

## ABSTRACT

NEARS, KENNARD. The Achievement Gap: Effects of a Resilience-Based After School Program on Indicators of Academic Achievement. (Under the direction of Sylvia Nassar-McMillan PhD and Edwin Gerler Jr. PhD.)

The present study examined the Wake County Super Opportunities with After-School Resources (SOAR) after-school program to determine its effectiveness concerning students' academic success. One thousand two hundred and four SOAR participants, including those students who were asked to attend, but did not, and 18,407 Wake County students who had not attended SOAR participated in the study using their End of Course (EOC) actual and expected scores. It was hypothesized that: (1) students involved with the SOAR after-school program would perform significantly better than students not involved with the program; (2) greater attendance in the SOAR after-school program would produce significant gains in academic achievement; (3) African American students involved in the SOAR program would perform significantly better than African American students in the same school district (Wake County) not involved in SOAR; and (4) African Americans students involved in the SOAR program would perform significantly better than European Americans students in the same school district (Wake County) not involved in SOAR. All hypotheses were supported. Participants in the SOAR program significantly outperformed students not involved in the program or attended once; students who attended ten or more times in the SOAR program significantly outperformed students who attended less than ten times. African Americans in the SOAR program who attended ten or more times, significantly outperformed European Americans in the SOAR program who attended ten or more times and African Americans and European Americans in Wake County not involved in SOAR. African Americans in SOAR did not outperform European Americans participating in SOAR when the entire sample was analyzed. This suggests that the group affect was greater for

African Americans. The present study provides evidence that a well-designed after-school program, which focuses on increasing students' resiliency by building their academic skills, their sense of belonging, their sense of usefulness, and their personal potency can close the achievement gap between African Americans and European Americans and can yield positive results for all students involved in the after-school program.

The achievement gap: effects of a resilience-based after school  
program on indicators of academic achievement

By

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## **DEDICATION**

I would like to dedicate this accomplishment to my mother, Silver Lee Nears (June 29, 1928 to June 5, 2003) who always supported me and provided unconditional love. My father Ben Nears Jr. who was my role model throughout life, who taught me the value of hard work; and to my beautiful daughter Keeauna, who inspired me and kept me balanced.

## **BIOGRAPHY**

Kennard Nears was born in Berkeley California. At the age of sixteen, Kennard graduated from high school and was accepted into a land surveying program. After graduating from the land surveying program, he was one of the first African-Americans accepted into the Operating Engineers as an apprentice land surveyor in San Jose, California. Kennard's experiences also include working for the California Department of Transportation (Caltrans) as a civil engineer. While working for Caltrans, Kennard was elected section President (Fresno), then section Director (Fresno) in his union, "The Professional Engineers in California Government" (PECG). Kennard testified before the California legislature on union issues and conducted several television news interviews in Fresno and Sacramento. He was in charge of conducting section meetings representing more than 400 civil engineers locally and more than 10,000 civil engineers Statewide. Kennard sat on the board of directors and on a four-member appropriation committee within the union, a committee that was in charge of a two million-dollar a year appropriation fund. He chaired interviewing panels at the State level, conducted interviews for Senior Civil Engineers, Secretaries, and Highway Patrol Officers for job placement and promotions. Also while working at Caltrans, he served as chairperson for the Black Advisory Committee and started a mentoring program for minorities at the middle-school level in Fresno. Kennard was in charge of setting up scholarships for those students in need, and recruiting minorities in an attempt to reach parity within the State of California Government. While mentoring, he decided to go back to school to pursue his passion, working and counseling with children in need. After returning to college, Kennard was accepted into the Ronald E. McNair Post-Baccalaureate Achievement Program. Admission into this program was highly competitive. Its purpose was to encourage promising college students to pursue doctoral study through participation in an

