LIFE BEYOND THE CEMETERY: THE MATHEMATICAL IDENTITY AND ACADEMIC ACHIEVEMENT OF TRADITIONALLY UNDERREPRESENTED MALE AVID PARTICIPANTS IN AN URBAN PILOT PROGRAM

A Dissertation
Submitted to
the Temple University Graduate Board

In Partial Fulfillment
of the Requirements for the Degree
DOCTOR OF EDUCATION

---

by
LaVarr Dixon
May 2015

Examining Committee Members:

Dr. Michael Smith Advisory Chair, Temple University Dean's Office
Dr. Jacqueline Leonard, University of Wyoming
Dr. James E. Davis, Psychological Organizational Studies Department
Dr. Kristie Newton, Teaching and Learning Department
Dr. Wanda Brooks, External Member, Temple University Dean's Office

ABSTRACT

This study was designed to investigate the mathematical identity and achievement of one cohort of underrepresented male youth who participated in a pilot school intervention program in an urban middle school. Using counternarratives and a case study method, the experiences of four traditionally underserved high school students were investigated to explore their emerging mathematical identities. Results revealed the intervention program had very limited effect on the participants' mathematical identity.

As engagement is prerequisite to student achievement, this study sought to understand what environmental factors (family, peers, teachers, self) affect student engagement and their developing mathematical identities. To explore the environmental factors, the Research Assessment Package for Schools (Institute for Research Reform in Education, 1998) was used to establish levels of engagement among family, peers, teachers, and self. Results indicated among the four environmental factors, family was most influential in their mathematical identity. Peers ranked second in terms of influence, self-engagement ranked third and teacher engagement ranked in the fourth position.

To understand the impacts of race and culture on mathematical identity, the Multidimensional Inventory of Black Identity was administered to explore levels of race (cultural) centrality, and regard (public and private) as well as explore their identities as being members of their respective groups. A cross case analysis was conducted on the four participants to determine the impacts of race (cultural) centrality and regard (public and private) on their mathematical identity. Results revealed each member had a high race (cultural) centrality score and a high private regard score and a moderate public regard score. Participants were aware of stereotype and stereotype threat; however, it did not appear to affect mathematical identity. This model integrates racial and/or cultural identity and the engagement of family, peers, teachers and self to better understand the conditions that contribute to the mathematical identity of traditionally underserved young men.

ACKNOWLEDGMENTS

Thank you to my university family. First and foremost to Dr. Jacqueline Leonard, my advisor, thank you for all your time and support; but mostly, thank you for your friendship. Thank you to Dr. Michael Smith for demanding my absolute best every time. Drs. Wanda Brooks and James Earl Davis, thank you for the laughs, quiet encouragement, and support. A special thanks to Dr. Kristie Newton for helping over the finish line. Second, a most heartfelt thanks also goes out to my teacher colleagues and friends who believed in me and went out of their way to support me. To my family, especially my mother and aunts, I am eternally grateful for your lifelong belief that I could accomplish anything, as well as your endless patience as I embarked on this journey. To you, my total devotion, and lastly, to my father who died of Cancer four years ago…promised fulfilled.

TABLE OF CONTENTS

Page

LIST OF TABLES

Table Page

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

African American Males: Policy and Education

Gutierrez (2008) specifies that gap analysis have left many school officials believing that underachievement is a singular problem; however, Gutierrez reports a multiplicity of factors contribute to underachievement. Too few know that there are schools that have mathematics textbooks that are seven years old. Some students, who face dire circumstances, assemble at school where there are not enough teachers to give the attention that each child needs. Ultimately, there are too few resources for the many underserved students who need assistance. Although Gutierrez and others have identified limited resources as contributory to poorer outcomes, a multi-pronged approach would be more productive in limiting possible alienation and dropping out of school, which regulates many to a life of menial labor. This lack of education and poor job prospects may leave many undereducated young men with few opportunities (Noguera, 2003); other than increasing the likelihood that they may choose to engage in criminal activity.

Education policies that encourage graduation and educational attainment among African American and Hispanic youth, particularly males, are needed to improve the odds that these youth will invest in their education. As policymakers and the educational establishment seek possible solutions to educational differences among some minority groups, underachieving minority students continue to be ill-prepared for the rigors of college life or for an ever-increasing highly-skilled workforce (Lipman, 2004; Noguera, 2003). Underachievement and a lack of preparation in mathematics results in decreased enrollment in academically rigorous mathematics courses in high school and ultimately impedes access to postsecondary institutions (Dantley & Leonard, 2010; Moses & Cobb, 2001). Still young minority males continue to leave traditional school settings unprepared for the technological jobs forecast by the Bureau of Labor and Statistics (Handbook, 2008; Moses & Cobb, 2001). Education stakeholders acknowledge current policies have been insufficient for increasing minority matriculation rates. To illustrate the importance of college access and opportunity, I offer my own experience as an African American male who attended an urban school.

My Counterstory

Somehow I managed to stay in school and to escape the cycle of poverty—call it dumb luck or divine intervention. As I had attempted to explore the factors of my students' mathematical identity and academic development, I had to look towards what factors influenced the person I am today. I always believed my childhood was unexceptional, although others may beg to differ. As far back as I can remember, when people would ask me what I wanted to be when I grew up, I would say, "When I grow I want to be a teacher."

I lived with my mother, who was both stern and nurturing, and my stepfather. My biological father did not live with my mother and me before she married my stepfather. He was supportive, yet distant, physically and emotionally. My mother always said I was a great child, but I do remember that if the teacher called and I had been playing in school, punitive corrective actions were sure to follow. My mother instilled in me at an early age the value of education. She would always tell me that she wished she had done well in school. Not only was it the expectation of my mother that I would do well, but also, my grandmother, aunt, and older cousin. My older cousin and I were very close when we were both younger despite the nine-year difference in our ages. Regina, (all names are pseudonyms), had attended an all girls' preparatory high school, which had affiliations with an Ivy League University in the city. She was valedictorian of her high school graduating class. As academic performance was a part of my family's culture, it was assumed that I would do well in school.

I had always assumed a strong mathematical identity. I always believed I could perform better in mathematics than in every other subject. From the time I entered school until sixth grade, I had been one of the top performers in mathematics. In third grade, at the supermarket with my mother, I was able to mentally add the costs of all our items before check-out. I was pretty accurate without the use of pencil or paper. My mother and I would just laugh. I definitely developed a confidence early in my mathematical career, and I felt as if mathematics was second nature to me.

At the beginning of sixth grade, I attended Frazier Elementary School (FES). I was the top student in the school. Frazier was around the corner from my house, and it was also two blocks from the housing project community. FES had a 100% disadvantaged population as all students qualified for free/reduced lunch. Despite being a poor neighborhood school, I had many teachers who cared about my progress and cared for me personally in school. Sometime in the course of the school year, my mother contacted an office in the school district so that I could receive a better middle school placement because my neighborhood middle school had an awful reputation. Throughout the course of the year, two new students transferred into FES, and unseated me as the valedictorian—Bradley, the son of a soldier who had been stationed in Germany, and later in the school year Claudia, an African immigrant. Claudia, Bradley, and I had a rivalry as to who would have the highest marks on tests. Soon, our other classmates joined in the competition. At sixth-grade commencement, despite being neither the class valedictorian nor salutatorian, I received the most academic awards. At the end of sixth grade, my mother's advocacy enabled me to go to Vanguard School, which has been rated a top middle school in the district for the last three decades.

At Vanguard, the school population was predominately from an upper-middle income, white professional class. Vanguard had 0% economically disadvantaged students, 81% proficiency on the state standardized test with the following demographic statistics: 51.1% White, 19.8% Asian, 15.1% African American, 8.9% Latino and 4.8% other. When I was at FES, I did not realize how few resources my neighborhood school had. It became clear very quickly that I had gone from a school with limited resources to one where resources were plentiful. In seventh grade, I was no longer the best student. Everyone in my class was the best student; however, I remained a top performer in mathematics class. But when I went to eighth grade, things began to unravel. I began to resent being the only African American in my class. I began to hate the fact that I had to get up two hours early in order to catch a train and a bus to school. I resented the fact that all my white classmates could have anything they wanted, and I hated that I could not have those things. I can remember vividly in Mrs. Shepard's eighth-grade foreign language class that I hated being poor, and I hated being Black. I did not know which I hated more. I do not know if it stemmed from being the only Black student in my classes or if it stemmed from my poverty or from my race.

Meanwhile, one day at gym class, I went downstairs to the locker room and into my classmates' gym lockers and took all my male classmates' lunch money. I was suspended by the vice principal. I left Vanguard and I never returned. At the expulsion hearing, the vice principal told my mother the reason they did not send me back to my neighborhood school was because I had been doing so well. I remember the look on my mother's face. The entire ride home on the bus, my mother did not say anything. I could have sworn that I was going to get paddled. In hindsight, I would have preferred it. The only thing my mother said was, "I am so ashamed of you," and she just walked out of my bedroom. My mother had never said that before. I sat on the edge of my bed and started crying. The more I thought about it, the more it upset me. In a matter of about 20 minutes I was crying uncontrollably, I was completely crushed. My mother walked back into my bedroom some time later. I could barely look at her. I could not take the disappointment I saw in her eyes. I then promised that I would never do anything like that again. My mother tearfully explained that we may be poor, but we do not take things that do not belong to us. She explained that if we did not have it, we did not need it.

Regent, the school I was transferred to, was not as state-of-the-art as Vanguard had been. When I walked into the building, I realized that I had made a mistake, and I would have to make the best of a bad situation. The kids at this school were not as nice as the students were at Vanguard. I was no longer in the top section. The vice principal and counselor of the school explained there was no space in the top performing class (the A track); instead, I would be placed in the B track. My classes were easy, and I had no trouble whatsoever. I became introverted while at Regent. Regent had a similar racial and SES composition as Vanguard. Regent was 54% White, 20.9% African American, 13.8% Latino, 5.8% Asian, and 4.6% other.

The day before eighth-grade graduation, I had asked my math teacher to sign my yearbook. The other kids are talking to each other while I was seated. I walked up to his desk. He told me I had been a pleasure to have in class. He also told me that I was the smartest math student he had ever had. I smiled and thanked him and went back to my seat. When he said this to me, it had no significance. However, I now know this was a turning point in my life, and I knew I could accomplish anything I set my mind to.

When I arrived at high school in the fall, I was reunited with the students that went to Vanguard. I began having classes with some of the same top performers from Vanguard. Many of the students remembered what happened six months earlier and why I left Vanguard. These students ostracized me, and rightfully so. I had stolen; therefore, I was a thief. I did eventually make a few friends in high school; however, most of the time I was alone. Academically, I remained extremely competitive. The introvert trait I had developed in eighth grade continued the next four years of high school. Since I had few friends, I focused most of my energy on doing well in school instead of seeking extracurricular activities. I began working as soon as I turned sixteen.

In eleventh grade, my high school counselor called me to her office; she suggested that I apply for an early admission program for minority students, which was sponsored by The Pennsylvania State University also known as Penn State. I remember talking it over with my mother and having some misgivings because I had a part-time job at the supermarket, and I would have to give my job up so that I could attend the program. With initial trepidation, I attended the program for the summer and later attended Penn State when I graduated from high school the following June.

I graduated from Penn State in 1989, becoming the first student in Pennsylvania to graduate from their college access program—the Minority Advanced Placement Program. I was only one of three African American college graduates from the School of Business that semester. After working for several years, I decided to return to college to obtain a master's degree. I enrolled at Cheyney University, partly because I had never attended a Historically Black College or University (HBCU). I finished my certification and master's degree program and began teaching in Chester, Pennsylvania.

In examining my own mathematical identity, I knew the power of my mathematical ability when I was in eighth grade, after speaking with my eighth grade mathematics teacher. During my first six years of school, I was very fortunate to have had teachers who genuinely believed in me. These teachers were definitely foundational to who I am today. In my family, my mother was foundational to promoting my mathematical identity as a youngster. My mother would quiz me on certain facts, and asked me different mathematical problems. My peers also shaped who I became mathematically. When I was in middle school at Vanguard, my classmates and I would compete for the highest scores on tests. This continued in high school, as many of the top performers in middle school were also the top performers in high school.

In examining my own racial identity, my family had impressed upon me at a young age that I would always have to try harder in school because I was Black. My mother is the person who racially-socialized me. My mother impressed upon me that since I was African American, my accomplishments would always be viewed as second best; therefore, she demanded that I perform optimally in school (Stinson, 2009). She also taught me the importance of being passive when engaging with White people, speaking with proper English, and striving to be perceived as non-threatening. My mother in particular explained the importance of honesty, and how I would always have a cloud of criminality around me based on my race. Because of my upbringing, I am an honest person with a strong work ethic.

I share this counterstory because I encounter the same difficulties that every African American man experiences in the U.S.—the second looks when I am in a major department store or the numerous taxis that have passed me by on rainy nights. I am telling my story from a lens of the one who is marginalized—perceived as the intruder. As I walk across the street on a rainy night on my way home, I hear the car doors lock. When I'm walking down the street with my friends, I notice White women looking at us, clutching their purses, and walking hurriedly away. Most times, I am able to ignore it and chalk it up to existence as a Black man living in America. There are many instances that stick out in my life, as it does for many other successful African American men. It is an adaptive reflex, I have learned largely to ignore it for the most part. However, there had been an occasion at a major department store in the central district, when I turned around and told the Black security guard that I was not going to steal anything. I then stormed off angrily. For those of us who have progressed beyond the anger, I wonder if it hurts their feelings, too, subconsciously.

Counterstories, such as my own, serve to counteract stories normalized within the research community by providing a direct contradiction to prevailing research on minorities and their achievement. This study was designed to elicit the counterstories of others by investigating the development of a mathematical identity and the factors that affected such development in one cohort of underrepresented minority males in a pilot school intervention program. This study also spotlighted the racial identity and cultural identity of those minority boys as well as documented their mathematics course-taking patterns in high school and their trajectory toward college attainment.

Statement of the Problem

Since *A Nation at Risk* was released in 1983, education reform has been at the center of political debate. For the past generation, the school reform movement has vacillated from one strategy to the next in hopes of spurring higher mathematical achievement among underrepresented groups (Cobb, 2009). Despite a plethora of well-intentioned educational programs, there still looms a cultural incongruence (Ladson-Billings, 2009), which fails to provide support for sustained growth among minority groups. School districts around the U.S. are continuously adjusting to the implications of proposed school reforms. A two-decade long national conversation continues to ensue as to how the achievement of minority men, particularly, African American and Latinos, can be made comparable to their White and Asian American counterparts (Tate, 1997). Gap analysis yield limited success (Gutierrez, 2008; Gutierrez, Bay-Williams & Kanold, 2008); moreover, these analyses have improperly overemphasized deficit theory. Deficit theory continues to be transmitted through traditional research and media, and promote stereotypes that ultimately devalue the African American and Latino male (Nasir, Atukpawu, O'Connor, Davis, Wischnia & Tsang, 2009).

The low achievement results from many factors including educational inequities; these inequities and differentiated educational access limit academic success. Noguera (2003) found that challenges in achievement stem from multiple factors such as lack of resources, inferior facilities, obsolete materials, and poor teacher training. These factors may also influence some students to turn away early in their educational careers and dropout of school. When minority students have fewer opportunities to acquire advanced mathematical knowledge before college entry, career options are limited. The result of this career limitation is an underrepresentation of minorities in mathematical careers, a loss of potential to society and fewer future minority successes.

To address shortcomings in educational opportunity, Title I of the Elementary and Secondary Education Act (ESEA) provided additional support for America's poorest schools. The policies under the Johnson administration, known as the Great Society, and the Economic Opportunity Act of 1964, established TRIO programs to provide underrepresented students with access to college opportunities. The name, TRIO programs, was derived from the first three programs provided by the government: Upward Bound, Talent Search, and Student Support Services. There are a total of eight subsidiary organizations housed under the TRIO program. This act provided for supplemental support in reading, mathematics, and science instruction. Most funding had been directed toward students in grades one through six. For the past fifty years, the Title I Act has been reauthorized every five years since its inception. Although authorized to expand opportunities for underserved students, No Child Left Behind (Law, 2002), which was sponsored by President George W. Bush, did little to improve access for underachieving and underrepresented students (Darling-Hammond, 2007; Martin, 2009). Six years after President Obama's Race to the Top initiative, educational parity has yet to be realized. Instead of equity what we have in place are high accountability measures to track educational outcomes. All these programs had good intentions; however, they lack the ability to follow through.

Background and Historical Context

Fifty years after the establishment of TRIO programs, the workforce of the U.S. has undergone dramatic changes. The workforce has shifted from an industrial economy to a service-based technological economy. Saunders and Serna (2004) reported that minority access to higher education is pivotal to future success in America in the 21st century. This technologically driven economy requires more workers that possess highly skilled training. Conversely, as this shift in workforce occurs, there will be a decreased need for low-skilled workers. With an increasing minority population and a decreased need for low-skilled workers, it becomes vitally important that intervention and college access programs be expanded to provide many more minority children access to postsecondary education, as postsecondary education will be highly advantageous to those future workers. King (2009) corroborated the necessity for greater access to higher education for underrepresented populations. Furthermore, King found intervention programs disrupt the social reproduction of underachievement by increasing college access, which in turn increases individual academic persistence. Current CAP programs aim to reconcile inadequate educational access by providing additional services such as career guidance, tutoring, and mentorships. Moreover, these programs provide academic and financial counseling, test preparation, college visits, and scholarships.

At the individual level, Mudge and Higgins (2011) maintained that education and specialized training serve as a gateway to employment by providing the student with skills that are valuable to the employer. Specialized training positively impacts the wages and lifetime earning capabilities of the individual; however, benefits extend beyond salary and wages. Non-monetary benefits also enjoyed include improved working conditions, fringe benefits, increased savings, and increased professional and personal mobility. In addition, the individual also enjoys improved quality of life for children, better consumer decision-making, and more hobbies and leisure activities.

As college access benefits the student, there are greater benefits to society. As proof, Saunders and Serna (2004) found economic investment in tertiary education provides financial rewards to society-at-large, the economy, as well as the individual. Society-at-large benefits through decreased crime rates, increased charitable giving, and a healthier population. The government yields benefits through increased tax revenues, consumption, and a decreased necessity for governmental financial support. Furthermore, added societal benefits include greater social cohesion, greater social participation, and greater political stability.

Since the TRIO programs' inception, gains in student aspirations, increases in academic preparation, and college enrollment have been noted (King, 2009). However, researchers argue that additional studies are needed in order to understand the characteristics and problems associated with college access programs (Bergin, Cooks, & Bergin (2007). Nevertheless, little feedback has been generated, which can be returned to K-12 to make CAP programs more responsive to student needs (King, 2009).

Saunders and Serna (2004) advocated expanding CAP services so that the interventions continued throughout college. They argued intervention programs have been neglected partially due to the current research framework that separate college access and college retention into separate policies. They asserted the extent to which college access programs have enhanced student success has been largely left unrealized.

In my counterstory, I provided a snapshot into the engagement of my family, teachers, peers and self and also provided a similar snapshot of my mathematical and racial identity. My home life and school life played an equally important role in my mathematical identity development. Mathematical identity development is therefore affected by both student environmental factors. This study served to investigate the mathematical identity, racial or cultural identity, and academic attainment of young men who participated in a pilot program in an urban setting. This study sought to provide insight into how the engagement of family, teachers, peers and self-affected participants' mathematical identity and how the participants negotiated their lives inside and outside of school as they forge a path to their future.

Purpose of the Study

The purpose of this study was to investigate the development of mathematical identity, racial identity, and cultural identity and to find what factors affected the development of these identities among one cohort of underrepresented minority males who participated in a pilot Advancement via Individual Determination (AVID) program. Mathematical identity is important to study because learning how others mathematize and function in their local communities helps the research community to understand how diverse students engage in mathematics to become mathematically empowered. To be mathematically empowered, the student has to believe in his/her mathematical ability, which is a major feature of mathematical identity. Identity development and knowledge construction are important links to understanding how children learn, particularly in their local communities (Kaplan & Flum, 2012). Similarly, mathematics identity helps children to understand themselves as mathematical beings including, how they use mathematics in their everyday lives, and how it helps them to negotiate their local communities of practice.

This study is about four underserved young men who participated in the AVID program while in middle school. The features of the AVID program are consistent with curriculum that enhances the development of students' mathematical identity. AVID provides students with support as they engage in challenging mathematics courses such as algebra and geometry at the middle school level. Students in the AVID program typically performed better in mathematics based upon additional support services provided for them, such as tutoring, mentoring, and college tours. As a result, the AVID program provides opportunities for students to engage at a higher level of mathematical cognition. Furthermore, AVID program facilitators provided students with guest speakers serving in many capacities throughout various STEM industries. This avenue was pursued to stress the importance of mathematics as a means to change life trajectories since students of color are underrepresented in STEM fields (Berry, 2008;

Bracey, 2011; Stinson, Jett, & Williams, 2013). Thus, the AVID program promoted confidence that led to strategies that may have motivated the participants to perform more successfully in the advanced mathematics classroom.

In addition to mathematical identity, which can be associated with academic success, students also exhibited cultural identity and/or racial identity (Ladson-Billings, 2009), which are also the tenets of culturally relevant pedagogy (CRP). Ladson-Billings (1995) reported the three tenets of culturally relevant pedagogy are: a) students can achieve academically, b) students must be able to perform in their local community of practice, and c) students must acquire a critical consciousness of the social order. Cultural identity and racial identity correlates to the second and third tenets of CRP—cultural competence and critical consciousness—respectively. Cultural identity is defined as an identity or feeling of belonging to, as a part of one's self-perception and self-concept to a specific ethnicity, generation, locality, nationality, religion, or social group that has its own distinct culture (Nasir, 2002). Racial identity is described as the extent to which societal and personal meanings of race influence a person's self-concept and, and thus his ensuing behavior. Furthermore, racial identity is also one's perception that an individual shares a common racial heritage with a racial group (Sellers, Chavous & Cooke, 1998). The AVID program promoted the tenets of CRP, as well as promoted mathematical access and equity. AVID maintains the student participates in an academically rigorous course load. AVID then provides additional support services including an AVID study hall, mentoring, and tutoring to ensure success. Thus, I made the a priori assumption that cultural relevance was important to the AVID participants in this study.

Theoretical Framework

Many prior studies have largely ignored students of color who had made gains or achieve excellence in schools (Martin, 2000). The notions of mathematical identity and academic brilliance press beyond mere standardized test scores for criteria and analysis. As gap studies have largely focused on two of the four dimensions of equity—access and achievement—there are relatively few studies with data that move beyond test scores to capture broader notions of mathematical identity or power. As a result, gap focus has left many broader conceptions of mathematical literacy unrealized. Among these missing components include the importance of developing a mathematical identity, the impact of culturally relevant pedagogical approaches on the development of that identity, and the way those approaches play out in one important educational initiative.

The theoretical framework that supports this study is critical race theory (CRT) and the construct is mathematical identity. As there has been a shift in research emphasis from behaviorism to sociocultural theories, greater importance has been placed on identity and its connections to mathematical learning (Martin, 2009). These theories reject traditional research paradigms that have been used to explain differences among student groups. Gloria Ladson-Billings and William F. Tate, IV, were the first education scholars to employ critical race theory (a legal ideology promoted by Derrick Bell and others) in education (Ladson-Billings, 1998; Tate, 2008). Critical race theory is an approach which foregrounds race and racism in all facets of the research process. This approach has been used to cultivate the cultural and social capital that diverse students bring to the learning environment (Bracey, 2011; Leonard, 2008). In this study, the perceptions of young men, who participated in a pilot college access program in an urban middle school, were examined. Additionally, the factors that influenced the development of their mathematical identities and academic achievement were investigated. The experiences of the study participants were viewed as a source of strength as this study illuminated their cultural and racialized experiences in mathematics.

Critical race theory (CRT) serves as a vehicle for marginalized persons to voice their concerns about issues of importance to the community. In this study, four high school males, who participated in the AVID program as middle school youth, shared their stories and counterstories about their experiences both in and out of school, especially their experiences in mathematics. Solórzano and Yosso (2002) described counterstories as a method that can be used to better understand the margins of society. They explained that counter storytelling is a method by which to document how individual and collective experiences contradict the validity of prevailing research held by the dominant group. Additionally, this tool is used to highlight the experiences of people who have been silenced and challenges stories that have been normalized within current discourse (McAdams, 2008).

While the CRT framework is necessary to capture the participant's voices to describe their development and experiences in mathematics, the construct of mathematical identity is central to understanding the participants' actual performance. Mathematical identity is formed as students come to believe in their mathematical ability as a result of taking advanced coursework (Martin, 2000). Martin (2000) describes mathematical identity as a person's belief about "(a) [his] ability to perform in a mathematics context, (b) the importance of mathematical knowledge, and (c) constraints and opportunities in mathematical contexts, and (d) the resulting motivation and strategies used to obtain mathematics knowledge" (p.19). Applying this construct to the research reported here permitted me, the researcher, to unravel the participants' stories and to learn how these male students constructed mathematical identities and what factors impact how they achieved mathematically and academically. I examined the influences of mathematical identity, cultural identity, and racial identity on the mathematical success of four diverse young men (see Figure 1.1). Although these constructs have been discussed separately in the literature, I assert that an individual's identity is constructed of several components that change across different communities of practice (i.e., home, school, and community).

In addition to this three-fold view of identity, I build upon prior identity and mathematics identity development as articulated by Schoenfeld (1992), Martin (2000), and McGee (2009). In prior work, Schoenfeld (1992) uncovered mathematics as a social activity that seeks to understand the patterns that exist in the world around us as well as the mind within us. Martin (2000) extended Schoenfeld's assertion of the importance of thinking mathematically and studied African American children to uncover how this phenomenon is expressed among African American students. McGee (2009) further develops the notion that mathematical identity is a negotiation between the self and the external racialized environment. Thus, the child's identity is shaped by those experiences and accordingly the ensuing narrative that is being constructed. In summary, Schoenfeld's work on mathematical identity was further applied by Martin to include mathematical socialization and mathematical identity among Black students.

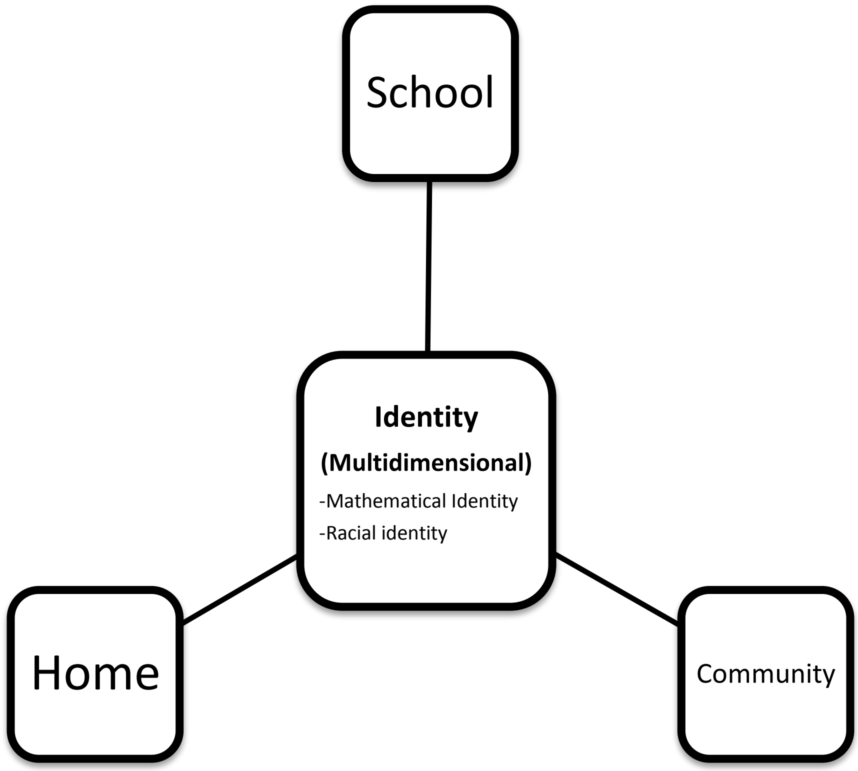

Figure 1.1. Model of Identity

Then McGee further developed Martin's work to include racial identity as an important construct to understand how Black students experience mathematical learning and participation. Finally, using McGee's work, I include cultural identity, which is critically important to understanding mathematical identity among students from other cultural groups (see Figure 1.2).

