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## **Race, Socioeconomic Status, and Implicit Bias: Implications for Closing the Achievement Gap**

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RACE, SOCIOECONOMIC STATUS, AND IMPLICIT BIAS: IMPLICATIONS FOR  
CLOSING THE ACHIEVEMENT GAP

by

Elizabeth Aurette Cox Schlosser

A Dissertation  
Submitted to the Graduate School,  
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December 2017

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by Elizabeth Aretta Cox Schlosser

December 2017

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## ABSTRACT

### RACE, SOCIOECONOMIC STATUS, AND IMPLICIT BIAS: IMPLICATIONS FOR CLOSING THE ACHIEVEMENT GAP

by Elizabeth Aurette Cox Schlosser

This study accessed the relationship between race, socioeconomic status, age and the race implicit bias held by middle and high school science teachers in Mobile and Baldwin County Public School Systems. Seventy-nine participants were administered the race Implicit Association Test (race IAT), created by Greenwald, A. G., Nosek, B. A., & Banaji, M. R., (2003) and a demographic survey. Quantitative analysis using analysis of variances, ANOVA and t-tests were used in this study. An ANOVA was performed comparing the race IAT scores of African American science teachers and their Caucasian counterparts. A statically significant difference was found ( $F = .456, p = .01$ ). An ANOVA was also performed using the race IAT scores comparing the age of the participants; the analysis yielded no statistical difference based on age. A t-test was performed comparing the race IAT scores of African American teachers who taught at either Title I or non-Title I schools; no statistical difference was found between groups ( $t = -17.985, p < .001$ ). A t-test was also performed comparing the race IAT scores of Caucasian teachers who taught at either Title I or non-Title I schools; a statistically significant difference was found between groups ( $t = 2.44, p > .001$ ). This research examines the implications for the achievement gap among African American and Caucasian students in science.

## ACKNOWLEDGMENTS

I would like to express my deepest appreciation to Dr. Sherry Herron, my mentor and committee chair. She is an advocate for her students, and I am fortunate to have performed my graduate work under her guidance. I thank the members of my committee for all of their contributions: Dr. Richard Mohn, Dr. Christopher Sirola, and Dr. Kathrine Malone. Their excellence in their fields has left a lasting impression on my life. I am grateful that I was able to have such experiences and opportunity.

I would also like to thank my family for listening to me and providing me with the support that I needed.

Finally, “Thank you,” Dr. Joseph Holloway & Melvina Holloway: simply put “you know”.

## DEDICATION

### *Father*

I dedicate this dissertation to my father Lt. Col. Norman G. Cox who passed away before the completion of this project; you fought a good fight. You were a courageous man, you never complained; you remained positive and unyielding in your faith to the very end. Dad, you helped me in so many ways. I would not have gotten to this point without you. You never sugar-coated the truth, and for that I am grateful. I will always remember your brilliance, your humility, your sense of humanity, and it is my hope that the light that burned in you shall not be extinguished as this work is inspired by you and will be a record of your legacy. Father, we have a bond that neither time nor distance can break. I love you dad!

### *Mom*

Mom, you were the best role model that a girl could have. You taught me the importance of having an education and the power of perseverance. I have learned not to give up, to do my best, that sacrifice shapes character, and the results of such accomplishments are ones in which I can be proud of.

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## CHAPTER I

### INTRODUCTION

This study measured implicit bias as it relates to middle and high school science teachers in the Mobile and Baldwin County Public School systems. The Mobile County Public School System, the largest public school system in the state of Alabama, employs approximately eight thousand personnel, of which over 100 are middle and high school science instructors. The Baldwin County Public System is the largest employer within Baldwin County with over 3,600 personnel. Baldwin County is the home of the oldest school in the state built in 1799. Baldwin County lies in the southwest corner of Alabama while Mobile County is located adjacent in the southeast region of the state. Both counties border Mobile Bay and the Gulf of Mexico. This study focused on middle and high school science teachers within selected schools using the race Implicit Association Test (IAT) as developed by Tony Greenwald from the University of Washington, Mahzarin Banajii from Harvard University, and Brian Nosek from the University of Virginia, as well as evaluated the socioeconomic status or median household income of the students at the selected schools. This study distinguished between explicit and implicit biases as well as addressed implicit bias as it pertained to various court cases, including affective experiences such as teacher expectations, cultural, and socioeconomic status.

According to educational studies conducted in America, implicit bias has been found in the instruction of students in the United States. Implicit bias refers to the attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner (Staats, 2015). These biases, which encompass both favorable and unfavorable assessments, are activated involuntarily and without an individual's awareness or intentional control (Blair, 2002; Rudman, 2004). For instance, someone

may have an overall positive view of African Americans but may still associate them with weapons. There are some who may have a positive stereotype of Asian Americans having high math aptitude but also abhor negative thoughts toward them according to Kang, Bennett, Carbado, Casey, Dasgupta, Faigman, Godsil, Greenwald, Levinson, & Mnookin (2010, p. 1129). American children are *explicitly* taught about the ideals of a free country that welcome immigrants, yet are consistently exposed to anti-immigration views. Research has shown that children's thoughts and rational are influenced by social norms and exposure (Brown, Mistry, & Bigler, 2007).

According to Chistia Brown from University of Kentucky, when American children and adults were surveyed as to whether people from other countries should be allowed to move here, there was no significant differences in response from both adults and children. The same participants were asked the question “why” people should be allowed to move to America from other countries? The overall responses given were similar in that America was referenced as being a free country or made an *implicit* reference to the ideals of freedom (Brown, 2011). However, the distinction became clear when the question asked, who is a “true” American? “Specifically, although all group members were described as being born in the U.S., White European American children in this sample considered White Americans to be “more American” than Black Americans, who were in turn “more American” than Asian Americans, who were in turn “more American” than Latino Americans (Brown, 2011). Symbolic attitudes are mental predispositions or “emotional lenses” that determine how we respond to relevant social and cultural phenomena (Rudd, 2014). These associations are generally believed to develop over the course of a lifetime beginning at a very early age through exposure to direct and indirect messages

(Castelli, Zogmaister, & Tomelleri, 2009; Kang, 2012). Implicit biases allow people to make connections to other groups based on fear or negative stereotyping. In addition to early life experiences, media and news programming are often cited as origins of implicit associations (Castelli, Zogmaister, & Tomelleri, 2009; Kang, 2012). Dasgupta (2013) wrote that exposure to commonly held attitudes about social groups permeate our minds even without our active consent through “hearsay, media exposure, and by passive observation of who occupies valued roles and devalued roles in the community” (p. 237).

Bias is defined as, “prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair” (New Oxford American Dictionary, 2001). Although many different types of biases have been identified by researchers, this study will address the following specific categories of biases: research bias, cognitive bias, social bias, congruence bias, and confirmation bias (Psychwiki.com, 2010). There are several types of bias that fall under the category of cognitive including confirmation bias, negative bias, gender bias, anchoring bias, memory bias, overconfidence effect, positive outcome bias, optimism bias, and attentional bias (Psychwiki.com, 2010). The Association for Qualitative Research defines *research bias* as technically meaning that a systematic error, where a particular research finding deviates from “true” findings. Research bias, also referred to as experimenter bias, is a process where scientists performing research influence the results in order to portray a certain outcome (Shuttleworth, 2009).

Cognitive bias as defined by Mathews and Macleod (2002) is a bias that draws on links between automatic thoughts, interpretive bias, and the tendency to draw negative interpretations from vague information that causes symptoms of anxiety in adults. Unlike *cognitive bias*, which is conceptualized as automatic (Wilson, Lindsey

& Schooler, 2001), *social bias* is defined as the existence of prejudiced situations prior to any actual act that can be defined as discrimination. Social bias may include several categories: actor-observer bias, hindsight bias, egocentric bias, notational bias, outgroup homogeneity bias, projection bias, self-serving bias, trait ascription bias, cultural bias, and correspondence bias (Psychwiki.com, 2010). The general consensus has been that in order for people to have a social cognitive bias, it had to be explicit. *Explicit bias* can be described as a sort of overt discrimination such as sexism, racism and other biases that have become less prominent and public over the past century but none the less still persist according to Kang & Lane (2010). *Explicit bias* receives an enormous amount of attention from judges, academics, and policymakers (Kang, Bennett, Carbado, Casey, Dasgupta, Faigman, Greenwald, Levinson, & Mnookin, 2010). According to Kang and Lane (2010), this sort of behavior is considered to be a conscious act of will, a deliberate decision made by an individual to openly practice discrimination against a group. With *confirmation bias*, we tend to remember and pay more attention to information that confirms our preexisting beliefs (Barkow, Cosmides & Tooby, 1995). Lastly, *congruence bias* is similar to confirmation bias in that it is based on people's trustful dependence when directly testing a given hypothesis and neglecting indirect testing (Encyclo.com.uk, 2014). In other words, it occurs when people do not consider alternate solutions to problems and go with their first instinct. According to The Kirwan Institute (2014), *implicit bias* is also known as *implicit social cognition bias*. Implicit bias refers to the attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner. There is a widely held belief by many researchers that implicit racial bias is fueled by “symbolic” attitudes that we all develop over the course of our lives starting at a very early age (Rudd, 2014).

The main purpose of this research is to focus on how implicit bias may be impacting science educators. Recently, the widening of the student achievement gap has raised concern and placed greater demands on the educational community to increase the quality of education in an effort to narrow the achievement gap. High-stakes-standardized testing required by Federal laws indicates that the scientific achievement gap between blacks and whites is narrowing in elementary and middle school. However, the gap between black and white high school students in science remains unchanged. It is essential that the causes which create this gap are identified so that corrective actions may be taken.

