Implicit Bias in Pre-Service Teachers: A Mixed Methods Approach

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Implicit Bias in Pre-service Teachers: A Mixed Methods Approach

A Dissertation
Presented by
TARA PEPIS

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2017

College of Education
Implicit Bias in Pre-Service Teachers: A Mixed Methods Approach

A Dissertation Presented

By

TARA PEPIS

Approved as to style and content by:

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enthusiasm, boundless energy, and love have provided me with the motivation to complete this dissertation.
Research Goals/Questions

Colleges of Education, through educator preparation programs, have applied a scattershot approach to addressing diversity through multicultural teacher education programs. These programs have not been shown to reduce bias levels in pre-service teachers and are not systematic or uniform. (King & Butler, 2015). This study focuses on an alternative approach to preparing pre-service teachers to work with diverse populations. It measured the levels of implicit bias in a sample population of pre-service teachers and attempted to reduce their implicit bias levels. The aim of the dissertation was to answer the following questions:

1. Can a brief, computer-based intervention decrease the level of implicit bias and increase awareness of bias in preservice teachers?

2. How does receiving their IAT scores affect preservice teachers’ experience with an intervention about implicit bias?

3. What can be learned from the implementation of an intervention in this setting that could be integrated in the larger context of Teacher Education?
4. In what ways can the interview data reporting on participants’ perceptions of the intervention help explain the quantitative results of the Implicit Association Test.

5. What can survey questions and open responses reveal about preservice teachers’ awareness of their own bias before and after a brief computer based intervention?

Research Methods

The dissertation established the levels of implicit bias in this sample of preservice teachers and their response to a habit reduction intervention. An explanatory sequential mixed methodology was used, and it involved collecting quantitative data first and then explaining the quantitative results with in-depth qualitative data. In the first, quantitative phase of the study, the Implicit Association Test (IAT) was used to collect data from 45 pre-service teachers to assess implicit bias and to test the impact of the IAT. In conjunction with the intervention, participants were asked to connect their field experiences with the strategies offered in the intervention. The second, qualitative phase was conducted as a follow up to the intervention to help explain the quantitative results. The qualitative phase included interviews with study participants.

Results

Pre-service teachers, in this population, were found to have higher levels of implicit bias on the as measured by the IAT in comparison to those in the general population. Although the results were not statistically significant after the administration of the intervention, there was a decrease in IAT scores for all participants. Those participants who did not receive their IAT scores or feedback before the intervention had a greater downward trend in IAT scores. Survey questions within the intervention showed differences between conditions on feelings about the IAT and the academic and discipline
performance of students of color. Survey questions and interviews revealed which bias reduction strategies participants felt they could apply in their current and future teaching careers.

Contributions

Through the implementation of an intervention it is possible to create a downward trend in IAT scores. The study offers Colleges of Educations a point at which to begin addressing implicit bias in pre-service teachers.
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CHAPTER 1
RESEARCH OBJECTIVE

Introduction

Bias, in all of its forms, is problematic for students of color in the United States K-12 public education system. Students of color encounter a system of racism that is subtle and implicit. They face structural inequalities, institutional practices, and racial ideologies that reinforce one another, but appear to be colorblind (Lewis & Diamond, 2015. P. 8). Those who seek to be teachers, or are already teachers, are at the forefront of this issue. The teaching force in the United States is more than 80 percent white, while more than 50 percent of the student population is comprised of students of color. In a system where those in power are disproportionately white, the potential to impact interactions between students of color and teachers is substantial. By targeting pre-service teachers for an intervention that seeks to reduce their levels of bias, it may be possible to have a positive impact on exchanges between students of color and teachers in public schools. The study employs a mixed methods approach, to uncover whether an intervention can reduce implicit bias levels in pre-service teachers. In addition, the study will make participants more aware of their own levels of bias and provide strategies for bias reduction.

Chapter 1 will act as an introduction to the content of the dissertation. The chapter begins by addressing the importance of confronting the issue of bias in pre-service teachers. A broad overview of the research questions and methods employed during the study are briefly explored.
Statement of the Problem

Teacher education programs have a responsibility to ensure that all candidates are prepared to teach in the diverse environment that constitutes the public schools in the United States. The Council for the Accreditation of Educator Preparation (CAEP) program stresses the importance of diversity as an overarching feature of quality education preparation programs. In order to ensure that education preparation programs meet diversity requirements, CAEP asks programs to document how diversity is integrated into their curricula. Specifically, as part of a diversity curriculum, pre-service teachers are called upon to be aware of biases they may hold and to address them within an educator preparation program (Council for the Accreditation of Educator Preparation, 2015).

How the diversity requirement outlined in the CAEP standards should be met is not defined; therefore, educator preparation programs are left to develop their own models to incorporate diversity into the curricula. While the ability of Schools of Education to develop their own standards allows for autonomy, it also makes it difficult to determine what should be instituted to address pre-service teachers’ awareness of their own biases. Although the need to address implicit bias is not directly stated in the standards, implicit racial bias should be addressed as part of a focus on diversity. Implicit racial bias, which was the focus of this study, is the unconscious association of stereotypes and attitudes towards groups of people. The research on the ways in which implicit bias can be addressed in a college population is limited; moreover, there is no
current research on how implicit bias can be addressed in teacher education programs for pre-service teachers.

According to Castro (2010), a number of colleges and universities educate students about diversity, but not specifically implicit bias, through multicultural courses. In her review of the literature on the impact of multicultural courses within teacher education programs, Castro found that courses alone are not enough to develop a critical consciousness about multiculturalism in pre-service teachers. Further, Castro found mixed results regarding the ability of the courses to change how candidates perceived and approached issues of diversity. Although pre-service teachers expressed a willingness to work in multicultural contexts, their understanding of the concept of multiculturalism was limited. They continued to hold stereotypes and employ deficit thinking in relation to minority groups. They often failed to recognize both their own biases, and the larger institutional structures that can lead to discrimination. It seems unlikely that one course in multicultural education will be able to undo lifelong exposure to bias; however, educator preparation programs often only require one course in multicultural education as part of their educator preparation programs. The University at which the study was completed only requires once course in multicultural/social justice education as part of their elementary education licensure program. Since there is no definitive answer as to why the coursework was not enough to reduce bias levels in pre-service teachers, as required by CAEP standards, it seems plausible that a more direct intervention focused on preservice teachers’ biases could be a better approach (Castro, 2010).

There is some evidence that using an intervention-based model can reduce the level of racial bias within individuals. Plant et al. offer that in order for an individual to
reduce a racial bias, one must first be aware of his bias and he must be concerned about the consequences of his bias. If these two conditions are met, then it is possible for an intervention to reduce the level of implicit bias in an individual (Plant et al., 2009).

Devine et al., in her work on implicit bias, has focused on undergraduate psychology students, and she has shown that an individual’s level of implicit bias can be reduced. The intervention that she conducted included components which made the participants aware of their bias, and the consequences that bias has on minority groups (Devine et al., 2012). In her 2012 study, Devine, et al, used the IAT in conjunction with other measures to determine the implicit bias of undergraduate psychology students. Once the authors had measured the implicit and explicit biases of the students, they implemented a brief computer based intervention to determine if implicit bias levels would change after completion of the intervention. They found that those that took part in the intervention decreased their implicit bias, as measured by IAT scores.

The present study builds on Devine et al.’s work by maintaining the bulk of the intervention while varying whether or not students were given feedback on their IAT scores. In this study, all participants took part in the intervention, and were randomly assigned to different conditions. In addition, survey questions embedded within the intervention were changed to focus on the field experience of the pre-service teachers. More details on Devine et al.’s method and how the present study method differs from it are in Chapter 3.
**Why Implicit Bias Matters.** “Implicit bias” is a term derived from the field of psychology. Implicit bias is a subconscious process involving negative stereotypes. A common example of implicit bias is white people associating black people with criminality (Implicit Bias Explained, 2017). Implicit bias is most often associated with an aversion to a particular group of people, and is part of a constellation of processes that include explicit bias, stereotype threat and racial anxiety. Racial anxiety is experienced by all racial groups albeit in a different manner. Minorities experience racial anxiety when they feel as if they will be the targets of discrimination or hostile treatment in interracial situations. Whites may feel they will be assumed to be racist and will not be trusted, or will encounter a hostile environment, when taking part in interracial interactions. Stereotype threat can occur in any racial group when an individual is concerned about confirming a negative stereotype of his or her group. Racial anxiety and stereotype threat can complicate efforts to reduce people’s biases by putting them under stress. Redford and Howell conducted a study to determine whether or not taking the IAT caused participants to have a defensive reaction. They found that those participants who received their IAT score had a greater defensive reaction than those that received no IAT score (Redford and Howell, 2015). Receiving an IAT score likely activated a defensive reaction that is related to racial anxiety and stereotype threat. All of these phenomena encourage behaviors that have negative effects on interracial interactions in many settings. This reality has implications in many different contexts; including health care, police work, court rooms and education. This dissertation deals with the ways in which implicit bias in student teachers can be recognized, measured, and reduced through an intervention (Greenwald, 1995; Godsil et al., 2014).
**Demographics of K-12 Education in the U.S.** The study’s focus on implicit bias in the pre-service teacher population is of paramount importance because of the demographic shifts occurring in the United States. According to recent statistics provided by the United States Department of Education, “minorities this fall (2014) are expected to make up 51 percent of public school students in grades pre-K through 8th grade and 48 percent of those in grades 9 through 12. Young Latinos alone accounted for at least 20 percent of public school kindergartners in 17 states, up from just 8 states in 2000” (Krogsted et al., 2014). This shift in demographics has broad implications for those who are preparing to become teachers within the United States, because this population remains overwhelmingly white. Currently, 81.9 percent of the teaching force is white, and although the level of racial and ethnic diversity in the teaching force continues to grow, it is not keeping pace with the demographic shifts observed in the nation’s classrooms (National Center for Education Statistics, 2016). Recent research on K-12 education suggests that implicit bias may be affecting the dispensation of discipline and the disproportionate affect it has on minority students (Losen, 2011; McIntosh et. al., 2014; Rudd, 2014). Discipline disparities contribute to achievement gaps by reducing learning time and engagement with school (Gregory et al. 2010), and students who have been suspended have lower educational attainment than others (Balfanz et al. 2015; Shollenberger 2015; Vandehaar et al. 2015).

The current study made pre-service teachers aware of their own implicit biases and provided strategies that they could use to addresses these biases. Although the current study does not determine whether the pre-service teachers will enforce discipline differently as in-service teachers, it lays the groundwork for future research on preservice
teachers’ biases and how to reduce them. There has been no research to date on the ways in which implicit bias might be reduced in the pre-service or in-service teacher population. This study used an intervention-based model, which measured implicit bias before and after an intervention. This model offers ways in which teacher education programs can address the implicit biases in teacher candidates, before they take on the role of a classroom teacher.

**Research Questions**

The study answered the following questions:

1. Can a brief, computer-based intervention decrease the level of implicit bias and increase awareness of bias in pre-service teachers?

2. How does receiving their IAT scores affect preservice teachers’ experience with an intervention about implicit bias?

3. What can be learned from the implementation of an intervention in this setting that could be integrated in the larger context of Teacher Education?

4. What can survey questions and open responses reveal about pre-service teachers’ awareness of their own bias, before and after a brief computer-based intervention?

5. In what ways can the interview data reporting on participants’ perceptions of the intervention help explain the quantitative results of the IAT?
Methodology. As will be detailed in Chapter 3, I adapted Devine et al.’s 2012 intervention that aims to reduce the levels of implicit bias in individuals. Unlike Devine et al., who used a control group that did not participate in the intervention, all of the participants in this study took part in the intervention. Participants took the IAT and then completed the intervention at time point 1. Prior to the initial administration of the intervention, participants answered questions about their beliefs in relation to the academic and discipline performance of students of color. In condition 1, the study provided IAT scores to the participants. In condition 2, participants did not receive IAT scores. This was done to see if participants who received IAT scores differed from those who did not receive IAT scores in follow up IAT testing. This design was also able to shed light on the different responses those assigned to condition 1 and condition 2 had on text based survey questions and feelings related to taking the IAT. Based on the research of Redford and Howell, who found that certain participants had a defensive response when receiving IAT scores, the two conditions allowed the study to look at defensive reactions based on assigned conditions. At time point 2, one week later, participants took the IAT and then completed demographic questions about themselves and provided their email address if they were willing to be interviewed. They also responded again to the questions about the academic and discipline performance of students of color. Six weeks later, at time point 3, participants took the IAT and responded to open-response questions. All participants who provided email addresses at time point 2 were contacted by the researcher. All participants who responded to the researcher’s email were interviewed. Four unstructured interviews were conducted to gain a greater understanding of what sense the participants made of the intervention.
**Significance.** The primary focus of this study was implicit bias in pre-service teachers. Implicit bias has not been directly addressed within teacher preparation programs. By the year 2025, the K-12 student population in the United States will be less than fifty percent white. The current population of K-12 public school teachers is over 80 percent white (Center for Education Statistics, 2016). Therefore, the quality of relationships between students of color and school personnel is an urgent issue in K-12 public education.

**Overview**

The dissertation is divided into five chapters. Chapter 2 is a critical review of relevant literature that places the study within a broader context. Chapter 2 explores the following: 1) effects of bias on students of color in K-12 public schools, 2) what the literature reveals about implicit bias, and how it affects interactions between students of color and school personnel 3) the intervention, and the importance of reducing implicit bias levels in pre-service teachers. Chapter 3 is a detailed review of the design of the proposed study. Chapter 3 details the following: 1) the research questions that the study will attempt to answer, 2) the quantitative and qualitative methods, and 3) the IAT and the intervention. Chapter 4 provides the quantitative and qualitative results of the study. Each section of Chapter 4 answers one of the five research questions. Chapter 5 of the dissertation is a discussion of the results and their broader significance.
CHAPTER 2
REVIEW OF LITERATURE

Literature Review

In this chapter, I will situate my study in four diverse areas of academic research. First, I will review the ways in which racial bias affects outcomes for students of color in the K-12 educational system. This examination guides the study and emphasizes the urgency of the issue. Secondly, I look at the ways in which Colleges of Education currently address bias in teacher education programs. By examining the literature and results of multicultural education practice, I hope to reveal what may or may not be effective for reducing bias levels. Next, I delve into the literature addressing the formation of bias in early life, and how it impacts later interaction between students and teachers, and their perceptions of race. This examination provides a grounding in the ways implicit bias is activated, and how that may impact the effectiveness of an intervention aimed at reducing implicit bias. Finally, I review the Implicit Association Test (IAT), and findings related to interventions attempting to reduce the levels of implicit bias. These interventions provided a model for the intervention used during this study, which was aimed at reducing the level of implicit bias in teachers.

Why Teachers' Ability to Work with Diverse Populations Matters

In United States public schools, it is quite likely for the foreseeable future that students of color will be taught by white teachers. By the year 2025, the K-12 student population in the United States will be less than fifty percent white. Although there are no specific projections for the demographic characteristics of teachers in the year 2025, the current population is more than 80 percent white. (National Center for Education...
Statistics, 2016). Based on the demographic makeup of the teacher population, and in the context of larger societal demographics, it is impossible to ignore the reality that the great majority of K-12 teachers belong to a racial group that is different from that of half of the K-12 student population. Therefore, the quality of relationships between students of color and teachers is of urgent concern in K-12 public education.

**Consequences of Racial Bias for Students.** In this section I will review the literature on the ways in which racial bias within schools affects students of color, focusing on interactions between students of color and school personnel. Implicit bias, and the ways in which it affects behavior, has been shown to affect the ways in which individuals treat people from ethnic or racial minorities. Moreover, in a school setting, students who are the target of discrimination experience it numerous times. For the individual student, it is not one act of discrimination but the compounding of multiple acts, perpetrated by different school personnel that leads to deleterious effects (Greenwald et. al., 2015). The bias of teachers may affect an individual student with each academic assignment or dispensing of discipline. What a teacher might perceive as a small, isolated issue may actually affect every aspect of the student’s schooling.

One example of how implicit bias can affect schooling is through discipline policies. Hughes and Kwok examined the ways in which relationships between students and teachers and parents and teachers influence reading achievement in first grade. Although this study did not assess teachers implicit biases as predictive of student ratings, the ratings themselves point to implicit biases being activated. The authors offer that when teachers in the study were asked to rate the levels of students’ aggressive behaviors, black students and Hispanic students were rated as more aggressive than white students.
Although the study did not focus on the role of race in the relationships, the authors speculate that behavioral styles of students of color may lead to less frequent interactions with teachers. The lack of interactions and the perception of negativity may lead to lower levels of academic motivation and engagement for students of color (Hughes & Kwok, 2007). If, as early as first grade, teachers perceive students of color as more aggressive than white students, the role of discipline is paramount in relation to academic achievement and life outcomes. The perception of negativity and repeated interactions that are perceived as negative by students of color makes finding ways to intervene before teachers enter the classroom more urgent.

As early as the 1970’s, school psychologists and sociologists asserted that social stratification begins as early as elementary school. This social stratification is associated with the ways in which teachers evaluate and value students’ behaviors, based on both their visible racial or ethnic appearance and behaviors associated with the socioeconomic class of the student (Rist, 1970; Rist, 2000). School level discipline is one area in which there is a clear difference in the administration of punitive measures. Minor infractions may lead to detention after school, while a more serious offense may lead to suspension. Black and Latino youth are disproportionately singled out for major and minor disciplinary infractions. In a review of the literature on suspension rates, 50 percent of black 10th grade students reported having been suspended in comparison to 20 percent of white students (Gregory & Skiba, 2010; Wallace et al., 2008). The rate of suspension for Latino students has not been as closely reviewed; however, there is some evidence that the rate of suspension is higher for Latino students than white students. Lewis and Diamond, in a study of a racially integrated school, propose that it is how the rules of the
school are applied in practice, rather than the rules themselves, that favors white students. The authors suggest that the “who” of the equation is just as important in the administration of discipline as the “what”. Discipline, like any other administrative function, works within the confines of the institution of schooling. Whiteness is a racial identity that is privileged within our society as a whole; therefore, that privilege carries over to the school environment. Also of concern is those doling out discipline within schools may believe they are applying the rules fairly; however, the idealized version of the discipline process is quite different from the performative process, or what actually happens (Lewis & Diamond, 2015). What actually happens within schools is likely related to pre-conceived perceptions teachers and other school personnel have in relation to students of color.

The difference between the ostensive process—what is publicly acknowledged as the process—and what actually occurs is often where race and perceived socioeconomic status (SES) disadvantages minority students. The publication of rules or guidelines for discipline or grades creates the appearance of fairness to teachers and community members. If individual students follow the rules and/or complete assignments correctly, then the outcome of the process will be fair and unbiased. However, Lewis and Diamond point to the differences in family resources, based on race and SES status, which become part of any process within the school. It is not merely that some families have more resources available to them economically; in addition, school staff perceive students and families differently based on their race and SES. How the school personnel perceive the student and their families’ reactions influences the application of school policies. For example, if an administrator believes that a family has the economic resources to hire a
lawyer if they feel a punishment is overly harsh, they may change which rules and processes are followed for that particular student.

In the school that Lewis and Diamond studied, administrators stated that white parents often acted to reverse punitive measures that they felt were unfair for their children. Parents of students of color often did not protest, and accepted the punishment as determined by the process. The disparate responses of parents are only an issue if the discipline process is set in motion due to arbitrary enforcement of discipline polices. The bias of school personnel probably affects the way in which policies are actually performed within the school; therefore, finding ways to combat this bias before it leads to negative outcomes for students of color becomes paramount. It is likely that the implicit bias levels of school personnel need to be addressed, in order to create an environment in which the performative process of discipline policy is applied equally.

Although Lewis and Diamond did not explicitly make this connection, it seems reasonable to explore the possibility that the schema formed during previous interactions with minority or low SES students are automatically activated during the application of policies. People create schemata in order to group experiences and concepts that share similar attributes into categories. This process is automatic and in constant flux. As individuals experience new situations, they continue to build and revise the schema that they have already established (Godsil, et al., 2014). If an individual’s association with people of color is negative, it is possible that their interactions with students of color are also likely to be negative.

Interactions between teachers and students of color is an area in which implicit biases may have an effect on academics, classroom management, and discipline. Kao
and Thompson, in attempting to explain the ways in which the racial achievement gap is related to SES and parental cultural beliefs, point to the fact that there is no mention of how interactions between students of color and school personnel may account for the racial achievement gap (Kao & Thompson, 2003). In reference to black males, Skiba et al. propose that white teachers may be unfamiliar with the communication style of adolescent black males, and may perceive the boys’ actions as threatening. As a result, the teacher may adopt a more authoritarian style of classroom management, which leads to further conflict and a higher chance of disciplinary actions being taken (Skiba et al., 2000). Yoon suggests that although teachers may be aware of racial disparities within educational settings, and while there are teaching pedagogies that combat racism, they lack a critical awareness of their own participation in racism (Yoon, 2012). This lack of awareness may impede their ability to fully implement anti-racist pedagogies, and to recognize disparities in how they relate to their students. Although an intervention that targets implicit bias does not directly address the academic achievement gap, it should make teachers aware of their own biases and the ways in which bias may affect their daily lives. Also, there is evidence that disparities in discipline experience contribute to academic disparities (Balfanz et al. 2015; Gregory et al. 2010; Shollenberger 2015; Vandehaar et al. 2015). If teachers are aware of their own biases it may aide them in applying discipline policies more equitably, which may lead to less time out of the classroom for students of color.

Teachers’ attitudes toward students have been shown to effect the outcome of students’ grades and the dispensation of disciplinary actions. In a review of the literature related to teacher interactions with black students, the authors noted that teachers often
see black students as more hostile and threatening. In addition, black male students were given lower evaluations and reprimanded for vague and subjective behavior (Cartledge & Kourea, 2008, Skiba et al., 2002). An intervention that attempts to reduce implicit bias levels and make teachers aware of their own biases, has the potential to change the ways in which teachers interact with students of color. Providing teachers with strategies designed to combat their own biases is more effective than simply telling teachers not to find black boys hostile or threatening.

What We Currently Know About Implicit Bias and How Educating Pre-service Teachers about Implicit Bias Might Fill Gaps/Shortcomings in What is Currently Being Done

The following section will define implicit bias, and its relationship to other psychological phenomena associated with racial prejudice. This section will examine the following: what implicit bias is and how it is formed and activated, the differences between explicit bias and implicit bias, and the phenomena of racial anxiety and stereotype threat. It will then explore the ways in which implicit bias may manifest itself in interactions between people from different racial and ethnic backgrounds.

Implicit Bias and Schemata. As discussed earlier, implicit bias is a term that is derived from the field of psychology. Greenwald and Banaji established the importance of implicit attitudes in social cognition. Implicit attitudes are unconsciously activated, and associated with prior experiences (Greenwald & Banaji, 1995). Crocker, Fiske and Taylor suggest that there are two ways in which schema can change; the variety of exposure to a specific social experience and/or being presented with incongruent information (Crocker et al., 1984). As individuals experience new situations they continue to build and revise the schema that they have established (Godsil et al., 2014).
The schema that individuals establish is subject to the influence of the environment in which they live. When an individual is presented with a person who fits into one of the categories they have encountered in the past, their schema is activated. Individuals then make an implicit association based on previous experiences. This schema, since it was constructed in a specific context, may be biased against certain groups (Kang et al., 2012). If individuals, or for the purposes of this study—teachers, as they are growing up, are mostly exposed to individuals who constitute their in-group, the schema that they develop about members of out-groups will be based largely on media portrayals. If media portrayals of the out-group are negative, which is often the case in relation to racial minorities in the United States, the schema you form about the out-group will tend to be negatively biased (Byrne et al., 2015; Johnson et al., 2015). Although a schema is resistant to change, if the right conditions are in place, specific schema may be revised. This revision can occur when the individual notices incongruent information, has the time to process the information, and is motivated to be accurate about the subject (Crocker et al., 1984).