Over the past twenty years, the conceptualization of a mathematical identity has been extended from Schoenfeld (1992) to the present day. Schoenfeld stated the importance of thinking mathematically. In doing so, the individual must develop a

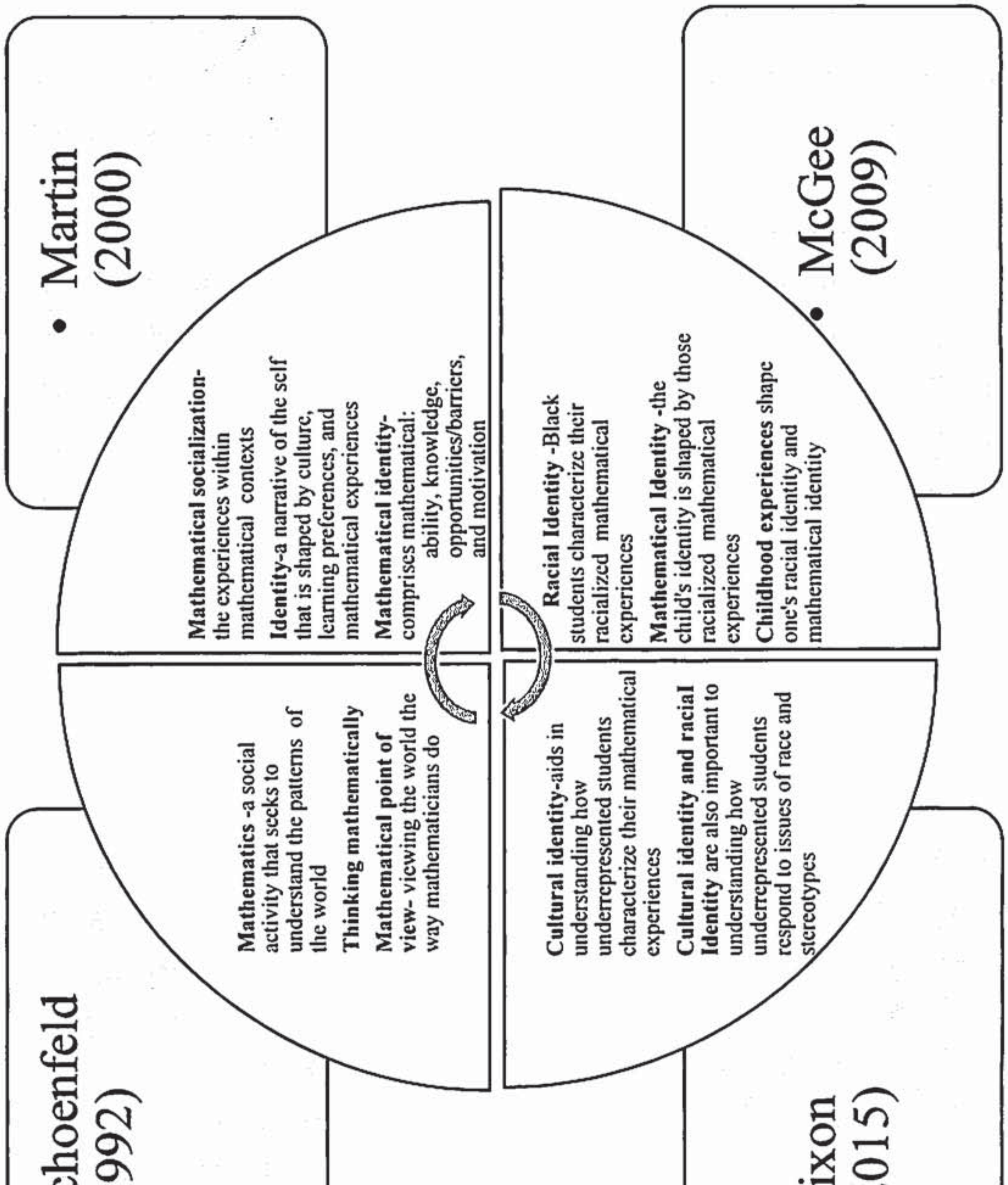

Figure 1.2. Historical Model of Mathematical Identity Construct

mathematical point of view, which he described as the ability to value the mathematical processes and abstractions and the partiality to applying those principles. Schoenfeld expressed that a mathematical point of view was learning to view the world in the same capacity as mathematicians do. Schoenfeld also specified that individuals develop a competency using mathematical tools in order to achieve mathematical sense-making.

As Scheonfeld explained the importance of understanding the patterns of the world, Martin asserted that mathematical socialization plays an important role in how students experience mathematics within a variety of mathematical contexts. Martin expressed that issues of mathematical identity were important to understanding how Black students experience school. Identity is defined as a narrative of a negotiated self that is shaped by culture, learning preferences, and mathematical experiences. Mathematical identity is then defined as one's belief about their mathematical ability, the significance of the mathematical knowledge, opportunities/barriers to mathematical fields and the motivation to obtain mathematical knowledge.

Using Martin (2000), mathematical identity had been characterized as involving mathematical ability, knowledge, opportunities/barriers and motivation. McGee (2009) expressed that identity is important in how Black students identify themselves, and are identified and treated by others. Racial identity then becomes important in understanding how Black students respond to issues of race and racism and how students characterize their experiences during mathematical learning and participation. Childhood experiences shape one's identity in general and influence students' academic performance and their perceptions of their identity in school and in mathematics classrooms.

Using McGee's understanding about how mathematical identity and racial identity are important to how Black students identify themselves mathematically in a racialized environment, I assert cultural identity becomes equally important in how underrepresented students characterize their experiences in mathematical learning and participation. Mathematical identity remains as a negotiation between the self and the external environment, and the child's identity continues to be shaped by those experiences along with the ensuing narrative that is being constructed. Cultural identity and racial identity are important to how underrepresented students respond to issues of culture, race and stereotypes. The experiences of the study participants were viewed as a source of strength as this study illuminated their racialized experiences in mathematics. Thus, this dissertation study adds to the literature on mathematical identity as a broader construct that includes racial and cultural identity.

Mathematical Identity

Many factors impact the mathematical identity and achievement of Black and Hispanic males. For decades, scholars in mainstream mathematical education research have largely failed to incorporate the minority perspective of mathematical identity into current theories. Recently, Martin (2000) and other researchers (McGee, 2009; Stinson, 2004) have begun to focus on the role of identity and what characteristics are indicative to mathematical success. These researchers have engaged in identity research on minority communities; however, it has been primarily focused on Black males in particular (Martin, 2006; McGee, 2009). Positive identity development and individual agency have also been reported as having the ability to change the course of one's life and contributes to future opportunities within the mathematical field (Martin, 2009; Stinson, 2009). The shift in emphasis toward mathematical identity was partly due to a lack of prior research focusing on how mathematical identity was constructed in the classroom. Martin (2007) noted that identity was a narrative of the self, which is positioned in between one's personal self-assertions and one's external surroundings. Similarly, he found mathematical identity was one's deeply held beliefs about his/her ability to effectively perform in mathematical situations. Ultimately, one's mathematical identity influences his/her belief in his/her mathematical ability and the power of his mathematical knowledge. Finally, this notion of identity, more generally, and mathematical identity specifically, is in a constant state of flux.

In this study, the student perceptions of young men, who participated in a pilot college access program in an urban middle school, were examined. Additionally, the factors were investigated that influenced the development of their mathematical identities and academic achievement. These factors help to inform researchers and teachers about practices that lead to high-quality mathematics instruction, student success, and advanced course-taking in mathematics.

Research Questions

The research questions were drawn from my assumptions about identity as an eighth-grade mathematics teacher who had become familiarized with some of the principles of the AVID program. More specifically the questions that guided this study were as follows:

1. What were the mathematical identities being constructed of young men who participated in a pilot college access program in an urban middle school?
2. What factors account for the development of those identities?

Each of these questions was explored in the context of student narratives and themes that supported evidence that linked cultural and racial identity to mathematical identity.

Significance of the Study

The goal of this study is to provide greater attention to the African American, Palestinian, and Hispanic male experience and to shed light on the larger question as to how to spur achievement among these groups. Additionally, this study analyzed the impact of the college access program known as AVID. It explained how AVID was a pathway to raise student achievement using mathematics identity as a construct to foster greater mathematical achievement. In the AVID program, students were enrolled in culturally relevant academically rigorous coursework to develop greater college awareness and vision. This study contributes to the growing body of research on the effectiveness of college access programs to develop mathematics identity. This examination serves to discuss the need for effective CAP programs and how these programs serve as a method to bolster achievement among diverse student populations.

In acknowledging student experiences as a way to elevate achievement and to foster greater understanding between diverse groups, stakeholders can gain further insight into how mathematical identity may play out in a college access program in a middle school setting. Partnerships between schools and universities that promote early college exposure and implement academic rigor with related support mechanisms, will facilitate greater academic competence and mathematical identity. This pathway positively impacts self-awareness as an effort to sustain greater achievement among underserved students in the U.S.

Summary

This chapter highlights the need to examine educational programs that aim to improve educational opportunities for underserved and underrepresented students, particularly in mathematics, as mathematics remains the gatekeeper for college access and economic opportunity (Leonard, 2009; Martin, 2000). Mathematical research has been bombarded with literature that focuses on accounts of minority student failure; however, there are relatively few accounts of mathematical brilliance and academic success among underrepresented groups (Leonard & Martin, 2013). This study examines mathematical, racial, and cultural identity as factors of success among one cohort of male participants in the AVID program. These areas of research undergird this study and will be discussed in Chapter 2 in an effort to understand the influences of a college access program to support the mathematical achievement of minority boys.

CHAPTER 2

REVIEW OF THE LITERATURE

Historical Overview

For the past two decades, new accountability standards have been implemented to narrow the achievement gap among diverse student populations. Reforms have targeted schools to improve performance among low-income, English language learners, and minority students. During this time, there has been substantial research in mathematics education that focuses on disparities that exist among these groups. This research, more specifically, compares the achievement of White and Asian Americans to African Americans, Latinos, and the working class.

In the recent past, gap analysis had been used to provide a snapshot of persisting inequities in America's schools. This form of analysis used large-scale achievement assessments to identify factors that contributed to underachievement. Gutierrez (2008) recounted how some gap analysis may have been beneficial. However, she also reported that gap analysis was most detrimental when presented on its own. This deficiency-based thinking continues to project a negative narrative about students of color and the working class. Additionally, Gutierrez (2008) reported that this analysis positions achievement differences as a technical problem. This results in reinforcing a myth that achievement differences can be ameliorated with a one-pronged solution. Largely, this research has failed to acknowledge the existence of additional factors such as class size and how teacher knowledge and expectations also affect "the gap" and levels of achievement.

As researchers have begun to question the usefulness of large-scale assessments of achievement, there has been a discursive shift to mathematical brilliance and the identification of factors that contribute to mathematical success (Leonard & Martin, 2013). Martin (2007) pointed out discrepancies in scores on standardized tests mirror discrepancies in opportunity. Thus Martin, Stinson, and others advocate not for the elimination of research based on achievement, but call for a modification with greater emphasis on advancement.

Identity is a term that is used to describe how an individual comes to understand him/herself as an independent being. One's identity reveals how a person labels himself as a member of a particular group. However, individual identity is malleable, as identity happens multi-dimensionally which indicates that identities change according to the environment or the situation. In addition to identity, race has received wider recognition as a socially constructed phenomenon. This construct categorizes people into large distinct groups based on any of the following affiliations: ethnic, genetic, cultural, social, religious, historical or linguistic. Since the 19th century, race science has been centered on a phenotypical method of differentiating various populations. The theories and ideologies of this era remain problematic today. Race has significant effects on the lives of the marginalized group through institutionalized practices of subjugation and discrimination. This construct manifests across legal, economic, and sociopolitical contexts, which exerts a profound amount of influence on underserved communities. Racially discriminatory action often parallels this mindset, where individuals and their ideologies perceive members of the marginalized group as racially deficient and morally inferior. As a result of racial stratification, underrepresented minorities for the most part have little power to fend themselves from the exclusion and oppression that is exerted by racist individuals and institutions.

The bodies of literature that support this dissertation research are racial identity, culturally relevant pedagogy and college access programs. The review of literature consists of six subheadings. The first section on racial identity serves to illuminate how African American students become mathematically empowered. Similarly, the second section on cultural identity serves to illuminate how underrepresented communities outside the African American community mathematize. The third section on stereotype threat serves to highlight the potentiation of this threat to suppress the mathematical identity and achievement of underserved populations. The next section explains how kinship relationships are critical to student mathematical identity and academic success. The fifth section explains how culturally relevant pedagogy becomes the most viable vehicle by which to mathematically empower minority students. The sixth section explains the importance of early intervention college access programs on college attainment.

Racial Identity

Traditional mathematics research had distorted the profound impact of race and had subsequently inadequately theorized the effects of racism (Gutierrez, 2008). Most traditional studies on differential outcomes in mathematics stems from an analysis of disaggregated data based on race, which Martin (2006) reported as a hierarchy of mathematical ability. As a result, there has been limited research on the complexities of race and culture on mathematics achievement.

In response to this issue, critical race theorists and other social scientists have used race as a theoretical framework to begin exploring the meaning of race as a social construction by exploring the assumptions, ideas and images of race as expressed through daily life. A developing body of literature on race uncovers the relationships between the social and historical perspectives of race as it has continuing repercussions in criminal and legal institutions and its disproportionate affect upon the policing and incarceration of minority men, particularly African Americans and Latinos.

Martin's work, among others, illuminates the discriminatory experiences that young people encounter inside and outside of the classroom, which continue to subjugate the minority community. Mathematical learning and participation becomes bookended by racialized experiences. Students' experiences, identity and outcomes are shaped by the meanings of race and culture that permeate through the wider society. Student meaning-making and relationships affect how learners are viewed, how mathematical competence and ability are reinforced (Martin, 2000; McGee, 2009; Schoenfeld, 1992) and how the goals of mathematics education are decided.

Using the student's perspective, racial identity explores the interconnectedness between racial and mathematical identity and how this convergence interfaces with mathematical participation and learning. Race identity is one's perception that an individual shares a common racial heritage with a racial group. The role of racial identity reflects the extent to which societal and personal meanings of race influences a person's self-concept and, thus, his ensuing behavior.

Racial identity research has been focused in two areas, the process of identity development or the content of the individual's identity (Scottham, Cooke, Sellers & Ford, 2010). They found there is some relationship between the process of developing an identity and identity content development. They found higher levels of development manifest as racial identity increases. This higher level of development is reflected through more positive group attitudes. Results also show higher levels of identification. Seaton, Yip, Morgan-Lopez and Sellers (2012) explained as racial socialization is transmitted from parent to child, these components are moments when important information, values, and perspectives are passed down. This racial socialization is believed to serve as an antecedent for the development of racial pride and promotes group knowledge in the formative years.

The literature on racial identity development reports having a realistic belief about race may serve as a protective barrier in students' lives (Jett, 2009). Students with strong racial identity associated with their respective group may be better capable of negotiating the potentially negative effects of dealing with discrimination and prejudice. Furthermore, racial identity researchers (Martin, 2009; McGee, 2009; 2013) reported the recipient is better adjusted in overall ability and self-concept. When racial identity is linked to academic pursuits, study results also reported students received better grades in school (McGee, 2009; Seaton, Yip, Morgan-Lopez & Sellers, 2012; Sellers, Smith, Shelton, Rowley, & Chavous, 1998)

As identity is pliable across situations, racial identity is similarly pliable. In summary, the degree to which racial identity is socially constructed needs further development. Additionally, as new forms of identity continue to emerge, there is a greater need within the realm of research to reinforce the conceptualization that an individual is a collection of various cultural identifiers. In this study, racial identity serves to foreground race as an important component in reporting the mathematical identity, achievement, and persistence of these four underserved participants. Ultimately, the examination of racial realities is necessary in order for society to fully comprehend and properly redress racism equitably.

Cultural Identity

Cultural identity reflects an identity or feeling of belonging to an ethnicity, nationality, religion, social class, and any type of social group that has its own distinct culture. Cultural identification happens individually as well as within a group of people who share that same cultural identity. Therefore, culture becomes very important in shaping identity. Culture has multiple complexities that affect the way in which people operate within their local communities of practice. Cultural identity is influenced by religion, ancestry, skin color, language, family and political views. Nationality is also a large factor that relates to cultural complexity as the state's infrastructure is foundational to individual identity; however, individual circumstances may alter one's cultural reality.

The individual's cultural arena may be affected by where he lives as well as the culture the individual choses to abide by. Surroundings, positionality, and other environmental factors play a role in how a person feels about his culture and the culture he adopts. For example, immigrants may feel compelled to change their culture to fit in with those around them in their new country. This can also present a cultural incongruence, and pose a problem to those straddling two or more cultures. However, some may be able to adjust to various cultures by committing to two or more cultures. This cultural plasticity enables one to feel like they are part of society, no matter where they go.

Phinney (1993) developed a three-stage model of ethnic identity stage process. The three stages are an unexamined cultural identity, a cultural identity search, and cultural identity achievement. At the first stage, unexamined cultural identity is a stage in which one's cultural characteristics are heeded without an interest in exploring other cultural issues. The second stage, cultural identity search is described as a process of exploring and questioning one's culture in order to gain greater awareness in understanding the implications of membership in that culture. This is where one might question one's beliefs and compare those beliefs to others. Personal growth is shown by an increasing awareness in social and political forums and by one's desire to learn more about his culture. The final stage, cultural identity achievement is marked by a clearer more confident acceptance of oneself and a personalization of one's cultural identity.

Foundationally, Nasir (2002) reported on a relation that exists among goals, cultural identities, and learning. She argued the understanding of this relationship is an important means to better understand the way that race, culture, and learning becomes intertwined for minority students. She found as players come to know these practices, there is a shift in goals as they seek to become more proficient at that practice. As a result, the individual begins to define himself based upon that practice. McGee (2009) asserted the existence of internal and external motivators that promote mathematical identity and achievement. Jett (2009) extended Nasir's findings reporting that the mathematical achievement and persistence of participants was due in part to a) internal characteristics such as a strong cultural identity, b) the ability to negotiate injustices, c) positive mathematical identity, and d) positive outlook concerning their participation in mathematics. Cobb (2009) concurred with Jett revealing that a multidimensional construction of mathematics affords greater opportunities for participants to engage in ways that are culturally congruent. Gay (2010) explained these ways of knowing provide valuable tools for learning, self-expression, and continued engagement, which is important to this study because cultural identity is important to understanding how culture manifests in participants' mathematical identity, achievement, and success.

Stereotype Threat

Inzlicht and Schmader (2012) expressed that stereotype threat is a situational quandary in which people believe themselves to be at-risk of confirming a negative perception about their group. Stereotype threat is a widely supported theory for understanding the achievement gap among underrepresented youth, particularly African American and Latino students. Stereotype threat reduces performance of those individuals who are associated with a stigmatized group. Steele (1997) reported when negative stereotypes are evident regarding a specific group; the group member is at increased risk of sustaining lessened performance, thus, suppressing their ability to perform optimally. The individual may be impacted irrespective of his belief about the stereotype for the threat to be activated (Beilock, Rydell & McConnell, 2007).

Stereotype threat occurs when negative ability perceptions increase the cognitive load of minority students and thus reduce their academic effort and negatively impacting academic performance (Beilock, Rydell & McConnell, 2007). Steele (1997) reported the existence of stereotype threat and how this threat impacts the intellectual identity and thus performance of certain groups. Steele stated that members affected by this disorder suffer many adverse reactions and consequences. Furthermore, the individual may be impacted irrespective of his belief about the stereotype for the threat to be activated (Beilock, Rydell & McConnell, 2007).

Although stereotype threat does not reflect the personality traits or characteristics of the individual, it affects both genders and manifests across multiple disciplines. Osborne and Walker (2006) reported Steele's theory may explain how many Black and Hispanic students that perform at elite levels, should also be more resistant to this threat; however, these highly-invested individuals are even more likely to experience the negative effects of this stigma (Owens & Lynch, 2012). Inzlicht and Schmader (2012) discussed how African American and female students at prestigious institutions did poorly on mathematics tests when they were reminded that members of their ethnic group or gender, respectively, were expected to have low performance. Moreover, Desert, Preaux, and Jund (2009) exposed how stereotype threat is also more prevalent across communities from lower SES.

Furthermore, Gilovich, Keltner, and Nisbett (2006) revealed that repeated exposure to stereotype threat can depress performance and increases the potential for the student to lose interest in academic pursuits. As repeat exposure can increase the potential of loss in academic interest, it becomes important that tasks be framed so that impact of stereotype threat can be mitigated. Therefore it becomes very important to decrease one's level for self-doubt that results in suppressed performance.

When stereotypical barriers are removed, these same students were able to learn how to manage stereotype threat and succeed despite the odds and low expectations of others (Inzlicht & Schmader, 2012). Owens and Lynch (2012) concur that stereotype threat can be managed. The results of their research show that immigrants tend to resist stereotype threat due to the connectedness of their immigrant identities and strong belief in the opportunity structure in American society. They found that first-generation immigrants were highly resistant to the disposition of an identity that supports stereotypes. They found second-generation immigrants experience very few dispositional elements of stereotype threat. Finally they report that immigrants tend to resist this threat partly due to the close proximity of their immigrant identity and the individual immigrant's position within the opportunity structures of mainstream society. In summary, it becomes increasingly more important to decrease the level of stereotype threat and the resulting self-doubt as a result of minority stereotypes. Learning to deal effectively with stereotype threat is important in this study because stereotype threat has the potential to decrease the productivity of the respondents of this study and it has the potential to become a major contributing factor to the suppressed academic performance in the underserved community.

Kinship Relationships

In addition to identity and managing stereotype threat, family support is critical to student success and academic attainment. Walker (2014) reported a kinship exists among the Black mathematical community. Walker specified these kinships can be identified as either: fictive or familial, formal or informal, and planned or serendipitous. Fictive ties are relationships that do not extend from bloodlines. These types of relationships have lineage in the African American community stemming back to slavery. Walker explained mathematical development is rooted in the family, and families are therefore crucial to mathematical development. They promote mathematical interest and encourage the learning of mathematical concepts. The family also serves as a protective barrier to circumvent low achievement. Family is also important to mathematical identity and mathematical socialization (Martin, 2000).

Kinships involve all of the following traits to some degree: caring, nurturing, instructing, socializing, mentoring and inducting. Formative years have been shaped by family members with extensive formal education, as well as by those who may not have the mathematical learning themselves. Families support mathematical development in many ways. For example, family members push young, budding mathematicians toward opportunities they did not have. Moreover, mathematical memories can rise from immediate family and extended family. Mathematical socialization is derived from narratives where discussions and interactions with family, peers, and teachers can carry substantial weight. Mathematical experiences happen outside of school and are promoted by family networks. These vicarious experiences may emerge from the narratives of family conversations and activities as well as classroom and extracurricular school activities. Walker found that communities that resemble family networks with caring and effective teachers where Black students are actively engaged, can aid in the development of these students' mathematical talent. Such experiences form key events in childhood and adolescence that may contribute to future mathematical pursuits. Kinship relationships are important to this study because kinships provide a way of examining students' mathematical identity through the engagement of those in the student's home, school and community.

Culturally Relevant Pedagogy

Culturally relevant pedagogy (CRP) has become increasingly more prevalent in America's classrooms. However, in the course of a debate among the mathematical research community, there has been some blurring in terms of what CRP entails. Stairs (2007) provided a very clear rationale for the use of CRP, declaring that CRP is an approach suited for urban schools, where some teachers are unprepared to educate diverse students. The underlying assumption of CRP is that culture is an asset that enriches all learning and is not a deficit that needs to be overcome (Stairs, 2007). In short, CRP addresses issues of culture, ethnicity, and race as central components in education, especially as it relates to power and privilege.

Researchers underscore demographic, democratic, and pedagogical factors that explain the importance of using culturally relevant pedagogy. As demographic trends show that the United States is becoming increasingly more culturally and ethnically diverse, pedagogically effective teaching strategies must address the needs of students irrespective of cultural background, class, or immigration status. Culturally relevant theorists like Ladson-Billings, Gay, and others encourage teachers to increase their cultural knowledge in order to transform their knowledge into quality instruction. The purpose of this practice is to maximize learning opportunities for those who have been identified as underserved, including minorities, low-income, and first-generation college-goers.

Culturally relevant pedagogy, a term coined by Ladson-Billings (1994), is comprised of three components: (1) rigorous academic content; (2) cultural competence; and (3) critical consciousness. This rigorous content involves aiding students in the development of reading/writing skills, mathematical skills, and higher-order reasoning. In order to maximize learning opportunities and promote cultural competence, teachers must be willing to connect academic subject matter to the culture of the community. CRP uses culture and language within instruction to bolster personal and community identities (Howard, 2003). CRP uses students' cultural strengths, collaboratively, in order to develop skills necessary to become social critics and affect change in the social and political arenas (Leonard, Brooks, Barnes-Johnson, & Berry, 2010). These connections transmit value to the student. As the teacher highlights the student's neighborhood, traditions, and history, the student becomes better able to recognize the assets of his environment.

As Ladson-Billings also advocated developing a critical consciousness, this heightened awareness permits the student to recognize social injustices that inhabit the student's life. Howard (2003) further explained the major implication of culturally responsive teaching ends with the teacher's responsibility to ensure that all students are afforded an equitable opportunity. Furthermore, Hill (2006) endorsed Ladson-Billings' notion of critical consciousness development noting that it not only enables the student to understand the political dynamics, but also helps the student to offer alternatives to the status quo. Tate (2008) added that this awareness empowers the student to critique and call to action in order to redress societal inequities.

Furthermore, Castagno and Brayboy (2008) discussed how to tailor educational practices to the cultures students bring from home. This type of instruction entails eliminating materials that are inconsistent with the cultural experiences of students. When culturally inconsistent material is presented, it may cause alienation and marginalization of certain student groups. Cultural incompatibility is often manifested as underachievement, poor performance, and high dropout rates. Accordingly, Gay (2010) extended Ladson-Billings' notion of culturally relevant pedagogy to enumerate specific characteristics that are distinctive to this teaching paradigm. Stinson, Jett and Williams (2013) contend that the development of culturally responsive teaching is characterized through the fostering of caring relationships among teachers and students. Furthermore, this teaching strategy relies heavily on student involvement, particularly when knowledge is being constructed. Teaching must build upon student interests and incorporate resources from the home and community. This comprehensive approach affirms student cultural backgrounds, which in turn elicits new attitudes, knowledge, skills, and values. In summary, Gay found the end result of this method was the liberation and empowerment of the student by affording the opportunity to excel in the classroom. This empowerment is also manifested through academic competence, courage to act, and personal confidence (Leonard, 2008).

Overall, mathematics, in conjunction with artifacts, should be a tool used to foster greater understanding of existing society, power, agency, and oppression (Leonard et. al., 2010) Moreover, mathematics should be used as a change agent and as a means by which to foster a well-informed and self-empowered citizenry (Freire, 2006). Researchers indicate even though culturally relevant practices build knowledge, many teachers may be ill-prepared to contend with issues related to social inequality. Although there may be some teacher discomfort in these practices, this paradigm provides support for student engagement in mathematics classrooms that also fosters stronger student-teacher relationships. As such, CRP remains in a quagmire; although it is believed to be beneficial, it is not acted upon. CRP is important to this dissertation study because the AVID program utilized many principles of culturally relevant pedagogy, therefore, the AVID program may have contributed to the mathematical identity of these minority young men.

College Access Programs

Trio Programs

In the aftermath of the Kennedy assassination, President Johnson established TRIO programs, in partial fulfillment of the Kennedy legacy of full participation of all of America's citizens. TRIO programs targeted students who had been identified as having a potential to succeed in college. These programs were designed to address some challenges that prevented poor and minority children from attaining a college education. TRIO programs have experienced only limited successes, due partially to the multiplier effects of factors that constrict student achievement. However, for many, high school is too late because academic support is needed in earlier grades. As achievement has been linked to student opportunity, mathematical participation becomes limited if the student has not engaged by grade four (Kunjufu, 1995; Martin, 2000; Van Sciver, 2006).

TRIO programs emerged from the Title I Act of ESEA of 1965 as the first generation of programs designed to propel low-income students toward postsecondary education. Later, college access (CAP) and college readiness programs targeted students who were identified as low-income, minorities, and/or first-generation college students. These programs attempted to address many more factors that were beyond the capabilities of the first generation programming (Ward, 2006).

College readiness programs help to address the multiple factors, which are influential to an individual's decision to go to college. College readiness programs and college access programs have many overlapping interventions. Both programs indicate collegiate development in four areas: a) academic rigor, b) staffing which supports academic rigor, c) early college exposure via campus visits and programming, and d) college credit opportunities while enrolled in high school (Bergerson, 2009). Furthermore, these programs advocate for supports inside and outside of school, as readiness involves developing abilities beyond academics. There is an emphasis on the development of relationships, which assist the student throughout school. Initially, the student must be aware of college academic requirements as well as understand the cultural differences between high school and college (Hooker & Brand, 2010). Additionally, efforts are targeted to improve student performance and promote college readiness through the focus on specific areas including: a) skill development; b) increasing self-esteem and efficacy; c) increasing student engagement, d) strengthening school and peer bonds; e) increasing college access and knowledge; and f) increasing student aspirations.

Similarly, Ahn (2010) extended Hooker and Brand's argument specifying that targeted students are influenced by school programs and interventions when planning for college. Ahn finds that preparatory programs provide the student with the necessary industry to complete coursework, as well as to bolster academic persistence, and motivation. Ahn also called for mentors to provide students with cultural capital and college-level knowledge that extends beyond the application process. Mentoring must also extend to assisting students with college selection and financial aid. College readiness allows the student to garner greater understanding of the college cultural environment, knowledge of the labor market, and future employment opportunities, to succeed.

Since there are fewer role models who possess college level knowledge in underserved communities, low-income and first-generation college goers may incur greater difficulties in the college experience. These difficulties may translate into poorer academic and social preparation for collegiate success. Hooker and Brand (2010) found the key component to college level knowledge is to develop a plan for college. Equally important is that the student self-identifies as a college-goer. The underserved student needs an early opportunity to complete college level coursework, which also contributes to collegiate knowledge development. The student has to be encouraged to develop academically successful behaviors including: study skill development, self-monitoring behaviors, and effective learning strategies. In conjunction with Hooker and Brand's findings, Ahn (2010) found that the larger the student network of those who have college experience, the higher the student's level of access to information and resources. Hooker and Brand advocate for programs to begin in middle school in order to help both students and families, with the aid of community partners, to build college knowledge and contribute to student success. CAP programs are important in this study since the respondents participated in a pilot school intervention program. Since college access programs utilize many principles of culturally relevant pedagogy, there is an increased potential that the CAP program may have positively affect the mathematical identities of the respondents in this study.

AVID Program

Advancement via Independent Determination (AVID) is the instantiation of a second-generation college access program that serves underserved students in grades four through twelve. This program prepares students for the academic rigor necessary to be successful in college. More specifically, this program was developed to assist underachieving secondary students' entry into four-year postsecondary institutions. Accordingly, the mission of this organization is to narrow student achievement gaps through student preparation and the promotion of student readiness (Swanson, 1989).