This paper hypothesized that implicit bias has an impact on student achievement. Furthermore, this study explored implicit bias in the Mobile and Baldwin County Public School systems as it pertained to race, age, and socioeconomic status of the students or the median household income of the students the teacher teaches. Socioeconomic status is commonly conceptualized as the social standing or class of an individual or group. Socioeconomic statuses often reveal inequities in access to resources as well as issues related to privilege, power and control. This study also examined barriers that block lower socioeconomic status families from accessing resources that could possibly narrow the achievement gap that exists between the rich and the poor. Investigated was the extent to which socioeconomic status of students and the race of teachers within Mobile and Baldwin County Public School systems determined the measure of race implicit bias and as to whether such factors predominate the teaching culture, shedding light on reasons why the gap in student achievement in science exists. Discussed is the degree in which teacher bias exists in Mobile and Baldwin counties schools and how race implicit bias

scores related to the teachers' race and age. Additionally, this paper explored how this bias influences student achievement.

*Statement of the problem (Purpose)*

The American science teacher plays an important role in the cognitive development of the systemized knowledge derived from observation and study. Nationally, there has been an increased demand for a work force that is science, technology, engineering and mathematics (STEM) ready. Nowhere else have these demands been heard more than by science and mathematics educators. For this reason, math and science teachers serve a crucial role in motivating and navigating students into STEM career paths. The instruction given by science teachers is not only instrumental to their career choices but also pivotal to a students' understanding of science and the way that the world works around them. The pedagogical practices employed by science teachers are extremely influential and can be used as a measurement by which teachers are assessed and evaluated. Test instruments, such as standardized exams or national examination, are valid tools for such assessments.

According to literature there is growing concern over the impact that implicit biases have on American culture at large. Researchers Ebaegu and Stephens (2014) explored the reasons why Japanese lesson study would fail to work in the United States. One reason cited by the authors was because of cultural differences between the two countries. Although cultural bias and cross-cultural research has been conducted on science teachers, the exploration of unconscious or race implicit bias and the relationship that it has on teachers' pedagogical beliefs have not been evaluated. This research project also addressed some of these concerns.



### *Research Questions and Hypothesis*

Prior studies have provided a limited understanding of race implicit bias in terms of the entire landscape encompassing the culture of American schools. Previous race IAT studies have been solely conducted on school administrators. In 1991 three scientists, Tony Greenwald (University of Washington), Mahzarin Banajii (Harvard University), and Brian Nosek (University of Virginia) developed the race Implicit Association Test (race IAT), an assessment test that measures race implicit bias. The researchers examined the cultural trends of American middle and high school science teachers in order to determine if there is a relationship between the race implicit bias elicited and the teaching practices employed. Using the race Implicit Association Test (race IAT) as a test instrument in this study, the researcher wants to clarify if there is a relationship between the race implicit biases of the science instructors based on their race, age, and the median household income of the students that attend the school in which the teacher is employed.

Specific Research Question: Does the race of the teacher determine the race implicit bias score? Research Hypothesis I: Teachers of the same race will have similar scores on the race IAT.

Specific Research Question: Does age determine the race implicit bias score observed in teachers?

Research Hypothesis II: Younger science teachers will have lower race IAT scores (less bias) than older science teachers.

Specific Research Question: Is there a relationship between the race implicit bias of the teacher and the socioeconomic status of the science teachers' students?

Research Hypothesis III: Teachers with high race IAT scores (preferences towards Caucasians) will have students with similar socioeconomic backgrounds as defined by teaching in Title I schools.

### *Significance*

The purpose of this research was to explore whether race implicit bias was a culturally adopted way of thinking that was influenced by race, age, and socioeconomic standing. Primarily studies have focused on the theoretical consciences of teachers as a whole. No previous studies had been conducted in the Mobile or Baldwin County School systems on race implicit bias. There is growing information in literature regarding the degree to which race implicit bias exists among Americans, and in recent decades, the race Implicit Association Test (race IAT) has become a widely accepted test instrument in which to measure this bias (Gawronski & Payne, 2010). For American science teachers, this factor may show a connection between the race implicit bias observed and the socioeconomic status of students. This in turn could provide necessary information that can be used to make changes to pedagogical practices that have largely been ineffective.

What this research sought to accomplish is an awareness of race implicit bias and the impact it has on the teaching beliefs of science teachers. Similar studies have yielded an increased understanding of teacher-student relationships enhancing the overall dynamic of education in the United States of America. Perhaps this research will encourage healthy discussions, enlighten, and foster effective modes of communication by which to navigate the delicate and touchy subject of race implicit bias awareness among teachers. The results from this research may provide answers to the best pedagogical practices teachers should adopt in creating an equitable classroom environment and an atmosphere of genuine respect for all students.

Additionally, this study may provide the much needed answers on how to close the achievement gap in science for African Americans.

### *Definitions of Terms*

*Bias* - is defined as, “prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair” (The New Oxford American Dictionary, 2001).

*Implicit bias* - is unconscious awareness that effects judgment, decisions, and behavior resulting from indirect cognitive processes (e.g., implicit attitudes and implicit stereotypes) that operate well below conscious awareness and without intentional control. Implicit attitudes and stereotypes responsible for implicit bias are those beliefs or simple associations that a person makes between an object and its evaluation that “are automatically activated by the mere presence (actual or symbolic) of the attitude object” (Dovidio, Gaertner, Kawakami, & Hudson, 2002).

*Explicit bias* - is deliberate thinking that members of a group behave the same way and is a characteristic of a particular group. This sort of thought process is under conscious control (Dovidio, 2011).

*Race implicit bias* – is unconscious negative bias in judgement of African Americans (Kirwan Institute, 2014).

*Cultural bias* – it is the belief held by teachers and administrators that European and North American culture is a superior way of teaching deliberately discriminating against those cultures that do not reflect such attitudes (Vygotsky, 1978).

*Confirmation bias* - involves being in support of communication which authenticates previously accepted values or biases. For example, people who support

or oppose a particular issue will not only seek information to support it, “they will also interpret news stories in a way that upholds their existing ideas.” (Cherry, 2017)

### *Assumptions*

Through participation in this study, the researcher presumes that participants will answer all the questions on the survey. Assumed is that the instruments being used were able to measure implicit bias. Therefore, it is assumed that the participants would be forthcoming and honest in answering questions using the race Implicit Association Test (IAT). Participants from the study are all full-time public school teachers who are varied in age, race, and number of years of experience. Archival information on the median household income was gathered by reviewing the most current information available on The Alabama Department of Education’s website. Median household incomes of the families of students that attend schools within Mobile County will be determined by collecting data on the percentage of students who received free or reduced lunch during the 2014/2015 academic school year. However, since that time, current policy has changed for students who receive free and reduced lunch, with an effective date of fall 2015 - spring 2016 academic school year. All students currently receive free lunch regardless of their median house-hold income. However, school districting has remained consistent over the past 15 years. It is assumed that the population demographics of the students who attend public schools within Mobile County have not changed within the year.

### *Delimitations*

The results of this study are delimited to middle and high school science educators in the Mobile County Public School System. Teachers who participate in this study came from various branches of science which include biology, chemistry, physics, earth science, and astronomy. The teachers who participate in this study are

from various public schools within the school system and were not equally distributed by teacher experience or by gender, race, or age.

*Limitations and Discussion*

The teachers who were selected for this research were middle and high school science instructors from various Mobile and Baldwin County Public schools.

Teachers were chosen who taught science; not on the basis of the level of the science taught. Only selected middle and high public school teachers in Mobile County were surveyed during the fall 2016 through the spring 2017 academic school year.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### *Introduction*

The widening of the student achievement gap has raised concerns and placed greater demands on the educational community to increase the quality of education. In the high-stakes-standardized testing required by Federal laws, the achievement gap remains unchanged between twelfth grade African Americans and White Americans. The International Mathematics and Science Study (TIMSS), which assesses the science and mathematics skills of students from 60 different countries internationally, is administered every four years (Brown & Brown, 2007). TIMSS results from the past five assessments indicate that Japanese students continue to outperform American students in mathematics and science.

Unlike Japan, the United States is a melting pot nation made up of many different races with diverse cultures and varying backgrounds. The majority of people who inhabit the Island of Japan are Japanese. There is little or no difference among the ethnic groups that exist within the Japanese population, and as a result, very little cultural differences exists (Bester & Hardacre, 2004). One suggestion made by researchers to close the gap between American students and their Japanese counterparts was to copy and implement the pedagogy of math instruction utilized by Japanese teachers (Stigler & Hiebert, 2004). Although changes to legislation were made in an effort to improve the mathematics curriculum with the excellence movement during the late 1980's and early 1990's in California public schools, it was met with little success in closing the standing achievement gap between Japanese and American students (Clarke, 2003). This may be explained by research conducted by Ebaegu and Stephens (2014) which indicated that by importing the mathematics

teaching methods of the Japanese school system, the United States public schools would also have to import the Japanese culture in order to be successful. In other words, it was determined that cultural differences between the two countries were at the heart of the problem.

Cultural bias has been identified in all facets of American public school curricula, standardized tests, and is a common practice that is implemented by school teachers and administrators according to Boykin, Tyler, & Miller (2005). Perhaps the reasons for such biases lie beyond the realm of our conscious control. According to researcher Dr. Jerry Kang of UCLA School of Law Professor, implicit biases come from movies, books, other people, stories, media and from culture (Bourgeois, 2012). Dr. Banaji suggests bias is like a thumbprint on our minds. Humans are innately able to associate between two things quickly. According to Dr. Banaji “what we teach ourselves, what we choose to associate is up to us” (Hill, Cobert, & Rose, 2010, p.78). Dr. Banaji suggests that everyone holds implicit biases which are unconscious prejudices. Perhaps these influences are so great and /or unrecognizable that we fail to identify them for what they really are. In recent decades, attention has been drawn to the role that cultural bias has on cognitive development (Boykin & Ellison, 1995).