If, based on schemata that were formed during childhood, implicit associations with racial out-groups are negative, an individual’s behavior toward members of that out-group will tend to be negative. (Johnson & Carpinella, 2015). Further complicating the issue, the individual is not aware that their behavior toward the out-group member is negative. When over 80 percent of America’s teachers are white and over half of the students they teach belong to a racial minority, it is imperative that we address any negative implicit biases they have toward those that would be considered an out-group—
minority students. The interventional approach used in this study attempts to make teachers aware of their own biases and to reduce their level of bias.

One powerful way that implicit bias may manifest itself is through race-based beliefs that reinforce stereotypes. By middle childhood most American children have learned to believe that black and Latino individuals are less intelligent than whites. This belief leads to stereotypes that are present throughout life (Aronson & Steele, 2005; Steele, 2008). Lewis, when completing an ethnography within a school setting, noted that overt expression of racist ideas by school personnel was rare. However, teachers relied on common stereotypes that often stood in for explicitly racist comments. Often teachers would describe the families of students of color as dysfunctional, chaotic and uncaring about their children’s education (Lewis, 2003). This belief system becomes a type of “common sense” within schools that are racially diverse. The acceptance of this stereotype, that students of color are not as smart as whites in academic settings, has potential to affect interactions between white teachers and students of color (Lewis & Diamond, 2015). The automatic assumptions that Lewis describes are likely based on schemata that teachers have established in relation to students of color. Interrupting the activation of negative schemata associated with students of color may lead to improved interactions between students of color and teachers. Ultimately, reducing implicit bias within the teacher population may lead to better academic outcomes for students of color in the future.

Negative behavior toward an out-group is one form of implicit bias. Although implicit bias was once deemed difficult to measure, the Implicit Association Test (IAT) has been able to provide a valid measure of the amount of implicit bias a subject has in
relation to race, skin tone, weight, etc. (Greenwald & Banaji, 1995; Johnson, 2015). In turn, scores on the IAT have been correlated with behaviors which affect the treatment of individuals from minority groups.

One form that negative behavior towards and outgroup might take is a microaggression. Microaggressions are brief negative messages that are sent to individuals who belong to minority groups (Sue et al., 2007). Microaggressions may be verbal in nature but the person perpetrating the microaggression is often not aware of how their comments or behavior are affecting the member of the minority group. Microaggressions may be intentional or unintentional; however, it is the unintentional microaggression that is linked to implicit bias (Sue, 2007). There is a large body of research on microaggressions that is outside the purview of this dissertation; however, it seems important to include microaggressions as an illustration of the ways in which consequences of implicit bias can include responses that are verbal and unintentional in nature. The connection between microaggression and implicit bias may have special resonance for teachers. Roll call, a seemingly innocuous activity, is an example of the ways in which microaggression may play out within a classroom. Although mispronouncing a student’s name can be unintentional it may have real consequences for students. A teacher who mispronounces a student’s name may laugh due to embarrassment; however, in a qualitative study of students from diverse backgrounds this behavior affected both the child’s perception of self and of their culture (Kohli et al., 2012). It seems plausible that making teachers more aware of their biases could also increase their ability to perceive and prevent microaggressions that they may commit within their classrooms.
Racial Anxiety and Stereotype Threat. The present study includes a comparison between those participants who received their IAT scores after taking the IAT, and those participants who received no IAT scores. There is some evidence that when people receive their IAT scores after taking the IAT, they are more likely to have a defensive reaction (Howell, 2015). This defensive reaction is likely rooted in racial anxiety and stereotype threat. The nature of implicit bias often leads to racial anxiety among both white and minority groups. Racial anxiety is experienced by all racial groups albeit in a different manner. Minorities experience racial anxiety when they feel as if they will be the targets of discrimination or hostile treatment in interracial situations (Steele, 2008; Godsil et al., 2014). Whites may feel they will be assumed to be racist and will not be trusted or will encounter a hostile environment when taking part in interracial interactions. Racial anxiety, and the way in which it often provokes defensiveness, makes it difficult for group members to recognize their own biases.

Stereotype threat is a form of racial anxiety that can occur in any racial group when an individual is concerned that they will confirm a negative stereotype about their group. Stereotype threat and other kinds of racial anxiety make discussing the topic of race difficult in most contexts (Greenwald, 1998). The unconscious nature of implicit bias, and the ways it manifests through nonverbal behavior, affects both minority and white groups. Both groups, when presented with individuals from an out-group, will unconsciously activate schemata from previous experiences. White group members may be unaware of their implicit racial biases; however, due to social norms and the desire to not appear racist, the mere mention of racism can cause racial anxiety. White teachers may feel racial anxiety when interacting with students of color, if they feel that what they
say or do might be construed as racist. The anxiety that they feel may lead to activation of implicit biases, since there is some evidence that anxiety and stress cause one to rely on implicit responses when the brain is taxed (Staats, 2016).

**How Programs Currently Prepare Teachers to Work with Diverse Populations**

This section will look at the ways in which multicultural education is deployed as a response to the requirement that pre-service and in-service teachers address diversity issues within schools of education. There are many different ways in which to address the issue of diversity within teacher preparation programs; multicultural education forms an umbrella under which many of the techniques fall. As a result, I have chosen the broad area of multicultural education as a focus for the ways in which teacher preparation programs address diversity, a term that is often used as a stand-in for reducing cultural or racial bias. This section will review multicultural education, the implementation of multicultural education, and its effectiveness in reducing bias. Multicultural education, as it is currently constituted, is not an effective method for reducing bias in pre-service teachers. In order to target bias, specifically, other methods must be explored and utilized.

**Multicultural Education.** Multicultural education is often required with teacher education programs; however, there is little evidence that it is an effective tool in combating racial bias (King & Butler, 2015; Carter, et.al. 2015). Some courses in multicultural education reinforce existing stereotypes of pre-service teachers (Sleeter, 1993; Haberman and Post, 1992). The purpose of the study is to look at a different approach to combating implicit bias in pre-service teachers. For the purposes of this literature review, I will focus on what multiculturalism means in relation to educational
pedagogy, specifically, teaching teachers. Within this literature, I will focus on places where multicultural pedagogy intersects with bias reduction. Multicultural coursework is often required in teacher education programs, as a means of preparing teachers to work with diverse student populations. However, how this is implemented and whether it has real effects on teacher candidates is idiosyncratic and far from standardized (King & Butler, 2015). Schools are one of the few places in which people of different races, who are not prepared to interact with one another, are expected to do so on a daily basis (Carter, et.al. 2015). It is imperative that future teachers are aware of their own biases and are prepared to work in an environment populated by students of color. Multicultural education, which does not directly address bias, is not enough to prepare teachers to work with students of color.

The role of multiculturalism, as a means to address diversity and bias, is difficult to quantify and study. Since the implementation varies across teacher education programs, and within teacher education programs, there is little evidence available by which to gauge effectiveness. Lowenstein (2009), in a review of the ways in which pre-service and in-service teachers are conceptualized as learners, points to both the scattershot nature of multicultural education and the demographic reality of those who enter the teaching profession. The majority of those who enter the teaching profession are white and middle class, and were often raised in homogenously white suburban environments and schools (Lowenstein, 2009). To compensate for the homogenously white suburban environment in which many pre-service teachers were raised, there would need to be a systematically measurable way to address the biases that they hold. The ways in which residential segregation functions in our society make it unlikely that pre-
service teachers, from the background described above, have had physical and psychological contact with people of color (Carter, et al., 2016). Therefore, multicultural education courses can only be of so much use, and it seems unlikely that a few courses will make up for different life experiences of teachers and students (Chisholm, 1994; Cochran-Smith, Davis, Lowenstein, 2009).

Gomez, in an article which details pre-service teachers’ views of students of color, calls for a radical rethinking of teacher education programs. Through an analysis of national surveys, Gomez concludes that the largely white and homogenous population of teacher candidates see the diversity of students as problematic (Gomez, 1994, see also Delpit, 1995). In the article “other” is used to refer to the student of color and to define how white teachers perceive this population of students. Although the article was written in 1994, and some things have changed in teacher education programs, the populations of prospective teachers and in-service teachers are still largely white and female. For both pre-service and in-service teachers that belong to the in-group of white culture, students of color will always constitute an out-group. It falls on both Colleges of Education and schools offering professional development to work to change this conception of students of color as “others”. Gomez goes on to suggest that there are no simple solutions to the question of how to change teacher perceptions towards students of color. However, being placed in diverse schools, reflective journaling on their experiences in diverse schools, and reading multicultural literature are offered as part of a program to address diversity. These programs may offer teachers varied ways of recognizing the importance of diversity within schools, however, it seems likely that teachers also need to recognize their own biases, and ways to combat these biases, to fully implement culturally
responsive practices within their classrooms. Furthermore, many interventions designed to teach white teachers about multicultural education and racism seem to have little lasting effects. In a review of the literature on how white teachers construct race, Sleeter points to the results of multicultural education as fleeting and often working to reinforce teachers’ preconceived conception of race (Sleeter, 1993; Haberman and Post, 1992). Interventions, which included over 100 hours of working with minority children in low income schools, had little effect on the attitudes of pre-service teachers toward minority students. These studies, placed within the framework of multicultural education, point to the difficulty of changing biases that pre-service teachers have before they enter schools of education.

Gaps/Shortcomings in How Programs Currently Prepare Teachers to Work with Diverse Populations

Diversity training in corporate America faces similar critiques to that of multicultural education. Although the corporate programs aim to promote diversity they sometimes have the opposite effect, similarly, multicultural education programs often run the risk of reinforcing stereotypes (Sleeter, 1993; Haberman and Post, 1992). Multicultural education courses that are required for degree completion in colleges of education are likely to face the same barriers to success as diversity programs in corporate America. Dobbin and Kalev, in an article about why corporate diversity programs fail, explain that the problem lies in the way in which diversity programs are delivered. By requiring people to participate, and using programs that stress diversity as a requirement to protect the corporation, the programs have the opposite of the desired effect. The authors offer that most diversity programs try to control behavior, which
tends to activate bias, rather than reduce it (Dobbin & Kalev, 2016). The article goes on to offer options for addressing diversity in a corporation, through programs that are both voluntary and stress the importance of social accountability. Creating an environment in which people feel that hiring and promotion decisions may have to be explained increased promotions of people of color and women (Dobbin & Kalev, 2016). Based on Dobbin and Kalev’s findings, the requirement to take a multicultural education course may cause an activation of bias, rather than decreasing levels of bias in pre-service teachers. The method of intervention in this study offers a different way to approach bias reduction in pre-service teachers. Multicultural education courses do not seek to combat bias; rather, they seek to promote diversity. This intervention addresses biases directly and provides the individual pre-service teachers tools to reduce their own bias. This intervention is also measurable—it provides a way to collect data on the effectiveness of the components of the intervention and to make changes based on the analysis of that data. Multicultural education, up to this point, has not provided a way in which to measure if there is an effect on the bias levels of pre-service teachers after participating in a multicultural education course.

Recent research on the ability of multicultural education to alter white teachers’ perception of race has shown mixed results. Although some studies point to a slight change in white teachers’ perceptions of race after coursework or field experiences, the results are not conclusive (Hollins and Guzman, 2005; Valentin, 2006). There are few longitudinal studies on the ways in which teacher biases are reduced or changed after what is considered multicultural course work or field experiences.
Contributing to this problem is the non-standardized way multicultural courses and fieldwork are defined. There is no agreed upon multicultural framework within the field that schools of education employ on a systematic basis; therefore, it is exceedingly difficult to gauge the effectiveness of multicultural education programs or experiences. Hollins and Guzman, in their review of the literature related to the implementation of multicultural education programs within schools of education, point to the fact that there are no longitudinal studies. Due to limited resources the studies that are available often use small sample sizes and attitude scales that may or may not be reflective of the program’s effectiveness (Hollins and Guzman, 2005). Furman, in a review of the literature on multicultural teacher education goes further and calls the research insular, inadequate and non-replicable (Furman, 2008). The flaws in the current research on multicultural education makes it difficult to gauge the effectiveness of programs; however, while there is a gap in empirically-based research on multicultural teacher education research, there is an opportunity for further study.

Research performed in other disciplines seems supportive of taking a different approach to multicultural education. A study that focuses specifically on reducing bias in pre-service teachers can add to the research on multicultural education by focusing on making pre-service teachers aware of their own biases and providing them with tools to combat their bias. In addition, the intervention provides a more standardized approach to reducing biases. Based on study results, the intervention can be modified to increase its effectiveness; results from the modified intervention can then be analyzed for further revision. An intervention focused on reducing levels of implicit bias will add to the current research on multicultural education by providing a different method of bias
reduction. If the purpose of multicultural education is to expose pre-service teachers to a
diversity of experiences and to infuse their future teaching practice with diverse
perspectives and viewpoints the current study seeks to build on this exposure. By
providing pre-service teachers with a way to addresses their own biases, in this study
racial biases, they can incorporate diversity into their future teaching practice in ways that
do not reinforce negative stereotypes or gloss over the ways in which bias affects students
of color.

In an educational setting, implementing an intervention, and then having teachers
explain it in terms of their own teaching practices, should make them more cognizant of
how their teaching practices impact students of color. While multicultural education
courses may make pre-service teachers aware of differing viewpoints and cultures, the
courses do not provide them with a way to become more self-aware. The exposure to
different cultural contexts and diversity may lead to self-awareness but it does not
provide explicit instruction in recognizing the biases that they might possess. The
methods being used in this study provide participants with explicit instruction on how to
recognize and reduce implicit bias. As part of the intervention, participants are made
aware that everyone has implicit bias and that is has real effects on people of color. The
strategies provided within the intervention to combat implicit bias are not presented as
directives; rather, participants are presented with multiple ways in which to combat their
implicit biases.

It is unclear whether existing multicultural education practices in educator
preparation actually reduce aspiring teachers’ biases. Indeed, a search for “multicultural
education” and “bias reduction” on the ERIC database returned no results. When the
terms were broadened to “multicultural education” and “bias” and the results were delimited to the years 2006-2016 and peer reviewed journals, there were 142 results. I reviewed the results to determine which were directly related to multicultural education, bias, and teacher education. I then downloaded the citations and abstracts from the ERIC EBSCOHOST and opened the file in Zotereo, a bibliographic manager which allows the user to download abstracts from online databases and query them to find specific information. This allowed me to search the abstracts and titles for specific terms. I conducted an advanced search for the terms “multicultural education” and “bias” and received 17 results. Of those results, 6 were directly related to multicultural education within teacher education programs in the United States of America. Although all were related to bias reduction 2 of the results were specifically about homosexuality (Flores, 2012 & Thein, 2013). One of the results was related to reducing bias in types of art education (Gorski, 2012); and the other three were an analysis of multicultural education courses offered in the college or university setting within teacher preparation programs (Chin, 2013; Schueths et. al, 2013; Chikkatur, 2013). Chin outlines ways in which multicultural art education may be implemented, but offers no evidence of its effectiveness at reducing bias. Schueths et al, in a qualitative study of the effect of the teacher’s race on a classroom lesson on diversity, had mixed results. The researchers found no clear pattern among the students that they interviewed. Chikkatur discusses the difficulties of teaching a multicultural curriculum to students who had different viewpoints and backgrounds. She provides no systematic analysis of how studying multicultural literature affects students.
Although multicultural education is an important facet of addressing bias among pre-service teachers, there are few systematic implementations of a unified curriculum. The intention of the courses was never to reduce bias, or for that matter, to address bias; rather, the original intention was to address the racial and ethnic diversity in K-12 students. There are even fewer studies to measure the effectiveness of multicultural education and its role in reducing bias. Searching for the terms multicultural education and implicit bias returned one result which was related to counselor education. Since multicultural education is often cited as the way in which diversity requirements are fulfilled, and there are few studies incorporating the ways in which it could reduce implicit bias, a new approach to teacher education is necessary (Hollins & Guzman, 2005; Furman, 2008). This study will add to the body of knowledge on how to reduce implicit bias in pre-service teachers. It may also expose ways in which teacher education programs can incorporate an intervention to reduce implicit bias, and address diversity within a multicultural framework.

Reducing Implicit Bias

Since studies on the role of implicit bias in US K-12 schools are limited, it is necessary to turn to international educational studies. In a study conducted in Norway, students from an ethnic minority were judged less capable by teachers in explicit and implicit bias testing. The IAT was used in conjunction with surveys to determine the levels of bias in teachers. The amount of implicit bias the teacher held toward minority students had a negative correlation with the achievement levels of that group of students. The students from ethnic minority groups who had teachers with high levels of implicit bias had lower grades than those students whose teachers had lower levels of implicit bias.
(Andersen, 2016). Most, if not all, teachers will be familiar with the ethnic and racial stereotypes of particular groups; however, the level of prejudice associated with the process of ethnic and racial categorizations varies from individual to individual. This variance, which can be measured through the IAT, can unmask underlying biases which the individual is not conscious of possessing (Fiske et al., 1990). Uncovering the implicit bias in teacher candidates, before they enter the classroom, could benefit the individual teacher and the students whom they will teach.

In the US context, Devine, et al. used the IAT in conjunction with other measures to determine the implicit bias of undergraduate psychology students. Once the authors had measured the implicit bias levels of the students, they implemented an intervention to determine if implicit bias levels could be changed through an intervention. Although this is only one study, it supports the supposition that implicit bias can be reduced through an intervention. Devine et al. found that those that took part in the intervention decreased their implicit bias, as measured by IAT scores: “… Following the manipulation, intervention group participants had lower IAT scores than control group participants… Moreover, the effects of the intervention on implicit race bias at 4 and 8 weeks were not systematically different from each other, indicating that the reduction in implicit race bias persisted throughout the 8-week interval” (Devine, et al., 2012).

Devine et al.’s intervention made participants aware of their own bias, and presented multiple bias reduction strategies to be used in different, everyday life situations. She speculates that reducing implicit bias “requires learning about the contexts that activate the bias; and how to replace the biased responses with responses that reflect one’s non-prejudiced goals” (Devine et al., 2012). It seems plausible that
making pre-service and in-service teachers aware of their own biases, and providing ways in which they can actively address these biases through an intervention, will lead to an awareness of the role of bias in the classroom. Likely, one short intervention will not be sufficient to replace a lifelong bias habit; but if the intervention creates some change, it may be a good starting point.

In Devine et al.’s intervention, all participants who were assigned to the intervention group received their IAT scores. The modification of Devine et al.’s intervention to include two conditions, which manipulate whether or not participants receive feedback on their IAT score, should aid in an understanding of how receiving IAT scores may affect their awareness of their own bias. Viewing IAT scores may lead to defensiveness among those participating in the intervention. Redford et al. found that those who had perceived themselves to have the most egalitarian values in relation to race, were the most likely to have defensive reactions when receiving their IAT results (Redford, 2015). Defensive reactions, can lead to anxiety and tax the cognitive abilities of participants. The defensive reaction described by Redford may also have the ironic effect of hindering individuals’ efforts at self-improvement (Howell, 2015). The finding described by Redford and Howell were in relation to a study in which all participants received their IAT scores after completing the task. There is a gap in the literature in relation to the ways in which IAT conditions might be varied. If individuals participating in a study which administered the IAT did not receive their scores, it might limit defensive reactions. In the absence of defensive reactions, participants may be better able to process the strategies offered in an intervention.
Conclusion

Implicit bias is only one of the factors that may have detrimental and long-lasting effects on interactions between students of color and teachers. Addressing pre-service teachers’ implicit biases is a starting point in building more positive interactions. The field of psychology offers a window into what brain-based processes lead to bias, and offers strategies aimed at reducing bias levels. Implicit bias within the individual is a process which has been measured with the IAT, and some interventions have shown the ability to reduce the levels of implicit bias an individual may possess (Devine et al., 2012). Therefore, creating an intervention which works to reduce the levels of implicit bias in teachers may be a way to change the treatment of students of color.
CHAPTER 3
RESEARCH METHODS

This chapter provides information related to the specific methods that were used to explore the questions in this study. Building on the gaps in relation to teacher educator preparation and bias reduction that were uncovered in chapter two, I conducted a mixed methods study that used an intervention designed to reduce implicit bias. The intervention is based on the one used by Devine et al., with modifications specific to this particular study of preservice teachers.

Central Research Questions

This study asked the following questions about implicit bias, and the ways in which it manifests itself, in pre-service teachers:

1. Can a brief, computer-based intervention decrease the level of implicit bias and increase awareness of bias?
2. How does receiving their IAT scores affect preservice teachers’ experience with an intervention about implicit bias?
3. What can be learned from the implementation of an intervention in this setting that could be integrated in the larger context of Teacher Education?

4. In what ways can the interview data reporting on participants’ perceptions of the intervention help explain the quantitative results of the IAT?

5. What can survey questions and open responses reveal about pre-service teachers’ awareness of their own bias, before and after a brief computer based intervention?

**Methodological Approach**

The study addressed the levels of implicit bias in pre-service teachers and their response to a habit-reduction intervention. An explanatory sequential mixed methodology was used; quantitative data was collected first, and then qualitative data.

The study took place in four stages. All parts of the study were conducted on the same group of students who were enrolled in two sections of reading class at the university. At time point 1, participants completed a 3 question pre-survey, which asked participants about their beliefs related to bias in schools. This was followed by the administration of the IAT. Once students had completed the IAT, they went to the intervention website. Survey questions were embedded within the intervention, for the complete intervention see Appendix A. At time point 2, one week after participants completed the intervention, a post-intervention IAT was administered, after which they answered basic demographic questions. At time point 3, six weeks after students had completed the first post-test, they took a 2nd post-intervention IAT. In the same session as the 2nd post-intervention IAT, participants were asked an open response question about
their experience. Finally, during the month after time point 3, four students participated in interviews.

A mixed methods approach was the most appropriate method for this particular research question, because the quantitative and qualitative methods complement one another. The pre- and post-intervention IAT scores do not address the experience of the pre-service teacher, and do not tell the researcher what part of the intervention was successful. Incorporating qualitative open-ended interviews into the process allowed the researcher to explore what the participants found most valuable about the intervention.

The open ended survey questions and the intervention were integral in revealing how participants perceived their ability to use the strategies offered in the intervention. What will act to decrease levels of implicit bias may vary and is not knowable without including their voices (Creswell, 2010). Bryman (2006), building on the work of Greene et al. (1989), who offer sixteen different reasons that a researcher may choose mixed methods to answer a research question. Based on his framework, I believe using a mixed methods approach was necessary because it provided context and offset. Qualitative methods were used to develop contextual understanding of the IAT results and uncover broader relationships between variables.