AVID students are identified as having the capability of excelling within a college preparatory environment but are failing to do so. To gain entry, these B, C, and D students must wish to go to college and must be willing to work hard. The students are then pulled from unchallenging classes and are placed into accelerated classes. AVID students typically enroll in advanced placement classes and an academic AVID class within the school day. Students receive supplementary support through the use of learning strategies, mentoring programs, and training, while they engage in rigorous coursework. Essentially, the elements provided are academic instructional support, tutorial support, and motivational support. AVID finds through internal and external investigations that students experience improvements in individual self-image that emanate from newly-acquired academic success and the encouragement of student role models. AVID reports students who complete three years of AVID training are accepted into four-year universities at a rate of 75% (Huerta, Watt, & Butcher, 2013).

AVID's curriculum is based on the use of writing as a learning tool. Additionally, the curriculum focuses on inquiry-based learning, collaborative groupings and academic readings, which is termed the WICOR method. These AVID components are consistent with those techniques used in culturally relevant pedagogy (Gay, 2010; Ladson-Billings, 1995), specifically the first tenet, which stresses academic success. Kahle (1998) and Spielhagen (2006) found that the key equity indicator of future success is associated with mathematical enrollment in algebra or geometry in eighth grade. AVID encourages middle school students to take algebra in eighth grade (Otten et. al., 2010). AVID reasons students will be more prepared for high school mathematics and science coursework if they take these courses. As a result, there is a greater likelihood that AVID students will attend and graduate from college at higher rates compared to those who had not taken algebra. Accordingly, AVID touts 61% percent of its eighth graders take algebra as opposed to 22% nationally (Huerta, Watt, & Butcher, 2013).

Within the typical AVID school, teacher coordinator of the program serves as the instructional leader and acts as the liaison between school personnel and college personnel. The teacher coordinator (AVID teacher) also assists in school-wide implementation of the program. The AVID teacher is also tasked with coordinating additional student supports. Local college students are also brought in to tutor middle school students. These college students also serve as role models, as parents and community leaders serve as partners to the AVID program. Parents are encouraged to attend meetings, maintain a relationship with the AVID coordinator, and support their child in order to achieve. AVID provides parents with family workshops and other supports such as: motivational speakers, college courses for high school students, and academic summer programs. In summary, AVID, which utilizes many of the same techniques as college access and readiness programs, share many techniques that are consistent with culturally relevant pedagogy.

The goal of this study is to provide greater attention to the African American and Hispanic male experience and to shed light on the larger question as to how to spur achievement amongst these groups. Additionally, this study will provide information on the college access program known as AVID. This study will contribute to the growing body of research on the effectiveness of college access programs. This examination serves to discuss the need for effective CAP programs and how these programs serve as a method to bolster achievement among diverse student populations. Some studies may point to the increasing number of minority men on campuses; however, graduation rates among these men still lag far behind their Caucasian and Asian counterparts.

In acknowledging student experiences as a way to elevate achievement and to foster greater understanding between diverse groups, stakeholders can gain further insight into how culturally relevant teaching plays out in a college access program in a middle school setting. Partnerships between schools and universities that promote early college exposure and implement academic rigor with related support mechanisms, will facilitate greater academic competence and mathematical identity. This pathway positively impacts self-awareness. This is also an effort to provide another pathway by which to sustain greater achievement among underserved students who are becoming increasingly more representative of the U.S. population.

Summary

Greater investment is needed in America's minority students and in programs that promote student achievement. Improvements are being slowly realized on multiple levels; however, urban schools are still plagued by lack of resources, inferior facilities, obsolete materials and poorer teacher training. Equally disturbing is that young men continue to be in peril. Despite an educational reform movement, minority students face many challenges relatively unknown to the larger society. There continues to be a need to educate the public of the negative perceptions of these individuals. As the research community continues to study this phenomenon, better practices and methods to promote success are needed to spur minority achievement. Thus far, researchers (Leonard, 2008; Martin, 2000; Nasir, 2002) have established that students should be targeted in early grades, and multilateral support needs to be provided in order for college to be a viable option for underrepresented students.

Gap analysis, which has been presented with relative exclusivity for the past two generations, has led to the unintended consequences of furthering the racial chasm. As gap analysis has illuminated student differences, the research community has been stymied by no less than a full decade of mathematical research inertia, as this method of research has gone largely unchallenged. The media continues to report educational difference to the public when test scores are published in the newspaper and online, but the media neglects to specify that a combination of factors is endemic to the problem of underachievement. Mere identification has not ameliorated the current circumstances as academic achievement has continued to decline. Essentially, gap analysis has done the opposite of what it was intended to do. Instead of creating an environment of opportunity, it reinforces the racialized environment that is so prevalent in all facets of American life.

King (2009) specified the importance of continuing to disrupt the social processes that represent the current state of affairs. As many researchers have pivoted away from the deficit-based gap analysis model, a paradigmatic shift has arisen in efforts to identify what characteristics are endemic to the mathematically successful student in an effort to help minority students achieve at greater rates. This is a movement away from the idea of what deficits are incurred by different groups. In order to understand how to encourage mathematical achievement, greater attention is needed to understand what constructs support successful students' identity development. Moreover, the mathematically successful minority student needs to be studied in order to understand what factors contribute to achievement and empowerment. It is also important to identify attributes that promote minority achievement in order to replicate it so that more minority students can enjoy success.

College access programs began in the 1960s to help mitigate the achievement gap among various demographic groups. These programs were established to target the underrepresented with greater college access and opportunity and were also designed to build academic rigor and provide the student with early college opportunities. As a method by which to make college a viable option for many minority students, college access programs such as AVID, provide the student with additional cultural tools needed to span the high school to college transition. Programs like AVID are needed to respond to limited research on the effectiveness college access programs and the link to college attainment and graduation.

This study seeks to document the mathematical identity and academic achievement of a group of young minority men, who had been identified as having the potential to go to college in middle school. It is important to document the achievement of minority men and understand their cultural and racial identities and kinship networks so that success can be rippled throughout their communities. It is equally important for others who may have similar circumstances to see what has been influential in the lives of students just like them. As researchers and their posterity seek alternatives to gap analysis, more solutions will be found to help those who have not had the social advantages to excel and attain higher education.

CHAPTER 3

METHODS

The following chapter provides a detailed description of research methods that were employed throughout the course of this study. The aim of this study was to understand the mathematical identities and the academic achievement of young men who have been identified as traditionally underserved. Using a qualitative research design, the life stories of these young men were examined using interview data and two survey instruments. A case study design was utilized to promote greater understanding of this population's mathematical identity and academic achievement and to investigate the factors that affected such development. This study also employed a counternarrative approach to elicit the life stories of a case involving four minority young men who participated in a college access program in an urban middle school.

Assumptions and Rationale for Qualitative Design

This dissertation used a qualitative case study design, situated in constructivism. Such an approach was grounded on the understanding that knowledge was co-constructed with the learner and this knowledge was also affected by context (Penuel, 1995). As this study investigated the mathematical identities of young men who participated in an AVID program in an urban setting, I additionally sought to identify what factors affected their development. Secondarily, the study's aim was to elicit the extent to which the AVID program influenced each participant, resulting in development of mathematical identity and academic achievement.

Qualitative Research

Qualitative research explores cultural phenomenon in that it elicits cultural meanings from distinct individuals (Geertz, 1973). As qualitative research focuses on the centrality of the human experience to world events, direct participation of informants creates new discoveries of how humans co-construct meaning. This paradigm has its origins in sociocultural theories where groups are examined through ethno genesis, social characteristics, and culture (Maynard & Purvis, 1994). Meanings are constructed by shared participant experiences of how individuals live, deal, and describe their realities. Stinson (2006) extended this idea specifying this approach contextualizes the complexities of school, life histories, and mathematical identity.

The purpose of using this method was to gather greater understanding of human behavior and the reasons why humans engage in such behaviors. This study was non-experimental in design with the aim of looking to understand the complexities of the social world. In this dissertation, I also used descriptive and interpretive research in order to focus the study on ensuing physical events and behaviors. Additionally, I sought to investigate how these young men made sense of life events and how their understandings influenced their behaviors and mathematical achievement.

Case Study Design

A case study design was used in order to gather detailed information on the young male participants of a college access program in an urban middle school setting. McGee (2009) argues the case study method is ideal in this application based upon its holistic and in-depth investigatory features. Case studies have been used in many areas of social research and have been garnering further use in the field of education (Hartley, 2004). Case study design has a distinct advantage in that it permits the voice and perspective of the informant to be more salient, which provides a more encompassing understanding of individual actions (Lichtman, 2010). McGee and others argue that education is a dynamic system with an inherent racialized component that cannot be disentangled. Students are, therefore, mere actors who engage in activities that have been shaped by the environment, and subsequently, informant activities must be viewed within a racialized context.

Case study and interview techniques provided a way to amass the inherent complexities between what happens in the informant's life and how the person chooses to internalize and understand the experience (McAdams, 2008). Accordingly, in this case study, I used these same techniques to ascertain a more holistic understanding of how these young men constructed mathematical and academically successful identities. Since this study was comprehensive in nature, body movements and gestures, speech patterns including intonation, expressions, as well as silence were also explored (Gee, 2004).

Story and Counterstory Analyses

Storytelling has a deep and rich tradition within human evolution; this human process has been implemented as a research method (Denscombe, 1998). Storytelling has been linked to a unique interview process that provides participants with greater awareness, education, empowerment, and realization. Historical and social circumstances provide a background for narratives and also aids in the understanding of individual agency within societal contexts. In contrast, counter storytelling, according to

Solórzano and Yosso (2002), is also a tool to be used to uncover individual experiences. As critical race theory is central to this methodology, this structure has been used to explore how minority mathematics students achieve. Researchers such as Berry (2008), Martin (2006), McGee (2009) and Stinson (2009) have incorporated counternarratives in mathematical research and education, which provides in-depth informant characteristics.

Counter storytelling was used to capture the voices of young minority men's mathematical experiences after participating in a pilot AVID program. This method permitted valuable and rich experiences to surface, particularly of those who have been marginalized. Freire (2006) justifies this approach as providing a way to access the voice of the oppressed. This method has been undergirded by a commitment to explore informant experiences and voice that enriches the knowledge of students who have been traditionally underserved. As in-depth interviews are a way to garner the perspective of the informant, this paradigm provides marginalized individuals an opportunity to relay their story to the broader mathematics community. More specifically, I used one demographic survey instrument and two other instruments as springboards for interviewing, in order to learn about the identities constructed in four students' lives. Following the argument of Leonard (2008), Martin (2007), and McGee (2009), one's identity is at least partially informed by the participants' familial, cultural, and educational contexts. Thus, stories and counterstories were told through the eyes of the informants. Memories were constructed and ideas were filtered and interpreted. The participants in this study told stories or counterstories as some had more normalized experiences than others.

Research Setting

Northwest Middle School (NMS) is situated in a large school district in a metropolitan city located in the mid-Atlantic region of the United States. NMS is located a few blocks south of a major thoroughfare in the city. This neighborhood consisted of primarily poor, working-class, and lower-middle class Hispanics and Blacks. There are many homes on each side of the street; the houses are tightly packed next to each other like perfect little soldiers. The median home value for this neighborhood within the metropolitan area was $52, 500, while the national average was $190,000 (www.homes.com). This difference in home value reflects median home prices in this area were approximately 25% of national median home prices. According to Homes.com, zip codes were scored against the national crime rate. Areas having the national average received a score of 100. The 2010 crime rate for this zip code was 243. This indicated that this zip code had a crime rate that was 2.43 times greater than the national average (www.clrsearch.com). Demographic statistics also revealed 47% of this population made less than $30,000 per year, and the median household income was $38,557, while the U.S. median household income for all demographics was $51,413 at end of 2011 (www.homes.com/Home-Prices. www.neighborhoodlink.com/zip/19120#).

A review of the school's history reveals an addition had been completed and attached to the former building site. The name of the school was then changed to Northwest Middle School. On the street where the school is located, there is a small parking lot that consists of administrative and handicap parking only. All other staff must park their cars within the neighborhood. On the front right side of the building, there is a large mural of an immigrant Hispanic girl holding a basket of fruit. Continuing past this mural is the old building, the former middle school. There is a distinct contrast between the old and new buildings. The old part of the building has tan bricks with dirty tan grout. The windows are the old-fashioned metal-cased windows, which open outward. In this wing of the building are the offices of the principal, vice-principal, the counselors, and the nurse's office as well as unused orchestra lesson rooms.

The new part of the building has chocolate brown bricks to coordinate with the old portion of the building and houses the classrooms. There are three floors: the lower level houses all seventh-grade classes, the second level houses all eighth-grade classes and the library, and the third floor houses sixth-grade classes. On the left side of the main entrance doors, the school name is displayed. The front of the building has three sets of double opening doors. In front of the main entrance, a woman sits behind a desk and directs incoming visitors. She sits in the school's large rotunda, which has large 12-foot panes of glass that open up to a large courtyard that contains another mural. The school is located in front of a cemetery and adjacent to a dilapidated factory. Since the back of the school faces the front of a cemetery, it was not uncommon during classes to see a funeral procession that was laying someone to rest.

At the beginning of the 2010-2011 academic year, a new principal, Mr. Daniels, was named and a pilot AVID program was instituted. Student enrollment at Northwest (NMS) was 683 students and in the following academic year 2011-2012, enrollment declined to 653. This decline in enrollment was due partially to charter school competition and the transience of new immigrants. The percentage of students by ethnicity was 60.1% Latino/a, 25.3% African American, 7.7% Asian and 4.5% other. The special education population was 17.2 % for students with disabilities and 2.3% for gifted students. As of the 2011-2012 academic year, 18.1% of the student population had been designated English Language Learners. The school had a 90.3% economically disadvantaged student population, as measured by students who benefit from the free and reduced lunch program.

At NMS, the school's administration recruited a cohort of eleven eighth-grade male students to participate in a pilot AVID program. Four young men from that cohort responded and agreed to be interviewed. Since then, the students had subsequently finished middle school and were enrolled in high school. These students attended the top high schools in the city. None of the participants attended a designated AVID high school. As such, the participants only received one year of AVID training. In the 2013-2014 academic year, these students were enrolled in the eleventh grade, two and a half years after completing the AVID middle school program.

Since this community was a blend of primarily poor, working-class and lower-middle class families, resources were very limited. There was a level of desperation within the neighborhood and this was reflected by many students' inability to afford school supplies and as a result many teachers purchased those supplies for their students. In portraying this profile of NMS, I wish to make clear the dire conditions within the research setting. This research study hopes to be relevant to those teachers and researchers who study impoverished populations. As teacher and researcher, I was committed to eliciting a true to life account of the circumstances of these young men who participated in an AVID program and who happened to also reside in an economically depressed section of a large city. As informants who participated in a pilot program, I sought to learn what factors contributed to their mathematical identity and academic achievement as they negotiated their local communities and strove toward success. My aim as the researcher was to learn how some students, despite living in adverse conditions, were empowered and were determined to succeed.

Role of the Researcher

Access to this facility was granted through principal permission and the assistant superintendent for the academic division. I am currently in my sixth year of employment as a middle school mathematics teacher in the school district. I spent three years at Northwest Middle School and have moved to another middle school. Reliability of the study may have been impacted positively or negatively since I, as the researcher, also serve as the primary source of data collection. As data collector and interpreter, my prior knowledge of the site may have shaped my perspective. Although familiarity with the site may have caused some potential conflict, familiarity also provided me with unfettered access that may have further enhanced the study.

As the teacher-researcher, I taught two of the eighth-grade students who participated in the AVID program. Students who I taught were selected based upon willingness to participate in the study. However, the participants I taught were instructed and repeatedly reminded that their genuine opinions were valuable to the study. I reinforced that my only interest was to reflect upon their personal experiences and perceived truths. Yet, there was still potential for my role as a mathematics instructor to influence the dynamics of the study. Understanding the possible bias this dynamic could present, I was committed to presenting stories and counterstories about these males as they negotiated their places in the local community. These young men were selected into the AVID program based upon their potential abilities in middle school. I studied their mathematical identities and mathematics achievement to encourage others that despite economic disadvantages academic excellence and persistence can provide the opportunity to attend college. Finally, I hope to shed light on the circumstances that impacted these young men as they pursued mathematical and academic success.

Participants and Sampling

The sampling was based upon a group of students from the general student population selected to participate in a pilot program. The students selected for the class were grouped by gender, with seventh- and eighth-grade boys who had an AVID class during the third period daily and a female class that followed the male class. The school principal, the AVID teacher coordinator, and the AVID teacher liaison selected the participants, eleven males were subsequently selected. The AVID teacher coordinator identified these students as having the potential to go to college; however, they had been dubbed as not working to their full potential.

The sampling was purposeful as it had been based upon one characteristic, which was participation in the school's AVID program. The students who had been identified for this special programming relinquished one elective class daily for the entire school year in order to attend the AVID class. Students were also removed from unchallenging classes and placed within the most rigorous mathematics classes in the school. All AVID male students received algebra in eighth grade.

Restatement of Research Questions

This study focused on an exploration of the mathematical identities and achievement of several young men who participated in a pilot college access program in an urban middle school. This study also sought to identify which types of instruction aided in the development of these identities. The questions that guided this study include the following:

1. What were the mathematical identities being constructed of young men who participated in a pilot college access program in an urban middle school?
2. What factors account for the development of those identities?

Data Collection

In order to protect the rights of the participants, permission was obtained from Temple University's Institutional Review Board (IRB) prior to the commencement of this study. Additionally, prerequisite assent and consent forms were obtained from participants and parents. These forms were completed prior to conducting interviews. Participants and their parents were contacted via mail, Facebook, and telephone calls to request student participation in the study. In order to facilitate participant confidentiality, I concealed their identities by using pseudonyms for the school and the participants. All Interviews were stored in a secure location and will be destroyed three years after study completion. Transcribed data were also stored electronically on a password-protected computer.

This case study employed various tools for data collection: two (one-hour) semi-structured interviews with two survey instruments used for triangulation of data. The interviews focused on four stages of human development: childhood experiences, mathematical identity, racial and/or cultural identity, as well and future aspirations (McGee, 2013). McGee (2009) used this model when investigating the narratives of African American college students. The intention of the data collected was to capture, within their natural setting, the narratives of these individuals' mathematical experiences in high school after participating in a pilot AVID program during middle school.

Data Collection Methods

During data collection, an interview was used to foster a relationship and to generate personal and in-depth portrayals of the individual and the community. Interviews with the participants were taped and transcribed. As no research is free from bias, I endorsed the idea of reflexivity to describe my involvement with the group under study and the possible influence this may have had on the resulting research. Interviews were employed as a research technique in order to help to elicit the voice and the experiences of the student. It allowed for the participant to provide a first-hand account of his experiences as he constructed meaning of those experiences (Denscombe, 1998).

In this study, the interview questions were semi-structured and open-ended rather than structured. The interviews were used to harvest as many details as possible. Participants were requested to answer questions based on their own perceptions. This process allowed informants to formulate their own thoughts and to speak more freely. Flexibility was needed to promote further topic development. The interviews were conducted in a face-to-face manner. This direct contact between the respondents and I helped to re-establish a rapport with them from their middle school years. I believed that I was able to yield richer data using this form of data collection rather than using alternate methods.

The semi-structured interview questions were developed by Martin (2000) and McGee (2009 & 2013). The interview protocols were derived from the questions Martin (2000) used in his dissertation where he identified successful seventh-, eighth-, and ninth-grade mathematics students. Some of the questions were modified for this particular setting described in this study. Since this investigation used semi-structured interviews, it remained consistent with the Martin investigation. More specifically, topics addressed included: mathematical and personal identity, personal goals and motivation to learn, and the belief and importance of mathematics. Accordingly, this enabled greater insight into the mathematical identity, success, achievement, and future plans of young men who had been identified as traditionally underserved.

The Research Assessment Package for Schools (RAPS) was used in ascertaining student supports and opportunities in school. This tool was designed to measure student engagement, beliefs about self, and students' experiences of interpersonal support. Sellers et al. (1998) reported that student engagement was perfunctory to student performance and adjustment. This tool was used to tap into three domains of the student's developing self. The first domain, the engagement domain, has two sub-domains that measured ongoing engagement and students' reactions to challenges. The second domain, the belief about self-domain, measured perceived student competency, perceived autonomy, and perceived relatedness. The third domain, the experiences of interpersonal support domain, measured student experiences of support from parents and teachers.

The RAPS was designed to study the interpersonal and psychological processes associated to school performance. This instrument has been used in educational, psychological, and sociological research. This diagnostic instrument has also been used to ascertain engagement information on various student populations, including many minority populations. The RAPS survey has also been used to determine the effectiveness of various programs. Furthermore, the RAPS has been used to track changes and to determine if individuals have achieved specific outcomes. This tool had been prescribed for use at the individual, classroom or organizational level.

The theoretical background for the RAPS explored the conditions that promote student success and adjustment. First, researchers found when students had a supportive environment; student self-beliefs and abilities were also bolstered. Second, students who possessed a strong positive feeling about themself, also revealed feeling more competent and in control of their environments. Additionally, those students also possessed a more positive feeling about parents, teachers, and peers. Student engagement manifests in the attention and efforts students provide to work at school and home. This instrument also examined the emotions connected to completing assignments and the importance of doing well. RAPS researchers found student engagement was the most robust predictor of student success and concluded these assumptions held true for students irrespective of social and economic advantage (Sellers, 1998). In order for the student to complete school with high academic performance and low at-risk behaviors, the student must engage. More broadly, students with high levels of engagement also enjoyed positive perceptions of self and abilities. School and community support also allow the child to develop techniques for enhanced school performance. This support also provides students with greater self-understanding including the roles of self and others. Academic support also enables students to more fully engage and graduate.

In this study, it was assumed that participants were highly engaged, possessed a high favorability of self, and received adequate interpersonal support from parents and teachers. It was further assumed that the students should score above 3.50 on each of the indicators, which is considered optimal performance. Student scores on the RAPS were compared based on summary scores as shown in Tables 3.1, which identify both high risk and optimal indicators for student groups.

The Multidimensional Inventory of Black Identity (Sellers et al., 1997) was used to assess the racial identity of the informants. This instrument uses a seven-point Likert scale that measures beliefs from strongly disagree (1) to strongly agree (7). Sellers argued racial identity is significant and provides meaning to individuals within a racial group. The MIBI Scale further examined how self-perception was affected by racial membership and what it meant to be a member of that group. As such, there were underlying assumptions in regard to race. First, identity is contextually specific and is stable. Secondly, race is a malleable and hierarchically ordered identity. Lastly, Sellers et al. explained the individual is best equipped to judge his/her own race in terms of values and beliefs.

Table 3.1. High Risk and Optimal Indicators

Composite	High Risk Indicators (Summary Score)	Optimal Indicator (Summary Score)
Engagement	Less than 3.00	Greater than 3.75
Belief about self	Less than 3.00	Greater than 3.75
Interpersonal support	Less than 2.75	Greater than 3.50
Parental Support	Less than 3.00	Greater than 3.75
Teacher support	Less than 2.75	Greater than 3.50

This inventory makes salient the extent to which race is relevant to a person's self-concept at a particular moment in time. The MIBI provided a snapshot of the person's racial identity; however, it did not examine development. This instrument measures a person's propensity to define one's self in terms of race and its centrality to the informant's identity. It also measures the way informants respond to certain instances and the subsequent feelings that may result. Racial centrality is determinative as to how an individual defines the self racially, and the extent to which race is central to that person's self-concept. The racial ideology dimension measures a person's philosophy on how one's race impacts the broader context, while he/she is engaged in social, political and academic activities. There are four philosophical ideologies associated with racial ideology: assimilationist, nationalist, oppressed minority or humanistic. Furthermore, this holistic measure assesses how racial identity, which is socially constructed, impacts minority children. As research development among Black students' advances, other scholars will benefit from a racial identity consideration. In this dissertation, interviews and case study analysis were used to ascertain student identity within a racialized context (Appendix E).

During the first interview, informants completed a demographic survey instrument that was administered orally as a means to ascertain life and mathematical and educational experiences. The demographic survey instrument, adapted from McGee (2009), was used to elicit the racial and/or cultural, economic, and living conditions of the participants. This survey was modified from McGee's dissertation and follow-up book chapter where she interviewed participants who had been previously identified as mathematically successful college students. Although some questions identified by McGee were pertinent to this study, some questions had to be modified for the current population (Appendix A). As McGee's instrument elicited data from college participants, the instrument needed to be modified for use with the high school students that participated in this study. Second, after completing the demographic survey, informants were asked to complete the RAPS survey, which was used to measure family engagement, self-engagement, peer engagement and teacher engagement. The RAPS survey instrument focused on levels of engagement as it had been established as determinative to student success (Appendix B). Next, after completing the semi-structured questions, the participants were asked to complete the MIBI survey, which focused on the individual's racialized identity. As McGee and others have specified, race impacts student achievement and identity. Lastly, the informants were asked several questions about their participation in the AVID program. The first interview concluded after completing the student perception of AVID questions. (Appendix C).

The second interview began with the semi-structured interview questions that were derived from Martin (2000). These questions focused on personal identity, the individual's motivation to learn, and personal goals (see Appendix D). The interview then shifted to focus on student perceptions of differential treatment including peer-to-peer interactions, as well as perceptions about peers, school climate, and teachers. Since Martin claimed some students encounter differential treatment from peers and teachers, the students were interviewed based on their beliefs about the importance of mathematics, prior and current experiences with teachers, and future aspirations. The end of the interview concluded with student future aspirations. At the conclusion of the interview, I thanked the participants for their time and insight. (See Table 3.2)

Data Analysis

There are several common approaches related to data analysis within qualitative research. As qualitative research is central to human activity, the products and symbols used by particular groups are essential to making sense of their circumstances. More specifically, researchers look at patterns of behavior, rituals, traditions, and relationships as a window into cultural norms, honing in on how patterns, behavior, and language are used (Denscombe, 1998). An overview of the research questions, data sources, methods of analysis, and unit of analysis for this qualitative research study are presented below in Table 3.3. A detailed description of the methods of analysis is outlined as well.

*Table 3.2***.** Overview of Data

Participants	Three Interviews
4 Students	Interviews: (60 minutes each) Childhood experiences and racialized mathematical experiences (McGee, 2009) a. Demographic survey b. RAPS survey c. MIBI survey instrument d. AVID questions 2. Mathematical Identity (McGee, 2009) a. Semi-structured interview on childhood experiences: personal identity . Motivation to learn and mathematical identity (Martin, 2000): math ability, identity, importance of mathematics, belief about differential treatment, and perception of teachers . Future aspirations Total 7 Individual Interviews

*Table 3.3***.** Overview of Data Analysis

Research Question	Data Sources	Analysis Method	Analysis Unit
1) What are the mathematical identities of young men who participated in a pilot college access program in an urban middle school?	Data transcription of semi-structured student interviews	Memoing and coding analysis	Meaningful word chunks, idea, and sentences
	Questions from Martin 2000, demographic survey	Memoing and coding analysis	The individual serves as the unit of analysis
	RAPS Survey	Mean scoring	Optimal level of engagement
	MIBI Survey	Mean scoring	Scale for Level of Centrality and Regard
2) What factors account for the development of these identities?	Data transcription of semi-structured student interviews	Memoing and coding analysis	Meaningful word chunks,idea, and sentences
	Questions from Martin 2000, demographic survey	Memoing and coding analysis	The individual serves as the unit of analysis
	RAPS Survey	Mean scoring	Optimal level of engagement

Analysis of Interview Data

Each participant was interviewed twice. The interview data were transcribed with details of location and time of recording, participant number, and interview number. These data were then compared and coded for themes and patterns using the constant-comparison method (Corbin and Strauss, 2008). Additional coders helped to establish inter-rater reliability. Thus, the codes were established to confirm the themes and patterns that emerged from the data. A back-up copy was made of all original materials and the back-up materials were used for analysis. As these data were irreplaceable, all digital audio recordings, interviews, and transcripts were copied. After coding the raw data, they were stored separately and a duplicate was used for analysis.

Since identities are inherently unique, I developed a separate case study on each of the respondents. Upon the completion of each interview, I began transcription. As I transcribed the audio recordings, I wrote memos to record my developing understandings of the aspects of each participant's mathematical identities. Upon completing analyses of transcribed interview and survey data (to be described), I developed a narrative for each participant.

RAPS Analysis

The RAPS instrument uses a 4-point Likert scale: Very true = 4, Sort of true = 3, Not very true = 2, and Not at all true =1. I assigned values to each of the participants' responses based on the scale. Then I began computing the means for each of the RAPS items. After computing all of the means for the items, I ranked the items according to their mean scores. I then began to categorize all of the RAPS statements into 4 separate categories: family, teachers, peers and self. After assigning the items into categories, I began to record the value of each individual response to all of the survey items for the 4 participants. In each category, family, teachers, peers, and self, all of the items were averaged for each participant.

Bracey (2011) used a predetermined rubric to measure levels of engagement (See Table 3.4). Using this same rubric and the scores for each participant in each category, I was able to determine level of engagement based on the rubric for family, teachers, peers and self. After determining levels of engagement for each participant's family, teachers, peers, and self, I then identified all of the items where the participants rated either 1 or 2 as clearly both of these numbers ranked in the at-risk level of engagement category according to the rubric. These items were sorted by participant, tallied, and labeled at risk items. These results were then reported in the student narratives to describe their levels of engagement in each category.

Table 3.4. RAPS: Item Distribution among Levels of Engagement

Scale	Level of Engagement
3.75 - 4.00	Optimal
3.50 – 3.74	High
3.26 – 3.45	Moderate
2.76 – 3.25	Low
0 – 2.75	At – risk

Threshold analysis was used to identify levels of engagement that may result in positive school outcomes as well as outcomes that may not (Klem & Connell, 2004; McGee, 2009). As there has been a shift away from a research-deficit perspective, threshold analysis diverges from group comparison and instead focuses how an individual relates to a pre-established baseline. Using the RAPS as a threshold indicator is supported by research that focuses on youth who are performing optimally, as well as those individuals who are at increased risk for negative school outcomes (Gambone, Klem & Connell, 2002, McGee, 2009). Furthermore, when using threshold analysis the researcher is able to better estimate various levels of support that promote or detract from engagement. The threshold for optimal range of engagement was set at a mean score of 3.75 or higher (Bracey, 2011). The purpose of this scale was to better categorize and analyze mean responses based on the number of items in each distribution.