As convincing research evidence accumulates, it becomes difficult to understate the importance of considering the role of implicit racial biases when analyzing societal inequities (Kang, Carbado, Casey, Dasgupta, Faigman, et al., 2012). Perhaps people are more willing to accept unconscious influences of their behavior opposed to a conscious assertion of bias or any conscious biases that would open a host of issues. For instance, determining whether differences of racial disparities are indeed discriminatory or simply reflections of group differences; in that case, it would prohibit the rational to discriminate (Banks & Ford, 2011).

The characterization of the IAT as a measure of implicit bias depends on being able to distinguish implicit bias from conscious bias. “Yet it is extraordinarily difficult to disentangle the two because, since the disavowal of racism during the civil rights era, research participants have become increasingly unwilling to openly express views that may be condemned as racist” (Banks & Ford, 2011, p. 57).

### *Socioeconomic Status*

Poverty is a major cause of the achievement gap. Poor children growing up usually are not provided the necessary nourishment that is essential for proper human development. Added to that is the fact their mothers were undernourished and did not receive adequate prenatal care (Gardner, 2007). Low socioeconomic children are less likely to receive proper medical diagnoses or be provided with proper medical treatment as compared to other children. They also suffer more than higher-socioeconomic children from hearing loss, lead poisoning, asthma, and other health-related factors that can affect their cognition and learning (Jensen, 2013). Like many other researchers, Fryer and Levitt (2004) believe that socioeconomic status, family structure, and the trappings of poverty are important factors to be considered in explaining the educational achievement gap. They obtained data from 22,000 kindergarten children enrolled in 900 different schools to investigate how a family’s socioeconomic status affects the child’s achievement level. Their aim was to investigate the relationship between a family’s socioeconomic status and the educational expectations that the family has for its children. The conclusion was the higher a child’s family’s socioeconomic status was, the greater the expectation of the child’s achievement.

Stull (2013) conducted research on the correlation between socioeconomic status and the achievement gap and found that the family’s socioeconomic status



paralleled student achievement; the higher the status, the greater student achievement. Although schools can do nothing about a child's socioeconomic status, Stull states that, "it is possible to understand how SES affects school conditions and to use school conditions to compensate for the differences in family SES" (p. 64).

The differences in wealth between families are also determinants of student achievement. The distribution of wealth is a major factor in the academic achievement gap. In most cases, the wealthier the family, the greater is student achievement. During the last generation, there has been an increase in the unequal distributions of incomes in the United States. Rothstein (2004) concluded that "this inequality contributes to the academic achievement gap" (p. 35).

Studies have shown that the socioeconomic status can account for some of the student-academic achievement gap between the races in the United States. The lack of black students' achievement can be contributed partially to their higher poverty levels when compared to whites and other racial groups. However, the student achievement gap not only extends among groups but within them. Student achievement is greater among the wealthier members of a group than among the group's poorer members. In disagreement with the poverty causes, there are those who argue that black-white student academic achievement gap is the result of blacks being genetically inferior to whites. Believers of this viewpoint usually try to justify their position by explaining "that these students are incapable of doing better; they are hindered by elements in their culture" (Stull, 2013, p. 55).

Children of high-socioeconomic-status families are more likely to be ready to learn when they enter kindergarten than children of low-socioeconomic-status families. This causes a student achievement gap that only widens as the children progress through school (Stull, 2013).

Children growing up in low socioeconomic status conditions usually have much smaller vocabularies than other socioeconomic groups. At the age of four, these children hear, on an average, 13 million words; whereby, similar children from high-socioeconomic families hear an average of 46 million words. Toddlers from high-income families use more words in talking to their parents than low-income mothers use when talking to their children (Jenson, 2003).

Socioeconomic segregation is a deeply important cause of educational inequality (Orfield, & Lee, 2005). National trends indicate that the average white and Asian student attend schools with a low number of poor students. “ The average black and Latino student attends schools in which close to half the students are poor, more than twice the exposure of whites to poor students” (Orfield & Lee, 2005, p.17).

#### *Court Cases*

For centuries, schooling for whites in this country has been perceived in a positive aspect. A good public education was thought to lead to success and socioeconomic prosperity. However, it was a different thing for people of color who were denied an education in the South during slavery. Even after slavery, state laws, Jim Crow codes, and other institutional forms of racism had devastating effects on their educational achievement (Gardner, 2007).

The Brown vs. the Board of Education of Topeka, Kansas was a milestone in school desegregation. However, the ruling handed down by the Supreme Court had little or no immediate effect on school desegregation. It was almost a decade later when President Johnson used his influence to get Congress to pass the Civil Rights Act of 1964 that things changed. This act joined the Supreme Court in its efforts to eliminate school segregation. Unlike in the Brown vs. the School Board of Topeka, Kansas, the Civil Rights Act gave explicit instructions. It authorized the creation of

specific guidelines to measure the progress of school desegregation. As a result of this act, southern schools became more integrated than any other section of the country. During the Nixon administration, school desegregation was set back because Nixon stopped the enforcement of school desegregation. The first desegregation law for the North did not occur until 1973. The northern states desegregation law had ambiguous guidelines in which victims of segregation would have to prove significant infringements. A court ordered examination of Northern public schools detailed countless infractions of how school boards redistricted schools, had unequal facilities, had segregated faculty, and where Whites were allowed to transfer from high minority schools and in-school segregation of minority students were documented. Almost all northern cities had such documented violations, yet little was done to change the current and ongoing segregation issues that exist.

Perhaps, the biggest blow to desegregation would come later during the 1990's with the Supreme Court decision to allow school districts to return students to neighborhood schools within their districts. The fifth vote needed for the Supreme Court ruling came from the newly appointed black Supreme Court Judge Clarence Thomas. The neighborhood school ruling meant a return to separate and unequal schools. Nothing has been more devastating to the progress of desegregation than this court ruling, according to Orfield and Lee (2005). In recent years, there has been a trend across the nation to reestablish segregation in public schools. It is difficult to imagine that this country's public schools will revert back to the status that existed prior to the Civil Rights Act of 1964.

Black students who attend the same schools as whites lose only a third as much ground as compared to students who attend all-black schools (Fryer & Levitt, 2004). However, high poverty schools are socially economically segregated with 90

percent of the student population being poor, receiving free or reduced lunches.

Usually these schools are predominantly black or Hispanic. Since the 1980's, there has been a gradual reversal of the court ordered "desegregation". The only blacks to make any substantial educational gains are those born between 1950 and 1975. Since that time period, little or no gains have been made by blacks as a racial or socioeconomic group (Johnson, 2013).

### *Family Stability*

Parenting practices play an important role in student achievement. Children reach greater academic achievement levels when their parents' expectations are high and are taught the importance of an education. It is interesting to note that the parenting practices that lead to high achievement among middle class white students differ from that of the parents of high achieving black students as noted by Stull (2013). In the past, the educational attainment of parents was one of the strongest indicators of how well children would achieve in school. Today, family socioeconomic status equals that of parental education attainment as a predictor of children's academic achievement. Students of families in the bottom quarter of the socioeconomic status scale rank more than a standard deviation below those children of families in the top quarter of the socioeconomic status scale (Reardon, 2011). "The presence of wealth over time in a family may have a stronger impact on engendering a sense of economic security and the ability to take risks among all family members, which, in turn, positively affects child development" (Yeung & Conley, 2008, p. 322).

Middle-income families with earnings of \$75,000 and above, when compared to poor families with incomes of \$15,000 or less, are more likely to have children who have higher test scores at the preschool level but there seem to be no differences in

later childhood stages. This paper used data obtained from the Panel Study of Income Dynamics to conduct an independent test on how family wealth affects the black-white achievement gap. A regression-based analysis plan was used in this study. Participants for the analysis included 2,222 children (1,177 whites and 1,045 blacks) between the ages of 3 and 12. Yeung and Conley (2008) concluded that there was little evidence to support the theory that family wealth was an intermediate cause of the gap in black-white children's test scores. However, it should be noted that they found a difference in middle-income families that had incomes of \$75,000 and above when compared to poor families who had incomes 20% or below them. These conflicting findings suggest that more research is needed in this area. The analysis did show that family wealth had a stronger association with the cognitive abilities of school-age children than preschoolers and school-age children's math achievement over reading (Yeung & Conley, 2008). The level of a parent's educational attainment is directly proportional to the parent's income achievement. Parents with higher incomes generally have a higher level of education. The wealthier the families are, the more money they can afford to invest into their children's cognitive development. Research indicates that parents who received a college education between 1965 and 2008 began to make such investments by engaging their children in more child-care activities, a trend which had not been seen prior to this time by their less educated counterparts (Stull, 2013).

### *Teacher Expectations*

Within the last decade, educational reform has had a major impact on how teachers have been viewed by the public. The No Child Left Behind Act requires teachers to be highly qualified. The highly qualified teacher must be able to improve student achievement. Student achievement is based on how well they perform on

standardized tests. The sponsors of the Act believed that highly qualified teachers would be the solution to closing the achievement gap between the two groups. A decade after the law's implementation, there has been no significant signs that the gap is closing. The role of teachers is an important one and their influence is substantial, but teachers alone cannot correct the inequalities that exist in our society. Closing the gap will not occur until the issue of social inequality has been eliminated (Jensen, 2013).

Why do black students have the lowest school grades in the United States when compared to other students, and even worse, why is the black student more likely to drop out of school? The explanation to this phenomenon can be seen in the "stereotype threat," the perpetuated idea that blacks have inferior intelligence impairs the performances of African American students (Yong, 2013). The negative stereotyping of black students imposes a burden upon them because they think that the people around them look down on them and perceive them as being inferior. Negative stereotyping can cause those students to worry about failing and could adversely affect their progress in school and at work as well (Yong, 2013).

