

STEREOTYPE THREAT SUSCEPTIBILITY FOR AFRICAN-AMERICAN STUDENTS FROM VARIOUS REARING ENVIRONMENTS

An Undergraduate Research Scholars Thesis

by

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ABSTRACT

Stereotype Threat Susceptibility for African-American Students from Various Rearing Environments

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Understanding the variation in performance amongst African-American students on academic aptitude tests has been a hard-pressed task for a while. Despite stereotype threat becoming more documented in relation to academic aptitude tests as an explanation for such variation across racial lines (Steele and Aronson 1995), the source of racial differences in intellectual ability has not been agreed upon in the literature, and there has been some evidence that environments can affect intellectual ability (Kaplan 2015, Sesardic 2010). This study tests for differentiated effects of negative stereotypes dependent upon the environment in which African-American subjects grew up, including SES and racial composition as predicted by (Johnson Richeson Finkel, 2011). These results will help to better understand the mechanism(s) by which the threat caused by stereotypes affect the performance of African-American students on intellectual ability tests.

ACKNOWLEDGEMENTS

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SECTION I

INTRODUCTION

Differences in the educational aptitude test performance of African-Americans relative to their White counterparts has been well documented. Steele and Aronson (1995) found that stereotype threat was a major factor in underperformance by African-Americans. They describe stereotype threat as “the risk of confirming negative stereotypes about an individual’s group identity as a response to cues in the environment.” In particular, the test scores of African-Americans are depressed when environmental cues (primes) induce the idea of an inability to perform on such tests by confirming the negative stereotype that African-Americans have lower academic abilities than their White counterparts (Steele and Aronson, 1995). However, there has been some work done on discovering differentiated stereotype threat effects for African-Americans (Harrison, 2006). Particularly, work has been done in regards to SES and how it affects the performance of African-American students. Harrison (2006) showed that there was increased test anxiety for individuals of lower SES regardless of race. This could make African-American students of lower SES more susceptible to stereotype threat and thus experience lower performance on educational aptitude tests.

Separately, Croizet and Claire (1998) studied stereotype threat amongst individuals of different SES. Croizet and Claire (1998) found that stereotype threat was the main culprit for the difference in performance on some intellectual tasks for individuals of different SES. It is worth noting, however, that this study was not performed with African-American individuals.

Furthermore, individuals who are from certain backgrounds may respond more strongly to the environmental cues that induce stereotype threat than their counterparts (Pinel, 1999). It is

reasonable to think that lower SES individuals may respond more negatively to stereotypes than their higher SES counterparts. For example, Johnson, Richeson, and Finkel (2011) found that individuals with lower SES thought they were less competent academically than their wealthier counterparts. These findings further illuminate how low SES individuals might see themselves in a worse light and thereby be inclined to perform worse on particular academic tasks than individuals of higher SES.

Most research on stereotype threat has viewed the effects for an entire group. Pinel (1999), however, showed that there may be differences in how individuals within a certain group respond to stereotype threat. She stated that this could be shown by how aware an individual is of his or her stigmatized status, i.e. stigma consciousness. On a math test, women with high stigma consciousness performed worse than women with low stigma consciousness (Brown and Pinel, 2003). We may see a similar trend for African-American students with their stigmatized status on verbal ability. Is it possible that African-Americans of low SES have higher stigma consciousness than African-Americans of higher SES? In turn, would this indicate that those individuals also have a higher susceptibility to stereotype threat?

Environmental factors have been shown to play a major role in differences in various educational outcomes (Mckay et al., 2003). Stereotype threat seems to be a significant factor in those differences, particularly for stigmatized groups (Croizet and Claire, 1998). Another key factor to keep in mind is the SES of an individual's peer group. There is no question that the environments in which individuals grow up play a huge role in their development. Even if an individual is a member of a family of high SES, his or her environment could be of lower SES. For adolescents and even college students, a considerable amount of time is spent at school amongst peers. There is convincing evidence that peer groups have an important effect on an individual's actions

(Bankston and Caldas, 1996). Much young adult behavior may be attributed to the peer group with which a person is most familiar. Furthermore, this study will examine whether African-American students who had peer groups that were predominantly black are more or less susceptible to the effects of stereotype threat. My hypothesis is that primed individuals will experience stereotype threat more intensely if their peer groups during their formative years are associated with being predominantly black. More specifically, I will explore the rearing environments that subjects experienced growing up in order to examine whether that will cause a differentiated effect from the stereotype.