MIBI Analysis

The MIBI uses a 7-point Likert scale: Strongly disagree=1 to Strongly agree=7. I then began to compute the means for each of the MIBI items. I assigned values to each of the participants' responses based on the scale. After computing all of the mean scores, I ranked them from greatest to least. The MIBI items were then sorted among race centrality, ideology, and regard (public and private). Although McGee (2009) had used the ideology items, I believed that these young men's ideology was still being formed. Therefore, I did not use McGee's analysis technique. As Bracey (2011) used a predetermined rubric to measure levels of engagement, I decided that I would use a similar process for the MIBI. Therefore, I developed a predetermined rubric (See Table 3.5). The 1-7 scores of the MIBI were computed to a 100% scale. Using the race centrality and regard scores, student mean scores were compared to the rubric to determine levels of race centrality and race regard. These results were then reported in the student narratives to describe racial and/or cultural identity.

*Table 3.5***.** Rubric for Racial Centrality and Personal Regard

1	2	3	4	5	6	7
0%	16%	33%	50%	66%	83%	100%
None	Minimal	Low-Moderate	Moderate	High-Moderate	Very-High	Maximum

As threshold analysis had been used to identify levels of engagement (Klem & Connell, 2004, McGee, 2009), threshold analysis was also used to determine students' level of racial centrality, private regard, and public regard. As previously stated, threshold analysis permits comparisons to be done using a pre-determined baseline instead of comparisons among groups.

Using the MIBI as a threshold indicator is supported in previous research studies to understand academic performance among youth of diverse backgrounds (Gambone, Klem & Connell, 2002; McGee, 2009). Threshold analysis allowed me as the researcher to better estimate various levels of racial centrality and regard. The threshold for maximum amount of racial centrality and regard was set at a score of 100%. Using a maximum score of 100, the purpose of this rubric was to better categorize and analyze responses based on the items within each distribution.

Trustworthiness

There are numerous methods a researcher may employ to establish trustworthiness. The criterion for reliability and trustworthiness is determinant to whether the instrument is neutral in its effect and whether another researcher would find the same result. As the self is an integral part of the research instrument, it is difficult to determine whether outcomes would be the same. A method by which to establish trustworthiness is through data triangulation. This method strengthens the study by combining varying methods and data. Data triangulation is an important means by which to control for bias and establish valid findings. This study used data triangulation by linking data obtained from two interviews with three instruments: a demographic survey, a RAPS survey, and a MIBI-adapted survey. Accordingly, just as reproducibility perpetuates reliability in a quantitative research, in a qualitative study, trustworthiness is its research counterpart. Within this context, the reasons behind key decisions were highlighted in the sampling data. This is provided to show how another researcher could possibly reach the same conclusions drawn here. The use of memoing detailed a record of the research process and decisions. The constructed data trail allows the reader to follow the path taken and show how decisions were made from the idea conception, to the findings, and the conclusions drawn from the findings (Creswell & Miller, 2000).

There are four important indications to trustworthiness: credibility, dependability, confirmability, and transferability. To establish credibility within this study, the RAPS and the MIBI were employed to triangulate the data according to established dictates of existing research. These instruments allowed for data to be triangulated and analyzed. Dependability within this study is shown through the perceived ability that the study's results can be replicated based upon description of context. Confirmability has been thereby established when demonstrating a trail of data. Confirmability has been established through meticulous recordkeeping of interviews, acts, and surveys. This aids in the objectivity of this study. Also, to increase dependability and reliability within this study, additional coders were employed to establish inter-rater reliability, so that the coding source was established from several views. Lastly, transferability was established by describing the study's participants, setting, methods, and time parameters, rather than to attempt to assert findings on a larger population (Creswell & Miller, 2000).

Limitations of this Study

This study is limited to the young men who participated in the first cohort of a pilot AVID program. Given that only eleven young men participated in the program, results of quantifiable data are limited. Generalizations beyond this population are beyond the scope of this study. Thus, qualitative data in the form of counternarratives as told by a select sample of young men from this cohort were used to learn what can be gleaned about the mathematical identities formed during the AVID program and beyond, their levels of engagement within their learning environments after completing the middle school program, and their racial and cultural identities.

My aim was to expose the complexity within the participants' lives. My self-interest has been presented in acknowledgment of influences on the research, but it did not cause biased reporting. Other explanations were explored. The findings were triangulated with the RAPS and the MIBI to bolster research confidence. The conclusions and findings were compared to other related research on the area of mathematical identity of academically successful students who have been identified as traditionally underserved.

CHAPTER 4

RESULTS

In her dissertation entitled, *Race, Identity and Resilience*, McGee (2009) presented the counternarratives of several academically successful college mathematics students. She presented those narratives within the structure of childhood experiences, racialized college experience, racialized mathematical experiences and future aspirations. In the same way, this study presents counternarratives of high school male minority students. This study is consistent with McGee's work as childhood experiences and future aspirations also emerged from the data. However, I will diverge by using mathematical identity and racial and/or cultural identity in lieu of racialized college experiences and racialized mathematical experiences since these young men are pre-college and are still forming their identities based on their experiences.

While participants interact with significant others in their world, identities are being formed. Identity is a narrative of the self that is situated between one's personal self-assertions and one's environment. Foundational to identity and the ensuing narrative are childhood experiences (Martin, 2006). Identity plays out in students' local communities of practice, including mathematics classroom. In that same vein, mathematical identity is the narrative that ensues as a result of one's deeply held beliefs about one's ability to effectively perform in mathematical situations. Subsequently, it also affects one's belief in his/her mathematical ability and the resulting power of his/her mathematical knowledge (Martin, 2007). As such, developing a positive mathematical identity has been associated with sustained interest in mathematics and promotes mathematical endurance.

Stinson (2009) reported there were four factors identified as contributing to an individual's belief of the importance of education, thereby reinforcing success. He found that male students were influenced by these factors to varying degrees. These emergent factors are a) observing or knowing family or community members who benefited from a formal education by achieving financial and societal success; b) experiencing encouraging and forceful family members who made expectations of academic and mathematical success explicit; c) encountering caring and committed teachers and school personnel who established high academic expectations for students generally, and developed relationships with students beyond school and academics; and d) associating with a high-achieving peer group with similar goals and interests. Stinson emphasized these factors must be evident for success.

Thus, this study seeks to examine how childhood experiences and mathematical and racial and/or cultural identities are being formed as these young men, who also participated in a pilot intervention program in middle school, negotiated their circumstances. Furthermore, the Multidimensional Inventory of Black Identity Scale (MIBI) and the Research Assessment Package for School-Student Report (RAPS) survey were used to ascertain participant racial and mathematical perceptions as well as perceptions of self, family, teachers, and peers.

The Case of Four AVID Students

Four individual narratives of young minority men, who participated in a pilot college access program, are presented to illuminate childhood experiences, mathematical and racial and/or cultural identity and future aspirations. The narratives are derived from four traditionally underserved young men who attended several top-ranked high schools in the city. Presented first is the narrative of Tariq, a Palestinian-American high school student. Following Tariq's story, Edgar reveals his experiences as a Puerto Rican Hispanic student. After Edgar's account, Felix's narrative is offered as he self-identifies as a Dominican Hispanic. Finally, Isaiah chronicles his story as an African American young man.

Tariq, Edgar, Felix, and Isaiah attended Northwest Middle School (NMS) in the 2010-2011 academic year. NMS, a school that is located in a large urban school district, had an entire school population that had been identified as underserved as it had a 100% poverty rate. The neighborhood consisted of primarily poor, working-class, and lower middle-class African Americans and Latinos. NMS faces the back of a cemetery, which frequently lays people to rest during class. A pilot college access program was initiated, in efforts to promote greater achievement among underserved populations. In addition to participating in the AVID program, these young men also partook in a year of algebra coursework in the eighth grade.

Tariq's Story.

Tariq was a Palestinian-American who attended Northington High School, which is part of the school district magnet program. Three years ago, he attended Northwest

Middle School. Fortunately, the middle school's tracking policy afforded Tariq the opportunity to participate in a pilot AVID program and to take algebra in eighth grade. Tariq thrived despite residing in one of the country's poorest zip codes. His drive to succeed was based on his responsibility to his family and to his mother in particular. He spent a significant portion of his time outside of school with his immediate and extended family.

Childhood experiences. Tariq was the second youngest of seven brothers and sisters. He is a Palestinian-American who was born in the United States. He said that throughout his childhood he went back and forth between his parents' homeland and the U.S. As Tariq was the second youngest child, he had very few responsibilities outside of school performance. His mother and father, as well as his brothers and sisters, always encouraged him to do well in school. His mother, who was a homemaker, talked to him about the importance of doing well in school more often than his father who worked long hours. Despite his father's long work hours, Tariq revealed the family often "hung out" in the living room, watched TV, and "chilled."

Tariq credited his family for helping him to develop a love of mathematics. As his older brothers and sisters encouraged him to do well in school, he specified they would direct him to take his time, as it will get easier. He noted from time to time, his mother would ask to see his older brother's homework, but he said confidently, "She knows that I will do it. She doesn't have to ask. She knows, I always gets As and Bs." Tariq was proud of his homework completion rate. In a moment of unexpected tenderness, he confessed that his mother counts on him to be the best brother. Since she wanted him to be the best, he was.

RAPS Survey: Family Engagement. Tariq's score on family engagement was 56 total points, with a mean score of 4.0, indicating his family's level of engagement was optimal. On the RAPS Family subscale, Tariq responded true to the following statements: a) his parents encouraged him to find out how schoolwork could be useful to him; b) his parents did a lot to help him; and c) his parents enjoyed talking to him about school. As a result, he also did not indicate any at-risk elements that might be contributory to poor school outcomes (see Table 4.1).

RAPS Survey: Self-Engagement (Agency). Tariq's score was 116 total points on self-engagement or agency, with a mean score of 3.87, indicating he was completely engaged in his school career and exerted optimal performance. On the RAPS Self-Engagement subscale, Tariq characterized the following six statements as true: a) when something bad happened to him in school, he tried to figure out what he did wrong so that it would not happen again; b) he could work very hard in school; c) when he was with his parents he felt good; d) he paid attention in class; e) when he thought about himself, he felt happy; and f) he worked on his classwork because doing well in school was important to him. Accordingly, he did not identify any at-risk elements that might contribute to possible poor school outcomes.

During the interview, Tariq recounted how he enjoyed working hard in school and that he was also very happy with himself. Tariq declared mathematics was his favorite subject "from way back." He also acknowledged that he was a good mathematics student based on the fact that other students had come to him for help in the past. Tariq explained, “When I’m in school, I usually shoot for As.”

RAPS Survey: Teacher Engagement. Tariq scored 58 total points on teachers’ level of engagement, with a mean score of 3.62, indicating that he believed his teachers’ level of engagement was high. On the RAPS Teacher Engagement subscale, Tariq indicated the eight following statements as true: a) his teachers had plenty of time for him; b) when he was with his teacher, he felt good about himself; c) his teachers had been fair with him; d) he could get his teacher to like him; e) his teacher cared about how he did in school; f) the classroom rules were clear; and g) it had been very true that his teacher thought what he said was important. However, he did recognize there had been two elements that might contribute to poor school outcomes (see table 4.1). Tariq responded negatively to the following two statements: a) my teacher doesn’t explain why we have to learn certain things in school; and b) my teacher isn’t fair with me.

These data are consistent with Tariq’s interview where he Tariq spoke highly of his teachers. When he spoke of his teachers, he articulated that he did not have just one favorite teacher. He declared, “You can’t really pick.” Hence, he believed his teachers cared about how well he did in school. Also, when describing his teachers, particularly, those at Northington High, he disclosed, “They treat you like friends.” He also believed, throughout his school career, that his teachers had been fair with him and had the proper expectations of him.

RAPS Survey: Peer Engagement. Tariq scored 12 points on level of peer engagement, with a mean score of 4.0, indicating he believed his peers were also operating at an optimal level of engagement. On the RAPS Peer Engagement subscale, Tariq indicated that when he was with his classmates, he felt good. He also indicated that he did not feel ignored or angry. As a result, he did not specify any at-risk elements (see Table 4.1).

In support of this finding, when Tariq discussed his peers, he labeled them as, "friendly and good to hang around with." Since he had been back in the United States, he confirmed he had seen some of his old middle school friends. He reported he had seen them "around the block." Tariq joked that his friends and he sometimes made negative comments about each other, but freely admitted they were mostly jokes. Beyond that, he explained how they enjoyed "just talking crap about each other, but nothing bad."

When it came to academics, Tariq asserted that competing against his best friend motivated him. He clarified how this competition between them in some regards fueled his drive. Tariq said his friend was really smart, "I always try to beat him at anything possible. I will try to get better grades, just to show off." He bragged that he never usually needed additional help; however, if he did need help, he had a plan of action. First, he would try to contact his teacher. Second, he would seek the help of his best friend if his teacher were unavailable. Finally, he stated he could always go to his brothers and sisters for additional support.

RAPS Summary. The total for the four subscales was 242 points, with a mean score of 3.87 (SD = 0.18). However, he did specify two teacher elements, which may contribute to less than stellar school outcomes. Despite Tariq's full engagement as well as the engagement of his family and peers, he believed his teachers had not always been fair with him and his teacher had not always explained why they were learning certain things. Overall, Tariq's responses indicated that family, teachers, peers, and self, were operating at an optimal level of engagement.

Table 4.1. Summary of Tariq's Total Engagement across RAPS Subscales

Tariq	Total points	Number of items	Mean score	Level of engagement	At-risk elements
Family	56	14	4.0	Optimal	None
Self	116	30	3.87	Optimal	None
Teachers	58	16	3.62	High	2
Peers	12	3	4.0	Optimal	None
Total	242	63	3.87 (0.18 SD)	Optimal	2

Mathematical Identity. Tariq asserted a strong mathematical identity and mathematical ability based upon how he bragged about mathematics being easy for him to learn because he focused in class. Confidently, he reported, "I've always done well in math." He responded, "It's easy."

Upon leaving middle school, Tariq spoke relatively briefly about his ninth-grade year at Northington High. There was a tension that could be clearly felt. Apparently, Tariq had a less academically successful year than he had had previously. He had enrolled in AP Algebra and by the end of the academic year he had been able to earn an A. He briefly mentioned how he had failed a test in one class miserably and had to spend the remainder of the school year struggling to pull up his cumulative average. Since he had been confronted with difficulties in ninth grade, he had to seek out his teacher for additional support. He asked the teacher for extra credit in order to boost his grade. Lastly, he struck a conciliatory tone as he acknowledged he had to keep away from his friends in class since many of them were unfocused during instruction. Ultimately, his poor performance contributed to his return to Palestine for tenth grade.

As ninth grade had been an academic valley for Tariq, tenth grade had been the complete inverse. Tariq identified his tenth-grade year—the school year he spent in Palestine—as his best year. He began by describing his mathematics/physics teacher. Tariq laughed as he reminisced about how strict his mathematics teacher had been. He said every time a student was disruptive the teacher would subtract a point from his grade. He admitted, “I had at least a hundred minuses.” He said she would always subtract points from his grade, even if it had been one of his friends who had been whispering in the back of the class. He also described an affinity for his computer teacher. He believed this teacher treated the students as if they were friends. He recounted how everyone loved him. He also confessed his classmates and he had gotten this teacher into a lot of trouble because they had been too playful in class. In summary, although having a difficult ninth-grade year, clearly, Tariq had recommitted himself to performing his best. Martin (2000) reported when students made missteps academically, they must call upon and reassert individual determination to strive for success (Figure 4.1).

Cultural Identity. Tariq had a strong cultural identity based upon his strong ties to his Islamic brethren in the city where he lived as well as his frequent returns to his homeland. This was also reflected in where he attended high school. He recounted how his mother had helped him to choose his high school. They chose this school based on his mother's knowledge of family members and other Arabian friends who also attended Northington. Although Tariq lived in a predominately poor Latino and African American community, there were a few Islamic families. These families occasionally interacted with each other socially. Coincidently, these families were also self-isolated as they limited their interaction with others outside their local community.

Tariq reminisced about an infamous rap battle while in Palestine in the schoolyard. He considered it as one of the best times he could remember in school. He then divulged he would be returning for twelfth grade. He disclosed after twelfth grade he would never see those friends again. As many of these Palestinian friends lived in different countries, he revealed his friends would return to their respective countries for college. Although he maintained a strong alliance with his Islamic brethren, he also possessed a strong cultural identity that clearly incorporated his American identity. He had been able to integrate two cultures and manage stereotype threat (Figure 4.1).

MIBI Survey. The MIBI measures three areas: racial and/or cultural centrality, private regard, and public regard. Among the three indicators of centrality, private regard, and public regard, Tariq obtained a mean score of 77.7% (SD = 22.4). Tariq's scored 96.4% on cultural centrality, which denoted his cultural centrality was nearly at its maximum. This reflected that his ethnicity was very important to his self-concept. Tariq's score on private regard was 83.6%, which indicated he maintained a very high degree of private regard for his people. Thirdly, he scored 53.1% on public regard, indicating he believed others outside his community viewed Palestinians at a moderate level. Public regard was over 30% lower than Tariq's racial centrality and private regard scores (see Table 4.2). To summarize, Tariq had a maximum degree of cultural centrality, a very high degree of private regard, and a moderate level of public regard. This indicates that his culture was very central to his self-concept and he possessed a very high amount of private regard (pride) for his people; however, he believed those outside his ethnicity had less regard for his people.

Table 4.2. Summary of Tariq's MIBI: Centrality and Regard

Participant	Centrality	Private Regard	Public Regard
	(1,6,7,9,13,33,48,51)	(4,8,19, 24, 30, 54,55)	(5,15,17,18,52,53,56)
	Max: 56	Max: 49	Max: 49
Tariq	54 = 96.4%	41 = 83.6%	26 = 53.1%
	Maximum Centrality	Very High Private Regard	Moderate Public Regard

Mean = 77.7, with SD = 22.4 (Very high race centrality and regard)

Tariq was proud to be Palestinian. He responded on his MIBI survey that being Palestinian had a lot to do with the way he felt about himself. He recognized his destiny was tied to the destiny of other Palestinians. He indicated he felt good about his people and was also proud to be Palestinian. He strongly concurred that Palestinians should surround their children with the culture's art, music, and literature. He believed his people have made major accomplishments to society at large. Although he acquiesced

Palestinian people have made major strides and advancements, he also understood other groups did not respect his people.

Although being Palestinian was an important reflection of who he was, it had not been a major factor in his social relationships. Tariq expressed his people should freely interact socially with people of other races or cultures; however, he strongly agreed Palestinians should not marry interracially. He ascribed to the notion that people regardless of race have strengths and weaknesses. He concurred that we are all children of a higher being; therefore, we should love people of all races.

Despite racial and cultural differences, he believed his people as well as others could live in harmony. He also conveyed that he was knowledgeable about the marginalization of other racial groups, highlighting the racial injustice and indignities experienced by Blacks. He also had confidence that Whites can be trusted where Palestinians are concerned. He believed Whites should be judged as individuals and not as members of the White race. Lastly, he strongly agreed his people must organize into a separate Palestinian political force.

College Access via AVID and Future Aspirations. Tariq did not discuss AVID until it was brought to his attention by the researcher. The researcher then refreshed his memory that the AVID program had taken place in the library when he was in eighth grade. After a brief pause, he recalled the games. After several additional seconds of thinking, he said that he believed AVID had helped him to grow into the person he was currently. He thought it helped him by providing positive academic experiences. Tariq stated that these experiences permitted him to experience "self" more. Furthermore, it had imparted upon him a sense of greater freedom, which he believed would permit him to follow his ambitions. He declared the AVID class had made him think about going to college even more. Although Tariq had been encouraged as a child to go to college by his family, he acknowledged AVID had reaffirmed his belief that he was going to college. Tariq articulated, “It helped you (me) to think about college and what you (I) want to do with your (my) life.” He specified he knew for sure that he would receive his college degree. He expounded after receiving his bachelor’s degree, he would most likely continue beyond a four-year degree. Finally, he revealed how much he enjoyed the AVID teacher. He explained that the AVID teacher was very encouraging and constantly reinforced things by saying, “When you get to college, you will learn more about this.” He also believed the trips to colleges and universities while in AVID and the lively discussions in the library contributed to his belief that he could succeed in college. Tariq revealed his ultimate goal was to be a doctor.

In summary, Tariq is a Palestinian American from a two-parent household. He explained how he enjoyed mathematics and declared that he catches onto new mathematical concepts quickly. Tariq, as well as his family, his peers, and teachers are highly engaged in Tariq’s education. Tariq has a high degree of social agency based upon his interactions with his successful and forceful family members. Tariq also stated that he had many committed teachers, and he had a high-achieving peer group. He possessed a cultural identity that was situated by a maximum degree of cultural centrality, a very high degree of private regard and a moderate level of public regard.

Edgar's Story

Edgar was a Puerto Rican-Hispanic who attended Barrett STEM High School. Barrett High School had been one of the highest achieving high schools in the metropolitan area. Three years earlier, he also attended Northwest Middle School as Tariq had. NMS had a student population which was 60% Latino, with most Latinos self-identifying as either Puerto Rican or Dominican. As NMSs' entire school population had been tracked according to state standardized test scores, Edgar's scores, similar to Tariq's, allowed him to participate in a pilot college access program in eighth grade. His test scores also granted him enrollment into the eighth-grade honor section, where he also received a full academic year of algebra coursework. While enrolled in the honor's section, Edgar attended the same AVID program Tariq had, which had taken place in the school library on the second floor of the middle school.

Childhood Experiences. Edgar was the elder of two sons. Edgar had been born in Puerto Rico but had resided on the mainland since he was a year old. He lived in a two-parent home, where they spoke both English and Spanish. He reported his mother had been born in a New England state and his father had been born in Puerto Rico. His father was an auto mechanic, and his mother had just been recently laid off due to school district restructuring. His mother had served as the parent-teacher organization vice-president and building support staff at Edgar's middle school.

Edgar divulged that his father did not speak English. Yet, he articulated that his father would help him with his mathematics homework. Hence, Edgar attributed his love of mathematics to his father for cultivating it when Edgar had been a youngster. Edgar affirmed his family also motivated him to do well. Edgar expressed that when he did well in school he would receive a small reward from his parents. Although his mother and his father encouraged him to do well in school and explained its importance, he confessed his mother was "pretty much in charge, and Dad just tags along."

RAPS Survey: Family Engagement. Edgar score was 54 total points on family's level of engagement, with a mean score of 3.85, indicating that his family's level of engagement was optimal (see Table 4.3). On the RAPS Family subscale, Edgar characterized the five following statements as true: a) his parents encouraged him to find out how schoolwork could be useful to him; b) his parents enjoyed spending time with him; c) his parents knew just how well he could do in school; d) his parents did a lot to help him; and e) his parents enjoyed talking to him about school. In summary, he reported his parents had enough time to hear what happened at school. He specified his parents had set clear expectations of him in school. He reported his parents enjoyed spending time with him and that they had explained to Edgar the importance of school. He also did not indicate any at-risk elements that might be contributory to poor school outcomes.

RAPS Survey: Self-engagement (Agency). Edgar scored 105 total points on level of engagement or agency, with a mean score of 3.50, indicating that his level of agency is also at a high level. On the RAPS Self-Engagement subscale, Edgar indicated the following nine statements were true: a) he worked very hard on his schoolwork; b) he worked on his classwork because it was interesting; c) when something bad happened to him school that he would say that the teacher had not covered the things on the test; d) when something bad happened to him in school he tried to figure out what he did wrong so that it would not happen again; e) he could do well in school if he wanted to; f) when he was with his parents he felt good; g) he paid attention in class; h) when he thought about himself, he felt happy; and i) he worked on his classwork because doing well in school was important to him. He also identified that there were seven at-risk elements that might contribute to one's poor school outcomes (See Table 4.3). He replied negatively to the following seven statements: a) I do my homework because I like to do it; b) when something bad happens to me in school (like not doing well on a test or not being able to answer and important question), I say the teacher did not cover the things on the test; c) I do my homework because I'll feel bad about myself if I don't do it; d) If I don't do well on my schoolwork, it's because I didn't try hard enough; e) I do my homework because I want to learn new things; and f) Trying hard is the best way for me to do well in school.

RAPS Survey: Teacher Engagement. Edgar scored 46 total points on the RAPS Teacher Engagement subscale, with a mean score of 2.88, indicating he believed his teachers exhibited a low level of engagement. Edgar indicated the nine following statements were true: a) his teachers had been fair with him; b) his teachers had the appropriate expectations of him; c) his teachers had plenty of time for him; d) when he was with his teacher he felt good about himself; e) the rules in the classroom were clear; f) he could get his teacher to like him; g) his teacher cared about how he did in school; h) his teacher had not explained why they had to learn certain things in school; and i) his teacher thought what he said was important. Overall, Edgar scored many of his teacher responses as a 3 on the four-point Likert scale, indicating that he believed things to be somewhat true, instead of very true. In conjunction with this, five elements had been identified that might be contribute to poor school outcomes (see Table 4.3). Edgar responded negatively to the following five statements: a) My teacher is fair with me; b) My teacher doesn't explain why we have to learn certain things; c) My teacher doesn't seem to have enough time for me; d) My teacher thinks what I say is important; and e) When something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I say it was the teacher's fault.

Edgar generally believed his teachers had cared about how he did in school and he believed his teachers had generally liked him. When Edgar discussed his teachers at Barrett, he believed they took their jobs seriously and similarly declared, "They really teach!" Edgar specified his enjoyment of geometry and his second algebra course had been partly due to the teachers. He expressed the instructors had been able to make it "come alive" for him. He regarded the teachers as his school's biggest strength. As the interview transitioned to the teachers he had admired the most, Edgar mentioned his African American history teacher twice. The first time he mentioned this teacher, he explained how his instructor had divulged some of his personal experiences when discussing the Civil Rights era. He explained how his teacher had presented a "personal tour." Moreover, he explained how his African American history teacher had given students the option of using their phones on a class assignment. Since the students had been able to use their phones on the assignment, he felt that his classmates and he were more engaged. He spoke of a need for more technology in his school. He explained that he wished they had devices, such as tablets in school: "I feel it furthers the learning."

RAPS Survey: Peer Engagement. Edgar scored 8 points on the Peer Engagement subscale, with a mean score of 2.67, indicating he believed his peers were operating at an at-risk level of engagement (See Table 4.3). On the RAPS survey, he indicated the following statement to be true: when he was with his classmates, he felt good. He then indicated the two following statements had not been true: a) when he was with his classmates, he felt ignored; and b) when he was with his classmates, he felt mad. He identified one at-risk element stating the following: when I'm with my classmates, I feel ignored.

When Edgar discussed his peer group, he explained the friends he had in school were from every kind of social group including both the "geeks" and "jocks." He revealed some might have considered him a geek, but quickly he countered with, "Some people know that I play sports, too." He noted he was good at mathematics because his classmates and he compared grades. He explained there was a level of competition. More broadly, when describing his peers, he described many of them as "crazy." Yet, many others he classified as "goof-balls." He detailed there were two other students who had gone to his high school who had also attended his middle school. One of these boys, Felix, was one of his best friend from middle school. He described the other student who attended his high school, Isaiah, as being "cool wit." Both of these students were also participants in the study.

Edgar explained many students in his high school displayed a negative attitude. He explained when people made negative comments, he immediately discounted it, explaining that he thought those comments were made by people who were jealous.

When someone tried to put him down, he showed resilience by just ignoring him or her and walking away. “To me…It really doesn’t matter to me, ‘cause it’s what I think I’m going to be in my future, not what they think, so it doesn’t really matter.” Edgar then explained that many in his school might want to be successful, but unfortunately do not show it outwardly. Edgar explained if he received a bad grade he would say to himself, “I’m goin’ to end up holdin’ myself back, when I should be moving forward.” He kept himself on track when he thought about his future. He chanted, “It’s about what I want to do and what I want to be.”

RAPS Summary. RAPS scores revealed that Edgar believed his family and he had a high level of engagement. He identified his family was optimally engaged, while he indicated his own level (i.e., agency) as highly engaged. In contrast, he rated the teachers as having a low level of engagement and his peers as having an at-risk level of engagement. Edgar also specified five teacher elements, one peer element and seven self-engagement elements that may contribute to less than stellar school outcomes. Edgar’s overall engagement was scored at 213 points, which meant that his family, peers, teachers, and self were operating at a low-moderate level, with a mean score of 3.23 (SD = 0.55).

Mathematical Identity. Edgar had a grade point average of 3.4 and was currently enrolled in International Baccalaureate (IB) classes. He explained he was satisfied with his mathematics classes because he comprehended the topics well. At times, he absorbed different topics without the need to study or to put forth much effort. He believed himself to be smart in mathematics since he had been able to solve some problems that others viewed as difficult. This was reaffirmed when he related that his classmates and he would

Table 4.3. Summary of Edgar's Total Engagement across RAPS Subscales

Edgar	Total points	Number of items	Mean score	Level of engagement	At-risk elements
Family	54	14	3.85	Optimal	None
Self	105	30	3.50	High	7
Teachers	46	16	2.88	Low	5
Peers	8	3	2.67	At-risk	1
Total	213	63	3.23 (0.55 SD)	Low-moderate	13

compare grades after tests and projects. He articulated if there were an impending task, he was quite secure in knowing he would be able to learn the topic. Edgar declared, "It sticks, and I pass tests."