Combining methods in this study allowed me to strengthen the study by offsetting any weakness of either method. Specifically, the quantitative results provided by the IAT were not able to uncover the ways in which the participants perceived the intervention and what meaning they created. Qualitative interviews, which are open ended, allowed the researcher to probe for further information on how the intervention was experienced by the participants.
The qualitative interviews allow for a more robust understanding of how specific conditions within the intervention may have influenced the participants’ participation levels and engagement with the material (see Appendix B for interview questions). Using mixed methods explanatory design and varying the conditions of the intervention provided a way to measure the effect of an intervention; however, it did not provide a narrative. By employing unstructured interviews, with a sampling of the participants, I was able to add a greater depth of knowledge to the study. In addition, survey questions and open response questions provided data about the participants’ awareness of their own biases, and their willingness to employ bias reduction strategies. Incorporating the qualitative component of unstructured interviews and open response survey questions, suggested what processes may or may not have led to a reduction in implicit bias levels among participants.

**Study Participants and Sampling**

The study took place during the Fall 2016 semester at a large R1 public university in the Northeastern United States. Participants were enrolled in an education course. Time point 1 took place on November 2, 2016. Time point 2 occurred one week later on November 9, 2016, and time point 3 took place 6 weeks later on December 14, 2016. All of the students enrolled in the course were required to take part in the intervention; however, they were able to opt out of having their data included in the study. Participants choose an anonymous code that they used at all three time points. The code they entered was used to match the participants across time points. The participant’s self-identified race/ethnicity and gender were part of the second time point of the study. Seven of the participants, who provided an email address and agreed to be contacted, were contacted
and offered the opportunity to participate in an interview. Four of the participants in the intervention replied and were interviewed. Of the 45 students in the class, 39 participated in the study and answered the demographic questions, this includes four students who IAT scores were not included in the quantitative analysis due to response time. Tables 3.1 and 3.2 summarizes their demographic characteristics are located in Table 3.1 and Table 3.2. Participants self-identified as White (87.8%), Black (0%), American Indian or Alaskan Native (2.44%), Asian (4.88%), Spanish/Hispanic/Latino (4.88).

Table 3.1

Demographic Characteristics of Study Participants

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>87.80%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>0.00%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>2.44%</td>
</tr>
<tr>
<td>Asian</td>
<td>4.88%</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>2.44%</td>
</tr>
<tr>
<td>Spanish/Hispanic/Latino</td>
<td>4.88%</td>
</tr>
</tbody>
</table>

The gender of the participants, detailed in 3.2 was female (90.2%) and male (9.8%).

Table 3.2

Gender of Study Participants

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percent of Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>9.8%</td>
</tr>
<tr>
<td>Female</td>
<td>90.2%</td>
</tr>
<tr>
<td>Other/Prefer not to answer</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

All of the students enrolled in the course are pursuing Early Childhood or Elementary School Licensure from the state. All of the students were juniors or seniors during the study. Table 3.3 details which grades they would prefer to teach. The largest
percentage of students reported that they would like to teach 5th grade (29.7%), 4th grade (21.6%), and 3rd grade (16.2%).

Table 3.3

Preferred Teaching Assignment, by Grade, of Study Participants

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.7</td>
</tr>
<tr>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>3</td>
<td>15.6</td>
</tr>
<tr>
<td>4</td>
<td>24.4</td>
</tr>
<tr>
<td>5</td>
<td>26.7</td>
</tr>
<tr>
<td>6</td>
<td>4.4</td>
</tr>
<tr>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>8</td>
<td>6.7</td>
</tr>
</tbody>
</table>

According to the National Center for Education Statistics, 68 percent of Bachelor’s degrees and 48 percent of Master’s degrees in education awarded in the United States of America in 2012-2013 were conferred by a public institution of higher education. Therefore, using a public university as a site for the study will allow for some ability to generalize to the larger population of pre-service teachers. However, since the theoretical population of the study includes all pre-service teachers who are seeking licensure, regardless of the higher education institution which they attend, the sample is not representative of all pre-service teachers. Table 2 contains information related to the types of institutions awarding degrees in Teacher Education nationwide. As Table 3.4 details, conducting the study at a public university will allow the findings to be generalized, since 68 percent of education majors attend a public institution.
Table 3.4

*Degrees Granted by Institution Type in the United States of America 2012-2013*

<table>
<thead>
<tr>
<th>Institution Type</th>
<th>All Institutions</th>
<th>Public Institutions</th>
<th>Private non-profit institutions</th>
<th>Private for-profit institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree Granted</td>
<td>B.A. degrees</td>
<td>Master's degrees</td>
<td>B.A. degrees</td>
<td>Master's degrees</td>
</tr>
<tr>
<td>Percentage by type of institution</td>
<td>-</td>
<td>-</td>
<td>68.3</td>
<td>48.8</td>
</tr>
</tbody>
</table>

Figure 2 taken Source: http://nces.ed.gov/programs/digest/d14/tables/dt14_318.50.asp

Those students enrolled in the course were placed in racially and ethnically diverse communities. The majority of the participants, 35, were placed within the local school district described in Chapter 1. Ten students were placed in a neighboring school district with similar demographics. The field work placements are an opportunity for the participants to be in a classroom environment and observe interactions between a diverse population of students and teachers. Table 3.5 is drawn from the Department of Education for the state in which the school district is located. Twenty eight percent of the district is characterized as economically disadvantaged which closely mirrors the states rate of economically disadvantaged students.
Table 3.5

Demographics of Field Work Site Compared with the State

<table>
<thead>
<tr>
<th>Race /Ethnicity</th>
<th>Field Work Site District</th>
<th>State</th>
<th>U. S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>8.6</td>
<td>8.7</td>
<td>16</td>
</tr>
<tr>
<td>Asian</td>
<td>13.9</td>
<td>6.3</td>
<td>5</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20.6</td>
<td>17.9</td>
<td>25</td>
</tr>
<tr>
<td>Native American</td>
<td>0.2</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>White</td>
<td>48.7</td>
<td>63.7</td>
<td>50</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>0.2</td>
<td>0.1</td>
<td>N/R</td>
</tr>
<tr>
<td>Multi-Race, Non-Hispanic</td>
<td>7.8</td>
<td>3.1</td>
<td>3</td>
</tr>
<tr>
<td>Economically Disadvantaged</td>
<td>27.6</td>
<td>26.3</td>
<td>51</td>
</tr>
</tbody>
</table>

Table 3.5 shows that the demographics of the students who the study participants encountered in their field work were close to that of the state in which the school district is located, and comparable with the national demographic makeup of PK-12 students. The comparable student demographics between the proposed school district and state and national student populations will allow the proposed study to be applicable in different contexts.

The IAT and Modifications of Devine et al.’s Intervention

In the quantitative phase of the study, the Implicit Association Test (IAT) was used to assess implicit bias and to test whether the intervention reduced pre-service
teachers’ implicit bias levels. Along with the IAT, participants engaged with an online intervention, modeled on the one used by Devine et al. (2012).

The IAT is the measure that is generally used for studies on implicit bias. The IAT measures latency response in relation to word and image associations, and evaluates response time. The IAT uses the concept of associative learning by testing the speed at which respondents perform sorting tasks with concepts that are strongly associated and with those that have a weak association (Greenwald & Banaji, 1995). Although implicit bias was once deemed difficult to measure, the Implicit Association Test (IAT) has been able to provide a valid measure of the amount of implicit bias a subject has in relation to race, skin tone, weight, etc. (Greenwald & Banaji, 1995; Johnson, 2015). The IAT uses the concept of associative learning by testing the speed at which respondents perform sorting tasks with concepts that are strongly associated and with those that have a weak association (Greenwald & Banaji, 1995). The measure of latency, what is referred to as the D score, has a range from -2 to 2 that correspond with skin tone preferences. The closer the D score is to 2 the higher the preference one has for light skin over dark skin. The closer the D score is to -2 the higher the preference is for dark skin over light skin (Implicit Association Test, 2017).

The administration of the IAT was conducted through Project Implicit. Project Implicit constructed an online testing environment in which to administer the Skin Tone IAT. All data from the IAT was stored on the Project Implicit servers and remained confidential. The data was collected during the fall 2016 semester, starting in November. The administration of the IAT and survey were anonymous, through the use of the Project Implicit IAT site and Qualtrics software, which allowed students to log in.
anonymously. Due to the sensitive nature of the study, anonymity provided a way in which the participants could feel more comfortable and less exposed when answering survey and open response questions. After students had taken the IAT, they entered a code into Qualtrics so that all questions were matched by the researcher once the study was completed. The code assigned by Project Implicit was passed to the Qualtrics Survey, which allowed the researcher to match the results for each participant in SPSS.

I obtained the original intervention used in Devine et al.’s 2012 study, because it had found that participation in the intervention reduced levels of implicit bias in participants. The four-step process explained above was chosen so that the study would maintain as many elements as possible from the study by Devine et al. However, the quantitative part of the present study deviated from Devine et al.’s study in several key ways: 1) all of the students were pre-service teachers in a college of education, 2) all participants took the intervention 3) conditions were manipulated so that only half the students received IAT scores and feedback, 4) there was only 1 week between time point 1 and time point 2, 5) survey questions were changed to include questions related to the field experience of the pre-service teachers.

Although Devine et al. measured the levels of implicit bias among undergraduate psychology students, levels of implicit bias in a sample of pre-service teachers had not been previously established. The population of pre-service teachers enrolled at the University skews female and white; therefore, their implicit bias levels should be established separate from those of psychology students. The demographic differences between the psychology students and the education students makes it likely that there IAT scores would differ. In addition, psychology majors may have been more familiar
with the concepts of implicit bias and the IAT; however, the majority of the pre-service teachers indicated on their survey responses that they had been unfamiliar with the concept prior to the intervention.

Unlike Devine et al., I did not have a control group for the proposed study; rather, I varied the conditions between two groups. There was no control group due to the small sample size of the study. The conditions were manipulated to measure if receiving IAT scores before the intervention had an effect on post-test scores. In condition one, the participants received their IAT scores, and in condition two, no IAT score was given before the intervention. Time point 1 included pre-IAT survey questions and all participants participated in the intervention. The conditions of the intervention during time point 1 were manipulated by the researcher so that only those assigned to condition 1 received their IAT scores and feedback. In Devine et al.’s study, all participants who participated in the intervention received their IAT scores and feedback which indicated whether they had slight, moderate, or high levels of bias. In this study, the conditions were varied to ascertain whether receiving IAT scores and feedback had an effect on survey responses and IAT scores at time points 2 and 3. The study also examined whether the effects of the intervention were different for participants who learned their IAT score than for participants who did not learn their IAT score. Howell et al. (2015) found that some participants, who received their IAT scores, had defensive reactions. The magnitude of the defensive reactions was correlated with the level of discrepancy between explicit and implicit measures of bias, which reflects the difference between the participants measured levels of implicit bias and their aspiration not to have biased beliefs (Howell et al., 2015). The initial IAT and intervention took place a week before
the second administration of the IAT, which should have allowed any ruminations that participants might be having in relation to race to diminish. The study was then able to measure whether the participants, after participating in the intervention, had decreased levels of implicit bias, as measured by the IAT. The results also showed the ways in which viewing an IAT score before an intervention effected post-test IAT test scores.

The timing of this study was different from Devine et al.’s study. Time point 2 took place one week after the intervention, while in Devine et al.’s study time point 2 took place two weeks after the initial intervention. IRB approval affected the time points in the intervention. The third time point, which took place six weeks after time point 1, was scheduled to coincide with the end of the semester and differed from Devine et al., who had eight weeks between time point 1 and 3. At the six-week time point the IAT was repeated to ascertain whether or not the intervention had a lasting effect on IAT scores.

The intervention was administered in one session and was accessed via a URL, similar to the design Devine et al., employed. The intervention provided participants with five strategies to counteract bias: stereotype replacement, thinking of counter-stereotypic examples, individuating instead of generalizing, perspective taking, and increasing opportunity for contact. After each strategy, there were three Likert scale questions with five points from 0-4 that participants responded to during the intervention. For each strategy, the Likert scale questions asked students the extent to which they will have the opportunity, willingness, and ability to use the strategies outlined in the intervention in their personal lives and field experiences. The Likert scale questions in Devine et al.’s study only related to the participants personal lives. Since part of the course was a field experience in which all students participated, with the majority of
students placed in diverse schools, including the field experience in the Likert scale questions allowed students to reflect on how the strategies could be applied in the classroom. I also incorporated open response items within the intervention that asked participants about their feelings toward the IAT and ways in which they can employ the strategies in their future classrooms. Please see Appendix A to view the intervention.

**Data Analysis**

Univariate statistical analysis was used to analyze IAT and survey data collected during the quantitative phase of the study. Participants’ IAT scores and survey scores were analyzed to determine whether the level of implicit bias, as measured by the IAT, changed after the implementation of the intervention. Condition 1, n=18, in which participants received feedback and IAT scores was compared to Condition 2, n=17, in which participants received no feedback or IAT scores, to measure effects within and between groups. Two one way repeated measures ANOVA were conducted. The first one way repeated measures ANOVA was used to compare the effect of (IV) time on (DV) IAT test scores, before the intervention, one week after the intervention, and six weeks after the intervention. The second one way repeated measures ANOVA was used to compare the effect of (IV) condition on (DV) IAT test scores, before the intervention, one week after the intervention and six weeks after the intervention. The alpha level was set at .05. In addition, T tests were conducted to determine if there were any differences between conditions in relation to how participants felt about the IAT. The T tests compared the effect of condition (IV) on feelings toward emotion related words (DV). The alpha level was set to at .05. Finally, a cross tabs analysis and chi square tests of independence were conducted on questions related to the opportunity, likelihood, and
intention to use the provided strategies. For each cross tabs analysis chi square test of independence was conducted to determine if the results were statistically significant.

The interviews were unstructured, which allowed flexibility in the process, and allowed me to probe for a deeper understanding based on participants’ responses. All interviews were recorded by a digital voice recorder and transcribed by me. Once all of the interviews had been transcribed, I imported the text into NVIVO for analysis. First, I read all of the interview text and marked passages that related to the research questions. Once passages were marked in relation to the research questions, I took all of the text related to a particular research question and then coded for recurring themes. Once all interviews had been marked, I coded the data based on common threads that emerged across interviews. Once the text of the interviews had been coded into themes, I explored the ways in which those themes were connected to my research questions (Seidman, 2013). Finally, I took the text of the interviews and connected them with the text that had been collected during the surveys. I then matched the survey responses with similar themes that occurred during the interviews.

**Ethical Considerations**

Recruitment and consent for this study raised several ethical considerations. First, I was the instructor for the course in which the participants were enrolled, which was problematic because students might have felt they needed to tell me what I wanted to hear, or might have felt coerced to participate. Therefore, I put systems in place that shielded students’ identities and kept my involvement to a minimum. Although all students participated in the intervention, they could opt out of including their data for analysis, and I did not know who had opted out. I did not bring students into the computer lab and was not present when the research was being explained to them; rather,
I had a graduate student explain the research and escort them to the computer lab. As a further assurance, I did not view any of the data collected until after final grades were submitted. I also built numerous identity safeguards into the online intervention and IAT administration. All responses remained anonymous, and no personally identifying information was requested of participants. To ensure the information was anonymous, all participants accessed the IAT, survey, and open response questions through an online system that did not retain personal identification information. Because I contacted potential interviewees by emailing all students who said they were willing to be interviewed, I did not know prior to the interview which experimental condition they had been in or which quantitative responses were theirs. This selection process ensured that their quantitative answers to the study remained anonymous.

Another ethical consideration was that racial bias and attitudes are a topic that may provoke racial anxiety. Racial anxiety, in relation to the study, might be activated due to the nature of the IAT and the intervention. Racial anxiety, in the context of this study, is likely to be related to white people’s fear of appearing prejudiced (Godsil et al., 2014). To minimize the amount of racial anxiety participants felt, the participants were told the study was seeking a general sense of peoples’ reaction to skin tone. At the completion of the study, participants were provided with a deception debriefing form which detailed the actual purpose of the study.

Prior to any data being collected, the study was approved by the University’s Institutional Review Board. Once approval was received, participants were notified that they would be taking part in the study. Permission to conduct the study at the University site was granted through the IRB and students enrolled in the two sections of the
proposed course were split into 2 conditions. All students were required to complete the intervention; however, they had the option to exclude their data from the analysis through an opt-out box on the participant consent form.

Limitations

Sample Size. The number of participants who agreed to participate in the study and have their data included were fewer than anticipated. The course enrollment was 50; however, only 43 participants agreed to have their data included in the study. Of the 43 who agreed to have their data included in the study 39 participants IAT scores were able to be matched over all three time points. In addition, 4 participant’s scores were excluded from the data due to the time it took them to complete the IAT invalidating their scores. I did include the text-based responses of the four participants whose IAT scores were excluded. Therefore, 35 participants were included in the final analysis, which is a smaller sample size than anticipated. The smaller sample size makes it difficult to determine if the results were statistically significant and how large or small of an effect the intervention may have had on IAT scores.

Conditions. The small sample size also affected the analysis of the two conditions in which the participants were placed. Participants assigned to Condition 1 received feedback on their IAT scores, while participants assigned to Condition 2 did not receive feedback on their IAT Scores. Condition 1 had 18 participants and Condition 2 had 17 participants, the small numbers of participants assigned to each condition makes it difficult to determine what effect, if any, the conditions had on their subsequent IAT scores during time point 2 and 3. The descriptive statistics indicated a greater decrease in
IAT scores for those assigned to Condition 2, however, the results were not statistically significant.

The qualitative portion revealed some of the mechanisms that participants felt helped reduce implicit bias during the intervention. However, since there are five ways in which the implicit bias was addressed during the intervention, teasing out which ways were most effective was difficult. Although the intervention did not have a statistically significant effect, the text based survey responses were able to help determine how participants responded to each strategy.

**Outside Factors.** The administration of the IAT took place at three different time points. The first-time point was one week before the United States Presidential Election. The second-time point was the day after the 2016 United States Presidential Election. Prior to taking the second IAT students participated in classroom activities and many were visibly upset during class time. There is no way to determine exactly how this might have influenced their IAT scores; however, it seems plausible that their emotional states might have increased the anxiety of some of the students and decreased their focus on the IAT task.
CHAPTER 4

RESULTS

Introduction

This chapter will provide an analysis of the study and is divided into six sections. Five of the sections will address one of the central research questions. The first section will detail the demographics of the study participants and will situate the location and timing of the study. The next five sections provide results for the study’s central research questions: 1) Did the intervention decrease the levels of bias and make participants aware of their own biases, 2) How does receiving IAT scores affect preservice teachers’ experience with an intervention about implicit bias? 3) What was learned about the strategies in the intervention and how could this information be placed into the larger context of teacher education? 4) What do the survey results, open response questions, and interview data offer about participants’ awareness of their own biases before and after the intervention, and 5) What does the interview data reveal about the participants’ perception of the IAT.

Central Research Question 1: Can a Brief, Computer-Based Intervention Decrease the Level of Implicit Bias and Increase Awareness of Bias?

Results. A Repeated Measures ANOVA was performed to compare scores on the Implicit Association Test at Time 1 (prior to the intervention), time 2 (1 week after the intervention), time 3 (6-week follow-up). The means and standard deviations are presented in Table 4.1. The change in participants IAT scores were not statistically significant between the first and subsequent administrations of the IAT. There was not a
significant effect for time [Wilks’ Lambda=.958, F (2, 33) = .729, p>.05, multivariate partial eta squared=.042]

Table 4.1

Repeated Measures ANOVA

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>factor1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.042</td>
<td>.729b</td>
<td>2</td>
<td>33</td>
<td>0.49</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.958</td>
<td>.729b</td>
<td>2</td>
<td>33</td>
<td>0.49</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>0.044</td>
<td>.729b</td>
<td>2</td>
<td>33</td>
<td>0.49</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>0.044</td>
<td>.729b</td>
<td>2</td>
<td>33</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Although the repeated measures ANOVA did not show a statistically significant result across the time points, the descriptive statistics did indicate a trend in the IAT scores over time. Table 4.2 shows the descriptive statistics with both conditions combined. There is a downward trend in IAT scores between time point 1 and 2 and between time point 1 and time point 3. It is possible that with a larger sample that the results would be significant.

Table 4.2

Mean and Standard Deviation for IAT Scores time points 1, 2, and 3

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.51</td>
<td>0.30</td>
</tr>
<tr>
<td>2</td>
<td>0.43</td>
<td>0.22</td>
</tr>
<tr>
<td>3</td>
<td>0.39</td>
<td>0.33</td>
</tr>
</tbody>
</table>
Survey Responses Related to an Increase of Awareness of Implicit Bias Levels. The second part of the first research question dealt with the ability of the intervention to make participants more aware of their own bias. Embedded within the survey were questions designed to make students think about their own biases and reactions. The following open response question shed some light on how participants believed stereotypes influenced their response: “Can you think of any times in the past where you had an automatic response that was influenced by stereotypes? Please briefly describe any instances that come to mind.”

Of the 39 students who entered a written response to the question only 3 claimed that they had not been influenced by stereotypes. All of the participants that made this claim belonged to condition 1 (did not receive IAT score or feedback). The majority of respondents detailed a situation in which they believed stereotypes had influenced their reactions. 14 of the respondents detailed a scene in which they were walking in a city and felt fear when they encountered a black man or a group of black males. One participant offered, “when walking home late at night, I have assumed that a Black man might hurt me.” This sentiment was echoed by another participant, who described living in Philadelphia for the summer and offered, “Philly has a large demographic of people of color, and I think at times I felt a little nervous, which is really awful of me, at night when I was alone and walked by a group of black men.” Numerous participants reported crossing the street, clutching their purses tighter, and walking faster to their destination. One student offered that when she tutored college athletes, “I was assigned a football player. I assumed he would be black, because all of my other football players are. I had a difficult time finding him on the first day because I was looking for a black man and he
happened to be white.” Although it may not be entirely attributable to the intervention, students were able to connect their stereotypical responses with an awareness of their biases. One student connected their experience to working with children, “I have often made assumptions about their family life. I always feel bad when I assume that children of color don’t have stable home lives”. This was the only response that dealt specifically with children; however, there were numerous participants who associated bad neighborhoods with bad people and feeling afraid of people who lived in what they considered a bad area. Based on the responses of the participants it seems possible that the question led students to explore the ways in which stereotypes influenced their thinking and led to biased reactions. However, the description provided in the intervention or the way in which the questions was formulated may have also led to the responses provided.

**Research Question 2: How Does Receiving Their IAT Scores Affect Pre-service Teachers’ Experience With an Intervention About Implicit Bias?**

All participants in the study took part in the intervention. Random assignment was used to assign participants to each condition. In Condition 1 participants received feedback and their IAT scores. In Condition 2 participants did not receive IAT scores or feedback. The sample size for each condition was limited; therefore, descriptive statistics were used to perform the analysis of the conditions.

**Analysis of Conditions.** When an analysis of the descriptive statistics is included with the 2 conditions, although the results were not statistically significant, there appears to be some change in IAT scores that may be due to assigned condition. In Condition 1 participants saw feedback which included their IAT score. In Condition 2 participants did
not see any feedback on their IAT scores. Table 4.3 details the results of the descriptive
statistics testing separated by condition. In both conditions IAT scores trending
downward in each subsequent administration of the IAT. Figure 4.2 of the estimated
marginal means provides a graphic representation of the two conditions over the three
time points.

Table 4.3

*Descriptive Statistics for time points by condition*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Time points</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.44</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.42</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Figure 4.1

*Plots of time points by condition*
The participants’ IAT scores decreased over the three time points but did not statistically differ over time. Still, there was a clear trend that indicated that at both post intervention time points scores on the IAT were reduced. In addition, although the changes in scores are not statistically significant, participants who did not see their IAT score after the first time point had a greater reduction in IAT scores. The limited sample size of this study might be the reason why the results were not statistically significant.