McCombs and Gay (2001) conducted research involving 80 teachers to obtain the effects of race, class, and IQ information on their judgements. Part of the research included teachers evaluating a set of four pictures which had previously been identified as Hispanic lower class, Hispanic middle class, white lower class, and white middle class. Few teachers recognized that the low and middle class pictures were of the same students. The results indicated that race and social class initially affected teacher judgements. Race still influenced teacher judgements when IQs were considered to the extent that the high IQ Hispanic child was evaluated less positive than the high IQ white child.

### *Student Perceptions*

The perceptions that students have for their teachers play important roles in student achievement. It is debatable as to whether black students see white teachers in a negative manner. Some researchers have reported that the race of teachers doesn't matter to black students as long as the teachers are effective and caring. Also, white teachers were able to motivate black elementary students as effectively as black teachers. However, other researchers "have concluded that African American students were given less attention, ignored more, praised less, and reprimanded more than their counterparts when taught by Caucasian teachers" (Casteel, 2003, p. 143). It is a fact that many Caucasian teachers treat black and white students differently. The relationship "between differential teacher treatment and differing educational outcomes is dependent on the students' perceptions of the treatment. Students' perceptions of teacher treatment may serve as intervening variables that can potentially mediate the effects of teaching behaviors on achievement" (Marcus, Gross, & Seefeldt, 1991. p.363). Black male students see white teachers in a different light than other students. In a study of mostly black female students, Casteel (2003) reported that the majority of the students were positive and believed that their teachers treated them fairly. Marcus, Gross, and Seefeldt (1991) conducted research had similar conclusions. However, when gender was a factor in the analysis of the results, black male students differed from that of black females, white females, and white males. Black male students had negative views as to their treatment. They believed that their teachers treated them like the teachers would treat lower achieving students.

### *Differences in School Funding*

Unequal funding is usually given as the reason that the large educational gaps exists between people of color and their white counterparts. During the 1920s, only eight of 170 kindergartens located in eight southern cities were funded for people of color, and they were all located in Kentucky. All over the South there were disparities in funding education for the races. For example, in 1926, Mississippi counties spent an average of \$3.59 a year per black student on education compared to \$68.15 for each white student (Gardner, 2007). Furthermore, according to Grander (2007), the single most impactful influence on the achievement gap that exists between black and white students is unequal funding. Historically, there has always been a great disparity in the funding of education for children of color and their white counterparts.

Efforts to reduce the disparities in the funding between rich and poor school districts have provoked controversy and resistance. Opposition to the equitable public school funding arises due to ignorance and inappropriate beliefs about the causes of poverty. Biddle and Berliner (2002) list individualism (success or failure results from individual effort and not from society), essentialism (people, such as blacks and Hispanics, inherit inferior genes that account for the lack of their success), and the culture of poverty thesis (minorities fail because of the inappropriate tradition in their homes, communities, or ethnic groups) as the main beliefs of those who resist equitable public school funding.

In the United States, public school funding comes from federal, state, and local sources; about one half of the total funding coming from local property taxes. This type of funding arrangement generates a large difference in school funding between states, within states, and even among school districts. Wealthier



communities provide more revenue than poorer ones. In other developed countries around the world, public education is equally funded regardless to the status (rich or poor) of the school district. Some countries allot additional funds to poor and minority children. This paper covers the inequality of public school funding in the United States, disparities in per-student funding levels, excuses that opponents of equal school funding give, and how funding affects student achievement. It also cites results from international testing organizations, the Advancement of Educational Achievement (Mathematics Benchmarking Report) and the Third International Mathematics and Science Study (Brown & Brown, 2007). Both of these organizations presented data that show that school funding and poverty play important roles in student achievement. The authors discuss how the Heritage Foundation and the Coleman report, both hostile to the public sector, attempt to sway public opinion by presenting flawed and erroneous information which assert that the levels of funding have little or no effect on student achievement. The paper concludes that “the achievements of disadvantaged students are more likely to suffer in response to inequities in school funding for two reasons: Those students are likely to attend poorly funded schools, and they are more likely to be hurt by lack of academic resources when schools are underfunded” (Biddle & Berliner, 2002, p. 59).

Data from the Third International Mathematics and Science Study support the conclusion that student achievement and school funding parallel; the more adequately the funding is, the higher the student’s academic achievement level. For example, the two best performing schools districts (Naperville, Illinois and Chicago’s North Shore) in the United States had high levels of funding and low numbers of impoverished students. Their scores were comparable to those of the top-scoring countries (e.g. Japan and Hong Kong). However, the two lowest performers, Miami-Dade County

Public Schools in Florida and the Rochester School District in New York, had low levels of funding and served many impoverished students earned achievement scores had low levels of funding and served many impoverished students earned achievement scores that were comparable to those of the worst scoring countries (e.g. Iran and Jordan). “Thus, differences in student advantage and funding in the United States generate achievement disparities that are comparable to those separating the highest and lowest achieving nations...[which] suggest that the U. S. public school system educational environments” (Biddle and Berliner, 2002, p. 55).

Gardner (2007) offered some answers to those questions. Unequal funding, the belief that children of color are less intelligent, poverty, how students are focused, and racism are reasons given for why an achievement gap exists. Four out of five African American graduates were either left out of an AP subject for which they had potential or attended a school that did not offer the subject (Abdul-Alim, 2012).

and attacked Coleman. “The report had used nonstandard procedures for statistical analyses” (Biddle & Berliner, p. 52), its authors had made major errors that possibly reduced the size of its estimate for school effectiveness on student achievement, and they had failed to properly validate their procedures. Data from the Third International Mathematics and Science Study support the conclusion that student achievement and school funding parallel; the more adequate the funding is, the higher the student’s academic achievement level. For example, the two best performing school districts (Naperville, Illinois and Chicago’s North Shore) in the United States had high levels of funding and low numbers of impoverished students. Their scores were comparable to those of the top-scoring countries (e.g. Japan and Hong Kong). However, the two lowest performers, Miami-Dade County Public Schools in Florida and the Rochester School District in New York, had lower levels of funding and

served many impoverished students earned low scores comparable to those of the worst scoring countries (e.g. Iran and Jordan). “Thus, differences in student advantage and funding in the United States generate achievement disparities that are comparable to those separating the highest and lowest achieving nations which suggest that the U. S. public school system educational environments” (Brown & Brown, p. 55). Gardner (2007) offered some answers to those questions. Unequal funding, the belief that children of color are less intelligent, poverty, how students are focused, and racism are reasons given for why an achievement gap exists. Four out of five African American graduates were either left out of an AP subject for which they had potential or attended a school that did not offer the subject (Abdul-Alim, 2012).

## CHAPTER III

### METHODOLOGY

We gathered data from random middle and high school science teachers from the Mobile and Baldwin County Public School systems. Both Mobile County and Baldwin County Schools systems are located in southern Alabama. This study seeks to answer the following research questions:

#### *Research Questions*

*Question I:* Do teachers of the same race have similar race implicit bias scores?

*Question II:* Do younger teachers have lower race implicit bias scores?

*Question III:* Is there a relationship between the race implicit bias of Caucasian teachers' and the socioeconomic status of the science teachers' students?

#### *Procedure*

Prior to conducting the study, permission was granted from the Executive Director of Research, Assessment, Grants and Accountability of the Mobile County Public School System (MCPSS), Baldwin County School System (BCSS) Superintendent Eddie Tyler, and the University of Southern Mississippi's IRB committee. Using Millisecond software (<http://www.millisecond.com/>), teachers were sent an email requesting their participation in the study. A link to the online survey was provided in an email. The race Implicit Association Test (<http://www.millisecond.com/download/library/IAT/>) is an instrument that can be used to measure the unconscious stereotypes that participants may have and would otherwise attempt to conceal (Greenwald, McGee & Schwartz, 1998). The race IAT is a method for indirectly measuring the strengths of association among concepts.

Participants were presented with a timed test of gray scale images of African American and Caucasian faces. Participants were then given the task of sorting and associating either positive or negative words with the photographs that were displayed. Participants' must then pair images to words that appeared on the computer screen by pressing specific keys on the computer key board as quickly as possible. At the end of the exercise, the computer calculated a score that reflected the nature and magnitude of one's race implicit bias, Hartman (2014). In most of the race IAT designed test, there are four categories representing two contrasting pairs, sometimes distinguished as object perception (black-white) and attributes (approve-disapprove). The strength of the race implicit association test is based on the reaction times of the participants' consistent and inconsistent trials. For instance, participants who take more time to sort through African American faces will receive a higher race implicit bias score which suggests a higher race implicit bias. The race IAT software reports an effect size in the form of a score, which is the difference in reaction times in response to the representation of consistent and inconsistent trials divided by the pooled standard deviation of the participants' latency responses (Greenwald, McGhee & Schwartz, 1998). The race IAT has shown to be a valid and reliable measure of implicit stereotypes (Greenwald & Krieger, 2006).

### *Analytical Approach*

An assessment of differences between race IAT scores of participants in the African American and Caucasian groups was examined using an Analysis of Variance (ANOVA). The ANOVA compared the means between different groups that had been split by two different factors. Specifically, it was used to determine if there was an interaction between these two factors on the dependent variable. The analysis tested all three hypotheses; additionally t-tests were used to test the third hypothesis:

**Hypothesis I:** Teachers of the same race will have similar scores on the race IAT.

**Hypothesis II:** Younger science teachers will have lower race IAT scores (less bias) than older science teachers. An ANOVA was performed to examine if the race IAT scores would significantly predict an effect on each of the two variables: race, age, and socioeconomic status of the school in which the teacher taught (Title I).

**Hypothesis III:** Teachers with high race IAT scores (preferences towards Caucasians) will have students with similar socioeconomic backgrounds as defined by teaching in Title I schools. An ANOVA and t-tests were performed to determine differences between the race IAT scores, and the socioeconomic statuses of the school that the teacher taught.

#### *Instrumentation*

A demographic survey consisting of seven questions was given before the introduction of the race IAT. Software was used that combined the demographic survey form with race IAT. The modification to the race IAT permitted the researchers to collect information on each participant. Each, participant was issued a code that recorded race IAT scores and demographic information.