Edgar worked hard in school because doing well academically was important to him. Likewise, he explained he knew how to balance being a good student. He alluded to the juxtaposition of working hard and knowing "how to stop…stop worrying so much about school and just relax." He uncovered at times he could also "get lazy," particularly if he felt as if he had been overworked. He admitted he worried about his future despite "sometimes goofing off" in class.

Edgar explained since he left middle school, he placed more emphasis on school and he took his classes more seriously than he had previously. He described how he had been happier since he had been allowed by his parents to participate in after-school activities and to attend some of the school's social functions. Edgar then described how he had already taken three mathematics courses since ninth grade. Edgar explained he had completed two credits of mathematics in his tenth-grade year: Algebra II and geometry.

Cultural Identity. Edgar proclaimed he was proud to be Hispanic, and he expressed how good he felt about his heritage. He revealed, “I really don’t have an idol, but seeing so many Hispanics that are like up there and doing well, I was like … I could be them, I could be that good one day.” On his MIBI survey, he indicated he had a strong sense of belonging to his people and reflected that being Hispanic was an important part of his self-image; however, it had not been a factor in forming social relationships. He described he believed that other groups did not view Hispanics in a positive manner. Similarly, he expressed a belief that others considered Latinos on the average to be less effective than other racial groups and were, therefore, less respected by the broader society. He then drove home this idea explaining how others respected Hispanics only because many Whites fear them.

Although Edgar agreed with the assertion that the dominant society devalued anything which was not White-male oriented, he also believed Whites should be judged as individuals and not as members of the White race. He expressed the belief that Hispanics should feel free to interact socially with White people. Accordingly, he believed they should also have the choice to marry interracially. He explained although he supported his heritage, many Hispanics do things he would never do. He then made reference to Ariel Castro, the serial sex offender and kidnapper from Ohio, who later killed himself in prison. He explained how Hispanics were considered good by some people and then he conceded some Hispanics were bad as well. Edgar strongly rebuffed the assertion his destiny was tied to other Hispanics. He retorted, “Just because certain Hispanics do a certain thing, that doesn’t mean I’m gonna do the same thing.” He then gave the example of Hispanics and the stereotype about baseball. He then claimed that he liked basketball. Edgar explained although many different cultures reside in the same neighborhood, there was also a separation based upon culture and race. He described how Blacks usually congregated with Blacks and Hispanics with Hispanics. He then elaborated when Hispanics do hang out with Blacks or Asians, Hispanics do not completely trust others outside their group (Figure 4.1).

MIBI Survey. Edgar had a mean score of 65.8 (SD = 25.76) across the three indicators of cultural centrality and private and public regard, Edgar’s cultural centrality score was 75%, which indicated his centrality was at a high-moderate range for his self-concept. Edgar’s private regard score was 85.7%, indicating he maintained a very high degree of private regard for his people. Lastly, public regard score was 36.7%, indicating he believed others outside his community had a low level of public regard for Hispanics. Nevertheless, Edgar maintained a very high degree of private regard for his group; Overall, Edgar had a high-moderate cultural centrality (see Table 4.4).

Edgar affirmed the following statements to be true on the MIBI: a) he had a strong attachment to Hispanic people; b) a thorough knowledge of his history was important for Hispanics today; c) being an individual was more important than identifying oneself as Hispanic; d) Hispanics should judge Whites as individuals and not as members of the White race; e) we are all children of a higher being; therefore, we should love people of all races; f) people regardless of their race have strengths and limitations; g) Hispanics should feel free to interact socially with White people; h) the dominant society devalued anything which was not White-male oriented; and i) Hispanics were not respected by the broader society.

College Access via AVID and Future Aspirations. Edgar, similar to Tariq, did not mention AVID until the interviewer brought up the subject. The researcher refreshed his memory of the program he had participated in while at middle school.

Table 4.4. Summary of Edgar's MIBI: Centrality and Regard

Participant	Centrality	Private Regard	Public Regard
	(1, 6, 7, 9, 13, 33, 48, 51) Max: 56	(4, 8, 19, 24, 30, 4, 55) Max: 49	5, 15, 17, 18, 52, 53, 56) Max: 49
Edgar	42 = 75%	42 = 85.7%	18 = 36.7%
	High moderate centrality	Very high private regard	Low level of public regard
Mean: 65.8, (25.76) (High-moderate cultural centrality and regard)			

Edgar explained how his time in AVID had been worthwhile. He recalled how the class would discuss current events and how they would play interactive games. He reminisced how at the beginning of class Mr. Williams, the school AVID coordinator, would tell jokes. "Usually…like at first we would start messing around, but we would end up becoming serious." As the subject shifted dramatically, the class would become engrossed in some topic that they would then discuss at great length.

Although Edgar could not recall any of the study techniques taught by AVID, he affirmed AVID "enabled me to have in-depth conversations, arguments, or debates, with other people with different beliefs." While enrolled in the program, he had an opportunity to visit colleges and universities. He revealed he had the opportunity to see college students in class and claimed this exposure made him want to go to college even more.

Edgar believed AVID had no role in the development of the person he had become. He reserved that honor for his family. Nonetheless, he attested he would recommend the program. He advised if a student paid attention, he/she would get a lot of it. He explained the student would learn new skills and learn to take better notes. He declared the student would also have an opportunity to help make his/her better life. He recounted how AVID had changed his belief. "It made me think…that I was able to do more…more than what I first thought I could."

Edgar disclosed he wanted to be an auto-body mechanic like his father. Although he wanted to be a mechanic, he revealed he also wanted to go to college. He indicated he wanted to obtain his bachelor's degree in Computer Science. In summary, Edgar is a Latino-American who lives in a two-parent household. He explained how he enjoyed mathematics and how he also caught onto new concepts quickly. Edgar was also highly engaged and he also reported his family was optimally engaged in his education. He possessed a high degree of social agency based upon his family members and his interactions with his high-achieving peer group. Although Edgar explained that he had committed teachers, overall he believed teachers possessed a low level of engagement.

Edgar possessed a cultural identity that was situated by a high-moderate degree of cultural centrality, a very high degree of private regard, and a low level of public regard.

Felix's Story

Felix was a Latino who also attended Barrett STEM High School. Similarly, three years had elapsed since leaving Northwest Middle School. Similarly, Felix's performance had been tracked by the middle school administration. Accordingly, as the tracking policy had afforded others the opportunity to participate in the AVID program and to take algebra coursework in eighth grade, this invitation was also extended to Felix. Felix claimed his drive to succeed was based upon his desire to seek a more financially independent life. He remarked how he spent three days per week attending an afterschool enrichment program.

Childhood Experiences. Felix was one of five children; he had three sisters from his single mother and a brother from his single father. Felix, at the time of this interview, resided with his father and a den mother. Felix's mother resided and worked near a large theme park with his three sisters. His brother lived with his mother in the Midwest. Similar to his brother, Felix had also born in the Midwest. His father had been born in the Dominican Republic, and his mother was Puerto Rican and lived in the Southeast. As a child, he had been shuttled from one parent to the next. He lived with his mother in the Southeast for a time; however, he spent most of his time residing with his father. There was only Spanish spoken at his father's residence, while at his mother's residence there was a blending of both Spanish and English. His father did construction work and odd jobs to make ends meet. Felix reported he had no chores at home.

As a youngster, Felix explained he used to reside with his mother in the Southeast. Later, he lived with his father when he attended elementary school from grades three through six. The summer after his sixth-grade year, he returned to live with his mother. Felix expressed how he began to encounter many difficulties both at school and at home. He explained how his parents approach to his childrearing was completely different. He remarked how things with his mother went downhill. First, there was no one to help him with his schoolwork. Secondly, his mother did not care about school as much as his father. So in response to this new freedom, Felix said, "Fuck it, and I started doing whatever I wanted." He revealed while living there, he also started "hustlin'", which meant he occasionally sold "weed" in his neighborhood. He confessed that his mother had completely lost control of him.

Felix also disclosed that his mother did not treat him the same way she treated his older sister. He expressed how his mother was more forgiving to her than him. When he was with his mother, if Felix got into trouble at school, his mother would not physically punish him. He explained how she at times would not speak to him for a week at a time. After one occasion of getting into trouble at school, he recalled her saying, "What the fuck you doin'? Why you go to school for?" He responded to her, "I'm not going to do it again, I'm serious." After that exchange, she stopped speaking to him. Bitterly, he voiced, "She doesn't do that shit with my sisters, and my sisters have done some really dumb shit." He divulged in retaliation he would then do things intentionally at home and school that would force her to talk to him.

Felix viewed it as a “good move” for him to return to reside with his father. After the transition, he visited his mother on holidays. Felix almost seemed joyful in how much better life had been since returning to his father. Felix explained when things went wrong, his father and he would have a “deep talk” to make sure the infraction would not occur again. He explained his father employed the disciplinary tactic of “holding something over his head.” In contrast to not having help with homework while living with his mother, Felix explained he was able to elicit the help of his uncle who was an engineer. He very much admired how well his uncle had been doing financially. In addition to his uncle, he expressed he could also seek out his three cousins who were in college to help him with his schoolwork. Felix explained whenever he received a good grade on a test or on his report card his father would be “nice to him” the entire weekend. For example, if he saw something in a store he wanted, he would say, “Yo Pop, let me get this.” Felix stated his father would respond, “Cool.” After the acquisition, he stated he had to continue to do well in school or his father would take it away. He revealed how this motivated him to do well. Ultimately, he revealed what was most important to him was seeing his father’s face when his father was proud of him.

RAPS Survey: Family Engagement. Felix’s family engagement score was 49 total points, with a mean score of 3.50, indicating his family exerted a high level of engagement. On the RAPS Family Engagement subscale, Felix endorsed the following statements were true: a) his father enjoyed speaking with him about school; b) his father always had enough time to listen to what happened in school; c) his parents enjoyed talking to him about school; d) his father made it very clear what was expected of him; e) at home, he was able to make more of his own decisions; f) his parents knew he was capable of performing well in school; g) since he lived with his father, he felt good; and h) his parents knew just how well he could do in school. He listed one at-risk element that might contribute to poor school outcomes (see Table 4.5). He rated the following statement poorly: my parents encourage me to find out how schoolwork could be useful to me.

RAPS Survey: Self-engagement (Agency). Felix's score on level of engagement was 95 total points, with a mean score of 3.17, indicating a low level of engagement. Thus his corresponding agency was also at a low level. On RAPS Self-Engagement subscale, Felix indicated the following seven statements were true: a) he had been generally very happy with himself, b) he could do well in school if he wanted to, c) if he did not do well on his schoolwork, it was because he had not tried hard enough, d) he knew how to get good grades in school, e) he had the capabilities to work very hard on his school, f) when he tried hard, he was able to do well in school, and g) when he was with his parents he felt good. Felix identified the following eight elements as at-risk: a) I do my homework because I like to do it; b) I work on my classwork because it's interesting; c) I'm pretty lucky at getting good grades; d) I don't try very hard in school; e) I do my homework because I want to learn new things; f) I do my homework because it's fun; g) I work on my classwork because I'll be ashamed of myself if it doesn't get done; and h) I work on my classwork because doing well in school is important to me.

RAPS Survey: Teacher Engagement. Felix scored 51 total points on teacher engagement, with a mean score of 3.19, indicating he believed his teachers' level of engagement was low (see Table 4.5). On the RAPS Teacher Engagement subscale, Felix indicated the following statements were true: a) his teachers had enough time for him, b) his teachers had liked him and had been fair with him, c) the rules in the classroom were clear, d) his teacher cared about how he did in school, e) his teacher thought what he said was important, f) his teachers had cared about how well he performed in school, and g) his teachers thought what he said was important. He responded negatively to two elements that might contribute to poor school outcomes. Felix identified the following two statements as at-risk: a) When I'm with my teacher, I feel good; and b) My teacher cares about how I do in school.

When Felix spoke about his teachers, he emphasized the importance of being able to talk to them. He expressed that he maintained relatively good relationships with most of his teachers and that he did not mind asking for help. However, if he were encountering difficulties in school, he reported that he would return to his middle school teachers for guidance. He was convinced that his old teachers were advocates, "I can go to them about anything, for real, for real." Felix explained how his retired middle school counselor had "really looked out for him" when he was deciding which high school to attend. He confided that he had applied to several high schools based on his counselor's recommendation.

Felix expressed how Barrett had been a very good school and it had a high ranking among city schools. He divulged the strength of his high school was its diversity. For example, he explained how the same group of students in one class would act completely different in another class. He revealed how some students did not respect certain teachers because they were too nice. Felix claimed greater balance was needed.

Therefore, he believed teacher in-service days should focus on classroom management. Felix believed school should be fun. However, he maintained the teacher needed to be able to corral the class “to get serious work done.”

RAPS Survey: Peer Engagement. Felix’s score on peer engagement was 11 total points, with a mean score of 3.67, indicating he believed his peers were operating at a high level of engagement (see Table 4.5). On the RAPS Peer Engagement subscale, Felix indicated the following statements were true: a) when he was with his classmates, he did not feel ignored; and b) when he was with his classmates, he felt good. Conversely, he indicated the following statement as not true: when he was with his classmates, he felt mad. He did not indicate any at-risk elements.

Felix’s best friend since middle school was Edgar, who was also a participant in this study. Felix revealed since Edgar had a new girlfriend they were not as close as they had been. He also indicated that Isaiah, another participant in the study, and he ‘were cool.’ Felix explained that he differed from many students in his school, indicating he had follow-through while many of his classmates did not. He revealed there were several occasions where he had to ask his classmates not to talk to him so he could grasp a new concept. When others made negative comments, he reported it did not faze him. He cited many of his peers were off-track primarily because they do not conduct themselves appropriately in school. He also cited many teachers did not exert adequate control over their students. Lastly despite a high graduation rate, he disclosed the great weakness was that students appeared not to care about school.

RAPS Summary. The total score on the four RAPS subscales was 206 points, which yielded a mean score of 3.38 (SD = 0.24). This showed Felix's family and peers were highly engaged; however he rated his teachers and himself as minimally engaged. In total, Felix deemed one family element, two teacher elements, and eight self-engagement elements that may contribute to less than stellar school outcomes.

Table 4.5. Summary of Felix's Total Engagement across RAPS Subscales

Felix	Total points	Number of items	Mean score	Level of Table 4.5. engagement	At-risk elements
Family	49	14	3.50	High	1
Self	95	30	3.17	Low	8
Teachers	51	16	3.19	Low	2
Peers	11	3	3.67	High	None
Total	206	63	3.38 (SD = .24)	Moderate	11

Mathematical Identity. Felix asserted a strong academic identity as well as a strong mathematical identity. He was currently enrolled in Algebra II but had not yet taken any advanced placement courses. In math, "I catch on to things fast, I think it's the way my brain works." In contrast, he explained he was not fond of literature expressing, "I don't like reading. It isn't difficult, I just don't like it." He revealed sitting quietly made him antsy, "I gotta get up an' do something." When discussing his report card he stated, "I would like to get straight As… I would be comfortable with a B, a C is ok." He stated he had received a C in geometry because he didn't like the teacher. She 'called him out' in the middle of class. "If you don't like it, we can take it to the streets." Later, since he was very angry, he went to speak with the teacher. After meeting with the teacher, he said the teacher had changed her tone. He said, “I wasn’t going to hit a lady, but I was ready to.”

Felix’s current GPA was 2.7, which he readily admitted did not reflect his best efforts. However, he was quite satisfied with how he was doing in math class. He explained that he enjoyed participating in math class. Smiling, he admitted, “I’m kinda hype with it.” Whenever his teacher would put a problem on the smart board, he would try to solve it before anyone else in class. He noted he competed with the boy who sat on the other side of his mathematics classroom. They would race to see who could get the correct answer first. “It’s like a war between me and this other kid in class.” Felix laughingly revealed at the beginning of one test, he actually bet the other student $5.00 he would receive a higher grade.

Felix revealed he was also satisfied with how well math class was going, particularly since his current math teacher “was not the best.” He admonished, “She doesn’t do her own PowerPoint. She gets them from the Internet. She just puts it up and tells us to copy it. She expects you to pretty much learn it on your own. She does no live examples. If we really don’t get it, she might pull out a problem or two. And if we don’t get it she tells us to “follow the steps.” Frustrated, Felix confessed, “For real, for real, I don’t like school. I do not like school period. I like learning; I like the education piece of it. I just don’t like school.” He expressed his disdain for school citing school was just a template in which everyone had to do the same thing, despite not all people learn the same way. He also complained that school started too early; he revealed how some students were failing because they arrived to school late every day (see Figure 4.1).

Cultural Identity. Felix exuded a lot of self-confidence and a positive self-image. He explained he was proud to be Latino and being Dominican was very important to him. He expressed being Latino was an important reflection of how he self-identified. However, he believed Hispanics had been an asset and had made considerable contributions to American society. He believed Hispanics are not respected by the broader society, reporting, "Some people don't like Hispanics." Even though Felix was Puerto Rican, he explained there was a perception that Puerto Ricans were loud and obnoxious. Although he was Puerto Rican, he professed to be Dominican. "Because I'm with my dad…I've lived with my dad longer, so I'm more Dominican than Puerto Rican. I don't know much about their culture there." Therefore, he maintained a stronger attachment to other Dominicans (Figure 4.1).

MIBI Survey. Felix's mean across the three categories of cultural centrality, private regard, and public regard, was 77.7% (SD = 14.44). The Cultural centrality score was 60.7%, indicating his cultural centrality was at a high-moderate level. Felix's private regard score was 87.7%, reflecting he maintained a very high degree of private regard for his people. Lastly, his public regard score was 65.3%, indicating he believed others outside his community viewed people of his background at a high-moderate level of regard. In summary, Felix possessed a high-moderate degree of cultural centrality, a very high private regard, and a high-moderate public regard (See Table 4.6).

On the MIBI survey, Felix expressed the following twelve statements were true: a) other groups did not respect his people; b) he felt good about Hispanic people; c) he has a great sense of belonging to his people; d) he believed it to be important to be connected to his culture's art, music, and literature; e) he professed to love people of all races; f) race had not been a major factor in how he formed social relationship; g) it was possible to live in racial harmony; h) Latinos should be allowed to interact and marry whomever they wished including White people; i) some White people could be trusted, while others could not; j) Whites should be judged individually; k) many people believe Latinos to be less effective than other groups; and l) any American institution that was segregated should be integrated.

Table 4.6. Summary of Felix's MIBI: Centrality and Regard

Participant	Centrality	Private Regard	Public Regard
	(1,6,7,9,13,33,48,51)	(4,8,19, 24, 30, 54,55)	(5,15,17,18,52,53,56)
	Max: 56	Max: 49	Max: 49
Felix	34 = 60.7%	43 = 87.7%	32 = 65.3%
	High moderate level of centrality	Very high private regard	High-moderate public regard
Mean = 77.7 with an SD = 14.44 (Very high race centrality and regard)			

College Access via AVID and Future Aspirations. Felix had not spoken about AVID during the interview. When questioned about AVID, he explained he remembered Socratic seminars in which students would utilize higher-order thinking skills. He explained how AVID aided in how much he enjoyed debating at present. Felix diverged claiming the topics in high school were "dry" in comparison to the topics that had been debated in the middle school library. He wished students were allowed to pick the topics more often despite, “Sometimes it’s too much, sometimes it’s inappropriate … but sometimes when we were inappropriate was when we learned the most.”

Felix declared AVID had played a role in who he had become. He believed AVID had been beneficial, despite utilizing none of the techniques employed by AVID. He believed it helped him by allowing him to see a college campus early on in school. He emphatically endorsed AVID to someone younger. He expressed AVID brings people with different ideas together. He also believed it taught him how to think, how to speak, and how to interact appropriately with others. Since leaving AVID, he had been able to stop smoking, drinking, and partying. Felix stated, “I think it opened up my eyes to the possibilities what tomorrow can be.”

Felix plans to go to college. He stated if he had the opportunity, he would like to study abroad preferably in Canada or in Europe. He indicated he received this idea after watching a documentary on PBS. He viewed mathematics as a tool that he would need to achieve college access in the future. He explained he also enjoyed working with his hands. At the time of the interview, he remained undecided as to a career path. He explained he intended to pursue a degree in engineering or computer science. He later divulged he did not have a dream school or dream job. He then spoke of his cousin who was a computer scientist. He explained he could not imagine being at a computer all day. “Every morning when I go to school, I tell myself that I’m going to get this money. Even though I don’t physically get this money, I’m preparing myself to go to college, prepare myself to work, to get that money.”

In summary, Felix is a Latino-American who lived with his single father. Felix had early problems as a youngster while living with his mother. Felix explained how he enjoyed mathematics and was eager to participate. Felix had a family that was optimally engaged and peers who were highly engaged in his education. Felix's social agency is based upon his successful and forceful family members. He also possessed a high-achieving peer group. However, Felix believed his teachers possessed low levels of engagement. He believed he had committed teachers in middle school; however, overall his rated the teachers as having a low level of engagement. Finally, Felix possessed a high-moderate degree of cultural centrality, a very high degree of private regard, and high moderate degree of public regard.

Isaiah's Story

Isaiah was an African American who also attended Barrett STEM High School. Three years had lapsed since he attended Northwest Middle School. Although NMS had a 100% economically disadvantaged population, approximately 30% percent were African American. Isaiah's middle school performance on his standardized test scores also permitted him the opportunity to be placed in the honor section. As such, he received a full academic year of algebra coursework and was enrolled in an AVID class simultaneously. In high school, Isaiah spent a significant amount of his free time playing sports. As a result, he had not performed to his potential during his freshman and sophomore years. However, Isaiah promised to perform more optimally, asserting that he had a great responsibility to his family to do better.

Childhood Experiences. Isaiah was one of five children and he was the only son. Isaiah was born in the metropolitan area where he resided. His single mother and single disabled father had also been born in the same greater metropolitan area. Isaiah, at the time of the interview, lived with his father and his father's parents. When he was younger before his father came home from an incarceration stint, Isaiah resided with his single mother and his four sisters.

As a youngster, Isaiah had encountered many difficulties in school, which were only exacerbated when his father was away. He claimed that he had hated school. Since he had four sisters, if anyone said anything "disrespectful," he felt it was his duty as the only brother to defend the honor of his sisters. This was very apparent as he exclaimed, "Family is everything." He recalled how there had been many times in his formative years where he would have to fight from the time he left his house in his mother's neighborhood to the time he returned home. After residing with his sisters, he revealed it had been in his best interest to reside with his father and grandparents, as he alluded to greater stability at his grandparents' house.

Isaiah believed within his family he had a great support system. "My Dad pushes me, umm… he want me to go to college. And my mom pushes me…everyone really in my family pushes me. Even cousins, they might be doing bad, they tell me we got you, anything you need. Just keep going on track." He recalled how his cousins would readily explain how they had made mistakes and how they wanted him to avoid those pitfalls that had impeded their progress. He later divulged this was why he had been sent to various programs and camps throughout his childhood. Lastly, he highlighted how particularly proud he was of his grandfather because he received his college degree later in life and had been able to eventually buy a nice car.

RAPS Survey: Family Engagement. Isaiah's score was 54 total points on family engagement, with a mean score of 3.85, indicating his family had been optimally engaged. On the RAPS Family Engagement subscale, Isaiah designated the following eight statements were true: a) his parents always had enough time to hear about what happened at school; b) his parents made it clear what was expected of him at school; c) his parents also enjoyed spending time with him; d) his parents enjoyed talking to him about school; e) his parents did a lot for him; f) his parents understood he could accomplish anything he set his mind to; g) his father allowed him to make more of his own decisions; and h) his parents knew just how well he could do in school. He also did not indicate any at-risk elements that may contribute to poor school outcomes (see Table 4.7).

RAPS Survey: Self-engagement (Agency)**.** Isaiah's score on level of engagement or agency was 91 total points, with a mean score of 3.30 (SD = 0.55), indicating his level of engagement and agency were at a moderate level. On the RAPS Self-Engagement subscale, Isaiah identified the following statements were true: a) when he thought about himself, he felt happy; b) he could do well in school if he wanted; c) he worked very hard on his schoolwork; d) if he had not done well on his schoolwork, it was because he had not tried hard enough; e) trying hard was the best way for him to do well in school; f) he worked on his classwork because doing well in school was important to him; and g) when he was with his parents, he felt good. Conversely, Isaiah designated the following statements were untrue: a) he worked on his classwork because it was interesting; b) when something bad happened to him school that he tried to see what he did wrong; c) he does his homework because he would feel badly about himself if he does not do it; d) he did not try very hard in school; and e) when something bad happened to him in school, he tries to figure out what he did wrong so that it would not happen again. Isaiah scored many of the items within the domain as sort of true, which he rated a 3, instead 4 for very true. He also identified there were ten at-risk self-engagement elements, which may contribute to one's poor school outcomes. The following ten statements had been classified as at-risk: a) I work on my classwork because it's interesting; b) when something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I say the teacher didn't cover the things on the test; c) I do my homework because I'll feel bad about myself if I don't do it; d) when something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I try to figure out what I did wrong so that it won't happen again; e) when something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I get angry with the teacher; f) when something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I try to see what I did wrong; g) I am unlucky in school; h) I do my homework because it's fun; i) I work on my classwork because I'll be ashamed of myself if it doesn't get done; and j) I often come to class unprepared.

RAPS Survey: Teacher Engagement. Isaiah's score on teacher engagement at 42 total points, with a mean score of 2.63, indicating he believed his teachers were operating at an at-risk level of engagement. On the RAPS Self-Engagement subscale, Isaiah identified the following seven statements were true: a) when he thought about himself, he felt happy; b) he could do well in school if he wanted; c) he worked very hard on his schoolwork; d) if he had not done well on his schoolwork, it was because he had not tried hard enough; e) trying hard was the best way for him to do well in school; f) he worked on his classwork because doing well in school was important to him, and g) when he was with his parents, he felt good. Conversely, Isaiah responded the following five statements were untrue: a) he worked on his classwork because it was interesting; b) when something bad happened to him school that he tried to see what he did wrong; c) he does his homework because he would feel badly about himself if he does not do it; d) he did not try very hard in school; and e) when something bad happened to him in school, he tries to figure out what he did wrong so that it would not happen again. He identified six elements that may contribute to poor school outcomes and negatively rated the following six statements: a) when I'm with my teacher, I feel good; b) my teacher doesn't explain why we have to learn certain things in school; c) my teacher doesn't seem to have enough time for me; d) when something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I say it was the teacher's fault; e) my teacher likes the other kids in my class better than me; and f) my teacher interrupts me when I have something to say.

Isaiah rated teacher engagement lowest among all participants. Isaiah quoted the following when discussing his teachers, "The teachers…I don't know how to explain them teachers. They know what they are doing, but when it come to like talking to them on a non-school level, I can't talk to them 'cause they don't understand the stuff that we go through and everything. They don't understand stuff like that. I only had one of my teachers, he was from (our city). But the rest of my teachers, they got no knowledge of the streets. Like anything that really go on, or they try to act like they don't. But as far as teaching us and getting the education through to us, they do that, they do their job."

RAPS: Peer Engagement. Isaiah score on peers' level of engagement was a total of 11 points, with a mean score of 3.67, indicating he believed his peers were operating at a high level of engagement. On the RAPS Peer Engagement subscale, Isaiah indicated the following statement was true: he felt good when he was with his classmates. Conversely, he designated the following two statements as untrue: a) he felt ignored when he was with his classmates; and b) he felt mad when was with his classmates. He did not indicate any at-risk elements (see Table 4.7).

Isaiah reported, "I really don't be worrying about the other students and stuff, 'cause I struggled freshman year. So I've been trying to get on track and everything; so I really been trying to build myself up rather than thinking about other people quite honestly." As he was faced with the adversity of having to repeat geometry, he resolved, "I'm going to come to class on time…umm. Make sure…you know, I just hand in my work, my homework, my classwork. I had good test scores but test scores don't mean nothing if don't have all the other stuff that go with it." Last year in algebra, he explained, "I had an 89 average. In geometry, I had a D average. That's because I didn't come to class and stuff."

RAPS Summary. Family and peers maintained an optimal and high level of engagement. However, his teachers' were engaging at an at-risk level; while his agency or engagement is low. The total for the four scales was 198 points, with a mean score of

3.30 (SD = 0.55). Additionally, six teacher elements, and ten self-engagement elements were identified, that may contribute to less than stellar school outcomes. Overall, Isaiah's responses indicated that family, teachers, peers and self were operating at a moderate level of engagement.

Table 4.7. Summary of Isaiah's Total Engagement across RAPS Subscales

Isaiah	Total points	Number of items	Mean score	Level of engagement	At-risk elements
Family	54	14	3.85	Optimal	None
Self	91	30	3.03	Low	10
Teachers	42	16	2.63	At-risk	6
Peers	11	3	3.67	High	None
Total	198	63	3.30 (0.55)	Moderate	16

Mathematical Identity. As mathematical identity is shaped by the student's mathematical experiences, Isaiah asserted both a strong academic identity and a strong mathematical identity. He explained, "I actually consider myself smart in math, because every time I apply myself, I haven't gotten nothing but As and stuff." He also declared he had good reading and writing skills, as when he was a young child, he would write books and stories. "I think every subject is important. Yeah, I guess, it's like every other subject, but I just like math more so. I'm just into it more." He clarified he also enjoyed physical education, history, and algebra. Furthermore, he stated, "I'll try for an A, if it's lower than an A, I really didn't try."

In contradiction to the high school mathematical performances of Edgar and Tariq, Isaiah described how he had not been satisfied with mathematics class in tenth grade. He explained he had done well on the class assessments; however, he did no homework. Consequently, he received a D in geometry, which meant he had to retake it before moving on to the next mathematics class. "So I failed geometry, I have to take that again. I might have to take it with another (math) class; it's kind of embarrassing." Isaiah explained he knew how to be a good student, but he had placed too much emphasis on the social components of school and too little on the academic. He was visibly disappointed in his performance. He admitted he would sit in the back of the class many times and talk while the teacher was instructing. When he encountered difficulties in school, he revealed, "I'm just not really comfortable asking for help. It's not me (Figure 4.1)."