**Other Differences between Conditions.** In addition to taking the IAT and completing survey questions related to the strategies, participants provided responses to additional questions. Prior to taking the IAT, participants were asked to answer questions on how they felt bias affects academic and discipline performance for students of color. During the post IAT survey, respondents were asked to choose which emotion-related words described how the IAT made them feel. At time point 2, the participants responded again to the questions about how bias affects students. The responses that participants provided to these items showed differences between experimental conditions.

**IAT Conditions and Emotion-related Words.** Those participants assigned to condition 1 (received their IAT scores) reported feeling more threatened than participants assigned to condition 2 (did not receive their IAT scores). This was determined through the use of Independent Sample T Tests. Independent samples T tests were conducted on all of the emotion related words contained in question 28 of the intervention survey (see appendix A). Participants were asked to rate their feelings using a 1 (strongly disagree) to 7 (strongly agree) scale. The question was as follows: We are interested in how you feel about the IAT. We will present a series of emotion-related words. Please indicate the degree to which each word describes your feelings.
Table 4.4

Details the results of the independent samples T test

<table>
<thead>
<tr>
<th>Emotion-Related Term</th>
<th>Condition 1</th>
<th>Condition 2</th>
<th>t values</th>
<th>df</th>
<th>p (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatened</td>
<td>3.14</td>
<td>2.41</td>
<td>2.060</td>
<td>41</td>
<td>.046</td>
</tr>
<tr>
<td>Calm</td>
<td>4.48</td>
<td>4.86</td>
<td>-.831</td>
<td>41</td>
<td>.411</td>
</tr>
<tr>
<td>angry at myself</td>
<td>3.35</td>
<td>3.41</td>
<td>-.120</td>
<td>40</td>
<td>.905</td>
</tr>
<tr>
<td>uncomfortable</td>
<td>3.81</td>
<td>3.64</td>
<td>.326</td>
<td>41</td>
<td>.746</td>
</tr>
<tr>
<td>Guilty</td>
<td>3.90</td>
<td>3.91</td>
<td>-.008</td>
<td>41</td>
<td>.994</td>
</tr>
<tr>
<td>Friendly</td>
<td>4.33</td>
<td>4.27</td>
<td>.163</td>
<td>41</td>
<td>.871</td>
</tr>
<tr>
<td>angry at others</td>
<td>3.43</td>
<td>3.09</td>
<td>.769</td>
<td>41</td>
<td>.446</td>
</tr>
<tr>
<td>Uneasy</td>
<td>3.95</td>
<td>3.45</td>
<td>1.087</td>
<td>41</td>
<td>.283</td>
</tr>
<tr>
<td>depressed</td>
<td>3.29</td>
<td>2.68</td>
<td>1.504</td>
<td>41</td>
<td>.140</td>
</tr>
<tr>
<td>Happy</td>
<td>3.71</td>
<td>3.27</td>
<td>1.277</td>
<td>41</td>
<td>.209</td>
</tr>
<tr>
<td>Embarrassed</td>
<td>3.76</td>
<td>3.48</td>
<td>.601</td>
<td>40</td>
<td>.551</td>
</tr>
<tr>
<td>Bothered</td>
<td>4.57</td>
<td>4.00</td>
<td>1.170</td>
<td>41</td>
<td>.249</td>
</tr>
<tr>
<td>satisfied with myself</td>
<td>3.90</td>
<td>3.50</td>
<td>1.035</td>
<td>41</td>
<td>.307</td>
</tr>
<tr>
<td>Anxious</td>
<td>3.90</td>
<td>4.18</td>
<td>-.630</td>
<td>41</td>
<td>.532</td>
</tr>
<tr>
<td>Frustrated</td>
<td>4.48</td>
<td>3.91</td>
<td>1.161</td>
<td>41</td>
<td>.252</td>
</tr>
<tr>
<td>annoyed with myself</td>
<td>3.86</td>
<td>3.50</td>
<td>.765</td>
<td>41</td>
<td>.449</td>
</tr>
<tr>
<td>Energetic</td>
<td>3.38</td>
<td>3.09</td>
<td>.745</td>
<td>41</td>
<td>.461</td>
</tr>
<tr>
<td>Regretful</td>
<td>3.52</td>
<td>2.86</td>
<td>1.684</td>
<td>40</td>
<td>.100</td>
</tr>
<tr>
<td>irritated at others</td>
<td>3.81</td>
<td>3.09</td>
<td>1.718</td>
<td>41</td>
<td>.093</td>
</tr>
<tr>
<td>disappointed with myself</td>
<td>3.67</td>
<td>3.55</td>
<td>.268</td>
<td>41</td>
<td>.790</td>
</tr>
<tr>
<td>Tense</td>
<td>3.95</td>
<td>3.68</td>
<td>.569</td>
<td>41</td>
<td>.573</td>
</tr>
<tr>
<td>disgusted with myself</td>
<td>3.14</td>
<td>3.41</td>
<td>-.554</td>
<td>41</td>
<td>.583</td>
</tr>
<tr>
<td>Optimistic</td>
<td>3.67</td>
<td>3.45</td>
<td>.556</td>
<td>41</td>
<td>.581</td>
</tr>
<tr>
<td>disgusted with others</td>
<td>3.60</td>
<td>3.09</td>
<td>1.161</td>
<td>40</td>
<td>.253</td>
</tr>
<tr>
<td>Content</td>
<td>4.05</td>
<td>3.52</td>
<td>1.407</td>
<td>40</td>
<td>.167</td>
</tr>
<tr>
<td>Low</td>
<td>3.71</td>
<td>3.32</td>
<td>.986</td>
<td>41</td>
<td>.330</td>
</tr>
<tr>
<td>pleased with myself</td>
<td>3.71</td>
<td>3.41</td>
<td>.875</td>
<td>41</td>
<td>.387</td>
</tr>
<tr>
<td>Sad</td>
<td>3.67</td>
<td>3.50</td>
<td>.381</td>
<td>41</td>
<td>.705</td>
</tr>
<tr>
<td>Helpless</td>
<td>3.19</td>
<td>3.09</td>
<td>.235</td>
<td>41</td>
<td>.815</td>
</tr>
<tr>
<td>Ashamed</td>
<td>3.71</td>
<td>3.55</td>
<td>.335</td>
<td>41</td>
<td>.739</td>
</tr>
<tr>
<td>Relaxed</td>
<td>3.76</td>
<td>3.68</td>
<td>.200</td>
<td>41</td>
<td>.842</td>
</tr>
<tr>
<td>self-critical</td>
<td>4.33</td>
<td>4.05</td>
<td>.638</td>
<td>41</td>
<td>.527</td>
</tr>
<tr>
<td>Good</td>
<td>3.86</td>
<td>3.45</td>
<td>1.171</td>
<td>41</td>
<td>.248</td>
</tr>
</tbody>
</table>
An independent-samples t test was conducted to compare the IAT emotion scores for condition 1 (received IAT scores and feedback) and condition 2 (did not receive IAT scores and feedback). Only one of the emotions listed returned a statistically significant result. The emotion related word that returned a statistically significant result between the conditions was the word threatened. There was a significant difference between condition 1 (M=3.14, SD=1.108) and condition 2 (M=2.41, SD =.1.221 t (41) =2.06 p=.046, two tailed). The magnitude of the differences in the means (mean difference = .734, 95%CI: .014- to 1.453) was moderate (eta squared=.09).

Questions about Bias and Students of Color. Participants in the study were asked two questions before taking the IAT the first time, and the same two questions before the second administration of the IAT. The results are detailed in Tables 4.4 and 4.5.

Table 4.5

*Academic Performance and Racial Bias by condition and time point*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Condition 1 Time Point 1 n=19</th>
<th>Condition 1 Time Point 2 n=19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>45.5</td>
<td>31.6</td>
</tr>
<tr>
<td>No</td>
<td>27.3</td>
<td>36.8</td>
</tr>
<tr>
<td>Maybe</td>
<td>13.6</td>
<td>31.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scale</th>
<th>Condition 2 Time Point 1 n=22</th>
<th>Condition 2 Time Point 2 n=19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>54.5</td>
<td>63.2</td>
</tr>
<tr>
<td>No</td>
<td>27.3</td>
<td>31.6</td>
</tr>
<tr>
<td>Maybe</td>
<td>0.0</td>
<td>5.3</td>
</tr>
</tbody>
</table>
Before participants took the IAT or participated in the intervention 45.5 percent of participants who received their IAT scores and feedback and 54.5 percent of participants who received no IAT scores or feedback answered that racial bias affects the academic performance of students in school. At time point 1 both condition 1 and condition 2 had 27.3 percent of participants who choose no. At time point 1 in condition 1, 13.6 percent of participants answered maybe, and 0 percent of participants in condition 2 answered maybe. One week after taking the IAT and participating in the intervention only 31.6 percent of participants still answered yes in condition 1. In condition 2 the number increased to 63.2 percent of participants who answered yes. The percentage of participants answering no in condition 1 increased to 36.8 percent and in condition 2 it increased to 31.6 percent. The percentage of participants who answered maybe in condition 1 at time point 2 increased to 31.6, while the percent of participants in condition 2 had a small increase of 5.3. Although the sample size is small it is interesting to note that 4 of the 5 participants who changed their answer to no at the second-time point were part of condition 1, and received feedback after the initial IAT. The initial IAT scores may have caused the respondents to feel threatened. It is possible that viewing their IAT scores caused them to change their answers since viewing their IAT score caused racial anxiety. Speculatively, it seems possible that the racial anxiety that the test invoked caused the respondents to feel less empathy for students of color; therefore, they may have changed their answer to no.
Table 4.6

Discipline Performance and Racial Bias by condition and time point

Do you think that racial bias affects the discipline performance of students of color in elementary school?

<table>
<thead>
<tr>
<th>Condition 1</th>
<th>Time Point 1</th>
<th>Time Point 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>n=21</td>
<td>n=17</td>
</tr>
<tr>
<td>Yes</td>
<td>57.1</td>
<td>47.1</td>
</tr>
<tr>
<td>No</td>
<td>23.8</td>
<td>41.2</td>
</tr>
<tr>
<td>Maybe</td>
<td>19.0</td>
<td>11.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition 2</th>
<th>Time Point 1</th>
<th>Time Point 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>n=22</td>
<td>n=20</td>
</tr>
<tr>
<td>Yes</td>
<td>72.7</td>
<td>80.0</td>
</tr>
<tr>
<td>No</td>
<td>25.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Maybe</td>
<td>12.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Before participants took the IAT or participated in the intervention, 57.1 percent in condition 1 and 72.7 percent in condition 2 responded that they believed that racial bias affected the discipline performance of students of color. Due to lower response rates for condition 1 and condition 2 for the second time point it is difficult to determine if there was a great deal of change in how participants answered the questions after participating in the intervention. However, while condition 1 had 47.1 percent answer yes at time point 2, condition 2 had 80 percent of participants answer yes. Condition 1 also had an increase from 23.8 percent of participants who answered no at time point 1 to 41.2 percent at time point 2. Condition 2 had a slight decrease from 25 percent to 20 percent of participants answering no. It is possible that this decrease is due to the intervention and that the participants were assigned to condition 2. Participants in condition 2 did not receive their IAT scores; therefore, they may have been under less stress and able to absorb more of the information in the intervention. The intervention addressed the ways in which implicit bias affects people of color in educational settings,
so it is possible that the participants changed their answer after learning about the negative ways in which implicit bias can affect people of color.

**Central Research Question 3: What Can be Learned from the Implementation of an Intervention in This Setting That Could be Integrated in the Larger Context of Teacher Education?**

This intervention was implemented as part of a course required for Elementary Education Licensure. The course required all students to participate in a field experience in local schools. The field experience component allowed participants to make critical connections between the intervention and their experience in the classroom. The connections that participants made between the idea of implicit bias, and the ways in which it might manifest itself in a classroom, were aided by participation in the field experience. Participants in the study offered numerous ways in which their field experience connected to their recognition of their implicit biases. Furthermore, participants were able to identify ways in which they perceived these implicit biases manifesting in a classroom setting. This section will present the survey results for each strategy provided. These results provide a way in which to determine if this method of delivery was an effective way to learn the strategies within the context of a teacher education program. It also provides insight into which particular strategies students understood and had the opportunity to use in a field experience setting.

The five strategies that the intervention addressed were: stereotype replacement, counter stereotypic examples, individuating, perspective taking, and opportunities for contact. Stereotype replacement involves labeling a response as stereotypical, evaluating the response and how it occurred, and thinking of ways to avoid a stereotypical response in the future. The last step of the stereotype replacement strategy involves replacing the
stereotypical response with one that is non-stereotypical. The counter-stereotypic examples strategy involves an individual recognizing a stereotype and thinking of an example of a person who shows that stereotype to be inaccurate. The individuating strategy asks people to go beyond racial categories and attend to the individual characteristics of others. The perspective taking strategy involves imagining what it would feel like to be in another person’s situation. The increasing opportunities for contact strategy involves actively seeking situations in which you are likely to have positive interactions with people of color.

For each strategy participants answered Likert Scale questions in order to determine their opportunities for use, intention of using, and likelihood of using each strategy. A frequency table was provided for each strategy to show what percentage of participants choose each category. The frequency table allowed an unfiltered look at the data and participants responses. After the frequency table, a median table was provided to analyze the Likert Scale responses. The median table was provided to limit the influence of outliers, which could skew results due to the small sample size. Finally, a cross tabs analysis was completed to determine how the participants’ opportunities to use each strategy affected their likelihood and intention of using the strategy.

**Strategy 1: Stereotype-Replacement Strategy.** This first strategy presented to participants was the Stereotype Replacement Strategy. Table 4.7 details the frequency with which participants indicated they would use the stereotype replacement strategy in the classroom and during their field experience.
Table 4.7

Frequency Table for Stereotype Replacement Strategy

<table>
<thead>
<tr>
<th>Question</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the stereotype replacement strategy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0= Never</td>
</tr>
<tr>
<td></td>
<td>26.70%</td>
<td>37.80%</td>
<td>22.20%</td>
<td>2.20%</td>
<td>8.90%</td>
<td>1=Once a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2=2-3 times a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3=4-6 times a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4=Daily</td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the stereotype replacement strategy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.70%</td>
<td>8.90%</td>
<td>8.90%</td>
<td>46.70%</td>
<td>26.70%</td>
<td>0=Extremely unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1=Somewhat unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2=Neither likely nor unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3= Somewhat likely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4= Extremely likely</td>
</tr>
<tr>
<td>To what degree do you intend to use the stereotype replacement strategy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0=Definitely will not</td>
</tr>
<tr>
<td></td>
<td>4.40%</td>
<td>0.0</td>
<td>28.9%</td>
<td>31.1%</td>
<td>33.3%</td>
<td>1=Probably will not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2=Might or might not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3= Probably will not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4= Definitely will</td>
</tr>
</tbody>
</table>

Study participants indicated that they were willing to use the stereotype replacement strategy, 33 percent of students responded that they definitely will use and 31 percent responded that they probably will use the strategy. (Table 4.4) Participants were also willing to use the strategy when presented with an opportunity to employ it. 33.3 percent responded they would definitely use the strategy and 31.1 percent responded that they probably would. (Table 4.4) However, over 63 percent of respondents indicated that in a given week they have less than one chance to use the strategy. (Table 7) The limited opportunities to employ the strategy at this point in their lives may limit the
participants’ ability to practice what they learned during the intervention. However, the field experience component of the course, which placed most students in racially diverse school districts, did allow some students to practice or envision themselves practicing the strategy.

The median score showed similar results to the frequency table. (Table 4.5) In relation to their ability to use the strategy the median score was 1, which indicated once a week. When asked about their intention to use the strategy and to use it when given the opportunity the median score was 3. The median score of 3 indicates that most respondents would employ the strategy if they were in a situation in which it could be used.

Table 4.8

<table>
<thead>
<tr>
<th>Question</th>
<th>Median</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the stereotype replacement strategy?</td>
<td>1</td>
<td>0= Never 1=Once a week 2=2-3 times a week 3=4-6 times a week 4=Daily</td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the stereotype replacement strategy?</td>
<td>3</td>
<td>0=Extremely unlikely 1=Somewhat unlikely 2=Neither likely nor unlikely 3=Somewhat likely 4=Extremely likely</td>
</tr>
<tr>
<td>To what degree do you intend to use the stereotype replacement strategy?</td>
<td>3</td>
<td>0= Definitely will not 1= Probably will not 2=Might or might not 3= Probably will 4= Definitely will</td>
</tr>
</tbody>
</table>

Table 4.8 is a crosstabs analysis. It provides participants responses as related to the stereotype replacement strategy.
Table 4.9

Likelihood of using stereotype replacement strategy

<table>
<thead>
<tr>
<th>Opportunities to use</th>
<th>Extremely unlikely</th>
<th>Somewhat likely</th>
<th>Neither likely or unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>25.0%</td>
<td>8.3%</td>
<td>16.7%</td>
<td>16.7%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>11.8%</td>
<td>58.8%</td>
<td>29.4%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>20.0%</td>
<td>0.0%</td>
<td>80.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>25.0%</td>
<td>75.0%</td>
</tr>
</tbody>
</table>

Table 4.10

Intention to use stereotype replacement strategy

<table>
<thead>
<tr>
<th>Opportunities to use</th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or Might Not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>16.7%</td>
<td>0.0%</td>
<td>25.0%</td>
<td>33.3%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>35.3%</td>
<td>29.4%</td>
<td>35.3%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>30.0%</td>
<td>30.0%</td>
<td>40.0%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>50.0%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

The more opportunities that participants reported having to use the strategy, the more often they reported that they were likely to use, and intended to use, the strategy. However, even participants who believed they would only have one opportunity a week to use the strategy responded that their intention was 35.3 percent “might or might not” 29.4 percent “probably will” and 35.3 percent “definitely will” to use the strategy. Participants who reported one opportunity a week to use the strategy reported a similar likelihood of using the strategy, 11.8 percent “neither likely nor unlikely” 58.8 percent “somewhat likely” and 29.4 percent “extremely likely”. Based on the responses to the
question concerning the use of the stereotype replacement strategy, the more opportunities participants had to use a strategy the higher their likelihood and intention of using the strategy. Even participants who answered they only had one opportunity for use a week, responded that they were likely and intended to use the stereotype replacement strategy. It is interesting to note that participants who indicated that they would never have an opportunity to use the strategy 33.3 percent “probably will” and 25 percent “definitely will” responded they had the intention to use the strategy. It is not clear how they would use the strategy and in what context this would occur; however, perhaps they felt that if the occasion presented itself they intended to use the strategy. Based on this analysis it seems important to explore ways in which pre-service teachers may be given more access to opportunities to practice stereotype replacement.

Participants were given the opportunity to write a text based response to the following question: Please think of a situation that may occur during your field experience in which you could use the stereotype replacement strategy and describe that situation below. The responses on stereotype replacement were coded into three categories: 1) participants who indicated that they could change their reaction when confronted with a stereotype, 2) participants who noticed stereotypes in the classroom and indicated that a stereotype replacement strategy could be used, and 3) participants who did not feel this strategy could be used in their field experience. There were 31 students who responded to the question.

Sixteen students reported using the strategy by changing their reaction in response to situation they encountered in their field experience classroom. The responses of the participants in the category varied, however, most focused on how this strategy applied to
their field experience. One participant described, “quickly assuming (black students) were below the developmental level of the other students. If I feel this way before getting to know the student, I can realize that that thought came from a stereotypical link to Black youth doing poorly in school compared to White youth. After I acknowledge the stereotype, I can rid myself of that assumption and approach the student like any other with an open mind”. She not only acknowledged a stereotype she held in relation to black students; she offered that it was something she could change. Another participant focused on race and housing status and how she could replace the stereotype that she held, “Instead of seeing a black child walk into the classroom and automatically assume he comes from low income housing instead ask about his family and background.” 6 of the participants who indicated they would work to change their reactions referred to students of color getting lower test score than white students. As the first respondent indicated, they recognized that acknowledging this stereotype could lead to a change in their bias.

The second set of respondents also noticed ways in which stereotypes might be present in the classroom. Numerous responses detailed ways in which the strategy could be used with students directly, such as, “I could use the stereotype replacement strategy after a student directly refers to a stereotype about another student. Because the students are young, the do not necessarily know how to bite their tongue and additionally have little knowledge about race and cultural differences”. Others offered ways in which changing expectations might lead to beneficial results, “I observe in a school where the town is 90% poverty, instead of assuming that all the students are underachievers I can
turn that around to assume that they are capable of getting their work done every time and believe in the students”.

**Strategy 2: Counter-Stereotypic Examples.** Counter-Stereotypic Imaging was the second strategy that was presented to participants. The descriptive statistical results of the Likert Scale data for the Counter Stereotypic Examples strategy showed an overall intention to use the strategy when presented with situations where it could be practice.

Table 4.11

<table>
<thead>
<tr>
<th>Question</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the thinking of counter-stereotypic examples strategy?</td>
<td>24.40% 40% 17.80% 8.90% 4.40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the counter-stereotypic examples strategy?</td>
<td>13.30% 31.10% 22.20% 13.30% 15.60%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To what degree do you intend to use the counter-stereotypic examples strategy?</td>
<td>4.40% 0% 28.90% 31.10% 33.30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Over half of the respondents indicated that they probably or definitely intend to use the Counter-Stereotypic Examples strategy. Over half of the participants reported that they were somewhat or extremely likely to use the strategy if given the opportunity. 15.6 percent of respondents responded that they were extremely likely 13.3 indicated that they were “somewhat likely” to use this strategy and 22.2 indicated that they will probably use the strategy (Table 4.11). The intention to use the strategy may be difficult to apply to real life situations. The opportunity to use this strategy may be lacking in the daily lives of students. With a median score of 1, the majority of the participants indicated that in a given week they would have one opportunity or fewer to use the strategy (Table 4.12). With a median score of 3 participants reported that they intended to use the strategy; however, with a median score of 2 they reported they might or might not use the strategy if given the opportunity.

Table 4.12

<table>
<thead>
<tr>
<th>Question</th>
<th>Median</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the thinking of counter-stereotypic examples strategy?</td>
<td>1</td>
<td>0= Never 1=Once a week 2=2-3 times a week 3=4-6 times a week 4=Daily</td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the counter-stereotypic examples strategy?</td>
<td>2</td>
<td>0=Extremely unlikely 1=Somewhat unlikely 2=Neither likely nor unlikely 3=Somewhat likely 4=Extremely likely</td>
</tr>
<tr>
<td>To what degree do you intend to use the counter-stereotypic examples strategy?</td>
<td>3</td>
<td>0=Definitely will not 1=Probably will not 2=Might or might not 3=Probably will 4=Definitely will</td>
</tr>
</tbody>
</table>
Tables 4.13 and 4.14 detail the results of the crosstab analysis for counter-stereotypic examples.