SECTION II

METHODOLOGY

The larger project, led by Dr. Catherine Eckel, conducted experiments at both Texas A&M University and Prairie View A&M University (PVAMU), where half of the participants at each location were primed with survey questions and test instructions that reinforce negative stereotypes. Based on previous research, we expected these primes to lower performance on GRE test questions (Steele and Aronson, 1995). After priming, all participants were given 25 minutes to answer a set of GRE verbal questions followed by a short survey to collect demographic data. My portion uses the PVAMU data collected from this experiment in order to examine the differences in stereotype threat for different socioeconomic environments.

The PVAMU data was collected in two separate sessions in October 2016. Between the two classes there were 71 African-American students in total. There were a few more students in the class, but since they were not African-American their results were dropped from my analysis. Ultimately, the control group consisted of 38 subjects and the treatment group had 33 subjects.

I use self-reported data from subjects about their respective childhood environments. This data consists of information indicating the socioeconomic environment in which the subjects grew up. There are a number of demographic measures that make up the rearing environment, including SES and race. These factors should be able to indicate the extent to which subjects are exposed to the stereotype of African-American's inferior abilities. Some of the environmental factors that we collected in our survey was the percentage of African-Americans in subjects' neighborhoods, demographics of students in his/her high school, and family income. The questions I will focus on

use the demographics of the subjects' high school and neighborhood environment to give us some idea of the peer groups by which they were surrounded during their formative years.

For this study, I am particularly interested in both the subjects' score and accuracy on the test, where the ratio of the number of questions correct to the total number of questions is the score, and the ratio of the number of questions correct to the total number attempted is the accuracy. Using such measures will allow me to examine the differences, if there are any, in predominantly black rearing environments' population in their response to the stereotype-threat primes.

I will first examine the overall stereotype threat effect due to the priming of the treatment group. This will be completed doing a simple treatment and control comparison. Next, I will examine if there are any differences in stereotype threat based off of the peer group associated with each subject. To do this I will use a difference-in-difference model that resembles the following equations:

$$(1) \quad \mathbf{Score} = \alpha + \beta * \mathbf{Treat} + \gamma * \mathbf{Envir} + \delta * (\mathbf{Treat} \times \mathbf{Envir}) + \varepsilon$$

$$(2) \quad \mathbf{Accuracy} = \alpha + \beta * \mathbf{Treat} + \gamma * \mathbf{Envir} + \delta * (\mathbf{Treat} \times \mathbf{Envir}) + \varepsilon$$

Where the *Score* and *Accuracy* variables are the measures I used to look at each subject's performance. The *Treat* variable is an indicator variable which states whether or not the individual was primed. The *Envir* variable is an indicator variable stating whether the individual grew up in a predominantly black environment. The *Treat * Envir* variable is an interaction term of the two which captures the difference in the stereotype threat of interest.

SECTION III

RESULTS

As mentioned previously, the control group consisted of 38 subjects and the treatment group consisted of 33 subjects. There were no significant differences between characteristics of the treatment and control groups (see Appendix). Therefore, a simple treatment and control comparison will suffice for my general analysis.

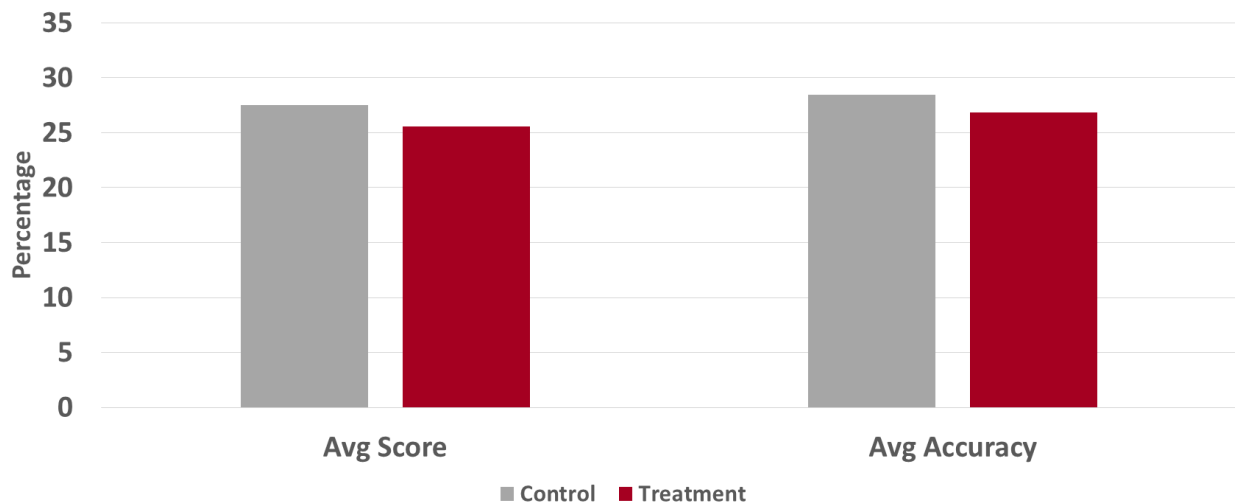


Figure 1. Bar graph showing the difference in scores/accuracy for treatment and control group.