Racial Identity. Isaiah is proud to be an African American. He stated being Black had a lot to do with how he felt about himself. He also felt in general very good about Black people and being Black was important to his self-image. Although proud to be Black, he reported his destiny was not linked to other Blacks. He reinforced the idea of individualism being more important than self-identifying as Black. Isaiah strongly agreed Black people should surround their children with Afrocentric literature, music, and art. He held it was vital for Blacks to have a thorough knowledge of African American history. In contradiction, he did not deem it to be essential that Blacks buy from Black-owned businesses. He surmised an individual should purchase from whomever he "feels most connected to" and most at-ease. He then reported on a societal dichotomy that exists among Black men. He sustained how Black men were overly scrutinized when going into various establishments. He remarked, "…Where we go and what we do and how we act and react is different. It's like you going in a store, it could be an Asian-owned store, a White-owned store, or a Spanish-owned store, they all going to look at a Black person that come into their store like they stole something."

Isaiah became increasingly more animated the more we discussed race: "People used to say older White people (are prejudice), but Black people are prejudice too… 'cause my grandmother, she's White, and 'cause we lived in an all-Black neighborhood and stuff, people used to say smart stuff to her. But Black people give it too, when a White person live in an all-Black neighborhood, people said stuff about my grandma. It happens both ways."

During the time of Isaiah's interview, there had been much local media coverage concerning bands of teenagers vandalizing homes and businesses in the central business district. He recounted:

> Me and my friends were downtown with girls, so we were walking around. Then one cop pulled over, he said, "I'm here to arrest kids like y'all." We said, "What?" I said, "Ok," and just kept walking. He wanted us to say something smart, so he could come out the car and say something. In a moment of frustration, Isaiah scoffed, "We talking to girls walking down the street. What is we doin? We not flash mobbing… (mocking) I'm here to arrest kids like y'all." Isaiah expounded how the racial issue was beyond Black –White. "I think it's urban, too, not just race. A lot of people do stuff to everybody…kids. Yeah, umm, we're in an urban setting…yes, they do a lot of stuff to us. They always try to come at the urban kids and stuff…schools and all the art programs and stuff, I always peep that…it's…it's not alright."

MIBI Survey. Across the three areas of centrality, Isaiah's responses indicated a mean score of 74.1% (SD= 18.50). Isaiah's race centrality score was 71.4%, which denoted a high-moderate level of centrality. This meant race was very important to his self-concept. Furthermore, Isaiah's private regard score was 93.8%, indicating a maximum degree of private regard. This indicated he felt very good about his people. Lastly, his public regard score was 57.1%, indicating he believed others outside his community viewed people of his ethnic background at a moderate level. Therefore, Isaiah had a high degree of racial centrality and private regard and a moderate degree of public regard (see Table 4.8).

On his MIBI survey, Isaiah indicated the following statements were true: a) he was proud to Black; b) he felt good about Black people and was happy he was Black; c) it was important for Black people to surround their children with its art, music and literature; d) we were all children of a higher being; therefore, we should love people of all races; e) people regardless of their race have strengths and limitations; f) he acknowledged the idea of Blacks and Whites have more commonalities than differences; and g) Blacks have made major strides and advancements, however, they were still not respected by the broader society; h) the dominant society devalues anything not White male-oriented; and i) he revealed Blacks should feel free to interact socially with White

Table 4.8. Summary of Isaiah's MIBI: Centrality and Regard

Participant	Centrality	Private Regard	Public Regard
	(1, 6, 7 ,9, 13, 33, 48, 51)	(4, 8, 19, 24, 30, 54, 55)	(5, 15, 17, 18, 52, 53, 56)
	Max: 56	Max: 49	Max: 49
Isaiah	40 = 71.4%	46 = 93.8%	28 = 57.1%
	High moderate centrality	Maximum private regard	Moderate public regard
Mean = 74.1% (18.50) (High moderate centrality and regard)			

***College Access via AVID and Future Aspirations*.** Isaiah, as well as Tariq, Felix, and Edgar, did not discuss AVID until it was brought to his attention by the researcher. The researcher refreshed his memory of the AVID program, which he had participated in during his eighth-grade year. Although he had a limited memory of the experience, he remembered the skills testing. He explained it "got (my) brain working and enabled (me) to answer certain questions." He responded he enjoyed the debates they had throughout the school year. "It did help me (to) debate and everything, 'cause I found it interesting, debating, getting my point across, seeing how other people get mad when they can't get theirs across and all that. So that was kinda fun."

He explained he had taken one trip to a college when he had been in AVID. "You know, it made me see how big and open it was…college freedom, more freedom than middle school, high school, all of that. That's what did it for me." When asked if AVID played any role in his development into the person he had become. He replied, "Yes at the beginning, I began questioning a lot of stuff, rather than just taking it in."

Lastly, Isaiah responded, “I want to do something that’s involved with sports. If I can’t be playing on a team or something like that, I want to be involved somehow. Sports journalism, anything. I want to go four years to college. I want to get my Master’s in something, I’m not sure. I definitely want to do that. If I play sports first, I would want…you always have to have a back-up plan.”

In summary, Isaiah is an African American who lived with his disabled single father. Isaiah had early problems as a youngster while living with his mother. When it came to mathematical identity, Isaiah explained how he enjoyed mathematics. Isaiah’s social agency was based upon his successful and forceful family members. Isaiah rated his family as optimally engaged, and he also identified his peers as highly engaged. He explained that he had not had committed teachers, so he rated his teachers at a level that reflected at-risk engagement. Isaiah rated himself as having a low level of engagement, and he was affiliated with a high-achieving group. Finally, the data reveal Isaiah possessed a high moderate racial centrality, a maximum degree of private regard and a moderate degree of public regard.

Cross-Case Analyses of Themes and Patterns

The four cases delineated above reveal similarity and stark contrasts in terms of engagement (i.e., family, teachers, peers, and self), agency, mathematical identity and racial or cultural identity. In order to examine themes and patterns in the aforementioned data, the researcher conducted cross-analyses of the narratives and survey data. An analysis of themes and patterns found in the narratives, RAPS survey comparisons, and MIBI survey comparisons revealed the emergence of four themes. After a discussion of the themes, these analyses conclude by answering the research questions related to the AVID program and factors that led to the development of mathematical identity.

The constant comparison method (Corbin & Strauss, 2008) was used to analyze themes and patterns in the narratives. Four themes were found in the narratives. The first theme that emerged across all four participants was the importance of family and the role of formal education. The second theme reflects the young men's sense of agency and social capital. The third and fourth themes reflect elements of the participants' mathematical identity and racial or cultural identity, respectively. Figure 1 provides an overview of these themes by participant Each of the themes are discussed in turn.

***Role of Family*.** Berry (2008) reported the importance of family support systems amongst mathematically and academically successful Black males. Furthermore, Walker (2014) reported that kinship networks in families were imperative to students' mathematical success. Parents and family members portray many roles in the life of the successful student. Berry explained parents and other members were: guardians of opportunity, standard setters, mathematical knowledge resources, models of success, and extended networks of support. The young men in this study had kinship networks in place. Each had at least one supportive parent. They all had a parent, family member or person who they admired. Each young man recounted the importance of family and each of them had a role model who benefitted from formal education.

The Role of Agency. Stinson (2009) reported there were four factors that contributed to individual's agency (i.e., belief about the importance of education) and thereby reinforcing success. These emergent factors are: a) observing or knowing family or community members who benefited from a formal education by achieving financial and societal success; b) experiencing encouraging and forceful family members who made expectations of academic and mathematical success explicit; c) encountering caring and committed teachers and school personnel who establish high academic expectations for students generally and developed relationships with students beyond school and academics; and d) associating with high-achieving peer group with similar goals and interests. Stinson emphasized that these factors must be evident for success.

The four participants in this study revealed some of those same features Stinson identified. All participants had forceful family members as well as family members who benefitted from a formal education. Moreover, all participants had a forceful family member who expected excellence. Felix, Tariq, and Edgar revealed they had had been associated with high-achieving peers. As such, Felix, Tariq, and Edgar had all four components needed for success. However, Isaiah was not associated with a high-achieving group, although attending a top-rated high school, and revealed he did not believe he had teachers who were committed.

Mathematical Identity. Focus on mathematics identity research has begun to provide a greater understanding of how men of color view, comprehend, and draw understanding from their mathematical experiences. It is then equally important to measure the impact that reverberates through others who reside in a traditionally underserved community. The identity of these respondents was expressed as a story from a negotiated self, which had been situated between one's own personal assertions and their surrounding environment. Identity is always in a state of flux. As mathematical identity is being formed, students are also forming social agency (Martin, 2000). Each participant in this study expressed how much he enjoyed mathematics. They also explained how they had the ability to catch onto new concepts quickly. Participants also placed more effort in their mathematics classes than they did in other classes. Some respondents indicated they had encountered difficulties; these students had to struggle and persist to overcome adversity. Since the respondents are teenagers, they are still motivated by external motivators, such family pride. However, as they mature, there should be a slow and inevitable shift from external motivators to intrinsic motivators, where students will be guided by wanting to succeed for self instead of others. Thus, their mathematics identities were still developing at the conclusion of this study.

Racial Identity and/or Cultural Identity. Each of the study participants made several comments during their interviews about their race or their culture. The findings are consistent with McGee's findings in terms of beliefs about participant race centrality and race regard. Her intra-group participants enjoyed varying degrees of race centrality, and also maintained a high private regard for their group and group members. In this study, Isaiah remains consistent with her participants, in which he maintained a high race centrality and high private regard, with a moderate public regard.

Equally compelling is that Felix, Tariq, and Edgar also maintained a similar high centrality score, and a high private regard score, and a moderate public regard. Since the members within this study are from varying communities, a wide variability in centrality would not be surprising; however, all reflect an above average 50% level of importance in centrality. Additional to varying centrality, all subjects reflected a high private regard and a similarly moderate public regard. McGee speculated Black students had been socialized to incorporate race when analyzing their world and as such culture also shapes identities. In conclusion, there may be more young men in this area who share the same vision as the respondents of this study.

Summary

The purpose of this study was to learn what influence the AVID program had on the study participants and the factors that influenced their development of mathematics identity. Throughout the course of each interview with each participant, there was no mention of AVID. However, upon refreshing the memories of the respondents, each participant spoke positively of Mr. Williams, the AVID teacher and the eighth-grade AVID experience. In summary, the participants were able to recall two events from their days in the eighth grade AVID program. First, they remembered the lively debates that took place among several pressing topics of the day. Second, they also remembered traveling on class trips to colleges and universities. They did not retain any of the various techniques taught by AVID. However, it seemed AVID exposure struck accord with them and bolstered their confidence in their mathematics ability and strengthened their belief in college attainment. The factors that most influenced the development of mathematics identity were family, peers to some extent, and self. While cultural or racial identity was important to the development of identity in general, cultural or racial identity appeared to play less of a role in the development of mathematics identity than family, peer, and self.

Participant	Family	Social Agency	Mathematical Identity	Racial and/or Cultural Identity
Tariq	2-parent household, Palestinian-American Father: owns ice cream business Mother: homemaker **RAPS Scores**: Family : 4.0=Optimal Self : 3.87= Optimal Teachers: 3.52= High Peers: 4.0= Optimal **Mean: 3.87 (with SD=0.18) Optimal**	Successful family members: brothers and sisters Forceful family member: mother and father Committed teachers: Yes High achieving group: competes with classmates	-declared a natural mathematic ability -catches onto new concepts quickly -took AP Algebra -had to go to teachers for additional support after failing test -competed against best friend -encountered difficulty first year of high school	-went to high school based on other Arabs being there -Middle Eastern self-isolate -frequently returns to homeland -rap battle in Palestinian schoolyard -high degree of centrality **MIBI Scores** Race Centrality score: 96.4%= Maximum Private regard score: 83.6%= Very High Public regard score: 53.1%= Moderate **Mean: 77.7 (SD=22.24) Very High**
Edgar	2-parent household, Hispanic-American Father: auto mechanic Mother: laid off school district employee **RAPS Scores:** Family: 3.85= Optimal Self: 3.50= High Teachers: 2.88= Low Peers: 2.67= At-risk **Mean: 3.23 (with SD= 0.55) Low-moderate**	Successful family member: mother Forceful family member*:* mother Committed teachers*:* Yes High achieving group: compares test scores with classmates	-encountered no difficulties in freshman year -declared a natural mathematic ability -catches onto new concepts quickly -believed he was able to solve problems others believed difficult -took two courses of math in one year -compares test results with others	-proud to be Hispanic - believes that there are many Hispanics will do bad things, -referred to Ariel Castro, the Ohio kidnapper -said that he likes basketball despite stereotype of Hispanics like baseball -explained many cultures in one community, tend to ally with own people. **MIBI Scores** Race Centrality score: 75%= High moderate Private regard score: 85.7%= Very high Public regard score: 36.7%= Low **Mean: 65.8 (SD=25.76) High-moderate**

Figure 4.1. Analyses of Case Study Themes by Participant

Participant	Family	Social Agency	Mathematical Identity	Racial and/or Cultural Identity
Felix	Single Father, Hispanic-American Father: construction worker Mother: works at major theme park **RAPS Scores**: Family: 3.85= Optimal Self: 3.17= Low Teachers: 3.19= Low Peers: 3.67= High **Mean: 3.38 (with SD= 0.24) Moderate**	Successful family member: uncle, 3 cousins in college Forceful family member: Father Committed teachers: Yes, middle school High achieving group: competes with math classmate	-encountered no difficulty freshman year -declared a natural mathematic ability -catches onto new concepts quickly -hates school -enjoys math class, said he's hype about it -competes with boy across math classroom, bet him money he would outperform -competes against boy across classroom	-proud to be Hispanic, but being Dominican -acknowledges people don't like Hispanics, loud and obnoxious -knows more about his father's Dominican culture than mother's Puerto Rican culture -high private regard, lower public regard **MIBI Scores**: Race Centrality score: 60.7%= High moderate Private regard score: 87.7%= Very High Public regard score: 65.3%= High moderate **Mean: 77.7 (SD=14.44) Very High**
Isaiah	Single Father, African-American Father: Disabled Mother: Unknown **RAPS Scores**: Family: 3.85= Optimal Self: 3.03= Low Teachers: 2.63 = At-risk Peers: 3.67= High **Mean= 3.30 (SD= 0.55) Moderate**	Successful family member: grandfather Forceful family member: cousins, father and grandfather Committed teachers: No High achieving group: None specified	-declared a natural mathematic ability -catches onto new concepts quickly -had an 89 average in Algebra -received a D in geometry, had to retake -encountered difficulty freshman year of high school - hated school -hated asking for help -stayed in back of classroom conversing -if he did not receive an A, he had not tried hard	-proud to be African American -explained that Black men are overly scrutinized -explained that racism is from both Blacks as well as Whites - 2 negative interactions with police -acknowledges disparity between urban vs. suburban -high private **MIBI Scores**: Race centrality score: 71.4%= High moderate Private regard score: 93.8%= Maximum Public regard score: 57.1% = Moderate **Mean= 74.1 (SD= 18.50) High-moderate**

Figure 4.1. Continued

CHAPTER 5

DISCUSSION

The core purpose of this study was to investigate the mathematical identities of four underrepresented young men in high school who participated in a college access program while they were in middle school. This study also contributes to an existing knowledge base about the mathematics achievement and racial identity among underrepresented populations. The case study method was used to examine the effects of exposure to a pilot college access program while enrolled in middle school on future school success in mathematics and college aspirations.

Historically, college access programs have had a unique opportunity to prepare students and their families for the challenges that come with college matriculation. Beginning in the 1960s, TRIO programs afforded many minorities the opportunity to ascend to the middle class through a college education. These programs began in high school, however, one of the major program criticisms had been that more students could realize a college education if those programs targeted, captured, and identified those students at a younger age. In 1998, the GEAR-Up program extended college access to middle school students. AVID is considered a second-generation college access program, as it integrates academic support with other support services, such as mentoring, and tutoring. The AVID program was designed to provide services throughout high school and college matriculation. AVID is a multi-year academic commitment.

Twenty-five young men had been recruited, 11 of which were in eighth grade. The opportunity to study these young men provided a window into the identities being formed, as they engaged with their community, which included their families, peers, and teachers. Four high school students among this group of 11 participated in this dissertation research study, which investigated their mathematical identity and the factors that contributes to this identity, including engagement and racial/cultural identity development. The results yielded varying levels of engagement among four subscales: family, self, teachers, and peers, as well as race or cultural centrality and regard. Results suggest that their participation in AVID was a worthwhile experience that provided them with a foundation for future success in mathematics.

The first finding reveals that AVID had a very limited impact on the participants' mathematical identities. Although the students did not discuss AVID explicitly during the interviews, AVID nonetheless created opportunities for success in mathematics. They recalled their AVID teacher, Mr. Williams, using humor to focus the class and provide explicit instructions to perform their mathematical tasks. This use of humor and explicitness is aligned with culturally relevant pedagogy. This opportunity gave the students a foundation for greater mathematical ability and awareness. As AVID is a multi-year commitment, the major constraint was the participants only received one year of AVID training.

The second finding is these students, nevertheless, exhibited mathematical identity in various ways (i.e., performance, knowledge, constraints and opportunities, motivation and strategies). Each of these students believed in his mathematical ability based upon his prior success as children, which yielded high self-efficacy. In relation to their peers, each of them had a peer that sparked their competitive nature. Their performance-oriented goals were evident when they competed with these peers on tests and other assignments, they pushed themselves to “out-math” their mathematical rivals. For example, Felix was so confident he would outperform his class competitor that he bet the student $5.00 that he would outperform him on a test. As a result of competing against their peers, the participants gained a greater sense of their mathematical ability. Moreover, each student placed high value on their mathematical knowledge. Edgar understood the importance of mathematical knowledge by completing two mathematical courses in his tenth-grade year (i.e., geometry and Algebra II). In terms of exhibiting the importance of mathematical knowledge, these young men reflected on the importance of mathematics as it pertains to their perspective careers. Tariq explained as he intends to become a doctor that mathematics would be vitally important to him attaining his goal. Similarly, Edgar explained that he would need mathematics as he pursued his dream of getting his bachelor’s degree in computer science, which would lead him to his eventual return to his father’s business as an auto mechanic. Felix explained that he, too, would need mathematics to pursue a degree in computer science or engineering In contrast, Isaiah did not specify what his eventual career would be or whether that career would require mathematics. However, did explain the importance of mathematics in daily life and indicated his future career would be “sports-related.”

The third finding is different external motivators motivated the participants as they continued to develop their mathematical identities. There were also several factors that accounted for these students’ identities. The factors that influenced these young men’s mathematical identity emerged from the RAPS (i.e., family, peers, self, and teachers), which was administered to support the counternarratives. As previously discussed, Felix and Edgar had not encountered any difficulties in the middle school to high school transition. However, Tariq and Isaiah had encountered difficulties in high school and had not performed as well as in prior years. They had to explain their drop in achievement to various family members who had set high academic standards. Tariq explained that his precipitous drop in achievement led to him return to Palestine for his tenth grade year. For Isaiah, he had to explain his drop in achievement to both his father and extended family, who asked him not to repeat their mistakes.

The young men underscored that the reason for their successes were related to family (Berry 2008). Tariq explained that his mother wanted him to be the "best brother." Edgar stated that it had been his mother and father who motivated him to do well in school. Felix explained that he liked knowing his father was proud of him. Isaiah expressed it had been his father and his cousins who warned him not to make their mistakes. As mathematical identity does not remain static, their identities will further evolve based on their engagement with the world and in the mathematics classroom. Developmentally, these young men were still influenced by external motivations such as making a parent happy, or bringing honor to the family.

In the case of Isaiah, his lack of success did not mesh with his expectations. "If I don't get an A, I really didn't try." After receiving a D in geometry, Isaiah indicated he would do all the required homework and classwork, in addition to receiving "good" test scores. Tariq had been sent to Palestine after performing substandard in ninth grade. After spending his tenth-grade year there, he had a greater motivation for performing well in the U.S. educational system. Edgar and Felix performed well with no reported difficulties. During times of turbulence, it was necessary for the participants to rededicate themselves to academic achievement (Martin, 2000). Thus, the RAPS revealed family engagement was the most important factor in these participants' mathematical success.

Peer engagement was another factor that influenced these participants' mathematics identity and academic achievement. Tariq, Felix, and Isaiah's scores on the RAPS reflected beliefs that peers were highly engaged. In contrast, Edgar scored peer engagement at an at-risk level. Each student expressed competing against classmates who were similarly motivated to perform well in mathematics. For example, Tariq explained how much he enjoyed competing against his best friend, who he thought was very smart. Isaiah did not reveal that he had a class competitor, but he did express that his friends would be surprised when he would get the correct answer to a teacher's question. Overall, the participants scored peer engagement second highest behind their families in terms of influence.

Self–engagement, however, fell into the moderate range among the four male participants in this study. Tariq and Edgar were optimally and highly engaged respectively, putting forth the required effort to continue to be successful in school. However, Felix and Isaiah exhibited a low level of engagement, which could indicate that more effort may be needed for continued success in high school. Self-engagement ranked third among these four participants.

Teacher engagement was not a factor that the study participants believed was an influence on their identity development. While Tariq, Edgar and Felix had teachers who had been encouraging; Isaiah did not believe he had a teacher who understood him. Tariq was the only student who assessed his teachers as highly engaged. Edgar, Felix and Isaiah's rated their teachers as low or at-risk levels of engagement. They expressed that they did not believe that teachers had enough time for them. Overall, teacher engagement was rated lowest across the four subscales on the RAPS.

In addition to the RAPS, the MIBI was used to help identify other factors that may have influenced the participants' mathematical identity. The MIBI was modified to capture racial and /or cultural identity. Mc Gee (2009) contended that Black students could not be adequately studied without looking at the influences of race on identity. Using this idea, I made a similar claim that the mathematical identity of any minority cannot be adequately studied without viewing the impact of race and culture. However, when studying factors related to mathematics identity, the results showed that race and/or culture was central to shaping one's identity, however, it was not as important in developing mathematics identity among these four participants.

Each young man explained how he had been confronted with stereotypes about his racial or cultural group. Tariq explained how some people viewed his people as terrorists. Edgar explained that there was a stereotype about how Hispanics love baseball; in opposition, he explained that he enjoyed basketball. Felix explained how people believed Hispanics are loud and obnoxious. Lastly, Isaiah revealed two occasions where he received unwarranted scrutiny. He explained how he was followed by the security guard at a local pharmacy. He also explained how the police harassed his friends while they had been walking around in the central metro district. As such, all believed that others did not view their group in a positive manner. Surprisingly, Tariq and Edgar explained that there were different cultural and racial groups that resided in his neighborhood. Edgar explained although they had friends from other racial or cultural groups, the people in their area tended to align with members of their own group. They explained how there was a level of distrust across different groups.

On the MIBI survey, all participants yielded high-moderate level to very-high centrality scores, which ranged from 60% to 96%. This indicated that race and culture played an integral role in the development of their self-concept. Private regard was substantially higher among the four study participants than public regard, indicating a great affinity for one's people. In contrast, each participants' public regard score was lower that private regard on the MIBI, which indicated they believed those outside of their respective communities viewed their group in a less flattering light. Thus, the students in this study had a high private belief about their group; however they believed that others did not perceive them well. Although racial identity and cultural identity were central to the participants' self-concept, it appeared to have limited effect on the participants' positive mathematical identity.

Conclusions

Mainstream mathematics education research has largely failed to incorporate Black and minority perspectives of identities into theories. Black scholars have pointed to issues of identity as fundamental to understanding school experiences and outcomes for Blacks students. These scholars have also begun examining issues pertaining to the co-construction of mathematical identity and racial identity. This was done in order to better understand the mathematical experiences of diverse learners through the use of counternarratives (Berry, 2003; Martin, 2000 & 2006; Moody, 2001; Nasir, 2000 & 2002; Stinson, 2004; Thompson & Lewis, 2005). Martin (2007) reported mathematical identity is one's belief about his/her mathematical ability, the significance of his mathematical knowledge, the opportunities or barriers to mathematics, and the motivation and persistence needed to obtain mathematical knowledge. Furthermore, it is imperative that the student develops a positive mathematical identity to help sustain interest and develop mathematical perseverance.

As mathematics is embedded in social and cultural practices, it cannot be separated from the existing power structure. Race and culture have been identified as factors that affect the identity development of minority students (Martin, 2007). However, various forms of identity, including racial and cultural identity, are not static. Students are continually evolving in terms of what it means for them to be a member of a group as well as in their perceptions of worldviews about their respective group. The participants in this study explained how they loved being a part of their ethnic group. Moreover, all of them believed that their ethnicity was important to their self-image. Finally, they believed that their group made valuable contributions to the American society. Racial and cultural knowledge provides educators with a means to understand student thoughts, feelings, and actions while raising teacher expectations. In essence, it becomes important for teachers to understand the learning preferences of diverse students if the greater goal is to raise minority participation in STEM and STEM-related careers.

The narratives provided during student interviews provided numerous example of mathematics identity development among this cohort of prior AVID participants. The

RAPS was used to determine the participants' perceived level of school engagement among family, self, peers, and teachers and how such engagement influenced the development of mathematics identity. The MIBI was used to determine race or cultural centrality and race or cultural regard (i.e., racial and cultural identity). The results of this study show that the AVID program had little long-term impact while family and peers had the most influence on these participants' development of mathematics identity. Racial and cultural identity had an influence on identity in general but did not influence the development of mathematical identity among these participants since none of the narratives explicitly mentioned the importance of race or culture on their mathematics ability or mathematics understandings. However, mathematics identity cannot develop completely6 independently of the school context where mathematics instruction takes place.

Further research is needed to garner greater understanding as to how the engagement of family, teachers, peers and self-engagement affects one's mathematical learning and participation. It is also important to understand how race and stereotypes as well as environmental factors may affect the identity formation and self-concept, as these factors also influence individual engagement.

Implications for Teaching

According to Jett (2009) students' achievement and persistence in mathematics are partially due to: a) internal characteristics, such as a strong identity, b) ability to negotiate racial injustices, c) positive mathematical identity, and d) positive outlook upon mathematical performance. Stinson, Jett and Williams (2013) documented one of the key factors inhibiting high performance among students of color in STEM is the discontinuity between students' home cultures and the mainstream culture that exists in most of the nation's schools. However, cultural congruence continues to be absent in classrooms as evidence by the interviews with the participants in this study who reflected that their teachers were not engaging them adequately. Teachers must examine and change their misconceptions of students of color, particularly male minority students in mathematics classrooms to change the educational outcomes and career trajectories of these students.

As teachers attempt to impart knowledge among their students, many remain unaware that their teaching practices may contribute to further disillusionment among their minority students (Tate, 2008). To combat this, mathematics education research suggests that teachers use introspection and self-assessment as a means to support mathematical achievement among underrepresented groups (Berry &McClain, 2009; Berry, Thunder & McClain, 2011; Martin, 2007; Stinson, Jett & Williams, 2013). Introspection is important to fully understanding how one's practices may be challenging for minority students. Introspection permits mathematics teachers to be attuned to their internalized beliefs about students (Howard, 2003; Milner, 2003). Fortunately, Tariq, Edgar and Felix made interpersonal connections with one or more of their teachers. Unfortunately, Isaiah had not.

Since teacher beliefs drive achievement, it is important to examine the results of this study in light of teacher practices. In view of the impending shift in school demographics, more focused awareness about culturally diverse students is needed to ensure the success of diverse students in STEM education. In response to this development, it becomes imperative that pedagogical approaches incorporate students' mathematical knowledge, bridge formal and informal experiences, and provide students with opportunities to demonstrate their understanding across multiple disciplines. Therefore, mathematics and science teachers should ground their instruction in the culturally relevant pedagogical paradigm. In this way, teachers have the opportunity to disrupt the stereotype that school mathematics and mathematics in general is a White institutionalized space (McGee, 2009). Stinson, Jett and Williams (2013) recommend that teachers of minority students and those vested in their education focus their attentions on: a) developing caring relationships, b) developing a culturally responsive pedagogy and c) disrupting the hegemony of Whiteness in mathematics (McGee, 2009). I enumerate each of these recommendations below.

Caring Relationships. Stinson, Jett, and Williams (2013) explained that a lack of understanding is the missing critical component among many STEM instructors of minority students. They insist that teachers develop a caring relationship and set high expectations of their students. Furthermore they indicate that teachers have the ability to access and promote out-of-school experiences and tap into local communities of practice. Students need to feel connected to their teachers and also need to feel as if the teacher has a vested interest in them. This relationship extends beyond the four-walls of the mathematics classroom. While effective teachers do not have to be involved or interested in every facet of the student's life, I wonder how much further along Isaiah would have been academically if he had had a teacher who cared and understood what he was going through when he was in middle school when his father was incarcerated.

Culturally relevant pedagogy. Culturally relevant pedagogy (CRP) connects teachers to their students' local communities and helps to facilitate student meaning. Moreover, CRP becomes particularly important when the race of the teacher is incongruent with their students. CRP aids in mutual understanding of everyone's experiences including his/her minority students. While CRP may be used to enrich content, mathematics teachers also need to develop a better understanding of identity issues and develop ways to interpret different behavior styles. In this study, culturally relevant pedagogy may have been important to further develop Felix and Isaiah's mathematics identity and mathematics achievement.

Employing cultural relevance enables teachers to be able to seize opportunities to make deeper interpersonal connections between teacher and student. Effective use of CRP is contingent to the receptiveness of the teacher and the student. As a result of this research, I have been enlightened about seizing opportunities to connect with the student. It requires an additional commitment from the teacher who has to initiate the dialogue and ask about their minority students' interests. Students tend to be eager to discuss their interests. The teacher then has to incorporate student interests into the mathematics lesson or project. While it may be difficult as to create time and space for this level of interaction to occur in the environment of high-stakes testing, the finding in this study suggests the effort to engage diverse students in CRP needs to occur in secondary schools.