## CHAPTER IV – PRESENTATION AND ANALYSIS OF DATA

### Introduction

The purpose of this study was to assess the relationship between race, socioeconomic status, and the racial implicit bias held by middle and high school science teachers in the Mobile and Baldwin County Public School Systems. Implicit bias refers to the attitudes or stereotypes that affect our understandings, actions, and decisions in an unconscious manner. At the time of this research, no studies had been conducted in the Mobile or Baldwin County School Systems on race implicit bias. Three hypotheses were used to analyze the data.

*Hypothesis I:* Teachers of the same race will have similar scores on the race IAT.

*Hypothesis II:* Younger science teachers will have lower race IAT scores (less bias) than older science teachers.

*Hypothesis III:* Teachers with high race IAT scores (preferences towards Caucasians) will have students with similar socioeconomic backgrounds as defined by teaching in Title I schools.

In this chapter, statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) to run an Analysis of Variance (ANOVA) and a t-test. The widely-accepted race Implicit Association Test (race IAT) was used to measure the bias of teachers (Gawronski & Payne, 2010). The race IAT consists of four categories that target concepts into two contrasting pairs. These pairs are sometimes distinguished as object perception (black-white) and attributes (approve- disapprove) and are thought to measure attitudes that are unconscious (see Appendix B for the race IAT images). The strength of the race implicit association test is based on the reaction times of the participants' consistent and inconsistent trials. For instance, participants who take more time to sort through African

American faces receive a higher race implicit bias score suggesting a preference towards Caucasians. The race IAT software reports an effect size in the form of a  $d$  score, which is the difference in reaction times in response to the representation of consistent and inconsistent trials divided by the pooled standard deviation of the participants' latency responses (Greenwald et. al., 1998). When a respondent's absolute value  $d$ -score is 0.15 or less, it is rated "slight preference", 0.35 or higher is rated "moderate preference", and 0.64 or higher is rated "strong preference" (Dalliard, 2015). In addition to the IAT, participants responded to a demographic survey which consisted of seven items: race, age, marital status, highest level of education completed, current employment at a Title I school, years of experience, and employment at a middle or high school (see Appendix B)

#### *Recruitment of Participants*

An email was sent out to all science teachers within Mobile County Public School District by the Department of Research, Assessment, Grants and Accountability. The email contained a request for participation and a link provided by software company Millisecond.com that enabled participants to retrieve and download the survey and test at their convenience (see Appendix C).

In Baldwin County, permission was granted by the superintendent of Baldwin County Public School District for individual emails to be sent to principals by the researcher (see Appendix D) as well as telephone calls requesting that they allow their science teachers to participate in the study. Three Baldwin County High Schools participated in the study. Participants consisted of three females; two African Americans, and one Hispanic teacher. Two of the Baldwin County Schools were Title I Schools. Participants, were represented for each age group; 20-34, 35-55, 55 and over. Each participant was issued an anonymous code that recorded race IAT



scores and demographic information. Research for this study began during the fall of the 2016 school year and ended the spring of the 2017 school year.

*Statistics*

Of the 140 science teachers who visited the website, 96 (68%) of the participants completed the demographic survey. Of those 96 participants that completed the survey, 79 (82%) completed both the demographic survey and the Race IAT. The ethnic population for this study consisted of 18 (23%) Black/African Americans, 55 (70%) White/Caucasians, 4 (5%) listed as Other, 1 (1%) Asian, and 1 (1%) Hispanic. Three Baldwin County High Schools participated in the study. Participants consisted of three females; two were African Americans, and one Hispanic teacher. Two of the Baldwin County Schools were Title 1 Schools. Participants were represented for each age group: 20-34, 35-55, 55 and over. Each participant was issued an anonymous code that recorded race IAT scores and demographic information. The scores for one Asian and one Hispanic participant were not included in the data analysis. The minimum, maximum, mean, and standard deviation (SD) for race IAT scores are reported in Table 4.1 below.

Table 4.1 *Race IAT Score: Grouped by Ethnicity, Age, and Title I*

Grouping	Category	N	Min	Max	$\mu$	SD
Ethnicity	Black	18	-.954	.898	.116	.493
	White	55	-.606	1.00	.343	.363
	Other	4	-.590	.542	.522	.423
Age	20-34 years of age	19	-.634	.928	.185	.388
	35-54 years of age	49	-.954	1.00	.341	.463
	55 years and over	11	-.519	.730	.2158	.451

Title I	Title I School	64	-.954	1.00	.236	.449
	Title II School	13	-.259	.898	.372	.330
Total		77				

Note. N = number; min = minimum; max = maximum;  $\mu$  = mean; SD = standard deviation

Table 4.2 provides a brief overview of participants based on age.

Approximately forty percent of participants ranged in age between 35-54 years of age; 44% between 30-34 years of age; and 14% were 55 years and older.

Table 4.2. *Age Groups (N=79)*

Age	Frequency	Percent
20-34	33	41.7
35-54	35	44.3
55 and over	11	13.9

Approximately 70% of the participants identified as Caucasian or White, thus making up the largest group of participants; approximately 24% were identified as African American or Black; and approximately 6% were identified as Other. Refer to Table 4.3.

Table 4.3. *Title I by Ethnicity/Race Groups (N=77)*

Socioeconomic Status (Title I)	Frequency	Percent
Caucasian/ White	55	69.6
African American/Black	18	24.1
Other	4	6.3

Table 4.4 provides an overview of marital status. The majority (approximately 65%) of the participants were married or in a domestic relationship; 17% were single; 12% were divorced; 5% were widowed, and none were separated.

Table 4.4. *Marital Status (N=79)*

Marital Status	Frequency	Percent
Single	14	17
Married or domestic relationship	52	65.8
Widowed	4	5.1
Divorced	9	12.1
Separated	0	0

Table 4.5 provides a breakdown of the levels of educational attainment held by the participants. Approximately, 30% of the participants held a bachelor's degree; approximately 55% held a master's degree. Eight percent of participants held a professional (specialist) degree and 15% held doctoral degrees.

Table 4.5. *Level of Education (N=79)*

Level of Education	Frequency	Percent
Bachelor's Degree	24	30.3
Masters' Degree	43	54.4
Professional Degree	6	7.6
Doctoral Degree	6	7.6

Table 4.6 reflects the total percentage of participants who were employed at a high school or middle school. Approximately 68% were high school science teachers; 32% were middle school science teachers.

Table 4.6. *Middle and High Schools (N=79)*

School	Frequency	Percent
High School	54	68.3
Middle Schools	25	31.6

Table 4.7 reflects the years of teaching experience of the participants. Teachers who had 5 years of teaching experience or less made up approximately 20% of the participants; those with 6-11 years made up 21%; those with 12-17 years made up 22%; those with 18-23 years made up 22%; those with 24-28 years made up 5%; and those with 29 years of teaching experience or more made up 9%. Notably, teachers who had five years of teaching experience or less made up approximately 20% of the participants; those with 6-11 years made up 21%; those with 12-17 years made up 22%; those with 18-23 years made up 22%; ranging up to 23 years were evenly distributed.

Table 4.7. *Years of Experience* (N= 79)

Years of Experience	Frequency	Percent
0-5 years	16	20.2
6-11 years	17	21.5
12-17 years	18	22.7
18-23 years	17	21.5
24-28 years	4	5.1
29 years and over	7	8.8

Table 4.8 provides an analysis for gender. Approximately, 26% of the participants were male and 73% were female.

Table 4.8. *Gender* (N=79)

Gender	Frequency	Percent
Male	21	26.5
Female	58	73.4

Table 4.9 reflects the socioeconomic status of the school which the participants taught. Of the 79 participants, two did not report the socioeconomic status of their school. Approximately 17% of participants worked at non-Title I schools. A school labelled as a non-Title I school indicated that those students come from families above the poverty level. In stark contrast, 80% percent of participants

worked at schools where the majority of students' families live below or at the poverty.

Table 4.9. *Title I (N=77)*

Socioeconomic Status	Frequency	Percent
Title I	64	81.0
Non- Title I	13	16.8

An (ANOVA, and t-test) were conducted using the Statistical Package for the Social Sciences (SPSS). The SPSS output was reviewed and conclusions were considered. In addition, a post-hoc analysis was performed using the Tukey HSD statistical procedure.

The ANOVA was utilized because it is considered a robust test that determines overall differences between groups. The one-way or one-factor ANOVA was applied since there was one dependent variable, race IAT scores. The statistic for the ANOVA is the F-test and measured at an  $\alpha = .05$  level of significance. Additionally, a paired sample T-test was performed because it is considered good practice to evaluate degrees of deviation; Cohn's *d* is usually performed accompanying a t-test, based on Cohn's (1992) guidelines. The independent variable included three levels to identify each ethnic group which consisted of Black or African American, White or Caucasian, and Other. The dependent variable was the race IAT score value. The mean and standard deviation values are as follows: Caucasians ( $M = .362, SD = .363$ ), African American ( $M = .094, SD = .493$ ), and the group listed as Other ( $M = -.153, SD = .52$ ). The base line is reported as ( $M = .260,$

$SD = .423$ ). Table 4.10 indicates that the analysis for ANOVA was significant at  $F(2, 77) = 4.56, p = .01$

Table 4.10. *One-Way ANOVA Summary Table Race IAT Score and Race*

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between groups	2	1.49	.747	4.56
Within group	74	11.05	.164	
Total	77	14.60		

Note: *df* = degrees of freedom; *SS* = sum of squares; *MS* = mean squared; *F* = *F* ratio

Table 4.11 reflects the results of the one-way ANOVA that was used to determine if the age of the science teacher influenced the race IAT score. The independent variable consisted of three levels: 20-34 years of age, 35-54 years of age, and 55 years of age and older. The dependent variable was the race IAT score value. The analysis for the ANOVA was not significant  $F(2,79) = 1.73, p = .074$  see Table 4.11.