extensive yearlong program. In October of 1998, Kennard received the McNair Director's Award. Each year the McNair Program Director selects one McNair scholar to receive the Director's Award. This award acknowledges the outstanding work the scholar has done while participating in the yearlong McNair Program. The award goes to the scholar who exceeds expectations for performance in the McNair program, who exhibits leadership qualities and collegially demonstrates the greatest degree of academic and personal growth, from the program orientation to submission of the final research paper. In addition to receiving the Ronald E. McNair director's award, he was awarded In March of 1999, the "Outstanding Student Achiever's" award by Kappa Alpha Psi Fraternity at California State University, Fresno. This award was given for outstanding academic achievement in the field of psychology, as well as continuous support of his campus community. In 1999, Kennard was awarded the "Pickford Scholarship" for outstanding achievement and scholarship. In 1999, he was also awarded the "Sally Casanova Pre-Doctoral scholarship" and was provided with funds to visit graduate schools around the country. Kennard began his graduate studies at North Carolina State University in August 2000. During his graduate studies, Kennard volunteered as a Guardian at Litem with Wake County of North Carolina, volunteered with the American Red Cross, serving during the Katrina and other disasters and served as a foster Parent helping at-risk youth.

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First, I want to give thanks to God, our father, for His many blessings; and pray that our Lord, eradicate from all living beings, disease, poverty, illness, starvation, and war; instead replace it with prosperity, abundance, wellness, healing and peace. Give direction and strength to our world leaders for the highest good of all living beings and the earth. To all the children of the world, give strength, protection and guidance; and to the starving children, nutritious food, love and healing. Let God's Will be done, not mine, man's or anyone else. Give me O Lord, I pray Thee firm faith, unwavering hope perfect charity. Pour into my heart the Spirit of wisdom and understanding; the Spirit of counsel and spiritual strength; the Spirit of knowledge and true godliness. Bless all schools, colleges, and universities, especially North Carolina State University, that they may be lively centers for sound learning, new discovery, and the pursuit of wisdom; and grant that those who teach and those who learn may find you to be the source of all truth. Bestow on us, O Lord, a genial spirit and unwearied forbearance; a mild, loving, patient, heart; kindly looks, pleasant cordial speech, and manners in the exchange of daily life; that I may give offence to none, but as much as in lies live in charity with all men. Lord, make us instruments of your peace. Where there is hatred, let us sow love; where there is injury, pardon; where there is discord, union; where there is doubt, faith; where there is despair, hope; where there is darkness, light; where there is sadness, joy. Grant that we may not so much seek to be consoled as to console; to be understood as to understand; to be loved as to love. For it is in giving that we receive. I also would like to thank my committee members, Sylvia Nassar-McMillan Co-chairperson, Dr. Edwin Gerler Jr. Co-chairperson, Dr. Stanley Baker committee member, and Dr. Mary Haskett committee member, for their encouragement and support. Your understanding and commitment is greatly appreciated. A special thanks to Dr. Nassar-McMillan

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## CHAPTER I: INTRODUCTION

The achievement gap can be defined as the difference in academic performance between ethnic groups; it is one of the most significant problems facing educators, researchers, and society today (U.S. Department of Education, 2003). The effects of the achievement gap can last throughout an individual's lifetime. The cycle begins with dropping out of high school. For example, those students who dropout of school find it difficult to obtain employment, and when they do obtain employment, those jobs are usually the lowest paid and least desirable jobs in American society (U.S. Department of Education, 2003). Most of these low-wage positions do not offer health care for their employees, leaving many employees and their families without adequate medical care. These low-wage jobs also force many individuals and families to live in poverty. In addition, neighborhoods that have the highest crime rate, also have the highest concentration of families living at or below the poverty level (U.S. Department of Education, 2003). Thus, the achievement gap can manifest in greater high school dropout rates within at-risk groups, along with diminished outlooks for employment, poorer health, and higher crime rates.

For the 3.7 million kindergarteners entering school in 2004, race and the additional risk factors of poverty, parents without a high school diploma or GED, and single parent households were the leading predictors of school success, college entry, earning capacity, and social status (National Center for Education Statistics, 2004). Risk factors are defined as psychological or environmental issues that harm or increase the risk to a child's normal development. Protective factors, conversely, are psychological or environmental factors that reduce the risk or harm to a child's normal development (Masten & Reed, 2002). As the number of risk factors increases, students experience smaller gains and an increased achievement gap in both math and reading;



math and reading scores are the primary indicators of a student's academic success (National Center for Education Statistics, 2004).