Disrupting Stereotypes. To disrupt this hegemony I believe it is important to disrupt stereotypes about people from different racial and cultural backgrounds. Each young man in this was keenly aware of the stereotypes that were pervasive among their respective ethnicities. Researchers who study minority students assume attitudes and beliefs about self have a significant impact on how students experience schooling (Berry, Thunder & McClain, 2011). Likewise, there is significant evidence that environmental, social, and racial factors influence student performance, particularly on high-stakes examinations (Jett, 2012). Steele (1997) reported group identity is rooted in the perception that one's ethnicity or gender is under threat. Stereotype threat is a perception that some group's achievement is less valuable in educational settings. This threat involves being viewed by others outside their group through a negative stereotypical lens. Those who are affected by stereotype threat are under constant fear of confirming the stereotype. Members of the stereotyped group are very conscious of the stereotype and perform worse when the threat is present.

Osborne and Walker (2006) extended this notion asserting although personal investment in school leads to positive outcomes, those who may most strongly identify with academics may be at a higher risk of negative outcomes. As such, when students are performing on high-stakes tests, those who are aware of the racial stereotype, may experience anxiety which in turn, may hamper performance. It becomes important to discuss stereotypes and empower the student to defy those stereotypes. As these stereotypes still have the potential to affect young men of color, it becomes increasingly more important to confront all stereotypes to avoid damaging self-concept and negatively impacting possibilities for student success and persistence in STEM-related careers.

Implications for Future Research

As I began interviewing these young men, I became keenly aware of the impact a teacher can make on the lives of his students. When I started teaching twenty years ago, I had only had a vague sense of the awesomeness of what I had been tasked with in life. Before knowing the research, I had always tried to reach out to each student. Sometimes it yielded a connection and sometimes it did not, but I made it a point to at least try. After conducting this study, I am interested in three areas of future research: culturally relevant teaching practices among minority male teachers and using student voice to develop mathematical identity among male and female underserved youth.

Minority teachers span membership across several communities, including the mathematically proficient. As a middle school mathematics teacher, I have, on more than one occasion, been the only African American male teacher in the building. There is a great need for minority male professionals, particularly Black and Hispanic, as many students need greater interaction with positive male role models. Minority male teachers, more broadly, have a confluence of experiences, perspectives, and knowledge domains critical to educating students. Minority teachers embody characteristics, practices and disposition that are potentially meaningful for students. These teachers are more able to support student capacity to participate and perform mathematically within racialized education systems, broader schooling experiences, and broader society (Evans & Leonard, 2013; Jett, 2009).

To promote cultural relevance and positive mathematical and racial (cultural) identity among underrepresented minority males, a study that examines the practices of minority male teachers may add to the extant literature. Gay (2010), Jett (2013), Ladson-Billings (2009), Ottmar, Rimm-Kaufman, Berry and Larsen (2013) argue affirmatively for culturally responsive practices citing rigorous culturally responsive mathematics enacts brilliance in the mathematical space. Accordingly, CRP should be used as a vehicle to create learning opportunities and promote an environment where marginalized students would feel free to examine their feelings, views, and perceptions. I propose a future study that will focus on studying minorities male teachers' culturally relevant practices on their underserved male students' developing mathematics identities. This work could yield the desired increased achievement that has left many gifted underrepresented male students behind.

In addition to exploring student identity through CRP, further research on using student voice (i.e., counternarratives) to develop mathematical identity among underserved youth is warranted. When race is foregrounded in mathematical research among diverse populations, "voice" should be employed as it values the lived experience, prior knowledge, intellectual strengths and personal interest of students to use it to create a context for learning mathematics and science. Integrating voice and experience yields a higher level of student commitment without labeling or devaluing. As young minority students begin to assert their voice, it is important for mainstream society to see, feel, and understand how these students mathematize the world differently based upon their life experiences. When the student believes he is being heard and understood by those around him, particularly, when the instructor and students are ethnically different, the school climate is more conducive for academic success. Thus, I propose in study learning through counterstories for as many of my students as possible, including females. This became apparent to me after Isaiah expressed how he made no connections with any of his teachers. Storytelling via counternarratives becomes a valuable way to enter the lives of others (Berry, Thunder & McClain, 2011, Martin, 2012; McGee, 2009). Although storytelling has not been traditionally important to a mathematics class, it becomes more important when working with students from underrepresented communities.

Summary

Citing the global competitiveness of the U.S., many stakeholders have called for increased STEM-professionals. This becomes an advantageous time to extend mathematical equity and opportunity to its minority citizens. As the U.S. becomes more ethnically diverse, it also becomes important that the research community seek out ways to mathematically engage and empower students of color. Many minority students who have unrealized talent could be cultivated into the needed mathematicians and scientists of tomorrow.

Nearly a century ago, Woodson's (1990) *Miseducation of the Negro* reported during the industrial revolution many African Americans in the U.S. had been trained on outdated technologies. As a result, the U.S. left many of these workers behind. Today as society embarks on the technological revolution, if America is able to explore and tap into the unrealized mathematical brilliance that dwells within its minority communities, America may be able to surpass its current global positioning. However, global competitiveness alone will not spur adequate investment in the educational opportunities of its underrepresented students. This lack of adequate mathematical training must be reconciled in order to prepare all students for the jobs of the 21st century jobs (Lipman, 2004). As mathematical research continues to look toward the brilliance of minority students, it remains important to explore how underrepresented boys and girls engage mathematically.

REFERENCES

Ahn, J. (2010). The role of social network locations in the college access mentoring of urban youth education. *Education and Urban Society,* 20(10), 1-21.

Beilock, S. L., Rydell, R. J., & McConnell, A. R. (2007). Stereotype threat and working memory: Mechanisms, alleviation, and spillover. *Journal of Experimental Psychology: General*, 136(2), 256-276. doi:10.1037/0096-3445.136.2.256

Bergin, D.A., Cooks, H. C., & Bergin, C. C. (2007). Effects of a college access program for youth underrepresented in higher education. *Research in Higher Education,* 28(6), 727-750.

Bergerson, A. A. (2009). College preparation programs. *ASHE Higher Education Report,* 35(4), 85-97.

Berry, R. Q. (2003). Mathematics standards, cultural styles, and learning preferences: The plight and the promise of African American students. *The Clearing House,* 76(5), 244-249.

Berry III, R. Q. (2008). Access to upper level mathematics: The stories of successful African American middle school boys. *Journal for Research in Mathematics Education,* 39(5), 464-488.

Berry III, R.Q., & McClain, O. L. (2009). Voices, power, and multiple identities: African American boys and mathematics success. *New England Mathematics Journal,* 41, 17-26.

Berry III, R. Q., Thunder, K., & McClain, O. L. (2011). Counter narratives: Examining the mathematics and racial identities of Black boys who are successful with school mathematics. *Journal of African American Males in Education,* 2(1), 10-23.

Botelho, G. (23 May 2012). What happened the night Trayvon Martin died. *CNN.* Retrieved from http://www.cnn.com/2012/05/18/justice/florida-teen-shooting-details/

Bracey, J. M. (2011). Assessing African-American and Latino middle school student engagement and motivation to persist in STEM domains. *Dissertation Abstracts International Section A: Humanities and Social Sciences,* 72(8-A), 2677.

Brown, L. M., Awad, G. H., Preas, E. J., Allen, V. K., J. Roberts, S., & Lusk, L. B. (2013). Investigating prejudice toward men perceived to be Muslim: Cues of foreignness versus phenotype. *Journal of Applied Social Psychology*, 43, 237-245.

Bush, G. W. (2001). No child left behind act of 2001. *Public Law*, *107*, 110. Washington, DC: Office of the President of the United States.

Castagna, A. & Brayboy, B. (2008). Culturally responsive schooling for indigenous youth: A literature review. *Review of Educational Research*, 78(4), 941-993.

CLR Choice Inc. (2012). CLRsearch.com: The right home in the right place. Retrieved from www.clrsearch.com

Cobb, P. (2009). The importance of a situated view of learning to the design of research and instruction. In D. Martin (Ed.), *Mathematics teaching, learning and liberation in the lives of Black children,* (pp. 45-82). New York, NY: Routledge.

Cochran-Smith, M. (2004). *Walking the road: Race, diversity, and social justice in teacher education.* New York, NY: Teachers College Press.

Corbin, J. & Strauss, A. (2008). *Basics of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage

Creswell, J. W. & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice,* 39(3), 124-130.

Dantley, S. J. & Leonard, J. (2010). The state of mathematics and science achievement among African American males. In V. C. Polite & E. M. Zamani-Gallaher (Eds.), *The state of the African American male in Michigan: A courageous conversation* (pp. 45-63). Lansing, MI: Michigan State University Press.

Darling-Hammond, L. (2007). Race, inequality and educational accountability: The irony of 'No Child Left Behind'. *Race Ethnicity and Education,* 10(3), 245-260.

Denscombe, M. (1998). *The good research guide for small-scale social research projects*. Philadelphia, PA: Open University Press.

Desert, M., Preaux, M., & Jund, R. (2009). So young and already victims of stereotype threat: Socio-economic status and performance of 6 to 9 years old children on Raven's progressive matrices. *European Journal of Psychology of Education,* 24(2), 207-218.

Esposito, J., & Swain, A. N. (2009). Pathways to social justice: Urban teachers' uses of culturally relevant pedagogy as a conduit for teaching for social justice. *Perspectives on Urban Education,* 6(1), 38-48.

Evans, B., Leonard, J., Ryan, S, & Krier, K. (2010 Winter). Elementary preservice teacher attitudes. *Academic Exchange Quarterly,* 14(4), 92-97.

Freire, P. (2006). Pedagogy of the oppressed. (30th Anniv. Ed.). New York: Continuum.

Gardner, D. P. (1983). *A nation at risk: The imperative for educational reform*. Washington, DC: US Government Printing Office.

Gambone, M. A., Klem, A. M. & Connell, J. P. (2002). *Finding out what matters for youth: Testing key links in a community action framework for youth development.* Philadelphia: Youth Development Strategies, Inc., and Institute for Research and Reform in Education.

Gay, G. (2010). *Culturally responsive teaching. Second Edition.* Multicultural Education Series. New York: Teachers College Press.

Gee, J. P. (2004). *Situated language and learning: A critique of traditional schooling.* London: Routledge.

Geertz, C. (1973). *Thick description: Toward an interpretive theory of culture.* In C. Geertz (Ed.), *The interpretation of cultures: selected essays* (pp. 3-30). New York, NY: Basic Books, Inc.

Gilovich, T., Keltner, D., & Nisbett, R. E. (2006). Social psychology. New York, NY: W.W. Norton & Company.

Gutierrez, R. (2008). A gap-gazing fetish in mathematics education? Problematizing research on the achievement gap. *Journal for Research in Mathematics Education,* 39(4), 357-364.

Gutierrez, R., Bay-Williams, J. & Kanold, T. (Oct 2008). Beyond access and achievement: Equity issues for mathematics teachers and leaders. *NCTM Bulletin*. Retrieved from http://www.nctm.org/news/content.aspx?id=16245

Gutstein, E. (2006). *Reading and writing the world with mathematics: Toward pedagogy for social justice.* New York: Routledge.

Handbook, O. O. (2008, Spring). The 2006-16 job outlook in brief. Bureau of Labor Statistics. U.S. Department of Labor. *Occupational Outlook Quarterly*, 52(1) 2-6.

Harper, S. R. & Davis, III, C.H.F. (2012). They (don't) care about education: A counter narrative on Black male students' responses to inequitable schooling. *Educational Foundations,* 26(112), 103-120.

Hartley, J. (2004). Case study research. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research*. (pp. 323-333). London: Sage Publications.

Hill, M. L. (2006). Negotiating multiple roles and identities in the field and behind the desk. *Qualitative Inquiry,* 12(5), 926-949.

Homes for Sale. (n.d.). Retrieved January 21, 2015 from http://www.homes.com/

Hooker, S. & Brand, B. (2010). College knowledge: A critical component of college and career readiness. *New Directions for Youth Development,* 127, 75-85.

Howard, T. C. (2003). Culturally relevant pedagogy: Ingredients for critical teacher reflection. *Theory into Practice,* 42(3), 1995-202.

Huerta, J. J., Watt, K. M., & Butcher, J. T. (2013). Examining Advancement Via Individual Determination (AVID) and Its Impact on Middle School Rigor and Student Preparedness. *American Secondary Education*, 41(2), 24-37.

Institute for Research and Reform in Education (1998). *Research Assessment Package for Schools (RAPS): Student supports and opportunities in school: engagement, beliefs about self, and experiences of interpersonal support*. (Manual for Elementary and Middle School Assessments 1998). Retrieved from http://www.irre.org/sites/default/files/publication_pdfs/RAPS_manual_entire_1998.pdf

Inzlicht, M., & Schmader, T. (Eds.), (2012). *Stereotype threat: Theory, process, and application.* (n.p.): Oxford University Press.

Jett, C. C. (2009). Mathematics, an empowering tool of liberation? A review of mathematics teaching, learning, and liberation in the lives of Black children. *Journal of Urban Mathematics Education*, 2(2), 66-71.

Jett, C. C. (2012). Critical race theory interwoven with mathematics education research. *Journal of Urban Mathematics Education,* 5(1), 21-30.

Jett, C. C. (2013). Culturally responsive collegiate mathematics education: Implications for African American students. *Interdisciplinary Journal of Teaching and Learning*, 3(2), 102-116.

Kahle, J. B. (1998). *Reaching equity in systemic reform: How do we assess progress and problems* (Research Monograph No. 9). Retrieved from National Institute for Science Education, University of Wisconsin-Madison, http://wcer.wisc.edu/archive/nise/Publications/Research_Monographs/KAHLE/KahleALL.pdf

Kaplan, A. & Flum, H. (2012). Identity formation in educational settings: Acritical focus in the 21st century. *Contemporary Educational Psychology,* 37(2012), 171-175.

Kea, C., Campbell-Whatley, G., & Richards, H. (2006). *Becoming culturally responsive educators: Rethinking teacher education pedagogy*. National Center for Culturally Responsive Educational Systems. Retrieved from http://www.niusileadscape.org/docs/

King, K. (2009). A review of programs that promote higher education access for underrepresented students. *Journal of Diversity in Higher Education*, 2(1), 1-15.

Klem, A. M., & Connell, J. P. (2004). Relationships matter: Linking teacher support to student engagement and achievement. *Journal of school health*, 74(7), 262-273.

Kunjufu, J. (1995). *Countering the conspiracy to destroy Black boys.* Chicago: African American Images.

Ladson-Billings, G. (1994). *The dreamkeepers: Successful teachers of African American children.* San Francisco: Jossey-Bass Publishing.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465-491.

Ladson-Billings, G. (1998). Just what is critical race theory and what is it doing in a 'nice' field like education? *Qualitative Studies in Education*, 11(1), 7-24.

Ladson-Billings, G. (2009). *The dreamkeepers: Successful teachers of African American children.* (n. p.): John Wiley & Sons.

Law, P. (2002). No child left behind act of 2001. *Public Law*, 107, 110.

Leonard, J. (2008). *Culturally specific pedagogy in the mathematics classroom: Strategies for teachers and students.* New York: Routledge.

Leonard, J. (2009). Still not saved: The power of mathematics to liberate the oppressed. In D. Martin (Ed.), *Mathematics teaching, learning, and liberation in the lives of Black children* (pp. 304-330). New York: Routledge.

Leonard, J., Brooks, W., Barnes-Johnson, J., & Berry, III, R.Q. (2010). The nuances and complexities of teaching mathematics for cultural relevance and social justice. *Journal of Teacher Education,* 61(3), 261-270.

Leonard, J., & Martin, D. B. (Eds.), (2013). *The brilliance of Black children in mathematics: Beyond the numbers and toward new discourse.* (n.p.): Information Age Publishing.

Lichtman, M. (2010). *Qualitative Research in Education: A user's guide* (2nd ed.). Washington DC: Sage Publications, Inc.

Linder, S. M., Powers-Costello, B., & Stegelin, D. A. (2011). Mathematics in early education and practical strategies. *Early Childhood Education Journal*, 39, 29-37.

Lipman, P. (2004). *High stakes education: Inequality, globalization, and urban school reform.* New York, NY: Routledge Falmer.

Little, D. (1999). Learner autonomy is more than a western cultural construct. In S. Cotterall & D. Crabbe (Eds.), *Learner autonomy in language learning: Defining the field and affecting change* (pp. 11-18). Bern, Switzerland: Peter Lang International Academic Publishers.

Lubienski, S. T. & Gutierrez, R. (2008). Bridging the gaps in perspectives in mathematics education. *Journal for Research in Mathematics Education,* 39(4), 365-371.

Martin, D. B. (2000). *Mathematics success and failure among African American youth: The roles of sociohistorical context, community forces, school influence and individual agency.* Mahwah, NJ: Lawrence Erlbaum.

Martin, D. B. (2006). Mathematics learning and participation as racialized forms of experience: African American parents speak on the struggle for mathematics literacy. *Mathematical Thinking and Learning,* 8(3), 197-229.

Martin, D. B. (2007). Mathematics learning and participation in the African American context: The co-construction of identity in two intersecting realms of experience improving access to mathematics. In N. S. Nasir, P. Cobb (Eds.), Improving access to mathematics: Diversity and equity in the classroom (pp. 146-158). New York: Teachers College Press.

Martin, D. B. (2009). Liberating the production of knowledge about African American children and mathematics. In D. B. Martin (Ed.), *Mathematics teaching, learning and liberation in the lives of Black children* (pp.3-38). New York: Routledge.

Martin. D. (2012). Diversity and mathematics education. In J. Banks (Ed.), *Encyclopedia of diversity in education.* Thousand Oaks, CA: Sage Publications.

Matthews, L. E. (2009) "This little light of mine!" Entering choices of cultural relevancy into the mathematics teaching conversation. In D. B. Martin (Ed.), *Mathematics teaching, learning and liberation in the lives of Black children* (pp. 63-87). New York: Routledge.

Maynard, M. & Purvis, J. (1994). *Researching women's lives from a feminist perspective.* London: Taylor & Frances.

McAdams, D. (2008) Personal narrative and the life story. In O. John, R. Robins, & L. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 241-261). New York, NY: Guilford Press.

McGee, E. O. (2009). *Race, identity, and resilience: Black college students negotiating success in mathematics and engineering.* Ann Arbor MI: ProQuest.

McGee, E. O. (2013). Growing up black and brilliant: Narratives of two mathematically high-achieving college students. In J. Leonard & D. B. Martin (Eds.), *The brilliance of Black children in mathematics: Beyond the numbers and toward new discourse* (pp. 247-272). Charlotte, NC: Information Age Publishers.

McGee, E. O. & Martin, D. B. (2011). "You would not believe what I have to go through to prove my intellectual value!": Stereotype management among academically successful Black mathematics and engineering students. *American Educational Research Journal,* 20(10), 1-43.

Milner, H. R. (2003). Teacher reflection and race in cultural contexts. *Theory into Practice,* 42(3), 173-264.

Moses, R. P., & Cobb, C. E. (2001). *Radical equations: Math literacy and civil rights.* (n.p.): Beacon Press.

Moody, V. (2001). The social constructs of the mathematical experiences of African-American students. In B. Atweh, H. Forgasz, & B. Nebres (Eds.), *Sociocultural research on mathematics education* (pp. 255-278). Mahwah, NJ: Lawrence Erlbaum Associates

Search Home Values Homes.com, Retrieved from www.homes.com/Home-Prices January 26, 2015. Searched Zip code: 19120 (population, demographics, lifestyle, job and employment)

Mudge, S. & Higgins, D. J. (2011). College access programming: Removing higher education barriers for underrepresented student populations. *The International Journal of Learning,* 17(11), 123-139.

Nasir, N. (2000). Points ain't everything: Emergent goals and average and percent understandings in the play of basketball among African-American students. *Anthropology and Education Quarterly,* 31(3), 283-305.

Nasir, N. S. (2002). Identity, goals and learning: Mathematics in cultural practice. *Mathematical Thinking and Learning,* 4(2-3), 211-245.

Nasir, N. Atukpawu, G.,,O'Connor, K., Davis, M., Wischnia, S. & Tsang, J. (2009). Wrestling with the legacy of stereotypes: Being African American in math class. In D. Martin (Ed.), *Mathematics Teaching, Learning and Liberation in the Lives of Black Children* (pp. 231-248). New York, NY: Routledge.

National Council of Teachers of Mathematics. (2008). *Equity in mathematics education: A position of the National Council of Teachers of Mathematics*. Retrieved from http://www.nctm.org/about/content.aspx?id=39817

Neighborhood Link: Your community connection Retrieved from: http://www.neighborhoodlink.com/zip/19120#overview (Searched:19120 Zip code profile) January 26, 2015. (Searched: real estate and home values, demographics, economics, map)

Nieto, S. (2002/2003, December-January). Equity and opportunity: Profoundly multicultural questions. Educational Leadership, 60(4), 6-10.

Noguera, P. (2003). *City schools and the American dream: Reclaiming the promise of public education*. New York: Teachers College Press.

Osborne, J. W. & Walker, C. (2006). Stereotype threat, identification with academics, and withdrawal from school: Why the most successful students of colour might be most likely to withdraw. *Educational Psychology,* 26(4), 563-577.

Otten, S., Herbel-Eisenmann, B. A, & Males, L. M. (2010). Proof in Algebra: Reasoning beyond examples, *The Mathematics Teacher,* 103(7), 514-518.

Ottmar, E. R., Rimm-Kaufman, S. E., Berry, R. Q., & Larsen, R. A. (2013). Does the responsive classroom approach affect the use of standards-based mathematics teaching practices? *The Elementary School Journal,* 113(3), 434-457.

Owens, J. & Lynch, S. M. (2012). Black and Hispanic immigrants' resilience against negative-ability racial stereotypes at selective colleges and universities in the United States.. *Sociology of Education,* 85(4), 303-325.

Penuel, W. R. (1995). Vygotsky and identity formation: A sociocultural approach. *Educational Psychologist,* 30(2), 83-92.

Phinney, J. (1993). A three-stage model of ethnic identity development. In M. Bernal & G. Knight (Eds.), *Ethnic identity: Formation and transmission among Hispanics and other minorities* (pp. 61-79). Albany: State University of New York Press.

Saunders, M. & Serna, I.(2004). Making college happen: The college experiences of first- generation Latino students. *Journal of Hispanic Higher Education,* 3(2), 146-163.

Schoenfeld, A.H. (1992). Leaming to think mathematically: Problem solving, metacognition, and sense making in mathematics. In D. Grouws (Ed.), *Handbook for Research on Mathematics Teaching and Learning* (pp. 334-370). New York: Macmillan.

Scottham, K. M., Cooke, D. Y., Sellers, R. M, & Ford, K. (2010). Integrating process with content in understanding African American racial identity development. *Self and Identity,* 9(1), 19-40.

Seaton, E. K., Yip, T., Morgan-Lopez, A, & Sellers, R. M. (2012). Racial discrimination and racial socialization as predictors of African American adolescents' racial identity development using latent transition analysis. *Developmental Psychology*, 48(2), 448.

Sellers, R. M., Chavous, T. M. & Cooke, D. Y. (1998). Racial ideology and racial centrality as predictors of African-American college students' academic performance. *Journal of Black Psychology,* 24(1), 9-27.

Sellers, R. M., Smith, M. A., Shelton, J. N., Rowley, S. A. J., & Chavous, T. M. (1998). The multidimensional model of racial identity: A reconceptualization of African American racial identity. Personality *and Social Psychology Review,* 2, 18-39.

Sellers, R. M., Rowley, S. A J., Chavous, T. M., Shelton, J. N., & Smith, M. A (1997). Multidimensional inventory of Black identity: A preliminary investigation of reliability and construct validity. *Journal of Personality and Social Psychology,* 73, 805-815.

Solorzano, D. G. & Yosso, T. J. (2002). Critical race methodology: Counter-storytelling as an analytical framework for education research. *Qualitative Inquiry,* 8(1), 23-44.

Southern Poverty Law Center (1991). Teaching tolerance. Retrieved from http://www.tolerance.org/

Spielhagen, F. R. (2006). Closing the achievement gap in math: Considering eighth algebra for all students.. *American Secondary Education,* 34(3), 29-42.

Stairs, A. J. (2007). Culturally responsive teaching: The Harlem Renaissance in an urban English class. *English Journal,* 96(6), 37-42.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist,* 52, 613-629.

Stinson, D. W. (2004). Mathematics as "gatekeeper" (?): Three theoretical perspectives that aim toward empowering all children with a key to the gate. *The Mathematics Educator,* 14(1), 8-18.

Stinson, D. W. (2006). African American male adolescents, schooling (and mathematics): Deficiency, rejection, and achievement. *Review of Educational Research,* 76(4), 477-506.

Stinson, D. W. (2009). Negotiating sociocultural discourses: The counter-storytelling of academically and mathematically successful African American male students. In D. B. Martin (Ed.) *Mathematics teaching, learning, and liberation in the lives of Black children* (pp. 265-288). London, UK: Routledge.

Stinson, D. W. (2010). Negotiating the "White male math myth": African American male students and success in school mathematics, *Journal for Research in Mathematics Education,* 41, 1-3l.

Stinson, D.W., Jett, C. C. & Williams, B. A. (2013). Counter stories from mathematically successful African American male students: Implications for mathematics teacher and teacher educators. In J. Leonard & D. B. Martin (Eds.), *The brilliance of Black children in mathematics: Beyond the numbers and toward new discourse*, (pp. 221-245). (n.p.): Information Age Publishing.

Swanson, M. C. (1989). Advancement via individual determination: Project AVID. *Educational Leadership,* 46(5), 63-64.

Tate, W. F. (1997). Critical race theory and education: History, theory and implications, *Review of research in education,* 195-247.

Tate, W. F. (2008). Putting the "Urban" in mathematics education scholarship. *Journal of Urban Mathematics Education,* 1(1), 5-9.

Thompson, L. R., & Lewis, B. F. (2005). Shooting for the stars: A case study of the mathematics achievement and career attainment of an African American male high school student. *The High School Journal,* 88(4), 6-18.

U. S. Department of Education, National Center for Education Statistics. (2000). The condition of education 2000 (Report No. 2000-062).Washington, DC: Government Printing Office.

U. S. Department of Education, National Center for Education Statistics. (2001). The condition of education 2001 (Report No. 2001-072).Washington, DC: Government Printing Office.

Van Seiver, J. H. (2006). Closing the diversity gap in advanced placement course enrollment. *Multicultural Perspectives,* 8(3), 56-58.

Varelas, M., Martin, D. B., & Kane, J. (2012). Content learning and identity construction (CUC): An interpretive framework to strengthen African American students' mathematics and science learning in urban elementary schools. *Human Development*, *55*(5-6), 319-339.

Walker, E. N. (2014). Kinships and Communities. In *Beyond Banneker: Black mathematicians and the paths to excellence* (pp. 19-42). Albany, NY: SUNY Press.

Ward, N. L. (2006). Improving equity and access for low-income and minority youth into institutions of higher education. *Urban Education*, 41(1), 50-70.

Watt, K. M., Huerta, J. & Lozano, A. (2007). A comparison study of AVID and GEAR Up 10th grade students in two high schools in the Rio Grande Valley of Texas, *Journal of Education for Students Placed At Risk*, 12 (2), 185-212.

Woodson, C. G. (1990). *The mis-education of the Negro*. Trenton, NJ: Africa World Press. (Original work published 1933.)

APPENDIX A

STUDENT DEMOGRAPHIC QUESTIONNAIRE

Interview #1, Part 1: *This demographic questionnaire will be administered orally.*

Life Beyond the Cemetery: The Mathematical Identity and Academic Achievement of Traditionally Underrepresented Male AVID Participants in an Urban Pilot Program

Please complete the following information

Race (check all that apply)

Black or African American

Hispanic or Latino

White or Caucasian

Asian (Oriental)

Asian (Middle Eastern)

Multi-ethnic/Multi-racial

Age: __________

Birth date: _________________________________

Do you live in a one-parent/guardian or two-parent/guardian household? _______________

With whom? (Mother, Father, Uncle, Aunt, etc.)

____

Do you speak another language other than English? ______________Yes _____________No

What language? ____

Is this the primary language spoken at home? ________________________________

What is the occupation of your primary caretaker? ___________________________________

Birthplace of Parents/Guardians (if not born in the U.S.)

____

How long have you been living in the U.S? ______________________________

Number of siblings in your household___________________________________

High School Information

What grade are you currently in? ____

What is the name of your high school? ____

What is your current math class or the last math class completed? __________________

What is your GPA? ____________

Have you or will you take AP classes in high school?

____

If so, list the classes you have taken ____________________________________

Do you plan to go to college? ________Yes _________ No

What is your future career?

____

Extracurricular activities

Do you have a part-time job? _________Yes ________No

What extracurricular activities do you enjoy?

____

Do you play any sports? If so, list them

____

Do you play on a sports team? ____

Family Background

Do you have chores or responsibilities at home after school? _____________________

If so, what are they? ____

How many people live in your house? ____

How does your family respond when you do well in school and particularly in Mathematics class? ____

When you are encountering difficulties in school, do you have a family member that is able to help you? ____

Does anyone in your house have a job that is related to mathematics? (bookkeeper, carpenter, bank teller, etc.)

____

When you were younger, if you had trouble with your math homework, was there someone who could help you? ____

APPENDIX B

THE RAPS-SM QUESTIONNAIRE

Student ID: ____________________

Research Assessment Package for Schools – Student Report

Read each of the following items. For each one, tell us how true it is for YOU by circling one of the four answers: VERY TRUE, SORT OF TRUE, NOT VERY TRUE or NOT AT ALL TRUE. There are no right or wrong answers.