Table 4.13

Likelihood of using counter-stereotypic strategy

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Extremely unlikely</th>
<th>Somewhat Unlikely</th>
<th>Neither likely or unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>18.2%</td>
<td>18.2%</td>
<td>27.3%</td>
<td>9.1%</td>
<td>27.3%</td>
</tr>
<tr>
<td>Once a week</td>
<td>16.7%</td>
<td>38.9%</td>
<td>22.2%</td>
<td>11.1%</td>
<td>11.1%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>12.5%</td>
<td>25.0%</td>
<td>25.0%</td>
<td>37.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>75.0%</td>
<td>25.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 4.14

Intention of using the counter-stereotypic strategy

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or Might Not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0.0%</td>
<td>18.2%</td>
<td>45.5%</td>
<td>9.1%</td>
<td>27.3%</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>27.8%</td>
<td>50.0%</td>
<td>22.2%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>25.0%</td>
<td>50.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>25.0%</td>
<td>25.0%</td>
<td>50.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The crosstabs analysis showed that when participants had the opportunity to use the strategy, even if it was once a week, they intended to use this strategy. However, even those that had the opportunity to use the strategy reported that they were less likely to use the strategy. Participants who had one opportunity a week intended to use the strategy, 27.8 percent “might or might not” 50.0 percent “probably will” and 22.2 “definitely will”.
However, they reported lower likelihoods of using the counter-stereotypic strategy, 16.7 percent “extremely unlikely” and 38.9 percent “somewhat unlikely”. It is not clear why participants, who indicated that they had an opportunity once a week to use the strategy and intended to use it reported being less likely to use the counter-stereotypic Examples strategy. One possible explanation may be that participants, who had a small number of opportunities for use, believed another strategy would be more effective. Therefore, while they reported intending to use the strategy when an opportunity arose they were less likely to do so because they believed another strategy might be more effective. Again, increased opportunities to use the strategies may provide pre-service teachers a greater ability to try different strategies and to determine which strategy might be most effective.

The Likert scale data was complemented by the open response that 32 of the students completed. The open responses detailed the ways in which they envisioned using the counter-stereotypic Examples strategies in their classrooms. The open response question asked them to think of a situation that may have occurred during their field experiences or daily lives where they could use the counter-stereotypic strategy. It also asked participants to describe the situation. There was a wider variety of responses to this strategy compared to the other strategies, but a few themes did emerge in the data. The responses were coded as follows: 1) Counter-stereotypic Examples related to a personal experience “someone they knew) 2) counter-stereotypic Examples related to a famous person or historical figure and 3) responses that did not connect to a specific event. The first group of respondents related ways in which they could employ personal connections if they detected themselves having a stereotypical reaction to an adult. One participant offered, “I volunteered in an academic center and the founder of the
organization is an old black man. He is very humble and gentle. Unlike those white people in suit and tie, he is in jeans and t shirt. Very easily to mistake him as janitor”. The student acknowledged that the founder did not fit her stereotype of founders but that his appearance, while not what she expected, belied his gentle and humble nature. Other participants detailed ways in which this strategy could be used to apply personal experience to professional experience, “If I am assuming a black child in one of my classes is not as smart as the others, I could think of my friend Be who is black and was VP of our graduating high school class”. The respondents’ willingness to apply their personal experiences to change stereotypes they might hold about students of color, appeared more powerful than those that related to historical figures.

The second group of respondents detailed connections between themselves and celebrities or historical figures as a means of using the stereotypic Examples strategy. In some ways, these responses seem to reinforce stereotypical ideas of black or Hispanic individuals. In addition, some of the respondents seemed to believe that thinking of a successful person of color, without attempting to make a connection between the person and a situation, would be a successful use of the strategy. A participant offered, “If I were to assume something about a student, I can think of examples that contradict my thoughts. This way, I am negating the stereotypes”. Without a specific plan for application it seems unlikely that this participant will be successful while using this strategy. Other participants made a connection to a historical figure but failed to identify ways in which they would change their thinking, “If I were to assume that a child was unintelligent ...I could think of Barack Obama... and that would change my stereotype”.
Participants also responded to the question in ways that seemed to reinforce existing stereotypes. There were a few examples that seemed representative of this type of thinking, “When I get frustrated with not being able to understand one of the ESL students in my class, I could think of Rhianna and how successful she is”. Another participant offered, “In my placement there are a lot of Latino students. In order to prevent stereotypes, I could think of someone from TV that is also Latino, like Sophia Vergara”. It seems clear that the strategy made students think of ways in which they could battle their own stereotypic Examples; however, many of the participants written responses seemed to imply only a surface understanding of the strategy. Numerous responses referenced their successful black friend who was, valedictorian of their high school class or went to Harvard, without exploring ways in which this counter stereotypic Examples could be applied in their field experience or life. Those that referenced famous or historic figures simply named that figure as successful without elaborating on how Examples that figure would change a stereotypic image they had in relation to a student or person in their daily lives.

**Strategy 3: Individuating Strategy.** A large percentage of participants indicated that they intended to use the individuating strategy. The Likert scale results are presented in Table 4.15.
The willingness to use the strategy is demonstrated by 72.2 percent indicating that they probably or definitely will when answering the question in relation to their field experience (Table 4.15). Over 70 percent of participants indicated that when presented with an opportunity they were likely to use this strategy. 40 percent and 31.8 percent respectively reported being “somewhat likely” or “extremely likely” to choose to use this strategy in classroom settings.

Similar to the other strategies mentioned, participants indicated that they have limited opportunities to use this strategy. The first question, which inquired about how often respondents could use the strategy had a median score of 1, which indicates one or fewer opportunities to employ this strategy per week.

<table>
<thead>
<tr>
<th>Question</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the individuating strategy?</td>
<td>22.70%</td>
<td>38.60%</td>
<td>22.70%</td>
<td>9.10%</td>
<td>6.10%</td>
<td>0= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1=Once a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2=2-3 times a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3=4-6 times a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4=Daily</td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the individuating strategy?</td>
<td>4.40%</td>
<td>6.70%</td>
<td>15.60%</td>
<td>40.00%</td>
<td>31.80%</td>
<td>0=Extremely unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1=Somewhat unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2=Neither likely nor unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3= Somewhat likely</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4= Extremely likely</td>
</tr>
<tr>
<td>To what degree do you intend to use the individuating strategy?</td>
<td>2.20%</td>
<td>4.40%</td>
<td>20.00%</td>
<td>35.60%</td>
<td>35.60%</td>
<td>0=Definitely will not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1=Probably will not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2=Might or might not</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3= Probably will</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4= Definitely will</td>
</tr>
</tbody>
</table>

Table 4.15

*Frequency Table for Individuating Strategy*
Table 4.16

*Median Table for Individuating Strategy*

<table>
<thead>
<tr>
<th>Question</th>
<th>Median</th>
<th>Scale</th>
</tr>
</thead>
</table>
| In a given week, how many opportunities do you think you would have to use the individuating strategy? | 1      | 0= Never
|                                                                          |        | 1=Once a week
|                                                                          |        | 2=2-3 times a week
|                                                                          |        | 3=4-6 times a week
|                                                                          |        | 4=Daily
| When you have the opportunity, how likely are you to use the individuating strategy? | 3      | 0=Extremely unlikely
|                                                                          |        | 1=Somewhat unlikely
|                                                                          |        | 2=Neither likely nor unlikely
|                                                                          |        | 3=Somewhat likely
|                                                                          |        | 4=Extremely likely
| To what degree do you intend to use the individuating strategy?          | 3      | 0=Definitely will not
|                                                                          |        | 1=Probably will not
|                                                                          |        | 2=Might or might not
|                                                                          |        | 3=Probably will
|                                                                          |        | 4=Definitely will

A cross tabs analysis compared participants’ opportunities to use the strategy and intention and likelihood of using the individuating strategy were compared. Table 4.17 and 4.18 detail the results.

Table 4.17

*Likelihood of using the individuating strategy*

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Extremely unlikely</th>
<th>Somewhat unlikely</th>
<th>Neither likely or unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>0.0%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0%</td>
<td>5.9%</td>
<td>17.6%</td>
<td>52.9%</td>
<td>23.5%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>20.0%</td>
<td>50.0%</td>
<td>30.0%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table 4.18

To what degree do you intend to use the individuating strategy

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or Might Not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>10.0%</td>
<td>10.0%</td>
<td>30.0%</td>
<td>0.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0%</td>
<td>5.9%</td>
<td>23.5%</td>
<td>52.9%</td>
<td>17.6%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>20.0%</td>
<td>40.0%</td>
<td>40.0%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>75.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Participants who had an opportunity to use the individuating strategy once a week reported intending to use the strategy 23.5 percent “might or might not” 52.9 percent “probably will” 17.6 percent “definitely will”. A similar percentage of participants 17.6 percent “neither likely or unlikely” 52.9 percent “somewhat likely” 23.5 percent “extremely likely” reported they were likely to use this strategy when presented with an opportunity. There is no definitive way to determine why the intention and likelihood numbers are consistent for the individuating strategy but based on some of the text responses, participants expressed a belief that they already see all people as individuals. Possibly, since participants were more likely to express a belief in seeing all people of color as individuals, they felt more capable of applying this strategy. It is also possible that they felt this strategy had been effective for them in past interactions. When this strategy was compared to the other strategies it ranked 2nd both in intent and likelihood of use. The relative popularity of this strategy may also explain why participants seemed equally matched in their intention and likelihood of using the strategy.
Participants were asked to respond to an open response question in relation to their field experience. The respondents were asked to describe how the individuating strategy could be used in their field experiences. The majority of the respondents answered the open response question in a similar manner; therefore, responses were coded in two ways: 1) how I can learn about each individual child in the classroom, and 2) other ways in which the strategy could be employed. Many of the responses were short and offered simple and direct ways in which to use this strategy. A typical short response was, “I can really listen and try to understand each one of my students”. A small number of participants related the strategy to ways in which they could get to know students families outside of the school, “I could use the individuating strategy by learning about a child’s background and family and this will help them take those factors into account instead of just thinking about race”. Many participants responded that they felt it was unfair to judge others and that they already try to see every person as an individual.

A limited number of the responses revealed participants’ stereotypes about children and seemed to use this strategy as a means by which to confirm or debunk their preconceived ideas. For example, one participant responded, “I could take the time to notice if the parents of the black child own a vehicle or if the child is well fed or appropriate dressed for the weather”. This response seemed more interested in finding what was wrong with the child’s family; rather than seeking to see them as an individual. Other responses seemed to follow a similar pattern, “In the classroom, you may assume that the Black child is much worse off than the other White children. However, by understanding more of him home life you could see how this child comes from a regular middle class family and is not struggling financial either”. Again, this response assumes
that black children are poor and struggling and that the only way to negate this stereotype is to learn that the child is middle class and therefore may more easily be equated with white children.

**Strategy 4: Perspective Taking.** Perspective taking stood out as a strategy that respondents felt they could employ on a more regular basis compared to the other strategies. Table 4.19 details the results of the Likert scale questions related to the Perspective Taking Strategy.

Table 4.19

<table>
<thead>
<tr>
<th>Frequency Table for Perspective Taking Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question</strong></td>
</tr>
<tr>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the perspective taking strategy?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the perspective taking strategy?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>To what degree do you intend to use the perspective taking strategy?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
| | | | | | | 4=Definitely will
Participants reported intending to use this strategy and using it when they are presented with a situation with which it could be employed. 35.6 percent and 37.8 percent respectively indicated that they definitely or probably will use the strategy (Table 4.19). 40 percent indicated that they would be extremely likely to use the strategy when presented with an opportunity.

Perspective taking had the highest percentage of students reporting that they would be extremely likely to use this strategy when the situation arose. It was one of the two strategies that had a median score of 2, which indicates that participants felt that they would be able to use this strategy 2-3 times per week (Table 4.20).

Table 4.20

<table>
<thead>
<tr>
<th>Question</th>
<th>Median</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the perspective taking strategy?</td>
<td>2</td>
<td>0= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1=Once a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2=2-3 times a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3=4-6 times a week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4=Daily</td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the perspective taking strategy?</td>
<td>3</td>
<td>0=Extremely unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1=Somewhat unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2=Neither likely nor unlikely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3=Somewhat likely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4=Extremely likely</td>
</tr>
<tr>
<td>To what degree do you intend to use the perspective taking strategy?</td>
<td>3</td>
<td>0=Definitely will not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1=Probably will not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2=Might or might not</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3=Probably will</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4=Definitely will</td>
</tr>
</tbody>
</table>
Although the sample size was limited, the crosstabs conducted on the perspective taking strategy revealed that most participants, even if they did not see an opportunity to use this one weekly basis, indicated they would use this strategy. Table 4.20 and 4.21 detail the intention and likelihood of participants to employ this strategy based on their opportunities of use.

Table 4.21

Likelihood of using the perspective taking strategy

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Extremely unlikely</th>
<th>Somewhat unlikely</th>
<th>Neither likely or unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>14.3%</td>
<td>0.0%</td>
<td>28.6%</td>
<td>14.3%</td>
<td>42.9%</td>
</tr>
<tr>
<td>Once a week</td>
<td>8.3%</td>
<td>0.0%</td>
<td>8.3%</td>
<td>50.0%</td>
<td>33.3%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>11.1%</td>
<td>44.4%</td>
<td>22.2%</td>
<td>22.2%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>28.6%</td>
<td>71.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>42.9%</td>
<td>28.6%</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

Table 4.22

Intention of using the perspective taking strategy?

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or Might Not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>0.0%</td>
<td>14.3%</td>
<td>42.9%</td>
<td>0.0%</td>
<td>42.9%</td>
</tr>
<tr>
<td>Once a week</td>
<td>8.3%</td>
<td>0.0%</td>
<td>8.3%</td>
<td>50.0%</td>
<td>33.3%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>11.1%</td>
<td>44.4%</td>
<td>22.2%</td>
<td>22.2%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>28.6%</td>
<td>71.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>28.6%</td>
<td>42.9%</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

In the case of the perspective taking strategy, participants, even those who indicated they may never have an opportunity to use the strategy, expressed an intention to use it. Participants who indicated that they would be able to use the strategy once a
week responded that 8.3 percent “might or might not” 50 percent “probably will” and 33.3 percent “definitely will”. Of the participants who had an opportunity to use the strategy more than 2-3 times a week over 50 percent indicated that they probably will or definitely will use the strategy. Participants who had the opportunity to use the strategy once a week indicated the likelihood of using the strategy as 8.3 percent “neither likely nor unlikely” 50 percent “somewhat likely” and 33.3 percent “extremely likely”. The numbers for intention to use and likelihood of using were consistent for those who indicated having once opportunity a week for use. Interestingly, those participants who had more opportunities to use the strategy, did not indicate a much greater intention or likelihood of using the perspective taking strategy, compared to those that only had an opportunity once a week. However, across all strategies perspective taking was the one that highest number of respondents indicated both the intention and likelihood of using the strategy. Perhaps, since this was the number one response both in intention and likelihood of use, participants felt comfortable with this strategy even if they felt they would never have the opportunity to use the strategy. Participants may have heard a similar strategy throughout childhood, i.e. how would that make you feel if somebody did that to you? Participants may have already used this strategy a multitude of times, making it easier to identify situations for use in relation to implicit bias.

A smaller number, n=23, offered a text based response to how they could apply the perspective taking strategy in their field experiences. To analyze the text based responses they were coded according to common threads found in the text. The responses were reviewed for commonalities and then coded into three categories: 1) personal experiences as a way to gain perspective on a situation 2) perspective taking strategies as
they might be used in a classroom during the field experience, and, 3) responses that were unique and did not fit with the other responses. Half of the participants reported ways in which a personal situation helped them to gain perspective. These respondents used to the strategy to think of challenging situations that might occur to them, “I would think about how it would make me feel if other students or teachers thought I was a trouble maker because of my race”. Other participants went further in personalizing their Examples, “I could think about how I must look to this black kid’s family, as a middle class white girl”. In relating ways in which this experience might affect them there were fewer responses that focused specifically on how this might play out within a classroom experience. However, one student did offer an anecdote directly from her field experience. The anecdote was related to the student’s home life, “When a child is acting out, I could take their perspective and understand that they may be going through something at home that is affecting his or her learning. For example, there is one student in my field experience classroom whose mother just got out of rehab. If I were this child, I may have a hard time concentrating in school as well”. Although this participant did not deal with race directly it seems important to note that this intervention may have broader applications. Teachers might be able to adapt these strategies to other situations in which taking a student’s perspective might lead to better treatment of the student. The broader answers were typified by this participants’ response, “I would hate to have people have these assumptions made about me when they don’t even know me yet. So instead I would not pass any judgement and think about what that person might be going through”. The breadth of this strategy appealed to most of the participants; although many made
connections to their own personal lives, half tried to think of ways they could apply it with their students in the classroom.

**Strategy 5: Opportunities for Contact.** The final strategy that the intervention measured was Opportunities for Contact. Table 4.23 below details the participants’ response to the questions that were embedded within the intervention:

<table>
<thead>
<tr>
<th>Question</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the contact strategy?</td>
<td>17.80%</td>
<td>33.30%</td>
<td>20%</td>
<td>4.40%</td>
<td>11.10%</td>
<td>0= Never, 1=Once a week, 2=2-3 times a week, 3=4-6 times a week, 4=Daily</td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the contact strategy?</td>
<td>4.40%</td>
<td>2.20%</td>
<td>26.70%</td>
<td>35.60%</td>
<td>24.40%</td>
<td>0=Extremely unlikely, 1=Somewhat unlikely, 2=Neither likely nor unlikely, 3=Somewhat likely, 4=Extremely likely</td>
</tr>
<tr>
<td>To what degree do you intend to use the contact strategy?</td>
<td>2.20%</td>
<td>4.40%</td>
<td>26.70%</td>
<td>35.60%</td>
<td>24.40%</td>
<td>0=Definitely will not, 1=Probably will not, 2=Might or might not, 3=Probably will, 4=Definitely will</td>
</tr>
</tbody>
</table>

There were a higher number of participants that thought they could use this strategy more frequently in daily life. Still, only 15 percent of participants saw this as something that they could use more than 4-6 times per week. However, over half of the
participants indicated that they would probably or definitely use this strategy. Moreover, over half of the participants were somewhat or extremely likely to use this strategy when presented with the opportunity. Opportunities for Contact and Perspective Taking were the only strategies with a median score of 2 in relation to their ability to use the strategy. Unlike the other three strategies, participants indicated that this was a strategy they were more willing to use in daily life. However, the median value of 2 indicates that participants might not have the opportunity to use this strategy on a daily basis. The limited opportunities that pre-service teachers would have to use this strategy is difficult to overcome since it requires that pre-service teachers be in an environment that has racial diversity.

Table 4.24

*Median Table for Opportunities for Contact*

<table>
<thead>
<tr>
<th>Question</th>
<th>Median</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the contact strategy?</td>
<td>2</td>
<td>0= Never 1=Once a week 2=2-3 times a week 3=4-6 times a week 4=Daily</td>
</tr>
<tr>
<td>When you have the opportunity, how likely are you to use the contact strategy?</td>
<td>3</td>
<td>0=Extremely unlikely 1=Somewhat unlikely 2=Neither likely nor unlikely 3= Somewhat likely 4= Extremely likely</td>
</tr>
<tr>
<td>To what degree do you intend to use the contact strategy?</td>
<td>3</td>
<td>0=Definitely will not 1=Probably will not 2=Might or might not 3= Probably will 4=Definitely will</td>
</tr>
</tbody>
</table>
The opportunities for contact strategy was one in which participants who indicated an opportunity for use indicated that they intended and were likely to use the strategy. Tables 4.25 and 4.26 detail the responses of participants.

Table 4.25

Likelihood of using the contact strategy?

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Extremely unlikely</th>
<th>Somewhat unlikely</th>
<th>Neither likely or unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>25.0%</td>
<td>12.5%</td>
<td>25.0%</td>
<td>12.5%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>33.3%</td>
<td>46.7%</td>
<td>20.0%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>44.4%</td>
<td>44.4%</td>
<td>11.1%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>20.0%</td>
<td>0.0%</td>
<td>80.0%</td>
</tr>
</tbody>
</table>

Table 4.26

To what degree do you intend to use the contact strategy?

<table>
<thead>
<tr>
<th>Opportunities for use</th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or Might Not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>12.5%</td>
<td>25.0%</td>
<td>37.5%</td>
<td>0.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Once a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>26.7%</td>
<td>53.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td>2-3 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>44.4%</td>
<td>44.4%</td>
<td>11.1%</td>
</tr>
<tr>
<td>4-6 times a week</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Daily</td>
<td>0.0%</td>
<td>0.0%</td>
<td>20.0%</td>
<td>0.0%</td>
<td>80.0%</td>
</tr>
</tbody>
</table>

Participants who had the opportunity to use this strategy once a week indicated that 26.7 percent “might or might not” 53.3 percent “probably will” and 20 percent “definitely will” intended to use the strategy when there was an opportunity. A comparable number of participants who indicated that they had opportunities to use the strategy once a week 33.3 percent “neither likely nor unlikely” 46.7 percent “somewhat likely” and 20 percent “extremely likely” would use the strategy when presented the
opportunity. In addition, of the participants who indicated opportunities to use the strategy once a week or more, none indicated that they were extremely unlikely or somewhat likely to use the opportunities for contact strategy. However, this strategy was not one of the top three strategies for participants, as indicated by choosing they intended “definitely will” or likelihood “extremely likely” categories. This phenomenon is likely due to limited opportunities for contact in their personal lives. This strategy, more than the other strategies, makes a strong case for increasing access to diverse school and classroom environments for pre-service teachers. The inability of pre-service teachers to use the strategies likely affected their intention and likelihood responses in relation to the opportunities for contact strategy.

Participants were asked to think of situation in which they could apply the Opportunities for Contact strategy in their field experience or real life. There were 34 participants who responded to this question. The responses were coded into the following groups: 1) Actions that they might take as an individual to increase their opportunities for contact, 2) ways in which they could work within their field experience or future classrooms to increase opportunities for contact, 3) other ways in which they could increase opportunity for contacts in their personal lives. 14 of the participants’ responses were related to ways in which they could take actions to increase their opportunities for contact with people from different racial or ethnic backgrounds. One participant responded, “I could join a racially diverse club or organization that would allow me to have positive experiences with Black people. Therefore, I would be less likely to stereotype Black students”. Although the next participant focused on a particular action that could be taken it also included the ways in which she might use her new-found
knowledge in the classroom, “I could make an effort to work with black children to get to know them and make more positive connotations about them to draw upon at a later time”.

Participants who indicated that they would like to use this strategy in the classroom often spoke in broad terms of diversity, “I could view the students as the many diverse friends that I personally have, and then attempt to place that understanding in the classroom and help foster diversity”. However, there were some respondents who envisioned direct classroom applications of this strategy,

I think that blending students that are diverse and integrating different ethnic backgrounds, especially at a young age, is a great way to utilize the seeking opportunities for contact strategy. In the classroom making groups of students that are diverse in nature provides them with the opportunity to use this strategy.

This type of direct application, in an elementary school classroom shows a way in which the intervention might not only impact the participant but her future students as well. Another respondent offered ways in which she could combine this strategy with others learned in the intervention to reach out to students in her future classroom, “In the classroom, I might observe other students expressing negative stereotypes towards the students who are Black. In that situation, I would encourage those students to broaden their friend group and maybe get to know the student they are not being very kind to. Friendship is a great way to get rid of negative stereotypes”.

However, there were a few students who felt this strategy might perpetuate racism, “I don't know that I would use this strategy. It seems more racist to me to seek out a student racially just to prove you don't have a racial bias”. Another respondent also took on a defensive tone in her response, “This section makes me feel very
uncomfortable assuming all of us have not had interactions with black people”. Although they were not in the majority of respondents it seems important to note that, as with other responses, there is the potential for the intervention to make participants defensive or feel that they are being accused of racism. Since it is entirely computer based, until an analysis is completed, there is no way to clear up misconceptions or have participants discuss their feelings in relation to the intervention.