The first interesting thing to note is that general stereotype threat effect seems to not be prevalent between primed and unprimed subjects. After running a t-test, the differences in average score and accuracy are not statistically significant.

Proceeding further, I break down all of the individuals based on their rearing environment being “predominantly black” or “non-predominantly black”. I used three different measures for the rearing environment. First, I study the effects of a student going to a predominantly black school. Next, I study the effects of having classes with mostly black students. At first glance it seems that these two variables are quite similar; however, it is definitely possible for a subject to have went

to a predominantly black high school yet only take classes that are not predominantly black or *vice versa*. This was the case for 7% of the PVAMU sample. Therefore looking at both makes sure to capture any of these possible scenarios. Lastly, I study the effects of having a predominantly black neighborhood.

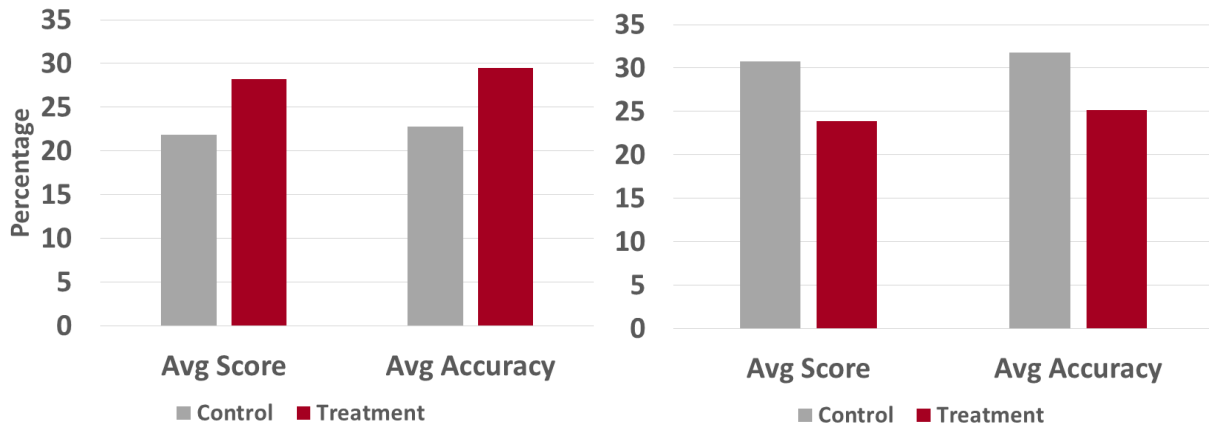


Figure 2. Treatment/Control Comparison for Predominantly Black HS (left) and Non-Predominantly Black HS (right).

Individuals that were primed for stereotype threat from predominantly black high schools outperformed their unprimed counterparts. This is not what would be expected based on past literature. For non-predominantly black high schools we see the primed individuals underperform the control group as expected. In neither case are the treatment differences within a high-school type statistically significant using t-tests.