1.	My teacher has plenty of time for me.	A Very True	B Sort of True	C Not Very True	D Not at all true
2.	I work very hard on my schoolwork.	A Very True	B Sort of True	C Not Very True	D Not at all true
3.	When I’m with my teacher, I feel god.	A Very True	B Sort of True	C Not Very True	D Not at all true
4.	My parents never have enough time to hear about what happens to me in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
5.	I do my homework because I like to do it.	A Very True	B Sort of True	C Not Very True	D Not at all true
6.	I don’t know how to keep myself from getting bad grades.	A Very True	B Sort of True	C Not Very True	D Not at all true
7.	My parents don’t make it clear what they expect of me in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
8.	When I’m with my parents, I feel mad.	A Very True	B Sort of True	C Not Very True	D Not at all true

9.	My teacher is fair with me.	A Very True	B Sort of True	C Not Very True	D Not at all true
10.	My parents encourage me to find out how school work could be useful to me.	A Very True	B Sort of True	C Not Very True	D Not at all true
11.	I work on my classwork because it's interesting.	A Very True	B Sort of True	C Not Very True	D Not at all true
12.	When something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I say the teacher didn't cover the things on the test.	A Very True	B Sort of True	C Not Very True	D Not at all true
13.	My parents don't think I can do very much.	A Very True	B Sort of True	C Not Very True	D Not at all true
14.	I wish I were someone else.	A Very True	B Sort of True	C Not Very True	D Not at all true
15.	I'm pretty lucky at getting good grades	A Very True	B Sort of True	C Not Very True	D Not at all true
16.	I do my homework because I'll feel bad about myself if I don't do it.	A Very True	B Sort of True	C Not Very True	D Not at all true
17.	When I'm with my teacher, I feel mad.	A Very True	B Sort of True	C Not Very True	D Not at all true
18.	When I think about myself, I feel bad.	A Very True	B Sort of True	C Not Very True	D Not at all true

19.	My parents enjoy spending time with me.	A Very True	B Sort of True	C Not Very True	D Not at all true
20.	My parents don't explain why school is important.	A Very True	B Sort of True	C Not Very True	D Not at all true
21.	I don't try very hard in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
22.	When something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I try to figure out what I did wrong so that it won't happen again.	A Very True	B Sort of True	C Not Very True	D Not at all true
23.	I can get my teacher to like me.	A Very True	B Sort of True	C Not Very True	D Not at all true
24.	I can work really hard in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
25.	My teacher's expectations for me are way off-base.	A Very True	B Sort of True	C Not Very True	D Not at all true
26.	If I'm unlucky, I won't do well in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
27.	My teacher cares about how I do in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
28.	I can do well in school if I want to.	A Very True	B Sort of True	C Not Very True	D Not at all true

29.	When I'm with my classmates, I feel ignored.	A Very True	B Sort of True	C Not Very True	D Not at all true
30.	When I'm with my parents, I feel good.	A Very True	B Sort of True	C Not Very True	D Not at all true
31.	I pay attention in class.	A Very True	B Sort of True	C Not Very True	D Not at all true
32.	My teacher doesn't explain why we have to learn certain things in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
33.	My parents know just how well I can do in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
34.	If l don't do well on my schoolwork, it's because I didn't try hard enough.	A Very True	B Sort of True	C Not Very True	D Not at all true
35.	When something bad happens to me in school (like not doing well on a test or bot being able to answer an important question), I get angry at the teacher.	A Very True	B Sort of True	C Not Very True	D Not at all true
36.	My parents do a lot to help me.	A Very True	B Sort of True	C Not Very True	D Not at all true
37.	When I'm with my teacher, I feel unhappy.	A Very True	B Sort of True	C Not Very True	D Not at all true
38.	I wish I felt better about myself.	A Very True	B Sort of True	C Not Very True	D Not at all true

39.	The rules in my classroom are clear.	A Very True	B Sort of True	C Not Very True	D Not at all true
40.	My teacher doesn't seem to have enough time for me.	A Very True	B Sort of True	C Not Very True	D Not at all true
41	I do my homework because I want to learn new things.	A Very True	B Sort of True	C Not Very True	D Not at all true
42.	I'm not very smart in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
43.	When something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I try to see what I did wrong.	A Very True	B Sort of True	C Not Very True	D Not at all true
44.	When I'm with my classmates, I feel mad.	A Very True	B Sort of True	C Not Very True	D Not at all true
45.	I am unlucky in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
46.	I do my homework because it's fun.	A Very True	B Sort of True	C Not Very True	D Not at all true
47.	When I'm with my parents, I feel unhappy.	A Very True	B Sort of True	C Not Very True	D Not at all true
48.	I don't know what it takes to get good grades in school.	A Very True	B Sort of True	C Not Very True	D Not at all true

49	Trying hard is the best way for me to do well in school.	A Very True	B Sort of True	C Not Very True	D Not at all true
50.	When I think about myself, I feel happy.	A Very True	B Sort of True	C Not Very True	D Not at all true
51.	I work on my classwork because I'll be ashamed of myself if it doesn’t get done.	A Very True	B Sort of True	C Not Very True	D Not at all true
52.	My parents don't let me make any of my own decisions.	A Very True	B Sort of True	C Not Very True	D Not at all true
53.	My teacher isn't fair with me.	A Very True	B Sort of True	C Not Very True	D Not at all true
54.	I often come to class unprepared.	A Very True	B Sort of True	C Not Very True	D Not at all true
55.	My teacher thinks what I say is important.	A Very True	B Sort of True	C Not Very True	D Not at all true
56.	I wish I liked myself better.	A Very True	B Sort of True	C Not Very True	D Not at all true
57.	When something bad happens to me in school (like not doing well on a test or not being able to answer an important question), I say it was the teacher’s fault.	A Very True	B Sort of True	C Not Very True	D Not at all true
58.	My parents like to talk to me about school.	A Very True	B Sort of True	C Not Very True	D Not at all true

59.	My teacher likes the other kids in my class better than me.	A Very True	B Sort of True	C Not Very True	D Not at all true
60.	I work on my classwork because doing well in school is important to me.	A Very True	B Sort of True	C Not Very True	D Not at all true
61.	My parents don't seem to have enough time for me.	A Very True	B Sort of True	C Not Very True	D Not at all true
62.	When I'm with my classmates, I feel good.	A Very True	B Sort of True	C Not Very True	D Not at all true
63.	My teacher interrupts me when I have something to say.	A Very True	B Sort of True	C Not Very True	D Not at all true

RAPS Manual, Rev. 10/28/98

APPENDIX C

AVID INTERVIEW PROTOCOL

In the 2010 school year, while you were in eighth grade at this middle school, you were enrolled in an AVID program.

1. What do you remember about the AVID program, which was located in the library on the second floor of the middle school?
2. In AVID, you took several trips to colleges/universities, how has this affected your beliefs about college?
3. How has AVID changed your belief in your ability to go to college?
4. In AVID, your teacher taught you study techniques and the Socratic method of learning (question based learning), do you use any of these methods taught to you by AVID? If so what?
5. In what ways did you think the program helped you?
6. Has it played any role into the development of who you are today?
7. Would you recommend the program to someone younger? If so, why? If not, why not?

APPENDIX D

IDENTITY, ENGAGEMENT, AVID, GOALS AND MATHEMATICS

This protocol will be administered orally.
-Developed from McGee (2009), Martin (2000) and self

Engagement domain measures two interrelated subdomains:

Ongoing engagement Subdomain
1. Are you satisfied with how you're doing in math class? Why?
2. What math class are you going to take next year?
3. How is your math class going? You're taking geometry? How is that class going for you?
4. Do you like school this year?

Reaction to Challenge Subdomain
1. What would happen if you got a D or F?
2. What would you do if you got all Fs?
3. Do you ever give up? Why or why not?

Beliefs about Self, domain measures three subdomains:

Perceived competence subdomain
1. How would you describe yourself as a person?
2. How would you describe yourself as a student?
3. In what ways do you consider yourself to be smart?
4. Have you always like school?
5. Look back on eighth grade and seventh grade, how you change changed? In what ways have you stayed the same? Do you have the same friends?
6. How do you keep yourself on track in school?

7. What do you usually shoot for in terms of grades? As and Bs? Are you happy with a C?

8. What is the difference between you and some of the people who are not doing well in school?

9. What motivates you to do well?

10. When you are having difficulties with your school, how do you go about getting help?

11. What high school are you currently enrolled in?

12. Why did you apply to this high school?

13. How is math class going for you?

14. Why do you have confidence in your math ability?

15. How do you balance being a good student and having a social life?

16. You've always been a good student?

17. What are your favorite classes?

18. How do you feel when asking for help?

19. What are the other classes you are good at besides math? (competence)

20. Did you apply to any other high school?

21. What mathematics classes have you taken since leaving middle school?

22. Did you apply to any other high school?

23. Do you think the other kids think you're good at math?

24. Let me ask you about your math class… Has it been one of your best subjects?

25. What do you think makes you good at math?

26. What other math courses are you planning to take?

27. Is math important to you or is it just like another subject?

Perceived Autonomy subdomain
1. What kinds of grades do you get in math class? (Autonomy)
2. When you are challenged in math class, what do you do to make yourself understand?

Perceived relatedness subdomain
1. What kind of group do you hang around with? Do people call you nerd?
2. Have people made negative comments about (you being a good student)?
3. Do people try and put you down?
4. Does that kind of pressure stop you from being successful and trying to stay on track or does it ever get in your way? What effect does it have on you?
5. What do other kids say about the fact that you do well?
6. Do you think there are more negative people, or people that are on track? Which group do you think is bigger and why do you think the other groups are the way they are?
7. How would you describe your school? The kids? The teachers? The learning that goes on?
6. As far as you can tell, do you think a lot of the kids care about being successful or wanting to do well in school?
7. Do you think the kids see any long tern benefits to schooling?
10. When you look at your school, what would you say are its biggest strengths?
11. What would you say is the biggest strength of the school and what's the thing that's kind of taking it down?

Experiences of interpersonal support domain measures two subdomains:

Experiences of support from parents subdomain
6. What about at home? Does your mom (anyone) push you?
9. Does anybody at home encourage you to do well?

Future Aspirations
1. How far do you want to go in school? (Future Aspirations)
2. What do you want to do when you get older?
3. What career do you want?
4. For your career, do you think you'll need math for that?
5. Do you see any reasons for having to learn math? Are you going to need it for anything?

APPENDIX E

MULTIDIMENSIONAL INVENTORY OF BLACK IDENTITY (MIBI) SCALE (ADAPTED)

		Strongly Disagree		Neutral			Strongly Agree	
		1	2	3	4	5	6	7
1	Overall, being Black has very little to do with how I feel about myself.							
2	It is important for Black people to surround their children with Black art, music and literature	1	2	3	4	5	6	7
3	Black people should not marry interracially	1	2	3	4	5	6	7
4	I feel good about Black people	1	2	3	4	5	6	7
5	Overall Blacks are considered good by others.	1	2	3	4	5	6	7
6	In general, being Black is an important part of my self-image.	1	2	3	4	5	6	7
7	I am happy that I am Black.	1	2	3	4	5	6	7
8	I feel that Blacks have made major accomplishments and advancements	1	2	3	4	5	6	7
9	My destiny is tied to the destiny of other Black people.	1	2	3	4	5	6	7
10	Blacks who espouse separatism are as racist as White people who also espouse separatism.	1	2	3	4	5	6	7
11	Blacks would be better off if they adopted Afrocentric values.	1	2	3	4	5	6	7

12	Black students are better off going to schools that are controlled and organized by Blacks.	1	2	3	4	5	6	7
13	Being Black is unimportant in my sense of what kind of person I am.	1	2	3	4	5	6	7
14	Black people must organize themselves into a separate Black political force.	1	2	3	4	5	6	7
15	In general others respect Black people.	1	2	3	4	5	6	7
16	Whenever possible, Blacks should buy from other Black businesses.	1	2	3	4	5	6	7
17	Most people consider Blacks, on the average to be more ineffective than other racial groups.	1	2	3	4	5	6	7
18	A sign of progress is that Blacks are in the mainstream of America more than ever before.	1	2	3	4	5	6	7
19	I have a strong sense of belonging to Black people.	1	2	3	4	5	6	7
20	The same forces which have led to the oppression of other groups.	1	2	3	4	5	6	7
21	A thorough knowledge of Black history is very important for Blacks today.	1	2	3	4	5	6	7
22	Blacks and Whites can never live in true harmony because of racial differences.	1	2	3	4	5	6	7
23	Black values should not be inconsistent with human values.	1	2	3	4	5	6	7
24	I often regret that I am Black	1	2	3	4	5	6	7

25	White people can never be trusted where Blacks are concerned.	1	2	3	4	5	6	7
26	Blacks should have the choice to marry interracially.	1	2	3	4	5	6	7
27	Blacks and Whites have more commonalities than differences.	1	2	3	4	5	6	7
28	Black people should not consider race when buying art or selecting a book to read.	1	2	3	4	5	6	7
29	Blacks would be better off if they were more concerned with the problems facing all people than just focusing on Black issues.	1	2	3	4	5	6	7
30	Being an individual is more important than identifying o9neself as Black.	1	2	3	4	5	6	7
31	We are all children of a higher being therefore we should love people of all races.	1	2	3	4	5	6	7
32	Blacks should judge Whites as individuals and not as members of the White race.	1	2	3	4	5	6	7
33	I have a strong attachment to other Black people.	1	2	3	4	5	6	7
34	The struggle for Black liberation in America should be closely related to the struggle of other oppressed groups.	1	2	3	4	5	6	7
35	People regardless of the race have strengths and limitations.	1	2	3	4	5	6	7
36	Blacks should learn about the oppression of other groups.	1	2	3	4	5	6	7

37	Because America is predominately white, it is important that Blacks go to White schools wo that they can gain experience interacting with Whites.	1	2	3	4	5	6	7
38	Black people should treat other oppressed people as allies.	1	2	3	4	5	6	7
39	Blacks should strive to be full members of the American political system.	1	2	3	4	5	6	7
40	Blacks should try to work within the system to achieve their political and economic goals.	1	2	3	4	5	6	7
41	Blacks should strive to integrate all institutions which are segregated.	1	2	3	4	5	6	7
42	The racism Blacks have experienced is similar to that of other minority groups.	1	2	3	4	5	6	7
43	Blacks should feel free to interact socially with White people.	1	2	3	4	5	6	7
44	Blacks should view themselves as being Americans first and foremost.	1	2	3	4	5	6	7
45	There are other people who experience racial injustice and indignities similar to Black Americans	1	2	3	4	5	6	7
46	The plight of Blacks in America will improve only when Blacks are in important positions within the system.	1	2	3	4	5	6	7
47	Blacks will be more successful in achieving their goals if they form coalitions with other oppressed groups.	1	2	3	4	5	6	7

48	Being Black in an important reflection of who I am.	1	2	3	4	5	6	7
49	Blacks should try to become friends with people from other oppressed groups.	1	2	3	4	5	6	7
50	The dominant society devalues anything not White male oriented.	1	2	3	4	5	6	7
52	Being Black is not a major factor in my social relationships.	1	2	3	4	5	6	7
53	Blacks are not respected by the broader society.	1	2	3	4	5	6	7
53	In general, other groups view Blacks in a positive manner.	1	2	3	4	5	6	7
54	I am proud to be Black.	1	2	3	4	5	6	7
55	I feel that the Black community has made valuable contributions to his society.	1	2	3	4	5	6	7
56	Society views Black people as an asset.	1	2	3	4	5	6	7

APPENDIX F

LIST OF A PRIORI CODES

A. The demographic survey will focus on family background and high school information. Listed below is a perfunctory list of codes expected to emerge from the interview data, and survey analysis.

List of A priori codes

Engagement domain measures two interrelated subdomains:

Ongoing engagement subdomain

Reaction to Challenge Subdomain

Beliefs about Self, Domain measures three subdomains:

Perceived competence subdomain

Perceived Autonomy subdomain

Perceived relatedness subdomain

Experiences of interpersonal support domain measures two subdomains:

Experiences of support from parents subdomain

Experiences of support from teachers subdomain

RAPS- Student self-report for middle school students

Engagement domain measures two interrelated subdomains:

Ongoing engagement subdomain	Question numbers
Student exerts effort in school, pays attention, prepares for class and believes doing well is important	2, 21, 31, 54, 84

Reaction to Challenge Subdomain	Question numbers
Projection items	12, 36, 57
Positive Coping Items	22, 43, 68

Beliefs about Self, Domain measures three subdomains:

Perceived competence subdomain	Question number
Perceptions of control	28, 66
Unknown strategy items	6, 48
Powerful others strategy items	64
Effort strategy items	34, 49
Luck strategy items	26
Powerful others capacity items	23, 80
Effort strategy items	34, 49
Ability capacity items	42, 82
Luck capacity items	15, 45

Perceived Autonomy subdomain	Question number
Interjected self-regulations items	16, 51, 72
Identified self-regulation items	41, 60, 83
Intrinsic self-regulation items	5, 11, 46

Perceived relatedness subdomain	Question number
Emotional security with Self items	18, 50, 71
Satisfaction with Self items	14, 38, 56
Parent emotional security items	8, 30, 47

Teacher emotional security items	3, 17, 37, 69
Peer emotional security items	29, 44, 62, 74

Experiences of interpersonal support domain measures two subdomains:

Experiences of support from parents subdomain	Question number
Parental involvement- school context items	4, 58
Parent autonomy support-school context items	10, 20, 75
Parent structure- school context items	7, 33, 70
Parent involvement –general context items	19, 36, 61, 76
Parent autonomy support-general context items	52, 66
Parent structure-general context items	13, 65, 79

Experiences of support from teachers subdomain	Question numbers
Teacher involvement items	1, 27, 40, 59, 81
Teacher autonomy support items	32, 55, 63, 78
Teacher structure items	9, 39, 25, 53, 67

As these codes are used as a beginning point to the investigation, these codes may need to be rearranged. As interview transcripts have been completed and reviewed, categories and subcategorize will receive revisions as needed. These codes will elicit reasons for success and quotes from the transcripts will be connected to the codes identified.

College of Education
TEMPLE UNIVERSITY®

Curriculum Instruction and Technology in Education- CITE phone 215- 204-2117/8377

1301 Cecil B. Moore Ave. Fax 215-204-1414

361 Ritter Hall email: www.temple.edu

Philadelphia, PA 19122

APPENDIX G

PERMISSION TO AUDIOTAPE

Project Title: Life Beyond the Cemetery: The Mathematical Identity and Academic Achievement of Traditionally Underrepresented Male AVID Participants in an Urban Pilot Program

Investigator: LaVarr Dixon (267-516-6031)

Affiliation: Temple University, College of Education/Mathematics C.I.T.E.

Primary Investigators/Advisors: Dr. Michael Smith (contact: 215-204-2296)

Dr. Jacqueline Leonard (contact: (215-514-1563)

Department: College of Education/ Mathematics Education C.I.T.E. (Curriculum, Instruction, and Technology in Education

Subject: ______________________________Date: ______________________________

I give permission to audiotape me. This audiotape will be used only for the following purposes:

EDUCATION

Audiotapes will be transcribed only for the purposes of research through Temple University.

RESEARCH

This audiotape will be used as a part of a research project at Temple University. I have already given written consent for my participation in this research project. At no time will my name be used.

Description:

WHEN WILL I BE AUDIOTAPED?

I agree to be audiotaped during the time period:

From _______________ to ____________________

HOW LONG WILL THE TAPES BE USED?

I give permission for these tapes to be used:

From _________________to ___________________

*The data collected for the purposes of this research study, including any and all audiotapes, will be stored for three (3) years after completion of the study.

WHAT IF I CHANGE MY MIND?

I understand that I can withdraw my permission at any time. Upon my request, the audiotape(s) will no longer be used.

OTHER

I understand that I will not be paid for being audiotaped or for the use of the audiotapes.

FOR FURTHER INFORMATION

If I want more information about the audiotape(s), or if I have questions or concerns of at any time, I can contact:

Investigator: LaVarr Dixon (267-516-6031)

Affiliation: Temple University, College of Education/Mathematics C.I.T.E.

Primary Investigators/Advisors: Dr. Michael Smith (contact: 215-204-2296)

Dr. Jacqueline Leonard (contact: 215-514-1563)

Department: College of Education: Mathematics/Science Education

Institution: Temple University

Street Address: 1301 Cecil B. Moore Avenue

City: Philadelphia State: Pennsylvania 209

Zip code: 19122

Investigator: (267) 516-6031

Primary Investigator: Office: 215-204-2296

This form will be placed in my records and the person(s) named above will keep a copy. A copy will be given to me.

Please print

Subject's Name: ____________________________________

Date:____

Address:

____

____

Phone: ____

Subject's Signature:

____

(Or Signature of Parent or legally responsible person if subject is a minor.)

Relationship to subject:

____

Witness Signature and
Date____

College of Education
TEMPLE UNIVERSITY®

Curriculum Instruction and Technology in Education- CITE phone 215- 204-2117/8377

1301 Cecil B. Moore Ave. Fax 215-204-1414

361 Ritter Hall email: www.temple.edu

Philadelphia, PA 19122

APPENDIX H

PERMISSION TO PHOTOGRAPH

Investigator: LaVarr Dixon (267-516-6031)

Department: College of Education/ Mathematics Education C.I.T.E. (Curriculum, Instruction, and Technology in Education

Project Title: Life Beyond the Cemetery: The Mathematical Identity and Academic Achievement of Traditionally Underrepresented Male AVID Participants in an Urban Pilot Program

Primary Investigators/Advisors: Dr. Michael Smith (contact: 215-204-2296)

Dr. Jacqueline Leonard (contact: (215-514-1563)

Subject: ______________________________ Date: ______________________________

Log #: ______________________________

I give permission__________________________ to photograph me. This (these) photograph(s) will be used only for the following purposes:

EDUCATION

This (these) photograph(s) may be shown to education professionals outside of for educational purposes. At no time will my name be used.

RESEARCH

This audiotape will be used as a part of a research project at Temple University. I have already given written consent for my participation in this research project. At no time will my name be used.

Description:

WHEN WILL I BE PHOTOGRAPHED?

I agree to be photographed during the time period:

From _______________ to ____________________

HOW LONG WILL THE PHOTOGRAPHS BE USED?

I give my permission for this (these) photograph(s) to be used

From _________________to ___________________

*The data collected for the purposes of this research study, including any and all audiotapes, will be stored for three (3) years after completion of the study.

WHAT IF I CHANGE MY MIND?

I understand that I can withdraw my permission at any time. Upon my request, the photograph(s) will no longer be used. This will not affect my relationship with _______________ in any way.

OTHER

I understand that I will not be paid for being photographed or for the use of the photograph(s).

FOR FURTHER INFORMATION

If I want more information about the audiotape(s), or if I have questions or concerns of at any time, I can contact:

Investigator: LaVarr Dixon (267-516-6031)

Department: Temple University, College of Education/Mathematics C.I.T.E.

Primary Investigators/Advisors: Dr. Michael Smith (contact: 215-204-2296)

Dr. Jacqueline Leonard (contact: 215-514-1563)

Institution: Temple University

Street Address: 1301 Cecil B. Moore Avenue

City: Philadelphia   State: Pennsylvania 209

Zip code: 19122

Investigator: (267) 516-6031

Primary Investigator: Office: 215-204-2296

This form will be placed in my records and the person(s) named above will keep a copy. A copy will be given to me.

Title: Life Beyond the Cemetery: The Mathematical Identity and Academic Achievement of Traditionally Underrepresented Male AVID Participants in an Urban Pilot Program

Please print

Subject's Name: ____________________________________

Date: ____

Address:

____

____

Phone: ____

Subject's Signature:

____

(Or Signature of Parent or legally responsible person if subject is a minor.)

Relationship to subject:

____

Witness Signature and Date____

College of Education
TEMPLE UNIVERSITY®

Curriculum Instruction and Technology in Education- CITE phone 215- 204-2117/8377

1301 Cecil B. Moore Ave. Fax 215-204-1414

361 Ritter Hall email: www.temple.edu

Philadelphia, PA 19122

APPENDIX I

CONSENT FORM FOR PARENTS OF STUDENTS UNDER THE AGE OF 18

Project Title: Life beyond the cemetery: The Mathematical Identity and Academic Achievement of Traditionally Underrepresented Male AVID Participants in an Urban Pilot Program

Investigator: LaVarr Dixon (267-516-6031)

Affiliation: Temple University, College of Education/Mathematics C.I.T.E.

Primary Investigators/Advisors: Dr. Michael Smith (contact: 215-204-2296)

Dr. Jacqueline Leonard (contact: 215-514-1563)

Dear Participants:

My name is LaVarr Dixon and I am currently enrolled in a doctoral program at Temple University, pursuant of an Ed. D. in Mathematics Education. My dissertation study seeks to investigate the mathematical identity of young men identified as traditionally under-served who participated in a pilot college access program while enrolled in an urban middle school. My advisors, Dr. Smith, Dr. Leonard, and I would like to obtain permission interview your child as a participant in a study based on student participation in an AVID program in a middle school program in an urban setting.

Student participants would be asked to interview three times for approximately sixty minutes. Interviews would be conducted at your convenience, but would never be conducted during instructional time. Interviews would be conducted after school or on weekends. Your child's name will never be used as a part of this study. I hope that participation in this study will be a fruitful experience for you and highlights the mathematical and academic achievement of AVID students. My interest in this study is to find out what factors influenced your child's achievement in mathematics and school, in general. This information would help to inform the importance of college access programs to foster greater mathematical and academic achievement among under-served populations.

There are no foreseeable risks to participating in this study. All information you provide is solely for the purposes of this study. Additionally, all information will be maintained in a secure area for a period of three years. Your real name will never be used. Your participation is greatly appreciated and is completely voluntary. You may opt out of the study for any reason, or at any time without prejudice or penalty. Your choice to participate or not to participate will have no impact on grades or status in school.

If you have any questions regarding any aspect of this study, please feel free to contact me via telephone (267) 516-6031 or via email: tub83678@temple.edu, or my advisors, Dr. Smith (215) 204-2296, Dr. Leonard (215) 514-1563. Thank you in advance for your participation. Your contribution to this project will provide valuable data needed to better understand mathematical and academic achievement of young men who have been identified as under-served in an urban, middle school pilot college access program.

I, ________________________, have read and understand the above consent form in its entirety and voluntarily agree to participate in this study. I further understand that no compensation is associated with participation in this study. I assert that I am over the age of eighteen (18).

For questions about my rights as a research subject, I may contact the Institutional Review Board Coordinator at (215) 707-3390. The IRB Coordinator may also be reached by email: irb@temple.edu or regular mail:

Institutional Review Board Coordinator
Temple University Research Administration
Student Faculty Conference Center
3340 North Broad Street – Suite 304
Philadelphia, PA 19140

Signing your name below indicates that you have read and understand the contents of this Consent Form and that you agree to have your child participate in this study.

Parent or Guardian Name (please print)____

Parent or Guardian Signature and Date ____

____

Investigator's signature____

Curriculum Instruction and Technology in Education- CITE phone 215- 204-2117/8377

1301 Cecil B. Moore Ave. Fax 215-204-1414

361 Ritter Hall email: www.temple.edu

Philadelphia, PA 19122

APPENDIX J

ASSENT FORM FOR STUDENTS UNDER THE AGE OF 18

Project Title: Life beyond the cemetery: The Mathematical Identity and Academic Achievement of Traditionally Underrepresented Male AVID Participants in an Urban Pilot Program

Investigator: LaVarr Dixon (267-516-6031)

Affiliation: Temple University, College of Education/Mathematics C.I.T.E.

Primary Investigators/Advisors: Dr. Michael Smith (contact: 215-204-2296)

Dr. Jacqueline Leonard (contact: 215-514-1563)

Dear Participants:

My name is LaVarr Dixon and I am currently enrolled in a doctoral program at Temple University, pursuant of an Ed. D. in Mathematics Education. My dissertation study seeks to investigate the mathematical identity of young men identified as traditionally underserved who participated in an AVID program in a pilot middle school program. My advisors, Dr. Smith, Dr. Leonard, and I would like the opportunity to interview you as a participant in a study based on your participation in an AVID program in a middle school.

Student participants would be asked to interview three times for approximately sixty minutes. Interviews would be conducted at your convenience, but would never be conducted during instructional time. Interviews would be conducted after school or on weekends. Your name will never be used as a part of this study. I hope that participation in this study will be a fruitful experience for you and highlights your mathematical identity and academic achievement. My interest in this study is to find out what factors influenced your achievement in mathematics and school, in general. This information would help to inform the importance of college access programs to foster greater mathematical and academic achievement among underserved populations.

There are no foreseeable risks to participating in this study. All information you provide is solely for the purposes of this study. Additionally, all information will be maintained in a secure area for a period of three years. Your real name will never be used. Your participation is greatly appreciated and is completely voluntary. You may opt out of the study for any reason, or at any time without prejudice or penalty. Your choice to participate or not to participate will have no impact on grades or status in school.

If you have any questions regarding any aspect of this study, please feel free to contact me via telephone (267) 516-6031 or via email: tub83678@temple.edu, or my advisors, Dr. Smith (215) 204-2296, Dr. Leonard (215) 514-1563. Thank you in advance for your participation. Your contribution to this project will provide valuable data needed to better understand mathematical and academic achievement of young men who have been identified as under-served in an urban, middle school pilot college access program.

I, ________________________, have read and understand the above consent form in its entirety and voluntarily agree to participate in this study. I further understand that no monetary compensation is associated with participation in this study. I assert that I am over the age of eighteen (18).

For questions about my rights as a research subject, I may contact the Institutional Review Board Coordinator at (215) 707-3390. The IRB Coordinator may also be reached by email: irb@temple.edu or regular mail:

Institutional Review Board Coordinator
Temple University Research Administration
Student Faculty Conference Center
3340 North Broad Street – Suite 304
Philadelphia, PA 19140

Signing your name below indicates that you have read and understand the contents of this Consent Form and that you agree to have your child participate in this study.

Parent or Guardian Name (please print)____

Parent or Guardian Signature and Date ____

____

Investigator's signature____