Comparison of Intention and Likelihood of Use Across Strategies. Table 4.27

and 4.28 provide a simpler way to compare responses across strategies.

Table 4.27

*Likelihood of using strategy*

<table>
<thead>
<tr>
<th></th>
<th>Extremely Unlikely</th>
<th>Somewhat Unlikely</th>
<th>Neither Likely nor Unlikely</th>
<th>Somewhat Likely</th>
<th>Extremely Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stereotype Replacement</td>
<td>6.70%</td>
<td>8.9%</td>
<td>8.9%</td>
<td>46.7%</td>
<td>26.7%</td>
</tr>
<tr>
<td>Counter-Stereotypic Examples</td>
<td>13.3%</td>
<td>31.1%</td>
<td>22.2%</td>
<td>13.3%</td>
<td>15.6%</td>
</tr>
<tr>
<td>Individuating</td>
<td>4.4%</td>
<td>6.7%</td>
<td>15.6%</td>
<td>40%</td>
<td>31.1%</td>
</tr>
<tr>
<td>Perspective Taking</td>
<td>2.2%</td>
<td>0%</td>
<td>17.8%</td>
<td>35.6%</td>
<td>40%</td>
</tr>
<tr>
<td>Increasing Opportunities for Contact</td>
<td>4.4%</td>
<td>2.2%</td>
<td>26.7%</td>
<td>35.6%</td>
<td>24.4%</td>
</tr>
</tbody>
</table>
Most participants expressed an intention to use the strategies; however, the likelihood of using the strategies was lower than the intention to use for all five strategies. The strategies with the highest intention of use were perspective taking (37.8 percent), individuating (35.6 percent), and stereotype replacement (33.3 percent) with respondents stating that they “definitely will” use the strategy. However, when we look at the likelihood of using the strategy it was lower than their intention to use the strategy. The highest likelihood of use, for the category “extremely likely”, were perspective taking (40 percent), individuating (31.1 percent), and stereotype replacement (26.7 percent). The numbers are different when we look at the “probably will” (intention) and “somewhat likely” (likelihood) responses. For the intention to use strategy, participants selected “probably will” at the highest rate for increasing opportunities for contact (38.1 percent) and then there was a tie at 35.6 percent for counter-stereotypic examples, individuating, and perspective taking. Participants indicated that they were “somewhat likely” to use stereotype replacement (46.7 percent), individuating (40 percent), and perspective taking

<table>
<thead>
<tr>
<th>Stereotype Replacement</th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or might not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter-Stereotypic Examples</td>
<td>4.4%</td>
<td>0%</td>
<td>28.9%</td>
<td>31.1%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Individuating</td>
<td>2.2%</td>
<td>4.4%</td>
<td>20%</td>
<td>35.6%</td>
<td>35.6%</td>
</tr>
<tr>
<td>Perspective Taking</td>
<td>0%</td>
<td>2.2%</td>
<td>20%</td>
<td>35.6%</td>
<td>37.8%</td>
</tr>
<tr>
<td>Increasing Opportunities for Contact</td>
<td>2.4%</td>
<td>4.8%</td>
<td>28.6%</td>
<td>38.1%</td>
<td>26.2%</td>
</tr>
</tbody>
</table>
and increasing opportunities for contact both received 35.6 percent. It seems possible that those who chose that they would definitely intend to use the strategy were not sure how, when presented with a real-life situation, they would be able to employ the strategy. This might account for the decrease in extremely likely responses in relation to the definitely will intention. Those that chose definitely will may have felt more comfortable choosing “somewhat likely” to account for any uncertainty they may have in relation to real-life situations. Counter-stereotypic examples had the highest percentages of respondents choosing extremely unlikely (13.3 percent) and “somewhat unlikely” (31.1 percent) for likelihood of using. However, their intention of using the strategy was much higher with 35.6 percent “probably will” and 24.2 “definitely will” indicating they intended to use the strategy but were unlikely to do so. Based on the text based responses of the participants, it seems plausible that some of the participants only had a surface level understanding of this strategy. In comparison to the other strategies, counter-stereotypic examples, received the lowest rating in both intention and likelihood of use. Perhaps the low rating is an indication that students did not understand or feel comfortable with this strategy, therefore, they did not intend to use the strategy.

**Discussion of Strategies**

The quantitative data about the participants’ willingness to use the strategies presented combined with their open responses reveals the ways that students reflected on their implicit bias during the intervention. Based on the survey responses the intervention was likely effective at making participants aware of their own implicit biases. However, further research needs to be completed—perhaps with more direct questioning to determine whether the intervention or some other factor made them aware of their
implicit biases. There were some problematic responses with two of the strategies. The Counter-Stereotypic Imaging seemed to reinforce existing stereotypes for some of the participants. The Opportunities for Contact strategy offended some of the participants. There were five responses out of 34 in which participants expressed feeling accused of racism and that the intervention was unfair. Despite some students having a defensive response, the intervention allowed all of the participants an opportunity to confront their own biases, and work to change them.

An important component of the intervention for this particular population of students was the incorporation of the field experience. By placing the majority of students in diverse schools, many had the opportunity to try the strategies at some point during the semester. 35 of the participants were placed within the local school district described in Chapter 1, and 10 students were placed in a neighboring school district with similar demographics. In addition, since the study was seeking ways to make pre-service teachers aware of their implicit biases, the field experience allowed them to both imagine and use the strategies in classroom situations with actual students. Although the actual intervention was brief and computer based it allowed the students to provide honest responses without fear of being accused of racism in a face to face interaction. The open response questions prompted participants to first recognize their own bias and then think about ways it might impact them and their students as teachers., Their field experiences allowed them to gain, not only an awareness of their biases, but imagine ways in which this new awareness could be actively used to reduce their biases in their personal and professional lives.
Central Research Question 4: What Can Survey Questions and Open Responses Reveal about Pre-Service Teachers’ Awareness of Their Own Bias, Before and After a Brief Computer Based Intervention?

The previous sections detailed participants’ responses to questions embedded within the intervention related to the five strategies and field experiences. At the end of the intervention, participants had the opportunity to offer open-ended feedback for the researcher. 19 participants offered feedback to this question. The participants’ responses were coded into three categories; negative, neutral, and positive. There were 8 neutral responses and the comments related to the time it took the intervention to load and references to computer issues. There were 9 responses that were coded as negative. Several respondents in the negative category felt that the intervention itself was racist, such as, “I think this study in general, even though it may have not been intended to, was racist itself”. This was one of the milder responses. Another participant offered, “I think that this survey in itself was very racist because it is assuming first of all that we are all white and that we are all racist. I understand that you are trying to break the idea of racism but you are doing it in a horrible offensive way”. These sentiments were consistent with previous participant responses in relation to using the strategies. There were other negative responses that were not as harsh but the participants were still offended by the study: “While I understand the purpose of this task it made me very uncomfortable that the questions assumed the extent of my own racial bias and I think the questions could have been more tactfully asked”. All of these comments point to the defensive reaction described by Howell et al (2015). Participants who received their IAT scores were more likely to have a negative perception of the test and the process after the IAT was administered. Participants’ comments and the statistical analysis from question
I seem to further boost this assertion. There was a greater reduction in IAT scores among those who did not receive feedback on their scores. Although this was a small sample, the qualitative and quantitative data combine to suggest that not receiving IAT feedback may lead to a less defensive response in participants.

The open response feedback was used by some respondents as a way to confirm that the study was a valuable experience. However, the positive feedback was quite limited. There were only 2 participants who offered positive feedback. The two participants who offered positive feedback were both assigned to condition 1. This could be an anomaly since only two of the participants assigned to condition 1 offered feedback; alternatively, perhaps these two particular respondents found the IAT scores and intervention helpful when thinking about implicit bias. One of the respondents offered, “This was very interesting to think about while I was doing the activities. Very informative about assumptions and bias stereotypes”. The only other comment that offered a similar conclusion stated, “This was a very eye-opening exam”. Although the open response feedback offered was limited, the interviews with participants were able to offer additional insights into how the intervention and the IAT affected participants.
Central Research Question 5: In What Ways Can the Interview Data Reporting on Participants’ Perceptions of the Intervention Help Explain the Quantitative Results of the IAT?

Interviews. All participants in the intervention were offered the opportunity to be interviewed. Students who agreed to be contacted were emailed after the second administration of the IAT and asked to provide times when they were willing to meet with the researcher. Of the forty-five students who participated in the intervention, seven were willing to be contacted for interviews. All seven that indicated a willingness to be interviewed were contacted. Four of the seven responded, after numerous emails, and set up a time to meet with the researcher. Participants M, Y, and C who were interviewed self-identified as white. Participant A self-identified as a non-white international student. All interviewees agreed to have the interviews audio recorded and all interviews were transcribed in their entirety. All four interviews were coded using NVIVO Software. Based on the participants’ responses four major themes emerged. 1) reaction to the IAT and how it made them feel; 2) previous work with students of color; 3) field experiences and how the strategies could be utilized; 4) ways in which they felt the intervention could be improved and/or implemented in the classroom.

All of the interviewees reported feeling uncomfortable taking the IAT. Their responses varied but feeling frustrated and nervous was a common response. The interviewees often described it as, “So. I mean I always feel a little anxious doing them [IAT’s as part of Psychology courses] I don't want it to tell me I'm a racist” (Participant M). Participants C, Y and M described trying to not let their biases come out while taking the IAT, “I guess, but I also understood that this task was kind of to see what your underlying like feelings were so I kind of went into this with open mind and tried not to
let any biases come out. Generally I don't think I have any biases and I am a pretty liberal person” (Participant C). Participant Y, when discussing the skin tone IAT and other IAT’s she had taken that related to religion said, “…surprised about like my inner biases and stuff because I tend to think that I'm a very outgoing person like I don't have biases. And I love being friends with everyone and making like awesome new connections with people but I'm taking those exams like really frustrate me because I'm just like wow like I guess I'm not as open minded and positive as I thought I was”.

The first three participants cited above self-identified as white and from middle income backgrounds. Participant A, who identified as an international student of color, had a different perspective on the IAT. Although she also indicated that did not feel as if she were personally biased, she did not think the test could be a fair measure, “And then it's kind like the test is more it is just tell you in the end-- say OK you are racially biased. And that makes me feel like how is this possible. You know like because me as a person of color. I don't feel that way, maybe I was so ignorant about myself, but at the same time feel I like just pressing the button can't really tell …” Despite the participants’ feelings about the IAT and the anxiety it provoked Participants M, C, and Y all agreed that that it opened their minds to the presence of implicit bias:

**Participant C:** “I really never would have thought of that before this test or before reading this. Before those lessons, I would have thought, like implicit bias is there to stay. I mean, you can work on them by you know there is really nothing you really can do. These strategies kinds of opened my mind a little.

**Interviewer:** So, now you think it can change?

**Participant C:** Yeah, and again, I never considered myself someone who had strong implicit bias. I always thought I very accepting but still like maintenance for everyone. Everyone can work towards it
Participant C’s response aligned with Participant M and Y who both offered that before the intervention they had not thought about bias. They stated that since participating in the intervention they question their responses, while interacting with students of color, to see if their responses might be related to an implicit bias they hold. Though the intervention may have made them uncomfortable or nervous, three of the four participants stated that they now consider how implicit biases may be working in their personal lives. They also indicated that their realizations about implicit bias would impact the way in which they would treat students in their future classrooms.

All of the interviewees shared experiences of working with children of color in a day camp setting or during their field experience. Two of the participants detailed ways in which they felt implicit, or in some cases explicit, biases, were demonstrated in these settings. Participant M worked in a summer camp and described how kids with darker skin tones were treated,

**Participant M:** There is what we all know it's like terrible to say but sometimes there was like this There is this past summer specifically there's a group of kids almost all children of color that are treated like this (trouble makers) like they had darker skin tones. And they they kind of were troublemakers like but I mean there were other groups of kids who were white who were also trouble makers you know what I mean’.

She expressed that she felt these students were singled out because of their skin tone.

She went on to describe her perception of the students of color during the summer camp experience:

**Participant M:** it's sort of like hard not to notice the fact that like that like a lot of the children of color came from single parent homes and stuff like that it's just like I think that's just something that there's all these reasons like why this happened to them in their city like I know there's all these like societal and like economic reasons that like this tends to happen. But like I I know that that's not always the case but it was hard not to notice.
that like it just happened like a lot of the children of color are either in foster care or like just just like didn't have as great of a home as well as a lot of the white students were like upper middle class. Like parents pay for them to go to get like that they would usually come for like a week and like it was their week at summer camp. Meanwhile a lot of the children of color were there like all summer and it was usually on voucher like the government or their school paid for them to be there.

It is clear that she is aware of systematic issues that may be affecting the children, however, she engages in stereotypes without clear evidence that the students of color to whom she is referring live in foster homes, get government assistance, or are from single parent households. Because her story was a good example of the ways in which the stereotype replacement strategy could be used in thinking about ways the intervention could be improved, this vignette could be incorporated as an example of a time when this strategy could be applied.

Participant A related a story about working in a Chinese Immersion Summer Camp in Springfield, Massachusetts where she saw explicit bias against students. The following is an excerpt from her interview:

**Participant A:** I think I did. I volunteer in a Chinese camp in Springfield and a lot of kids are students of color--black kids. And I was like my first year here in United States I don't. We don't like there are not many African American in Taiwan or Africans So I don't know how to interact with them. And then I'm trying to be humorous by saying those Yo what's going on you know-- black English. I thought that is a way off to approach them you know. But now I think about it I reflected in my only experience I was just like I'm just like other teachers who don't understand them trying to be cool about it.

**Interviewer:** So you had that experience you reflected on it?

**Participant A:** Yeah they're pretty racist, I mean overtly

**Participant A:** So the teachers just pull them out all the time and ask them to go to the office because they're not cooperate in the class and all that and calling them racial slurs because it's in Chinese so the kids don't really know what's that about. So at that time even though I am part of implicit racism I
still see them doing that. So I feel like oh I am not doing that so I am OK but. Not really because I am pretty much--, I was participating in implicit but not overt racism

Participant A and Participant M were open and honest in describing stories of working with students of color and the ways in which they perceived bias occurring in these settings. Both participants, after taking part in the intervention, indicated a willingness to reflect on their actions and the action of others in the situations they described. Despite the fact that they did not mention using specific strategies as part of their reflections, it is clear that the intervention prompted self-examination. Indeed, it made them question a default answer that the three provided during the interviews — I do not have any biases. All four participants, three in relation to their anxiety about taking the IAT, referenced their belief that they do not think they are biased. Part of their anxiety was around their perception that the IAT would find them racist. Participant A stated that she knew the IAT would find her biased but wondered how that is possible if she is a minority herself.

Three of the participants connected their field experiences and the ways in which the intervention made them think about biases. Specifically, they discussed biases that they felt the students in their classrooms might possess. Participant C noted her experience with black students in her placement,

**Participant C**: So a couple kids, students in my class and they're brother and sister and they're African-American. And they celebrate slightly different holidays then the other kids in class. So, it's been interesting working with those students and working with other students in the class because it’s interesting how the other students perceive those two students. And that's definitely like we don't want to ostracize any students. So we've really been like working with the students and acceptance.
She goes on to discuss the ways in which the white students perceive the black students in the classroom and wonders if there might be an intervention to use with young children. The interviewee expressed a willingness and an interest in addressing bias in the classroom with their students.

Participant M offered that while she found the intervention interesting, “And so we basically learned a lot of important definitions. And we read. We read a lot… definitely some theoretical stuff. So, I really enjoyed that concept it would've been nice if it was like teaching me how to use that stuff as a teacher in a classroom”. Although the study was not focused on how these strategies could be translated into teaching practice, based on the interviews, it seems clear that this sample of pre-service teachers would be receptive to a course on the topic. In particular, they were interested in a course that would address the ways they could use the strategies themselves, and teach ways in which to integrate the strategies into lessons for their students.

The students who choose to be interviewed felt that the intervention made them think of implicit bias as something that could be recognized and changed, “yeah most definitely because just the idea of implicit bias just kind of stuck with me. Like it's always going to be there you always have implicit bias because you have to really watch that. And in my experiences, I get in the classroom, and at school, they can work and you know the experience is just the kind of to like recognize that I do have an implicit bias but I can change that. That part of the study was, you know, that was kind of really just eye-opening” (Participant C). Participant M also expressed that the intervention made her think that implicit bias was something that she could use, “I could see myself doing that and actually using these and I think it could be like a really helpful tool especially if
The results of the Repeated Measures ANOVA indicated that there was not a statistically significant change between the first administration of the IAT and subsequent administrations. However, there was a clear downward trend in the mean between time point 1 and time point 2. In addition, there was a greater downward trend in scores for those participants who were assigned to condition 2 and did not receive feedback on their IAT scores prior to the intervention. The downward trend in IAT results, particularly for those in condition 2, is compelling enough to repeat this study with a larger group of pre-service teachers to see if a larger sample size would lead to a statistically significant result.

The participants’ Likert scale responses during the intervention revealed a great deal about the willingness of the participants to use the strategies provided. Overall, most participants intended to use the strategies, but saw little opportunity to do so on a regular basis. The exceptions to this finding were the Perspective Taking and Opportunities for Contact strategies. Participants indicated an intent to use these two strategies, a willingness to apply them in a situation in which they were able to do so, and the ability to use them in their daily lives. Although students expressed a willingness to use the other strategies, Perspective Taking and Opportunities for Contact seem the most promising
since students would have the opportunity to apply and practice them in daily life. Further studies might isolate these two strategies and offer additional methods of strategy application.

The interviews, although limited in number, offered further insight into the ways in which students perceived the IAT and the intervention. They also revealed the types of interactions participants had previously with students of color and how being part of this study has made them pause and review their reactions. The interviews also reinforced the need for a more direct and concrete way to address bias, and implicit bias specifically, while pre-service teachers are enrolled in licensure programs. It is clear that this population has implicit biases that need to be addressed. Making pre-service teachers aware of their own biases, and providing strategies to combat those biases, should be incorporated into licensure program curricula.
CHAPTER 5
DISCUSSION

Introduction

The premise of this study was that using Devine et al.’s intervention would reduce the level of implicit bias in pre-service teachers as measured by the IAT. Although the results of the quantitative testing in relation to the IAT were not statistically significant, the downward trend in IAT scores, survey results, and interviews point to study participants being newly aware of their implicit biases. This chapter will offer the following: 1) discussion of findings and possible explanations of the findings; 2) limitations of the study; 3) implications of findings and recommendations for future research.

Presence of Implicit Bias

The results of the IAT, at all three administrations, present a clear finding that pre-service teachers have implicit biases. Although the amount of change in the participants’ implicit bias levels was not statistically significant across the three time points, the downward trend should spark further research into the implementation of an
intervention to reduce implicit bias in pre-service teachers. Compared with a larger population’s IAT scores, the implicit bias levels indicated in the IAT results provide a basis for continuing this line of inquiry. Project Implicit, as part of the Open Science Foundation, provides data files with IAT scores of individuals who went to their website and completed the Skin Tone Bias IAT. In 2015, Project Implicit’s overall mean D score for over 10,000 administrations of the Skin Tone Bias IAT was .29, while the pre-service teachers’ mean IAT D score in the present study was .51 pre-intervention. Even though Project Implicit’s population score may not represent that of the population at large because the people assessed were self-selected, the higher level of implicit bias in pre-service teachers, compared to the Project Implicit’s sample population, suggests a need to address implicit bias in pre-service teachers. Although there is limited research on the ways in which teachers’ implicit bias might impact academic achievement of students, Andersen’s findings, that teachers who had higher levels of implicit bias assigned lower grades to students of color, makes a compelling case to continue modifying this intervention (Andersen, 2015). Modifying the intervention used in this study, or creating a new intervention, has the potential to reduce implicit bias levels in pre-service teachers. The downward trend in scores found in the current study indicates that there was some reduction in implicit bias for certain pre-service candidates. Therefore, modifying the current intervention, based on the student survey responses, could lead to the creation of an intervention that would decrease the implicit bias levels in pre-service teachers.

All the participants, as part of the education minor, are required to take a social justice course offered by the College of Education. Based on the survey results and interviews it seems clear that one course in social justice is not enough to address implicit
bias in pre-service teachers. In addition, the types of courses that can meet this requirement range from a course on special education to one on teaching with hip-hop music. Without a targeted approach to reduce bias it seems unlikely that pre-service teachers will be able to address and modify their own biases in the context of a teacher education program. Therefore, more focused course work or an intervention aimed at reducing implicit bias, should be implemented as part of the requirements for pre-service teachers.

**Course on Racial Bias in Education**

Based on the findings of this study, a one-time computer based intervention was not enough to fully address implicit bias in pre-service teachers. A course that was required of all pre-service teachers in order to gain licensure could address racial bias in education and have an intervention embedded within the course. The course would be in addition to the current course requirement in social justice. There are myriad ways that the course could be implemented; however, maintaining a focus on racial bias in education seems paramount. It seems important that the course be focused on racial bias and not bias as a larger construct. Although the results are preliminary and further research is necessary, survey responses indicated that participants felt uncomfortable acknowledging race. A course broadly formulated about bias in education may allow participants to minimize race and focus on other types of bias that they find less offensive or easier to discuss. On the other hand, those participants who did not receive feedback on their IAT scores showed less of a defensive response, which may have made them more open to the intervention. The course would need to be structured to minimize defensive responses so students are more likely to absorb and learn the material. This will
be achieved by delivering course content in phases. In phase one students would focus on the historical origins of racial bias in education that will allow students to gain perspective on the issues of racial bias without feeling implicated themselves. Between the first and second phase of the course students will take the IAT and receive no feedback. This would serve as an introduction to implicit bias and the second phase of the course. During the second phase of the course, students would learn about implicit bias as a concept and the strategies that would allow them to combat implicit bias in their daily lives and future teaching practice. In phase three of the course, students would study current issues related to racial bias in education and how to practice anti-racist pedagogy while using the strategies provided during phase two. The rationale for the three phases is to allow time for trust to develop between the instructor and students enrolled in the course. As students gain familiarity with other students and the instructor, it should allow for a minimization of defensive reactions. This is a general outline of a proposed course and specific components would need to be explored. However, based on the findings of the study, providing a course that explicitly addresses racial bias in education is necessary for pre-service teachers to address individual implicit biases and the tendency of participants in the study to profess colorblindness.

**Conditions**

The varying of conditions during the administration of the IAT led to a difference in the survey responses of those who did receive feedback on their scores. Globally, those that were assigned to condition 2, who did not receive their scores, had a greater (yet not significant) decrease in their IAT score than those assigned to condition 1. In addition, those assigned to condition 2 had the more defensive responses to the final question on
the survey. One of the survey questions asked participants to choose how they felt about taking the IAT. “Threatened” was the only emotion for which there was a statistically significant difference between condition 1 and condition 2.

The final question allowed participants to provide unstructured feedback to the researcher. The comments of those assigned to condition 1, included a belief that the test itself was racist, the intervention did not apply to them, and that the IAT was inaccurate. These comments confirm Redford’s finding that receiving a score and feedback on the IAT leads to a defensive reaction (Redford, 2015). In addition, of those students who agreed to be interviewed, three of the four stated that they had not received feedback on their IAT scores after the IAT administration. Although there is no definitive way to know if the IAT score and feedback dissuaded some students from agreeing to be interviewed, it may have been a factor. The greater downward trend in IAT scores for those assigned to condition 2 unlocks a new way in which to view IAT administration as part of an intervention. Although further study is necessary, not providing IAT feedback to participants in an intervention, may decrease defensive reactions.