Table 4.11. *One-Way ANOVA Summary Table Race IAT Score and Age*

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between groups	2	.845	.423	2.23
Within group	76	14.15	.181	
Total	78	14.59		

Note. *df* = degrees of freedom; *SS* = sum of squares; *MS* = mean squared; *F*= *F* ratio

An ANOVA was performed to determine whether there was a significant difference in race IAT scores based on the socioeconomic status of the students (Title

I status) taught by the science teachers. The Title I status is based on the economic assessment of the student population of an individual school. In order for a school to obtain Title I status, at least 50% or more of the school's student population must receive free or reduced lunch. The independent variable consisted of two levels, Title I schools or non-Title I schools (Table 4.12). The reported mean value for Title I schools  $M = .236$ , and the reported mean value for non-Title I schools  $M = .498$ . The standard deviation value for Title I schools  $SD = .498$ , and the reported standard deviation values for non-Title I schools  $SD = .330$ . The analysis revealed that these factors were not significant,  $F(1,77) = 1.08$ ,  $p = .301$ . A post-hoc comparison using Tukey HSD was not performed using the race IAT scores of participants based on socioeconomic assessment of the school (Title I), because there were fewer than three groups for such a comparison to be made. Not reported are the statistics for the group Other.

Table 4.12. *One-Way ANOVA Summary Table Race IAT Score and Title I School*

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between groups	1	.202	.202	1.08
Within group	75	14.39	.187	
Total	77	14.60		

Note. *df* = degrees of freedom; *SS* = sum of squares; *MS* = mean squared; *F* = F ratio

Tables 4.13 - 4.14 provides a comparison of race IAT scores of teachers of the same race and socioeconomic assessment of the school. To determine whether there was a difference between Caucasian science teachers race IAT scores who taught at Title I schools' and those who taught at non-Title I schools', group mean scores and



the standard deviations were compared. The mean and standard deviation for Caucasian Title I school teachers was  $M = 1.16$  and  $SD = .370$ . The mean and standard deviation for Caucasian non-Title I teachers was  $M = .397$  and  $SD = .241$ . A paired sample t- test was performed. The assumption was considered as the skew and kurtosis level were estimated .444 and -.525 which is less than the maximum allowable values for a t-test a (i.e., skew  $|2|$  and kurtosis  $|9|$ ; Posten, 1984). It should be noted that  $t(55) = 2.44, p > .001$ . The Cohen's  $d$  was estimated at 1.64, which is a large effect based on Cohn's (1992) guidelines. Thus, the finding suggested that white science teachers who taught at Title I schools had IATs scores that reflected a moderate bias towards white students and those white teachers that taught at non-Title I schools exhibited stronger preferences toward white students.

To determine whether there was a difference between African American science teachers race IAT scores who taught at Title I schools and those who taught at non-Title I schools', group mean scores and the standard deviation were compared. The mean and standard deviation of teachers that taught at Title I schools was  $M = .228$  and  $SD = .349$ . There were a total of three African American teachers who taught at non-Title I schools. The race IAT scores of the two female teachers indicated a slight to moderate preference toward white students. However, the race IAT score of the African American male indicated little no preference for either black or white students. The mean and standard deviation of non-Title I African American teachers was  $M = .248$  and  $SD = .352$ . A paired sample t- test was performed  $t(18) = -17.985, p < .001$ . The Cohen's  $d$  was estimated .014, which indicated little effect size. Thus the finding suggested that there was no effectual difference between the race IAT scores of black science teachers that taught at Title I schools as compared to those black teachers that taught at non-Title I schools. This data demonstrates that

regardless of the race of the science that there is no preference at all for the African American student.

Table 4.13. *Title I (N=54)*

Socioeconomic Status	Frequency	Percent
Title I Caucasian Teachers	44	69.6
Non- Title I Caucasian Teachers	10	30.4

Table 4.14. *Title I (N=18)*

Socioeconomic Status	Frequency	Percent
Title I African American Teachers	3	16.7
Non- Title I African American Teachers	15	83.3

Post- hoc comparisons were conducted using the Tukey HSD test, a test that assumes equal variances among the three groups (see Table 4.15). Post-hoc comparison using the Tukey HSD test indicated that the mean score of Caucasians ( $M = .343, SD = .366$ ) was significantly different from that of African Americans ( $M = .128, SD = .493$ ) ( $p < .05$ ).

Table 4.15 *Tukey HSD Comparison of Race IAT Scores by Race*

Race	$\mu$	<i>SD</i>
White	.343	.366
Other	.132	.571
Black	.128	.490

*Summary*

In this study, the relationships between race, socioeconomic status, and the racial implicit bias held by middle and high school science teachers in the Mobile and Baldwin County Public School Systems were examined. Chapter IV provided statistics of the participants' demographic surveys and race IAT scores. Chapter IV also provided an assessment of differences between race IAT scores of African American and Caucasian participants. An ANOVA analysis was used to test all three hypotheses. A paired sample t-test was also used to test the third hypothesis.

## CHAPTER V

### DISCUSSION

This study was designed to bring attention to the importance of continued race implicit bias research and to discuss the potential impact of science teachers' subconscious predispositions on their students as well as the need for social and economic reform. The immediate purpose of this study was to determine the presence of racial implicit bias among secondary science teachers in a particular region of the southeastern United States and whether such racial biases, if they exist, are unique to this area. Race, age, and the socioeconomic status of student populations were the specific factors measured through implicit bias scores from the race IAT.

*Research Hypothesis I:* It was hypothesized that teachers of the same race would have similar scores on the race IAT. Hypothesis I was supported. There was a significant difference between African American and Caucasian teachers' race IAT scores ( $F(2, 77) = 4.56, p = .01$ ). Caucasian teachers had a moderate to strong preference for other Caucasians. However, the race IAT scores of African American science teachers revealed that they held neither moderate nor strong preferences for whites or blacks. African American participants either had a slight preference toward Caucasians or a slight preference toward African Americans.

Prior studies conducted by Banaji and Heiphetz (2010) corroborated the results of this study. Their results revealed that African Americans in general showed a slight, mixed preference toward either Caucasians or their own race compared to whites' moderate to strong bias for their own race. The researchers credited this tendency to oppressive social burdens that have been placed on blacks, persistent media references that promote negative stereotypes about African Americans, as well as an established history of systematic legal discrimination against African

Americans. South Africa was the only other country besides the United States that imposed codified social inequities based on racial difference (Banaji & Heiphetz, 2010). However, Nicholas Kristof, a New York Times journalist and two time winner of Pulitzer Prizes was quoted as saying that the wealth gap between blacks and whites in the United States is "greater than the black-white wealth gap was in apartheid South Africa" (Stewart & O'Neil, 2014, Badger, 2014, p.3).

The implications produce palpable effects not only in the economic and social rifts that exist between blacks and whites but also in terms of educational gaps. Dasgupta (2013) wrote that "exposure to commonly held attitudes about social groups permeate citizens' minds even without active consent through "hearsay, media exposure, and by passive observation of who occupies valued roles and devalued roles in the community" (p. 51). According to Dasgupta, African Americans have had a history of being discriminated against and that those past themes are still prevalent in the psyche of Americans. This is demonstrated through science teachers' race implicit bias scores reported in this study.

*Research Hypothesis II:* It was hypothesized that the younger science teachers would have lower race IAT scores (meaning less bias) than older science teachers. Hypothesis II was rejected. There was no significant difference between age groups based on race IAT scores. This finding contradicts commonly held assumptions that younger generations are less racially biased than their older counterparts. However, it should be noted that younger Caucasian participants between the ages of 20 - 34 exhibited moderate biases toward their race, while older Caucasians race IAT scores between the ages of 35 - 64 indicated a moderate to strong preference toward their own race. Of the study population, seventy percent were Caucasian. (Ninety-eight percent of white participants were also female, though gender was not a tested factor.)

The age-specific baseline ( $M=.259$ ,  $SD=.423$ ) for the group surveyed once again indicated an overall preference toward Caucasian Americans. However, analysis revealed that age did not make participants less biased in their preference for Caucasians ( $F(2,79) = 1.73$ ,  $p = .074$ ). Regardless of whether the participants were Millennials, Generation Xers, or Baby Boomers, race implicit bias linked all generations, despite commonly held assumptions that younger generations are less racially biased than their older counterparts. Despite trends that suggest that racial prejudice in the United States has waned a bit in the last half a century (Gaertner & Dovidio, 1986) widespread evidence suggests that African American people face continuing discrimination and have harsher outcomes than Caucasian people across a variety of domains related to their success and well-being (Bertrand & Malainathan, 2004).

Christia Brown, a professor at the University of Kentucky, also conducted a study to determine if age affected implicit bias and how different American ethnic groups were perceived. Brown's study supports the data presented in this study; likewise, her results showed no aged-based difference. She further suggests that the negative impact of race implicit bias upon students starts at an early age. According to researchers at Yale University, preschool teachers' implicit bias directly influenced perceptions of black preschoolers. In one study, researchers used eye-tracking technology to measure racial bias among preschool teachers (Young, 2016).

Preschool teachers “showed a tendency to more closely observe black students, and especially males, when challenging behaviors are expected” according to lead researcher and Yale professor Walter Gilliam (Young, p. 3). In other words, when researchers directed preschool teachers to watch a video of preschoolers interacting and to identify which child had “problematic” behavior amongst the

children, the teachers more often focused on black male children as sources of disruptions that, in reality, did not exist (Young, 2016). This finding could also be indicative of another phenomenon, *cultural bias*. In education, this would be seen as teachers and administrators holding the belief that the dominant or mainstream (presumably European and North American) culture as a superior way to learning and knowing than those learning cultures that do not reflect such attitudes (Vygotsky, 1978). This study's race IAT findings—moderate to strong levels of bias among secondary science teachers—could indicate negative dynamics comparable to Brown's research and the Yale findings.

