly, analyzing responses in this way allowed researchers to aggregate the data more. For example, they found Black women talking more about their oppressions of being a woman of color in science rather than just focusing on race. In the conclusion, the authors make the point again that whether you are a student or scientist, Black people have felt a lack of Alignment and Microaggressions from those within the science community. They found that the scientists were more likely to provide reasons, such as meritocracy, as ways to overcome the racial biases in the science community. Students were less likely to be able to provide ways in which they overcame racial biases. This was seen as a reason that scientists were able to make it through their degree and find a job in STEM.

Social identity contingencies - The challenges individuals face because of widely held stereotypes about their social group (race, ethnicity, gender, etc.)

Microaggressions – subtle forms of racism usually transpiring in situations of racial and cultural differences