These findings are intriguing and may point to the ways in which stereotype threat and racial anxiety are activated, although further research is necessary. Not including IAT scores in feedback before an intervention may lead participants to not feel threatened; in turn, this would allow them to focus cognitively on the content of the intervention.

The defensive reaction of participants may be related to racial anxiety. The IAT may activate racial anxiety in pre-service teachers, making it more difficult for them to process the information presented in an intervention. This finding would be consistent with that of Staats, who found that racial anxiety causes a stress response that leads
individuals to rely on implicit responses because the brain is overloaded (Staats, 2016). To reduce racial anxiety and defensive responses, not providing IAT scores or feedback, may lead to a greater ability of those involved in an intervention to learn the material and apply it in future situations.

Schema

Based on the survey responses it is clear that the IAT, intervention, and field experience made participants consider their own implicit biases. This awareness is the first step in reducing their biases. Crocker, Fiske, and Taylor suggest there are two ways in which schema can change: variety of exposure to a specific social experience and/or being presented with incongruent information (Crocker et al, 1984). The combination of being presented with an intervention that explicitly states that all people have some implicit bias and participating in a field experience, in a school setting that contained racial, ethnic, and socioeconomic diversity, may have been the first step in the students’ revision of their schema. Based on the survey data, the majority of participants expressed a new awareness of their own implicit biases and described how those biases had manifested themselves in their daily lives. In addition, some of the respondents expressed ways in which reading about stereotypes allowed them to connect to earlier events they believed were influenced by their own stereotypes of racial minorities. The connections that participants were able to establish between their current life, and their envisioning of how that might affect them and their students in their professional careers, appeared to be a powerful way for the participants to begin to revise and replace their beliefs in relation to students of color.
Counter-Stereotypic Examples

The largest component of the intervention were the five strategies aimed at reducing the implicit bias levels of the pre-service teachers. One concern raised by the results of the survey is the ways in which the participants applied the strategies. In particular, when applying the Counter Stereotypic Examples strategy, students were apt to respond with answers that were superficial. For example, if I think of a historical figure that was successful, then I will negate my negative stereotype about a person’s race. While this is an example of applying the strategy, it seems unlikely that this will make a difference in reducing their implicit biases. Without contextualizing the strategy and Examples a situation in which one might find oneself using the strategy, the strategy will not work. The inability to gauge the ways in which the participants were understanding the intervention while it was taking place is problematic.

Participants’ misunderstandings around the Counter Stereotypic Examples strategy could have been addressed in a face to face setting, which could have led to immediate clarification of how to use the strategy. If the intervention remains computer based, these misconceptions could be addressed by adding a component that provided participants with feedback on their responses. Modifying the intervention to include feedback for the participants around their applications of strategies would strengthen the ability of participants to implement the strategies. The integration of feedback through a real time or asynchronous model is an area for further investigation. Speculatively, providing feedback and a means for participants to clear up questions, could lead to a greater decrease in IAT scores, since participants would then be able to apply the strategy correctly.
Colorblindness

Participants’ responses to the survey, in relation to the individuating strategy, expressed a belief that they see students as individuals—without seeing race. Of the students who offered a text based response, the reluctance to see race, was expressed equally by participants in both conditions. The survey responses to the individuating strategy were the strongest indicator that some of the participants viewed themselves as colorblind. This might be constructed as a reflection on the students’ belief that race should not be used as a factor when looking at individual students. As Kennedy offers in his book, *For Discrimination: Race, Affirmative Action and The Law*, being colorblind might have some positive consequences but it is also dangerous because it is a way to gloss over injustices (Kennedy, 2013). If each student is as an individual, devoid of racial identification, one need not discuss race in relation to student outcomes. Claiming to see each student as an individual, devoid of race, allows one to espouse being colorblind—essentially shutting down discussions that relate to the ways in which race is affecting students.

However, the place in which participants claimed not to see race was within the context of the individuating strategy; therefore, it is also possible that their responses focused on individual students in relation to race because they were prompted to think of ways in which they could see students as individuals. It is thought-provoking that when asked to see students as individuals, many participants wanted to take race out of their identity. Does the removal of race from a student’s identity make it easier for participants to relate to a student of color as an individual? Is race such a salient factor that only through colorblindness can one identify with the student? Alternatively, does removing
race as part of students’ identity reduce the participant’s level of racial anxiety? These questions are intriguing and seem to warrant future study.

**Racial Bias and Socioeconomic Bias**

Participants’ responses to the ways in which they viewed students racially were often entangled with their views about the socioeconomic status of students. Participants seemed to equate being poor with being a minority. This was evident in both the open response sections of the survey and during interviews. The open response section provided evidence of this when, for example, one participant indicated they would check on whether or not a black student’s family had a car to see if they were struggling economically. Another response assumed that all black children would be struggling financially and that this fact affected their views of black students. During the interview process two of the participants expressed the belief that black children, who attended the summer camps in which they worked, were poor and receiving government assistance to attend the camps. If the intervention was successful in making students aware of their implicit biases around race it did not address bias associated with socioeconomic status. Based on students’ responses in the survey, it is difficult to determine how socioeconomic status and race were intertwined for participants. One way to address this finding would be to incorporate socioeconomic status into the five strategies provided in the intervention. Alternatively, pre-service teachers would need an entirely different intervention that focused solely on socioeconomic status and the application of the strategies.
Students, Families, Race, and Socioeconomics

Many participants mentioned looking to students’ families to gauge the home lives of their students. There seemed to be an assumption, on the part of many of the participants, that students of color were poor. Lewis and Diamond had similar findings—they found that school staff perceive students and families differently based on race and assume that white students are better-off than black ones (Lewis and Diamond, 2015). Based on the open responses that participants provided, the pre-service teachers also held similar views based on race and socioeconomic status of students of color and their families. The participants’ open responses, in relation to students’ families, were unexpected. Participants espoused a desire to get to know families but not for building community or to understand students; rather, participants cited getting to know families as a way to minimize race or determine a student’s socioeconomic status. Interestingly, getting to know the students’ families was offered as a way to reduce the salience of the students’ race. Participants in both conditions seemed to minimize race. Perhaps the students’ perceptions of students’ families were related to what Sleeter described as a tendency of the field experience to reinforce pre-existing notions of race (Sleeter, 1993).

The minimization of race and the focus on the socioeconomic status of students was an unanticipated finding. In additions, it was difficult to separate the biases the participants had in relation to race from those related to socioeconomic status. This study raises important questions about the implicit bias pre-service teachers may have about students who are from low socioeconomic status backgrounds. It also raises questions about how pre-service teachers are being taught to relate to the families of students. When families of students were mentioned in the surveys the students had no positive
connections to working with families. Anecdotally, in my work with graduate level pre-service teachers, who are completing their student teaching at local schools, many blame the families when they have difficulties with a student. It often appears that preservice teachers have had little training in how to work with the families of students. Incorporating best practices for working with families into the curriculum might aid in changing the perception of pre-service teachers.

**Multicultural Education Courses are Not Sufficient**

As juniors and seniors in a licensure program, most, if not all of the participants have taken a course in social justice as part of the requirements for licensure. The courses that are listed as fulfilling the social justice requirement have different areas of focus. Special education courses are included within the arena of social justice, and while special education courses serve an important purpose, they are not specifically related to racial bias reduction. In addition, none of the courses listed, as meeting the social justice requirement, have a field experience component. While the current findings are preliminary, the field experience component seemed to play a key role as participants began to contemplate their implicit biases. The field experience also assisted students by allowing them to apply strategies, and begin to imagine how using these strategies would be beneficial in their current and future teaching practice. Dobbin and Kalev offer that requiring people to take part in an activity or course that attempts to control behavior often creates a negative reaction in diversity program participants. While the IAT, and possibly the intervention, may have activated defensive reaction it did not attempt to control the participants’ behavior; rather, it asked them to apply bias reduction strategies as they deemed appropriate. Therefore, it seems prudent to consider ways of integrating
specific strategies to reduce bias into the curricula. Participants will feel that they are in control of when and how they apply these strategies, which should reduce the defensive reaction that Dobbin and Kalev describe in relation to corporate diversity training.

**Increase Opportunities for Strategy Use**

The cross tab analyses that were conducted on all of the strategies provide a glimpse into participants’ intention and likelihood of participants using the strategies based on opportunities for use. While the percentages of participants who indicated that they intended and were likely to use the strategy varied; overall, participants were more likely to indicate that they intended to use the strategy while a lower percentage indicated that they were likely to use the strategy. The more opportunities they had to use the strategy the more likely they were to indicate that they intended and were likely to use the strategy. This finding makes a strong case for locating field experiences within diverse schools and classrooms. This is one way in which educator licensure programs can provide students with an opportunity to use the strategies provided in the intervention.

Across all five strategies, those that had the opportunity to use the strategy once a week or more, indicated a greater intention and likelihood of using the strategy. Pre-service teachers need more access to environments in which they could practice the strategies contained in the interventions. Those that indicated they never had an opportunity to practice the strategies, even if they indicated that they intended to use the strategy or were likely to use the strategy, would not have the ability to implement what they had learned. One way to provide situations in which pre-service teachers would be able to use the strategies is through the field experience. Although it varied between strategies, only 8-10 pre-service teachers choose never under the category opportunities
for use. There is no way to tell if this number would have been larger without the field experience but it seems likely. Increasing access to field experiences in schools with students of color should provide all pre-service teachers the opportunity to use the strategies. Although this might be a difficult task depending on the geographic location of a college or university, it is one that schools can strive toward. In addition, it may be possible to have students observe and interact with students in diverse areas through the use of video enabled communications. Research into the effectiveness of using video to implement the strategies would have to be conducted; however, it is one option for colleges and schools who are not located near diverse K-12 schools.

**Future Research**

The results of this study indicated that the brief computer based intervention created by Devine et al., with the changes described in Chapter 3, had some impact on the participants and their awareness and understanding of implicit bias. The downward trend in IAT scores, particularly for those participants in the condition which did not receive IAT feedback is compelling. I plan to complete further research where I manipulate the IAT conditions in the same manner as this study. In future research, I will vary the IAT feedback condition to see if the IAT feedback is received differently in different study designs.

In future iterations of the research I would like to vary the way in which the intervention is delivered. A future study could compare the effects of delivering the intervention in person over an eight-week period to delivering it in an asynchronous online environment. In the in-person condition, students would be able to interact with the instructor and each week would provide a more in depth explanation of the strategy
and allow participants to ask questions. Participants will be asked similar survey questions to determine the effectiveness of the intervention. The in-person model may lead some participants to feel less comfortable and they might not provide honest responses to questions due to social pressure. Participants may also have a defensive reaction if they feel they are being forced to participate in a discussion about race. Therefore, the other condition will be conducted anonymously online, through a learning management system. The intervention would be delivered over the eight-week time frame and participants would have the opportunity to interact with the researcher and ask questions about the strategies. By providing responses to participants’ text based responses it may be possible to clear up misconceptions and surface understandings. The online environment, which will allow the participants to maintain anonymity, may lead to fewer defensive reactions. However, since their interaction with other participants would be limited they may receive the benefit that peer questions and interaction might provide.

An additional avenue of research I would like to explore is the use of video in both the in-person and on-line environments. Creating videos that model using the racial bias reduction strategies in everyday interactions, and in classrooms, might provide a way to consistently deliver the intervention over time. Video would also provide participants with a more interactive and engaging experience than reading an intervention that is text based. In areas where pre-service teachers may not be able to access diverse environments, video would provide a model for what using the strategies would entail if they were located in a different area. Video is not the same as being able to practice the strategy in real life situations; however, it would provide a visual model of the strategies
being used to address implicit biases. Modeling the strategies in video may address the superficial understanding some participants in the study seemed to have, by providing concrete and explicit images of the strategy.

Limitations of the Study

The sample size of the study was small and the demographic makeup of the pre-service teachers was overwhelmingly female and white. In addition, all of the pre-service teachers in the study attended the same public university which makes it difficult to generalize findings across the entire population of pre-service teachers. The participants in the study were all undergraduate elementary education minors, so these results may not be applicable to pre-service teachers who are seeking licensure in secondary education. In addition, there is a risk that this study, and possible future studies, may lead some to conclude that pre-service teachers would need to meet a set threshold on IAT scores in order to become teachers. As evidenced by the results of this study, measuring implicit bias and reducing implicit bias levels, is more complicated than simply partaking in one intervention.

Implications of Findings

The findings of this study indicate that pre-service teachers in this sample have implicit bias related to race. This finding makes it imperative that implicit bias be directly addressed within the curricula of Colleges of Education. Current curricula, although they vary greatly depending on the program, may or may not, require students to take a course in multicultural education. The pre-service teachers who participated in this study were required to take one course in social justice. Based on the findings of the study, for this particular population of pre-service teachers, one course on social justice did not
completely address the implicit biases they may hold. Therefore, a new way of addressing implicit bias in the classroom should be further researched.

The intervention used in the study had promising results. There was a clear downward trend for all of the participants in the intervention. There was an even greater downward trend for those participants that did not receive their IAT scores or feedback on their performance. In light of these findings future research may choose not to include IAT scores or feedback as part of the intervention. How to deliver an intervention and/or incorporate implicit bias instruction into the curriculum needs further research; however, based on the current study an intervention can make pre-service teachers consider their implicit biases and begin to work to reduce them.

Pre-service teachers’ implicit biases are wrapped up with their biases around socioeconomic status. While this was not something this study was focused on it should not be ignored. Pre-service teachers, who are going into to public schools in the United States are likely to be faced with students in poverty. According to the Southern Education Foundation more than 51 percent of students in U.S. public schools live in poverty (Suitts, et al., 2015). This study could not disentangle the implicit racial biases from the implicit socioeconomic biases of the pre-service teachers; therefore, future inquiry should seek to determine how race and socioeconomic status are related to one another within the framework of implicit biases.

**Conclusion**

This study moved forward knowledge in several areas of implicit bias as it relates to pre-service teachers. Key findings include: 1) pre-service teachers have varying levels
of implicit bias which are not currently being uniformly or systematically addressed by
colleges of education, 2) a brief computer based intervention can make pre-service
teachers, in the selected population consider their own implicit biases, 3) The majority of
pre-service teachers expressed a willingness to employ the strategies in the intervention
to work to reduce their own implicit bias levels, 4) For some of the participants in the
study, receiving their IAT scores and feedback created a defensive response, 5)
participants perceptions of race and socioeconomic status are closely intertwined.

The findings listed above lead to the following recommendations for Colleges and
Departments of Education: 1) incorporation of an intervention or course work that
addresses the implicit bias of pre-service teachers and aims to reduce that bias, 2) make
pre-service teachers aware of their own implicit biases through a brief, computer based
intervention as a first step in incorporating implicit bias awareness into the curricula, 3)
Provide opportunities for pre-service teachers to employ bias reduction strategies by
incorporating a field experience that will expose pre-service teachers to racially and
socioeconomically diverse students, 4) consider ways in which to incorporate feedback
on the IAT into a course or intervention that does not cause racial anxiety or defensive
reactions in pre-service teachers, 5) continue to research the ways in which race and
socioeconomic status are intertwined for pre-service teachers and find effective solutions
to reduce their implicit bias levels around both issues.
APPENDIX A

INTERVENTION

Consent Form

You are being invited to participate in a research study titled Pre-Service Teacher Attitudes. This study is being done by Tara Pepis from the University of Massachusetts Amherst. You were selected to participate in this study because you are enrolled in a course required for educator licensure in Massachusetts.

The purpose of this research study is to determine teacher attitudes toward different groups. If you agree to take part in this study, you will be asked to complete an online survey/questionnaire. This intervention is based on a 2012 study by Devine, Forscher, Austin, and Cox. This survey/questionnaire will ask you to complete a task related to attitudes toward different groups and you may be asked to complete an intervention related to teacher attitudes and it will take you approximately 30 minutes to complete.

You may not directly benefit from this research; however, we hope that your participation in the study may positively affect your attitudes towards different groups of people.

Your participation in this study is completely voluntary and you can withdraw at any time. You are free to skip any question that you choose.

To the best of our ability your answers in this study will remain confidential. We will minimize any risks by keeping all responses anonymous. You will be assigned a randomly generated code that the researcher will not have access to. This code will be used to complete all surveys related to the study. All information will be stored in password protected files.

This is a research study that involves questions related to sensitive topics that may cause distress. As researchers, we do not provide mental health services and we will not be following up with you after this study. However, we want to provide every participant in this study with contact information for available clinical resources, should you decide you need assistance at any time. For studies with the UMass community: You can contact
the Center for Counseling and Psychological Health (CCPH) at (413) 545-2337 (Mon-Fri from 8-5pm) - on weekends or after 5pm, call (413) 577-5000 and ask for the CCPH clinician on call. You can also contact the Psychological Services Center at 413-545-0041 (Monday-Friday 8am-5pm) or psc@psych.umass.edu. In a serious emergency, remember that you can also call 911 for immediate assistance.

If you have questions about this project or if you have a research-related problem, you may contact the researcher(s), Tara Pepis at 413-658-8807. You may also contact the Faculty Sponsor, Kathryn McDermott, at (413) 545-3562.

If you have any questions concerning your rights as a research subject, you may contact the University of Massachusetts Amherst Human Research Protection Office (HRPO) at (413) 545-3428 or humansubjects@ora.umass.edu.

By clicking “I agree” below you are indicating that you are at least 18 years old, have read and understood this consent form and agree to participate in this research study. A paper copy of this consent form has been provided to you.

☐ I agree
☐ I do not agree

Q3 The intervention will begin once you click on the arrow.

Q4 Please enter the code you received after completing the IAT.

Q5 The measure that you just completed is called the Implicit Association Test (IAT). We will now show you a presentation that describes 1) some background that will help you understand the IAT, 2) what the IAT measures, and 3) some examples of behavior related to the IAT. We will also describe some strategies people can use to change their IAT scores and, consequently, behaviors related to the IAT.

Q6 Background: Spontaneous Stereotypic Responses
Q7 Sometimes in everyday life, people experience spontaneous thoughts, feelings, and behaviors that are different from what they desire. Like bad habits, these spontaneous reactions can be extremely difficult to control because they occur automatically, before a person even notices them or has time to reflect on them. These spontaneous reactions vary from person to person, depending on the specifics of where one grew up. However, because people are exposed to many of the same environmental factors, such as the same movies and television shows, many people experience the same unwanted reactions.

Q8 Imagine that it’s past midnight on a Friday night. Pete and Joe are walking down State Street on their way home from a friend’s house. The lighting is poor, and it’s late enough that they only meet an occasional person on the darkened sidewalk. Pete and Joe see a person in the distance walking towards them. As the person gets closer, Pete sees through the dim light that the person is a middle-aged black man, carrying a small duffel bag. Pete thinks, “Maybe I should cross the street so this guy can’t hit me up for money. Whatever, Joe’s with me, and we can just ignore him if he asks.”

Q9 They keep walking and, as the man approaches, Pete starts to feel a little tense. He shifts a bag he was holding in his left hand to his right, so that it’s farther away from the man. He feels even tenser as he makes eye contact with the man. Nothing happens. As the man passes, Pete thinks, “That was weird. He must not have wanted to ask me for money after all.” As Pete and Joe walk away, Joe says to Pete, “Did you see that guy’s shoes? Those were the ones that I wanted from the store the other day, but they were too expensive to buy.” Pete feels confused. Why would a homeless man have expensive shoes? And why isn’t Joe surprised that the homeless man didn’t ask for any money? Pete turns around, only to see the man getting into a BMW parked in a side street. Pete thinks, “Wow, I guess I just assumed he was homeless. Why did I do that? Now that I think about it, he was wearing pretty nice clothes.”

Q10 In this example, Pete was quick to expect that the black man was homeless. His initial expectation led to spontaneous, inaccurate thoughts and unwarranted tense feelings. If Pete would have seen this man for longer than 15 seconds, he may have realized that the man was not homeless because he was wearing nice clothes. However, it was late at night, somewhat hard to see, and Pete had to make a quick judgment. This judgment turned out to be inaccurate. Why did Pete jump to the conclusion that the black man was homeless?

Q11 Stereotypes that black people are poor or homeless likely influenced Pete’s initial expectations about the man. Stereotypes are pervasive in our society, so we all learn about them whether we want to or not. For example, black people are often portrayed as criminal or
unintelligent in movies, TV shows, and in other mass media. Because stereotypes are all around us, we can’t help but learn them and come to associate black people with negative racial stereotypes.

Q12 The prevalence of stereotypic representations of black people is likely greater than you imagine, and they can sometimes be quite subtle. Consider this example from two different press reports following Hurricane Katrina.
Q13 Notice that the reports criminalize the black man by describing his actions as “looting” food. On the other hand, the reports justify the white couple’s actions by describing them as “finding” food. Can you think of specific times when you noticed the media portraying black children stereotypically? Please briefly describe any instances that come to mind.

Q14 It is hard to avoid negative reactions to black people when we are so frequently exposed to stereotypes in everyday life. We see them so often that they become firmly ingrained in our minds. Without intending it, we learn to associate black people with negative stereotypes. As a result, when people think about or interact with black people, the negative stereotypes spring to mind, even among people who disagree with the stereotypes. Once in mind, these stereotypes can influence people’s thoughts, feelings, expectations, and behavior. In this way, stereotypes are like bad habits, in that they can occur without thought or intention. Because people often don’t realize when stereotypes influence their reactions to black people, avoiding the influence of stereotypes can be very difficult.

Q15 Now think back to the situation with Pete and Joe that we described in the beginning of this presentation. Why do you think that Pete automatically assumed that the black man was homeless, despite a lack of clear evidence? Perhaps Pete’s judgment was influenced by the stereotype that black people are poor and homeless. This stereotype may have led him to expect that the man was homeless solely because of his race. How would you have reacted in Pete’s situation? Is it possible that you, too, would have been quick to think that the black man was homeless?
Q16 The example with Pete demonstrates how one’s reactions can be racially biased without any awareness of the bias. If not for Joe’s comments about the man’s shoes, it is very likely that Pete would not have realized that his assumption that the man was homeless was inaccurate. These types of automatic associations can lead to expressions of racial bias that are so subtle that people often fail to detect the bias in their thoughts, feelings, and behavior. Can you think of any times in the past where you had an automatic response that was influenced by stereotypes? Please briefly describe any instances that come to mind.
Q17 Measuring Automatic Associations: The Implicit Associations Test

Q18 Recent work by social psychologists has found that the degree to which one has learned automatic stereotypes about blacks can be reliably measured by the Implicit Associations Test (IAT). The IAT measures how easily you pair a white or a black face with pleasant vs. unpleasant words. The idea underlying the IAT is that people find it easier to pair two concepts, such as black faces and unpleasant words, if they are already associated in memory. Because stereotypes about blacks are often negative, people who have learned stereotypes about blacks to a greater degree find it relatively easy to pair black faces with unpleasant words than the reverse.
Q19 Think about your own performance on the IAT. Did you find it relatively easy to do the task when black faces were paired with negative words and white faces with positive words? If so, you are not alone. Extensive research with people all over the country suggests that about 85% of all non-black people in the United States show an anti-black bias on the IAT. This means that most people favor whites over blacks at an automatic level, regardless of what they believe on a conscious level.