What could be at stake for science students and the learning process if perceptions of students are already tainted; if racial implicit biases are already predetermining the relationships between teachers and especially their science students of color? The lack of age and the influence on implicit bias suggests that this unconscious preference is somehow being cultivated from generation to generation, despite the outward appearance of tangible social progress in American race relations.

*Research Hypothesis III:* It was hypothesized that teachers with high implicit bias scores (preference towards whites) would also have students who come from similar socioeconomic backgrounds. Hypothesis III was rejected. There was no significant difference between race IAT scores and the socioeconomic status of the school in which the teacher taught ( $F(1,77) = 1.08, p = .301$ ). There was no difference between the race IAT scores of black science teachers who taught at Title I schools as compared to black teachers who taught at non-Title I schools. The t-test revealed that regardless of the race of the teacher, there was no moderate to strong preference for African American students. The t-test also revealed that Caucasian teachers who taught at a Title I school had less bias than those who taught at non-Title

I schools. Regardless of their students' socioeconomic status, white teachers held a moderate to strong preference for their own race. African American teachers' race IAT scores indicated a slight preference for blacks in some cases and/or a slight preference towards whites in other cases, thus exhibiting less overall racial implicit bias.

Perhaps this finding could be attributed to the diminished presence of African Americans within the non-Title I schools included in this study. This finding could also be indicative of *confirmation bias*, a tendency of teachers to be more supportive of those students who share the same beliefs and/or confirm the teachers' own perspectives. This trend toward stronger levels of bias among teachers at non-Title I schools also suggests deeper connections between socioeconomic status and students' academic attainment. Significant levels of racial implicit bias could be a major factor in the continuing academic educational gap between black and white students in science.

In 2015, only seven percent of African American students who graduated from high school met college readiness benchmarks in each of the four primary subjects: English, reading, math and science (UNCF 2017); the latter being this current study's focus. The National Assessment of Educational Progress (NAEP) notes that although scientific achievement gaps between blacks and whites are narrowing in elementary and middle school, the gap between black and white high school students' science achievements has remained relatively unchanged as of the organization's most recent 2015 published National Report Card.

The relationship between economic status and academic performance gap is a complex issue that cannot be attributed to just one cause. Like many other researchers, Fryer and Levitt (2004) believe that socioeconomic status, family



structure, and the trappings of poverty are important factors to be considered in explaining the educational achievement gaps between blacks and whites. Studies have shown that black student achievement gap can be contributed partially to blacks' higher poverty levels when compared to socioeconomic levels of whites and other groups. Unfortunately, the student achievement gap not only extends among groups but within them. Student achievement is greater among the wealthier members of groups than among the group's poorer members. In disagreement with the poverty causes, there are those who argue that black-white student academic achievement gaps are the result of blacks being genetically inferior to whites. Believers of this viewpoint usually try to justify their position by explaining "that these students are incapable of doing better; they are hindered by elements in their culture" (Stull, 2013, p. 55). The Third International Mathematics and Science Study suggest that the achievement of students and school funding parallel each other (Brown & Brown, 2007). The data implies that the more adequately a school is funded, the greater the students' academic achievement. The top performing schools in the United States often have high funding, whereas the lower funded, impoverished schools tend to have the lowest achievement nationwide.

### Limitations

This study examined the relationship between factors that influenced implicit bias such as race, socioeconomic status, and age. To accomplish these goals, two things were required: a clear definition of what it means to have racial implicit bias and a valid way to measure it. The test instrument selected to measure racial implicit bias (Appendix A) of the participants was the widely accepted race Implicit Association Test (race IAT) (Gawronski & Payne, 2010).

Participants consisted of middle and high school science teachers from the lower southeastern and southwestern region of Alabama. An email was sent out on the researcher's behalf by the Department of Research, Assessment, Grants and Accountability of the Mobile County Public Schools District to all science teachers within Mobile County. Permission was granted via the superintendent of Baldwin County School System and individual emails were submitted to science teachers across Baldwin County soliciting their participation. The email contained a web based link provided by software company Millisecond.com, consisting of a seven-question demographic survey (see Appendix A) and the race IAT (see Appendix B). The emailed survey allowed educators to retrieve and download the study at their convenience. The race IAT designed assessment is made up of four categories. Each category is composed of two contrasting pairs of terms. For instance, the words "good" and "bad" may appear for participants to distinguish between pictures. Using object perception of black and white photos of African American and Caucasian subjects, participants must assign a term to the photo based on categorizations which are then paired showing a relationship between the terms, categories, and photos such as "approve" or "disapprove". The strength of the race implicit association test is based on the reaction times of the participants' consistent and inconsistent appraisals. In other words, participants who take more time to sort through African American faces will receive a higher race implicit bias score with a preference towards whites which suggests a higher race implicit bias. Research for this study began during the Fall 2016 academic school year and ended the Spring 2017 academic school year. Limitations in this study included the following:

1. Participants were limited to the Mobile and Baldwin County School systems.

2. The Department of Research, Assessment, Grants and Accountability of the Mobile County Public School approved a letter which was submitted to teachers on the researcher's behalf. The researcher was not allowed to visit schools within Mobile County.
3. All action pertaining to the distribution of the request for participation was handled through the Department of Research, Assessment, Grants and Accountability. (Appendix C)
4. Although permission was granted to conduct research in Baldwin County, principals were given the authority to either recommend or deny the participation of their science teachers (Appendix D).
5. Of the 140 participants that visited the site, 31 participants were dropped at the launch of the software, eight participants were dropped after the launch of the software, and seven participants encountered technical errors.

#### *Recommendations*

The data collected from this study is consistent with similar studies showing that bias has been found within the American educational system. The presence of continuing racial disparities, combined with the empirically-proven links between race implicit bias and harmful discriminatory results, has launched a clarion call for methods to lessen these biases (Smedley, 2007). There is scientific evidence from both psychologists and fellow researchers alike that implicit bias can be changed or adjusted. Neuroscience researchers suggest that the part of the limbic system known as the amygdala is responsible for harvesting implicit biases and that the amygdala is maladaptive and given to change. According to Dr. Toni Schmader from the Department of Psychology at the University of Arizona, strategies exist to promote change. Schmader (2009) observed a reduction in bias after Caucasians were shown

positive images of African Americans in science and math prior to taking the race IAT. Devin and colleagues describe implicit bias as a bad habit that can be changed. The experimenters have designed a 12-week, multi-faceted, prejudice habit-breaking intervention (Devine, Forsher, Austin & Cox, 2012). Furthermore, experts have determined that the intervention's effects on reducing implicit race bias are long term (Devine, Forsher, Austin & Cox, 2012). However, individuals must be held accountable for their decisions and take responsibility for making snap judgements. According to Correll and Benard (2006), this therapy has real-world applications, helping individuals recognize their biases, for instance, in hiring practices of employers. Researchers Uhlmann and Cohen (2005) found that listing job requirements immediately prior to selecting a candidate constrained opportunities to use subjective criteria during candidate selection thereby reducing bias. Such methods are necessary for effectual change to occur in the prevention of racial discrimination fueled by such race implicit bias.

The recommendations that are made as a result of this study are as follows: 1) change the curriculum within universities for students seeking degrees in education and 2) change the present secondary science curriculum. First, national reform should occur in the way that we prepare teachers for the classroom. Part of our national curriculum should include race implicit bias training; this would enable better teacher preparation for the classroom. Training would help future teachers become aware of race implicit bias and assist them in developing strategies that foster more efficient modes of communication between teachers and their students. The implementation of a race implicit bias course would not only provide teachers with greater self-awareness but also would essentially provide teachers the means to reduce such bias that could be a major factor in the achievement gap between races. According to the

U. S. Department of Education (2016), the reality is that approximately 80% of teachers in the United States are Caucasian who teach mostly non-white students. Therefore, training is imperative. Veteran teachers should also be provided professional development on race implicit bias awareness. The training should center on a metacognitive approach to teaching. Whereby educators would examine their biases and make adjustments using instructional strategies denoted. The course would provide teachers the tools to create an equitable classroom environment for all students.

Secondly, the nation's science curriculum and secondary course offerings need to be offered equally, regardless of funding. Aproximately 80% of Asian Americans and 70% of white high school students attend schools that offer a full range of math and science courses such as calculus and physics. However, approximately 70% of African American and Latino students are not offered such courses nor have access to the full range of math and science courses in their high schools according to the U.S Department of Education Office of Civil Rights, 2014. "Yet, across the country, 2 in 5 high schools don't offer physics, according to an Education Week Research Center analysis of data from the U.S. Department of Education's Office for Civil Rights." (Heitin, 2016, p. 1) This current practice of offering a reduced curriculum in middle and high school diminishes the chances for African Americans to enroll or gain eligibility to many colleges and universities and the opportunity to have a future in STEM. This researcher is convinced that implicit bias due to race is a factor: the sense that poorer, minority students are perceived to be underachieving and somehow incapable and undeserving of higher sciences instruction in those foundational K-12 years of development.

### *Future Research*

Further research is needed to fully understand the theoretical framework and construct of race implicit bias. Proposed are the following recommendations:

1. Further research is necessary to determine the most effective strategies to mitigate the effects of race implicit bias.
2. Future studies should be conducted on the effectiveness of race implicit bias training on teachers.
3. Future studies should be conducted on students' perceptions of their teachers before and after their teacher has received race implicit bias training.
4. Longitudinal studies on the effectiveness of race implicit bias training should be conducted with a review of student achievement scores.