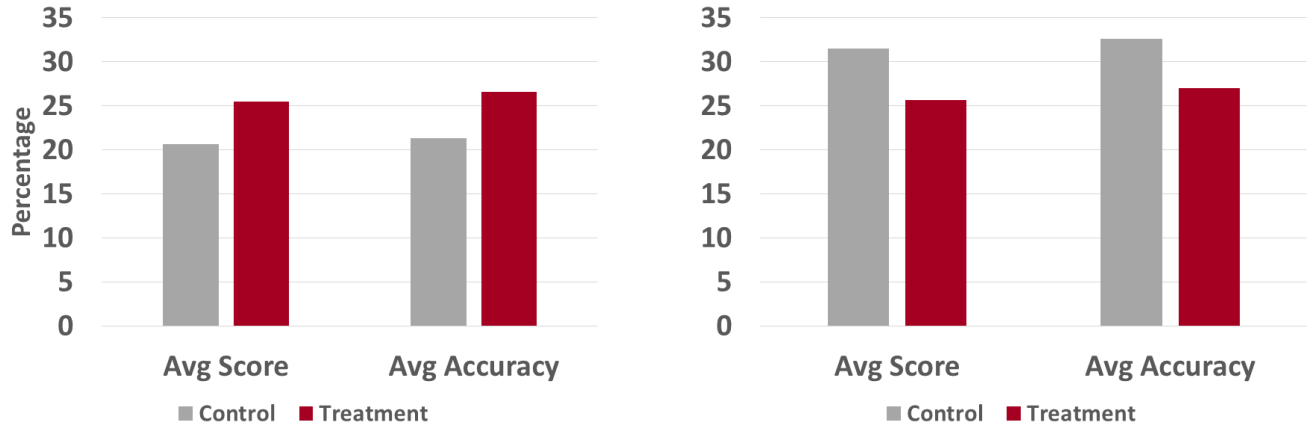


Figure 3. Treatment/Control Comparison for Predominantly Black Classes (left) and Non-Predominantly Black Classes (right).

While looking at predominantly black classes, there is a similar trend to that of predominantly black high schools. Individuals that were primed for stereotype threat from predominantly black classes outperformed their unprimed counterparts. On the contrary, primed individuals from non-predominantly black classes underperform the control group as expected. Again, in neither case are the differences statistically significant using t-tests.

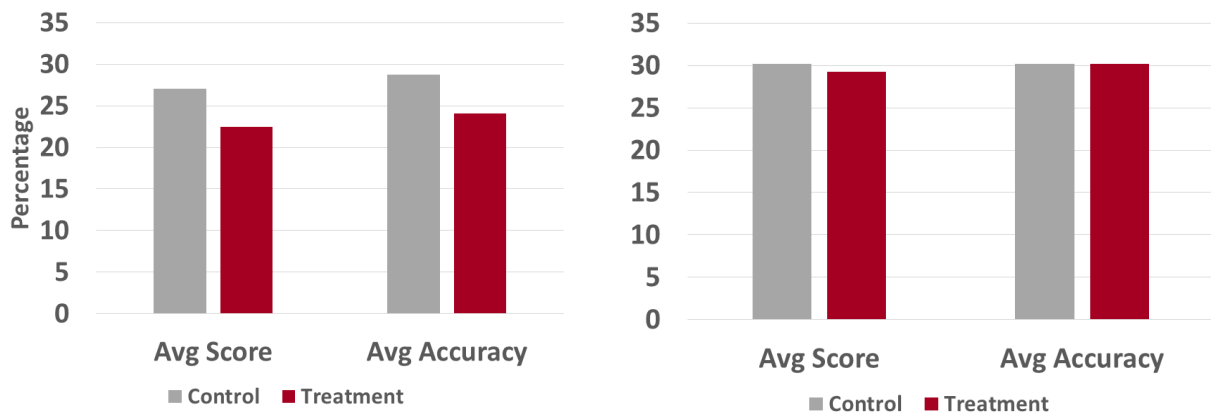


Figure 4. Treatment/Control Comparison for Predominantly Black Neighborhoods (left) and Non-Predominantly Black Neighborhoods (right).

When looking at predominantly black neighborhoods as an indicator of rearing environment, there is a change in the pattern. Now primed individuals from predominantly black neighborhoods

underperform the control group slightly. There is virtually no difference between test results for non-predominantly black neighborhoods. There was no statistically significant differences in either case.

In all three cases, there was no evidence of statistically significant differences between the treatment and control groups. However, I am interested in the difference in the stereotype threat and not the stereotype threat itself. Therefore, I performed a difference-in-difference as stated previously which yielded the following results:

VARIABLES	(1) Predominantly Black HS	(2) Predominantly Black Class	(3) Predominantly Black Neighborhood
Treatment	-6.898 (4.351)	-5.820 (4.678)	2.894 (5.189)
Black School	-8.962* (5.312)		
Treatment x Black School	13.28** (6.767)		
Black Class		-10.85** (4.952)	
Treatment x Black Class		10.65* (6.258)	
Black Neighborhood			-1.105 (5.167)
Treatment x Black Neighborhood			-7.427 (6.947)
Constant	30.79*** (3.518)	31.48*** (3.656)	28.13*** (2.924)
Observations	71	71	71
R-squared	0.062	0.075	0.043

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Figure 5. Diff-in-Diff Regression Results Table for “Score” variable based off of “Envir” variable.

The difference-in-difference regression yields some significant results. In the first model, the insignificant coefficient on “Treatment” shows that there is not a significant main effect of the treatment for the full sample. The negative, significant coefficient on “Black School” indicates that students from predominantly black schools have lower levels of achievement on the test overall. However, most notably, the positive, significant coefficient on the interaction between Treatment and Black School indicates that there is a positive difference in stereotype threat for individuals from predominantly black schools than from non-predominantly black schools. Students from black high schools respond positively to the stereotype-threat treatment, relative to students from the mixed schools.