Q20 It may be hard to believe that a simple task like the IAT could measure one’s automatic stereotypes. There are three main ways in which people question the validity of the IAT. First, people often think that how they performed on the test was influenced by the order in which they did the pairings. Several studies show that bias favoring whites over blacks consistently occurs, no matter what order the pairings are completed.

Q21 Secondly, some people feel that the IAT just measures more general associations, unrelated to race, that link the color black with evil and the color white with good. This occurs, for example, in Westerns where good guys wear white hats and bad guys black hats. This issue has also been investigated, and the research shows that these general color associations are unrelated to performance on the IAT. Thirdly, people often wonder whether millisecond differences in reaction time on the task really matter in the grand scheme of things. This is an important question; after all, if IAT performance was unrelated to behavior in real-world situations, there would be no reason to care about the IAT. However, research suggests that performance on the IAT is related to a wide range of outcomes, from subtle things like thoughts and feelings during an everyday interaction, to behavior in high-stakes settings, such as interviews, hospital emergency rooms, and a police officer’s beat.
Q22 Consequences of Automatic Stereotypes

Q23 Medical Decisions: Recent studies have shown that white people are more likely to receive expensive, and potentially lifesaving treatments, than black people suffering from the same symptoms. The extent to which treating physicians show a treatment bias favoring white people is related to their degree of bias on the IAT.
Q24 Police Decisions: It is often reported that black suspects are more likely than white suspects to be shot by police officers. In threatening situations, where the suspect is behaving ambiguously, people speculate that automatic stereotypes may influence the decision to shoot a black suspect. The research evidence supports this expectation. In studies mimicking the split second decision of whether or not to shoot a potentially threatening person, citizens and police officers alike are more likely to shoot an unarmed black man than they are to shoot an unarmed white man. They also shoot armed white people less often than armed black people. Furthermore, this shooting bias is related to bias on the IAT.
Q25 Employment Decisions: Imagine how the activation of automatic stereotypes might influence an employer’s initial evaluation of a black job applicant and subsequent thoughts and feelings towards the applicant. Negative stereotypes might color the first impression of the applicant, leading to lower evaluations of black applicants as compared to white applicants. The research evidence shows this to be true, and once again, the degree of bias is related to bias on the IAT.
Q26 Everyday Interactions: Physicians, police officers, and interviewers are not the only ones who show cognitive and behavioral biases. College students show biases in the way they interact with black students compared to white students in everyday settings. These students show an avoidant interaction style, making less eye contact, sitting further away, showing more nervous behaviors, and cutting interactions short. Once again, the degree to which the students show these avoidant behaviors is related to bias on the IAT.
Q27 An important aspect of all these studies on the relationship between the IAT and subtle race bias is that the participants are unaware that they have acted with bias. In fact, many of the participants in these studies report that they did not want to treat black people differently from white people and that they believed that acting with bias is wrong. Yet, despite their best intentions, the biases occur.

Q28 Think back to the IAT. We are interested in how you feel about the IAT. We will present a series of emotion-related words. Please indicate the degree to which each word describes your feelings using a 1 (strongly disagree) to 7 (strongly agree) scale.

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<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Threatened</td>
<td>disgusted with others</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Content</td>
<td>Low</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>pleased with myself</td>
<td>Sad</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Helpless</td>
<td>Ashamed</td>
<td></td>
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</tbody>
</table>
Q29 Breaking the Prejudice Habit

Q30 In many ways, the research that we just reviewed is discouraging, because it suggests that even people who want to treat black people fairly can act in racially biased ways. This has led some researchers to explore whether it is possible to reduce biases resulting from automatic stereotypes. Here there is some good news. If a few conditions are met, it is possible to reduce automatic race bias. Specifically, people can reduce automatic race bias if they: 1) are motivated to overcome the bias 2) become aware of their bias and why it exists 3) are able to detect the subtle influence of stereotypes and 4) learn and practice strategies that help reduce automatic bias. Being motivated to reduce prejudice and automatic biases is a necessary first step. Without motivation, it is unlikely that people will expend the effort needed to eliminate the effects of automatic biases. Being motivated is a personal decision that people must make for themselves.

Q31 Even if people are motivated to reduce their bias, they still need to become aware of it and why it exists. We have discussed why so many people are affected by automatic bias, even when they believe that prejudice is wrong. In what follows, we outline how to detect the influence of automatic stereotypes and describe strategies that, if learned and practiced, will help you rid yourself of automatic bias.

Q32 Detecting the influence of stereotypes

Before we can overcome the negative effects of automatic stereotypes, we must be able to detect stereotypical depictions of black people in our environment and when our own responses are affected by these depictions. Detecting these biases allows us the opportunity to do something about them. Because our social environment plays such a large role in perpetuating stereotypes, we must first learn to detect biased portrayals, whether they occur in the media or in interactions with others. While we may not be able to stop how black people are portrayed by others, we can choose how we react to those portrayals by recognizing when a biased portrayal occurs, and expressing disapproval of it. As we demonstrated with the Hurricane Katrina news report, sometimes bias can be quite subtle, so we must be vigilant to detect this bias.
Q33 As important as the detection of bias in our external environment, is the detection of bias within ourselves. This involves figuring out the situations in which we are most likely to be subtly influenced by automatic stereotypes, and monitoring our responses in these situations. We must take similar steps to break other kinds of habits, like nail-biting. In order to stop biting nails, we must figure out the situations that trigger nail-biting behavior. After we have figured out how stereotypes are reinforced by our environment, and when stereotypes are likely to pop to mind, we can work to prevent the influence of stereotypes by training ourselves to behave in different, unbiased ways. Research offers five strategies shown to be effective at reducing automatic stereotypes, and, therefore, their influence on people’s behavior. Practicing these strategies can help break the “prejudice habit.”

Q34 Bias Reducing Strategies

Q35 Strategy 1: Stereotype Replacement

Q36 Stereotype replacement involves replacing stereotypic responses with non-stereotypic responses. This strategy can be used in two contexts: when you detect stereotypic portrayals of blacks in your environment and when you detect a stereotypic response within yourself. After the influence of a stereotype has been detected, this strategy involves (1) labeling the response or portrayal as stereotypical, (2) evaluating the situation to determine how the response or portrayal occurred, and how it might be prevented in the future, and (3) replacing the stereotypical response or portrayal with one that is non-stereotypical.

Q37 To go back to the story we presented earlier with Pete and Joe, Pete could have used this technique after he saw the man approaching him by recognizing that his feelings of tension were partly influenced by stereotypes linking black men to poverty and criminality. He could have then labeled his response as stereotypical, recognized that he jumped to a quick assumption, and replaced his feelings of tension with calmer feelings. Please think of a situation that may occur during your field experience in which you could use the stereotype replacement strategy, and describe that situation below.
Q38 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once a week</th>
<th>2-3 times a week</th>
<th>4-6 times a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the stereotype replacement strategy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q39 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Extremely unlikely</th>
<th>Somewhat unlikely</th>
<th>Neither likely nor unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you have the opportunity, how likely are you to use the stereotype replacement strategy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q40 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or might not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>To what degree do you intend to use the stereotype replacement strategy?</td>
<td></td>
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</tbody>
</table>
Q41 Strategy 2: Thinking of Counter-Stereotypic Examples

Q42 A second thing you can do after a stereotype has been detected is to think of examples of either famous or personally known people that show the stereotype to be inaccurate. For example, while watching a movie that portrays black people as unintelligent, one might think of Dr. Martin Luther King, Jr., Barack Obama, Condoleezza Rice, Frederick Douglass, or any intelligent, personally-known black friends or acquaintances. Thinking of counter-stereotypic people provides concrete examples that demonstrate the inaccuracy of stereotypes.

Q43 In our story with Pete and Joe, Pete could have used this technique by thinking about positive examples of black people who are neither impoverished nor dangerous criminals, or he could think of a friend or acquaintance that counters black stereotypes. Please think of a situation that may occur during your field experience in which you could use the counter-stereotypic examples strategy and describe that situation below.

Q44 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th>In a given week, how many opportunities do you think you would have to use the thinking of counter-stereotypic examples strategy?</th>
<th>Never</th>
<th>Once a week</th>
<th>2-3 times a week</th>
<th>4-6 times a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
Q45 Based on your field experience and everyday interactions, please answer the question below:

| When you have the opportunity, how likely are you to use the counter-stereotypic examples strategy? |
|---|---|---|---|---|
| Extremely likely | Somewhat likely | Neither likely nor unlikely | Somewhat unlikely | Extremely unlikely |

Q46 Based on your field experience and everyday interactions, please answer the question below:

| To what degree do you intend to use the counter-stereotypic examples strategy? |
|---|---|---|---|
| Definitely will not | Probably will not | Might or might not | Probably will | Definitely will |

Q47 Strategy 3: Individuating Instead of Generalizing

Q48 Using a stereotype involves generalizing a set of characteristics to all members of a particular racial group. This generalization leads people to ignore the individual characteristics of each person within that racial group, leading to inaccurate and faulty conclusions. Individuating involves going beyond racial categories by attending to the individual characteristics of others. Gathering this individual information allows us to get to know others on a personal basis, and thus make judgments on the basis of their personal, rather than group, characteristics. Individuating does not involve ignoring race or being “color blind”. For many racial minorities, racial identity and culture are an important part of life. Being color blind ignores and denies the importance of racial identity and culture. Individuating involves recognizing that race is just one facet of other people that makes each person unique.
Q49 Pete could have used this technique by paying attention to the fact that the black man was wearing nice shoes and other nice clothing. This information would have indicated that assumptions based on stereotypes are inaccurate. Please think of a situation that may occur during your field experience in which you could use the individuating strategy and describe that situation below.

Q50 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once a week</th>
<th>2-3 times a week</th>
<th>4-6 times a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the individuating strategy?</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Q51 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Extremely unlikely</th>
<th>Somewhat unlikely</th>
<th>Neither likely nor unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you have the opportunity, how likely are you to use the individuating strategy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q52 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th>To what degree do you intend to use the individuating strategy?</th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or might not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
</table>

Q53 Strategy 4: Perspective Taking

Q54 Perspective taking involves Examples what it would feel like to be in another person’s situation. By using this strategy, one can imagine how it would feel to have one’s abilities called into question, or to be viewed as lazy and potentially violent on the basis of race. This strategy can be used either proactively, without any prompting from outside sources, or reactively, after a stereotypic response or portrayal has been detected. Perspective taking, especially perspective taking that occurs after the detection of a stereotypic response or portrayal, is very useful in assessing the emotional impact of stereotyping on others.

Q55 Pete could have used this strategy by thinking about what it would feel like to have others assume that he was dangerous or homeless based on his race. This strategy may have helped him realize the unfairness of automatic race-based expectations and assumptions. Please think of a situation that may occur during your field experience in which you could use the perspective taking strategy and describe that situation below.

Q56 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th>In a given week, how many opportunities do you think you would have to use the perspective taking strategy?</th>
<th>Never</th>
<th>Once a week</th>
<th>2-3 times a week</th>
<th>4-6 times a week</th>
<th>Daily</th>
</tr>
</thead>
</table>
Q57 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Extremely unlikely</th>
<th>Somewhat unlikely</th>
<th>Neither likely nor unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When you have the opportunity, how likely are you to use the perspective taking strategy?</strong></td>
<td></td>
<td></td>
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</tbody>
</table>

Q58 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or might not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To what degree do you intend to use the perspective taking strategy?</strong></td>
<td></td>
<td></td>
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</table>

Q59 Strategy 5: Increasing Opportunities for Contact

Q60 You may find that you don’t have much of a chance to interact with black people. You can make up for this lack of opportunities by actively seeking situations where you are likely to have positive interactions with black people. You can do this by taking particular classes, joining particular clubs, and/or participating in particular events. Seeking out interactions will allow you to meet black people who disconfirm stereotypes. In addition to seeking personal contact with black people, you can modify your visual environment by watching movies, TV, and news that portray black people in non-stereotypical ways.

Q61 This strategy does not transfer directly to our story with Pete and Joe. However, if Pete had previously made an effort to make black friends and acquaintances, he would have had more positive examples of black people to draw upon when using the counter-stereotypic examples strategy. This might have guided his first impressions of the man approaching him from down
the street. Please think of a situation that may occur during your field experience in which you could use the seeking opportunities for contact strategy and describe that situation below.

Q62 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once a week</th>
<th>2-3 times a week</th>
<th>4-6 times a week</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a given week, how many opportunities do you think you would have to use the contact strategy?</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Q63 Based on your field experience and everyday interactions, please answer the question below:

<table>
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<tr>
<th></th>
<th>Extremely unlikely</th>
<th>Somewhat unlikely</th>
<th>Neither likely nor unlikely</th>
<th>Somewhat likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you have the opportunity, how likely are you to use the contact strategy?</td>
<td></td>
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</table>

Q64 Based on your field experience and everyday interactions, please answer the question below:

<table>
<thead>
<tr>
<th></th>
<th>Definitely will not</th>
<th>Probably will not</th>
<th>Might or might not</th>
<th>Probably will</th>
<th>Definitely will</th>
</tr>
</thead>
<tbody>
<tr>
<td>To what degree do you intend to use the contact strategy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q65 The goal of this presentation is to explain how stereotypes are automatically activated, even among people who believe that stereotypes are wrong. It was explained how automatic stereotypes can be measured, and how these stereotypes can lead to unintended discrimination. Finally we explained how, through a combination of motivation, awareness, and strategies, people can reduce automatic race bias and break the prejudice habit. Although each strategy was described separately, practicing one strategy can make practicing the others easier. For example, getting to know black people while seeking opportunities for contact with them, will also provide plenty of people to be used as counter-stereotypic examples. Likewise, individuating others by attending to their personal characteristics can help people identify situations in which they might otherwise have had stereotypes come to mind, allowing the replacement of those stereotypes with counter-stereotypic thoughts. Over time, if the techniques are practiced, they should require less effort and less time. When these techniques are well-learned, they may become automatic responses themselves!

Q66 If you have any feedback for the researchers please enter it below:
APPENDIX B

UNSTRUCTURED INTERVIEW QUESTIONS

1. I'm conducting these interviews so that I can learn from you about how it felt to participate in the online intervention. What stands out most in your mind when you think back on the experience?

2. If you received a score on the IAT, how did you feel about the score?

3. I don't want to know your IAT score unless you decide to share it with me. But I'm wondering if you remember what your score was?

4. Do you believe it was accurate? Why or why not?

5. Did your feelings about the IAT change after the intervention?

6. What do you think about the bias reduction strategies?

7. Were there any strategies in particular that stood out?
   a. Why?

8. Have you had a chance to practice any of the strategies?
   a. If so, elaborate on the experience

9. Had you heard of implicit bias before the intervention?
   a. If so, what had you heard?

10. Do you think knowing about implicit bias will impact your teaching?
    a. If so, how?
    b. If not, why?
11. Did your views of how bias might affect your teaching change after taking the intervention?

12. Do you think there is implicit bias in schools? Can you think of any examples you might have seen during your field experience?

13. Additional questions will build on the participants’ responses.
APPENDIX C

PRE-IAT QUESTIONS --TIME POINT 1

Q1 What grade are you most interested in teaching?
- Pre-School (1)
- Kindergarten (2)
- 1st Grade (3)
- 2nd Grade (4)
- 3rd Grade (5)
- 4th Grade (6)
- 5th Grade (7)
- 6th Grade (8)

Q2 Do you think that racial bias affects the academic performance of students of color in elementary school?
- Yes (1)
- Maybe (2)
- No (3)

Q3 Do you think that racial bias affects the discipline of students of color in elementary school?
- Yes (1)
- Maybe (2)
- No (3)
APPENDIX D

DEMOGRAPHIC QUESTIONS/ TIME POINT 2

Q1 Please enter the code given at the end of your IAT session.

Q2 What is your year of birth?

Q3 Choose one or more races that you consider yourself to be:
   ☐ White
   ☐ Black or African American
   ☐ American Indian or Alaska Native
   ☐ Asian
   ☐ Native Hawaiian or Pacific Islander
   ☐ Spanish/Hispanic/Latino

Q4 What is your gender?
   ☐ Male
   ☐ Female
   ☐ Other/Prefer not to answer

Q5 Did you attend elementary school in the United States?
   ☐ Yes
   ☐ No

Q6 What is the name of the town and state in which you attended elementary school?
Q7 Do you think that racial bias affects the academic performance of students of color in elementary school?

☐ Yes
☐ Maybe
☐ No

Q8 Do you think that racial bias affects the discipline of students of color in elementary school?

☐ Yes
☐ Maybe
☐ No

Q9 Are you willing to be contacted by the researcher for an interview?

☐ Yes
☐ No

If No is selected, then skip to End of Survey

If Yes is selected

Q10 Please enter your email address below:
APPENDIX E

DEBRIEFING FORM FOR PARTICIPATION IN A RESEARCH STUDY

University of Massachusetts Amherst

Thank you for your participation in our study! Your participation is greatly appreciated.

Purpose of the Study:

Earlier in our consent form we informed you that the purpose of the study was to measure pre-service teacher attitudes about skin tone. In actuality, our study is about Implicit Bias in pre-service teachers i) the purpose of this study was to measure the effects of an intervention on the levels of implicit bias in pre-service teachers; ii) the title of the original study was misleading, since it stated the study was related to teacher attitudes towards different groups of people; and iii) we are looking to determine implicit bias levels, and if there was an effect on implicit bias levels among those who completed the intervention.

Unfortunately, in order to properly test our hypothesis, we could not provide you with all of these details prior to your participation. This ensures that your reactions in this study were spontaneous and not influenced by prior knowledge about the purpose of the study. The title of the study did not mention implicit bias as the focus of the research and intervention. If we had told you the actual purposes of our study, your ability to participate in the intervention could have been affected. We regret the deception, but we hope you understand the reason for it.
Confidentiality:

Please note that although the purpose of this study has changed from the originally stated purpose, everything else on the consent form is correct. This includes the ways in which we will keep your data confidential. To the best of our ability, your answers in this study will remain confidential. We will minimize any risks by keeping all responses anonymous. You were assigned a randomly generated code that the researcher does not have access to. This code was used to complete all surveys related to the study. All information will be stored in password protected files.

Now that you know the true purpose of our study and are fully informed, you may decide that you do not want your data used in this research. If you would like your data removed from the study and permanently deleted please contact me at tpepis@umass.edu or 413-658-8807. You may also contact the Faculty Sponsor, Kathryn McDermott, at (413) 545-1523. Please provide the code you were assigned in your email, during the phone conversation, or voicemail message.

Final Report:

If you would like to receive a copy of the final report of this study (or a summary of the findings) when it is completed, please feel free to contact us.

Useful Contact Information:
If you have any questions or concerns regarding this study, its purpose or procedures, or if you have a research-related problem, please feel free to contact the researcher, Tara Pepis at 413-658-8807.

If you have any questions concerning your rights as a research subject, you may contact the University of Massachusetts Amherst Human Research Protection Office (HRPO) at (413) 545-3428 or humansubjects@ora.umass.edu.

***Please keep a copy of this form for your future reference. Once again, thank you for your participation in this study! ***
1. What is this form?
This form is called a Consent Form. It will give you information about the study so you can make an informed decision about participation in this research.

This consent form will give you the information you will need to understand why this study is being done and why you are being invited to participate. It will also describe what you will need to do to participate and any known risks, inconveniences or discomforts that you may have while participating. We encourage you to take some time to think this over and ask questions now and at any other time. If you decide to participate, you will be asked to sign this form and you will be given a copy for your records.

2. Who is Eligible to Participate?
All students who are at least 18 years old and enrolled in 482E are eligible to participate.
3. WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this research study is to determine teacher attitudes toward different groups. If you agree to take part in this study, you will be asked to complete an interview with the researcher.

4. WHERE WILL THE STUDY TAKE PLACE AND HOW LONG WILL IT LAST?

The interview will take place in Furcolo Hall and will last between 45 minutes and 1 hour.

5. WHAT WILL I BE ASKED TO DO?

There are two parts to the research study. In the first part you were asked to complete an online task and intervention. In the second part you were asked to complete the online task and answer questions related to demographic information. After the second part of the study, you indicated that you were willing to participate in an interview with the researcher. You were randomly selected from the group of students that indicated they were willing be contacted for an interview. The researcher would like to audio record the interview; you may choose not to be audio recorded. If you consent to being audio recorded, please check the box below:

- Yes, I do consent to be being audio recorded during the interview.
- No, I do not consent to being audio recorded during the interview.
During the interview you will be asked questions related to the tasks and intervention you completed. You may skip any question you feel uncomfortable answering.

6. **What are my benefits of being in this study?**

   You may not directly benefit from this research; however, we hope that your participation in the study may positively affect your attitudes towards different groups of people.

7. **WHAT ARE my RISKS OF being in THIS STUDY?**

   This is a research study that involves questions related to sensitive topics that may cause distress. As researchers, we do not provide mental health services and we will not be following up with you after this study. However, we want to provide every participant in this study with contact information for available clinical resources, should you decide you need assistance at any time. For studies with the UMass community: You can contact the Center for Counseling and Psychological Health (CCPH) at (413) 545-2337 (Mon-Fri from 8-5pm) - on weekends or after 5pm, call (413) 577-5000 and ask for the CCPH clinician on call. You can also contact the Psychological Services Center at 413-545-0041 (Monday-Friday 8am-5pm) or psc@psych.umass.edu. In a serious emergency, remember that you can also call 911 for immediate assistance.

8. **How will my personal information be protected?**

   To the best of our ability your answers in this study will remain confidential. We will minimize any risks by keeping all information confidential. All email addresses and interview information will be stored in password protected files. All interview data will
be transcribed and stored in password protected files. The audio recording device will be kept in a locked cabinet in the researcher’s office in Furcolo Hall. All email addresses and audio files will be deleted after transcription. Pseudonyms will be used in all research reports to maintain confidentiality.

10. What if I have questions?

Take as long as you like before you make a decision. We will be happy to answer any question you have about this study. If you have further questions about this project or if you have a research-related problem, you may contact the researcher, Tara Pepis at 413-658-8807. You may also contact the Faculty Sponsor, Kathryn McDermott, at (413) 545-3562. If you have any questions concerning your rights as a research subject, you may contact the University of Massachusetts Amherst Human Research Protection Office (HRPO) at (413) 545-3428 or humansubjects@ora.umass.edu

11. Can I stop being in the study?

You do not have to be in this study if you do not want to. If you agree to be in the study, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate.

You will be notified of all significant new findings during the course of the study that may affect your willingness to continue.
12. What if I am injured?

University of Massachusetts does not have a program for compensating subjects for injury or complications related to human subject’s research, but the study personnel will assist you in getting treatment.

13. Subject Statement of Voluntary Consent

When signing this form I am agreeing to voluntarily enter this study. I have had a chance to read this consent form, and it was explained to me in a language which I use and understand. I have had the opportunity to ask questions and have received satisfactory answers. I understand that I can withdraw at any time. A copy of this signed Informed Consent Form has been given to me.

________________________  __________________
________
Participant Signature:   Print Name:    Date:

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

_________________________    ____________________  __________
Signature of Person   Print Name:    Date:


International Journal of Education & the Arts, 14 (14).

Chisholm, I. M. (March 08, 1994). Preparing Teachers for Multicultural Classrooms. 
Journal of Educational Issues of Language Minority Students, 14, 43-67.


In Attitudinal judgment (pp. 197-226). Springer New York.


Krogstad, J., & Fry, R. (2014, August 18). Dept. of Ed. projects public schools will be ‘majority-minority’ this fall.


OSF | Skin_Tone_IAT_public.2015.zip