### *Conclusion*

The U. S. Department of Commerce reports that STEM (science, technology, engineering, and mathematics) occupations are growing at 17%, while other occupations are growing at approximately 10%. The income of STEM degree holders is much higher than the income of non-STEM degree holders. STEM workers play a key critical role in the sustained growth and stability of the U.S. economy. Classroom dynamics are important because they produce real world effects. Rothstein (2004) addresses the achievement gap that exists between the wealthy and the poor as well as between blacks and whites. He argues that to blame the education system solely for the achievement gap is purely nonsense. The difference in wealth among the various groups in America is a major contributor to the gap, especially among those who go on to pursue a STEM career. The higher an individual's economic background, measured in terms of parental social class and parental education, the more likely they

were to work in science. This link was so “strong that it could be described as a gradient, just as the relationship between socioeconomic background and a child’s educational achievement is often described in the literature as a gradient,” (Guterl, 2014, p.8).

In 2010, the British Royal Society analyzed the socioeconomic background of scientists and engineers in the workforce and determined a strong correlation between the socioeconomic background and the pursuit of science-related careers. Narrowing the social and economic gap between the lower and middle classes would greatly contribute to shrinking the student achievement gap than school reforms exclusively. Rothstein (2004) concludes that when the social-economic gap that exists between the different sectors of our society is properly addressed and corrected, the student achievement gap will begin to disappear. The focus of this study centers on the implicit bias that disrupts this process. Awareness of race implicit bias could spur social and economic reforms that would permit American students to graduate from school equally prepared.

How then is America preparing its students for STEM careers and why is it important? Unfortunately, the black-white academic achievement gap in science has persisted, in part, because politicians who are not educators have enacted laws that do not solve problems, laws that neglect the most basic relationships that promote learning and professional growth - the relationships between teachers and students. Also, there has not been a commitment by the citizenry demanding a solution. The entire burden of solving the problem has been placed on the educational system where educators labor on a regular basis to prepare students for life in the 21<sup>st</sup> century. The solution to the problem calls for changes of attitudes, an end to racism, a commitment

to ending poverty, and above all, a willingness to change because of the desire to want it to happen.



## Appendix A

What is your age?

- 20-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old
- 75 years or older

Ethnicity origin (or Race): Please specify your ethnicity.

- White
- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian / Pacific Islander
- Other

Marital Status: What is your marital status?

- Single, never married
- Married or domestic partnership
- Widowed
- Divorced
- Separated

What is the highest degree or level of school you have completed? *If currently enrolled, highest degree received*

- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

What school is currently employed?

**Mobile County Middle Schools**

Chastang-Fournier K-8 School

Alba Middle School

Clark-Shaw Magnet School

Burns Middle School

Denton Magnet School of Technology

Calloway-Smith Middle School

Dunbar Magnet School

Causey Middle School

Mae Eanes Middle School

Grand Bay Middle School  
Hankins Middle School  
Lott Middle School  
Mobile County Training School  
North Mobile County K-8th  
Phillips Preparatory  
Pillans Middle School  
Scarborough Middle School  
Semmes Middle School  
Washington Middle School

**High Schools**

Baker High School  
Blount High School  
Bryant High School  
Citronelle High School  
Davidson High School  
LeFlore Magnet High School  
Montgomery High School  
Murphy High School  
Rain High School  
Theodore High School

Vigor High School  
Williamson School

**Baldwin County Middle Schools**

Bay Minnette Middle School  
Central Baldwin School  
Daphne Middle School  
Elberta Middle School  
Fairhope Middle School  
Foley Middle School  
Gulf Shores Middle School  
Spanish Fort Middle School  
Summerdale Middle school

**Baldwin County High Schools**

Baldwin County High School  
Daphne High School  
Fairhope High School  
Foley High School  
Gulf Shores High School  
Robertsdale High School  
Spanish Fort High School

Is your school classified as a Title I school?

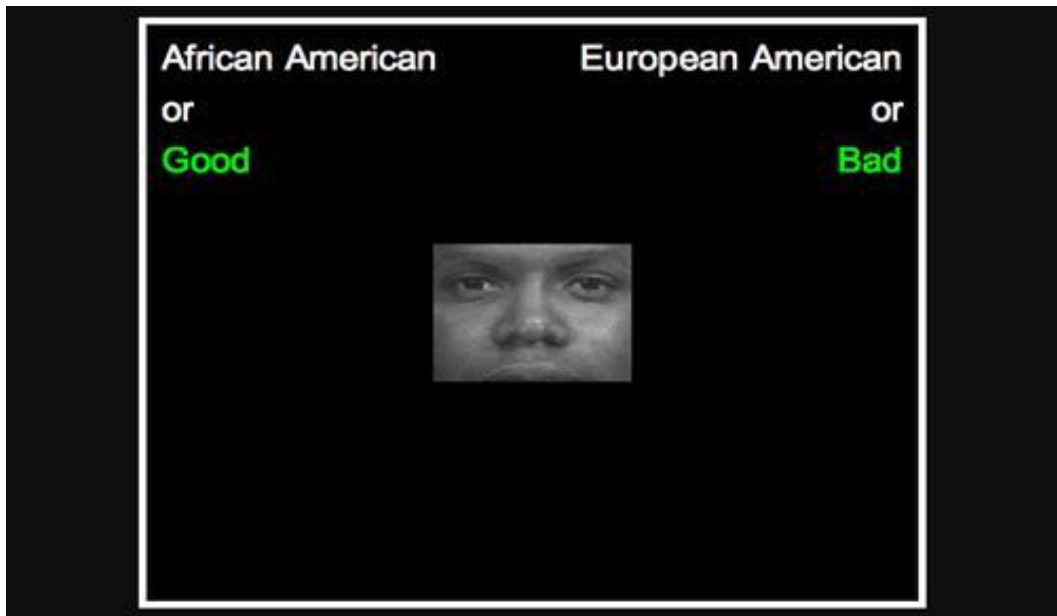
Yes                      No

## Appendix B

# RACE IMPLICIT ASSOCIATION TEST (race IAT)

A tool used for measuring race implicit bias.

The Harvard Implicit Association Test for race reveals racial bias by measuring the amount of time it takes an individual to make an association between two concepts displayed as either words or images. So, for example, a person with implicit bias against African Americans might take longer to associate the word “good” with a Black face than with a White face.



## Against Stereotype

African American      European American

or

or

Good

Bad



## Stereotype

European American

African American

or

or

Good

Bad



## Appendix C

Subject: Request for participation

Dear Mobile County Science Teacher,

As a science teacher in the Mobile County Public School System I understand the dynamic involved with being an educator. You play an important role in the cognitive development of today's youth. The instruction you provide is pivotal to a student's' understanding of science and the way that the world works around them.

Your participation in this study will help to better understand influences that may be beyond our conscious control. Similar studies have yielded an increased understanding of teacher-student relationships. The results from this research may provide answers to improved pedagogical practices. The following references can provide information about implicit bias.

Your name will not be known to me. Each participant will be reported as a code. All electronic data will be kept in a password protected file and destroyed within three years after the study is completed. Participation is completely voluntary. Please feel free to decline participation without fear of penalty, prejudice, or any other negative consequence. Once have begun the process of starting the survey you are committed to the survey's completion. In other words once the survey has been launched you will be unable to disengage from the survey and must see it to its completion. Please feel free to ask questions about this project or your participation in this study. You may contact me at [Elizabeth.Schlosser@eagles.usm.edu](mailto:Elizabeth.Schlosser@eagles.usm.edu).

Permission for this study has been granted by the Executive Director of Research, Assessment, Grants and Accountability of the Mobile County Public School System, the University of Southern Mississippi's IRB committee, and Baldwin County Superintendent Eddie Tyler. The risks associated with this study are no greater than normal daily activities. The survey and test are very brief and will only take 10 minutes of your time. The survey asks basic demographic items including the school where you teach. The Implicit Association Test (IAT) is an instrument that can be used to measure the unconscious stereotypes that participants may have and would otherwise attempt to conceal. Unlike explicit bias, people are not consciously aware of an implicit bias (Greenwald et al., 1998).

Staats, C., Capatosto, K., Wright, A. R., and Contractor, D., (2015). State of the science: implicit bias review. Ohio State University. *Kirwan Institute*. Retrieved from <http://kirwaninstitute.osu.edu/myproduct/state-of-the-science-implicit-bias-review/>, March 01, 2014.

Staats, C. Understanding implicit bias: what educators should know. *American Educator*, Winter (2015-2016), 30. Retrieved from <http://www.aft.org/ae/winter2015-2016/staats>

By completing the survey and test, you are giving permission for this anonymous and confidential data to be used for the purposes described above. This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-6820.

**Directions:**

Please click on the link listed below or copy and paste the address in an Internet browser.

In order for the survey to be run a component must be download, this will only takes a few seconds.

Please find a quiet area that you can commit at least 10 to 15 minutes to completing this brief survey. Thank you again for your participation.

Survey link: <http://research.millisecond.com/elizabethschlosser/batchstudy.web>

Sincerely,

Elizabeth Cox Schlosser

Supporter of Mobile County Public Schools

PhD. Candidate, University of Southern Mississippi

## Appendix D

BALDWIN COUNTY PUBLIC SCHOOLS  
*Building Excellence*

### ***OFFICE OF THE SUPERINTENDENT***

Eddie Tyler, Superintendent  
2600-A North Hand Avenue  
Bay Minette, AL 36507  
E-mail: [etyler@bcbe.org](mailto:etyler@bcbe.org)

TEL: 251-937-0308  
FAX: 251-580-1856

February 13, 2017

Elizabeth Cox Schlosser  
PhD. Candidate, University of Southern Mississippi

Dear Ms. Schlosser:

Please be advised that approval is granted to provide information to Baldwin County Public Schools regarding your anonymous survey. Please be advised it is the final decision of the principal to accept and distribute your information on his/her respective campus. A copy of this letter should be taken with you when visiting our schools.

Thank you for your interest in Baldwin County Public Schools.

Sincerely,

*Eddie Tyler*

Eddie Tyler, M.Ed.  
Superintendent



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