The second model follows a similar pattern as the first model. The coefficient associated with treatment is once again insignificant, indicating no main treatment effect for the entire sample. The negative coefficient for “Black Class” is significant which suggests that subjects who were in classes with majority black students also have lower test scores overall. Furthermore, there is a significant, positive coefficient on the interaction between Treatment and Black Class, thereby suggesting a positive difference in stereotype threat for individuals from classes with majority black students as compared to individuals from classes that do not consist of majority black students.

The third model yields completely different results from the other two models. Again, there is no significant main treatment effect. The negative coefficient associated with students who are from majority black neighborhoods is also insignificant. Therefore, there is no difference in scores between individuals from predominantly black neighborhoods and non-predominantly black neighborhoods. Lastly, the negative coefficient associated with the interaction between Treatment

and Black Neighborhood is insignificant. Hence, there is no difference in response to stereotype threat by students from black neighborhoods relative to non-black neighborhoods.

The results discussed were for the subjects' scores. The results for accuracy were nearly identical, so to not be redundant, those results can be seen in the appendix below.

SECTION IV

CONCLUSION

The study yields some interesting, significant results relating to stereotype threat susceptibility. Individuals from predominantly black schools and classes are less vulnerable to stereotype threat than individuals from non-predominantly black schools. Indeed, their response to the experimental treatment is positive rather than negative. There are many possible reasons why this may be the case. It is possible that individuals from predominantly black schools or classes are less familiar with the stereotype due to being surrounded by peers like themselves. In other words, they have less exposure to the stereotype, thus a lower stigma consciousness and a smaller stereotype threat effect as found by (Pinel, 1999). On the flip side, the experience of being in a lower-status minority may be what triggers anxiety about confirming negative stereotypes by one's performance. Although based on this particular study, none of these theories can necessarily be confirmed.

Nonetheless, these results suggest that there are other effects to explore as it pertains to integration efforts for schools. When we push for integration we are benefitting African-American students in some respects, but there are some negative aspects associated with it as well. On the one hand attending a predominantly black school reduces performance on the test, but on the other hand it reduces – or indeed reverses – the effect of stereotype threat. The counter-intuitiveness of these results also seems to suggest that “separate, but equal” schools may be a viable alternative to integrated schools.

These results also help show that stereotype threat is not always the same for an entire group. Therefore it may be necessary to explore the heterogeneity of stereotype threat between other minority groups in future studies.

Future studies could also look at how stereotype threat susceptibility affects outcomes later in life by doing an observational study of subjects over time. For example, are these individuals from predominantly black environments always less susceptible to stereotype threat or does it change if they attend a PWI for higher education and vice versa? Seeing how these individuals would react to these changes could give some indicator as to whether stereotype threat susceptibility can be influenced throughout their lives. And if there is some indication that stereotype threat susceptibility can be influenced, that may open the door to find ways to mitigate the effects of stereotype threat in the long run and improve educational outcomes for African-American students.

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APPENDIX

	CONTROL (N=38)	TREATMENT (N=33)
AVG AGE	19.81	20.00
AVG YEAR (GRADE LEVEL)	1.97	2.53
AVG MOM EDUC	5.91	5.71
AVG DAD EDUC	4.41	4.65
PERCENTAGE OF FEMALES	0.58	0.45
AVG GPA	3.24	3.23
PERCENTAGE PREDOMINANTLY BLACK SCHOOL	0.37	0.39
PERCENTAGE PREDOMINANTLY BLACK CLASSES	0.37	0.36
PERCENTAGE MAJORITY BLACK NEIGHBORHOOD	0.58	0.64

Figure 1. Characteristics of Treatment and Control Groups

Note: None of the differences were significant

VARIABLES	(1) Predominantly Black HS	(2) Predominantly Black Class	(3) Predominantly Black Neighborhood
Treatment	-6.632 (4.441)	-5.610 (4.800)	3.674 (5.143)
Black School	-9.015 (5.463)		
Treatment x Black School	13.34* (7.006)		
Black Class		-11.27** (5.029)	
Treatment x Black Class		10.86* (6.450)	
Black Neighborhood			0.564 (5.289)
Treatment x Black Neighborhood			-8.348 (7.080)
Constant	31.79*** (3.626)	32.62*** (3.790)	28.15*** (2.914)
Observations	71	71	71
R-squared	0.058	0.075	0.033

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 2. Diff-in-Diff Regression Results Table for “Accuracy” variable based off of “Envir” variable.