### *Purpose of the Study*

Research has indicated that comprehensive after-school programs which enhance protective factors and reduce risk factors and are integrated into the regular school program and family and community support systems can yield positive outcomes for at-risk students and their families (Caplan & McElvain, 2003). After-school programs can increase learning via activities linked to school goals through promoting skills needed to succeed academically (National Institute on Out-of-School Time, 2002). After-school programs also play a role in promoting personal assets and ensuring that students have skills in problem solving, analysis, and higher-order thinking (National Research Council, 2003).

Studies have examined the benefits of after-school programs in several domains. Examples include counseling programs' contributions in helping high risk middle school students promote healthy identity and adaptive personal choice behavior (Kruczek, Alexander, & Harris, 2005); preventing violence among urban girls in the U.S. (Molnar, Roberts, Browne, Gardener, & Stephen, 2005); raising reading and math GPA's for at-risk tutored students (Zuelke, & Nelson, 2001); helping improve homework skills (Cosden, Morrison, Albanese, & Macias, 2001); helping at-risk children bond and reduce risk (O'Donnell, Michalak, & Ames, 1997); and promoting self-esteem in school age children (Berman, Winkleby, Chesterman, & Boyce, 1992). A study conducted by Pierce and Shields (1998) examined a community based after-school program designed to build resilience in at-risk youth to withstand pressure from peers and their community related to substance abuse. Their researchers found that children who participated in the program scored higher than the comparison group on twelve of sixteen

resilience measures. This study examined resilience in students, but did not examine if resilience transferred to academic success.

There may be other benefits of an after-school program, for example, reducing high-risk behaviors such as sexual activity, substance abuse, and school suspensions and expulsions. Many at-risk students are not supervised during the hours between 2 p.m. to 6 p.m. Cohen et al. (2002) conducted a study in six public high schools, with 1065 boys and 969 girls from a school-based Sexually Transmitted Disease (STD) screening program. They found 56 percent of the students reported being home without an adult for more than four hours a day after school. Among the participants who had reported having sexual intercourse, 91 percent reported that the last time they had had sex it was been in a home setting, either their own home, their partner's or a friend's. Students who were unsupervised more than 30 hours per week were more likely to be sexually active than those who were unsupervised five hours or less a week. In addition, participants with the greater amount of unsupervised time had the highest number of lifetime sex partners. Among female participants, sexual activity was associated with nonparticipation in after-school programs, and boys who were unsupervised five or more hours per week were more than twice as likely to have gonorrhea or Chlamydia infections than boys unsupervised for five hours or less (Cohen, et al. 2002).

There are many studies on after-school programs. No studies, however, have examined an after-school program that is supported and run by the students' own school district, employs outcome measures used to assess student promotion, examines whether after-school attendance improves test scores both on standardized tests and within student's' core subjects, and attempts to close that achievement gap between European Americans and African Americans by building student's resilience. The present study has attempted to fill this gap in the literature. In the

present study, at-risk is defined by race (African Americans), low social economic status (as indicated by free and reduced lunch), and low academic performance (as reflected in EOC scores).

The purpose of the present study was to examine whether a comprehensive after-school program developed to enhance participants' resilience, promote cohesiveness between the community and the schools, and promote parental involvement, would improve at-risk and African Americans students' scores on standardized tests used to assess students in core subjects and determine student advancements, and thus close the achievement gap between African American students and European American students. Due to the small number of participants in the SOAR program, Hispanic, Asians, and Multiracial students were not compared in the present study.

### *Statement of the Problem*

As mentioned earlier, the achievement gap can affect African Americans and other at-risk students' dropout rate, employment outlook, income level, health, and whether or not they live in a high crime environment. In American society, those who do well educationally obtain higher wages, have more stable employment, receive better employee benefits, enjoy better health, and live in safer environments than do those who do not do as well educationally. The achievement gap places one racial group at the top of society socially and economically and other groups at or near the bottom. This has a direct effect on school dropout rates, employment outlooks, health status, and exposure to crime.

*Dropout rates.* Dropout rates include students aged 16 to 24 who are not enrolled in school and have not completed a high school diploma or equivalent. About 10 percent of the 3.8 million students enrolled in high school in October 2003 left before October 2004 without

completing their high school program (Dropout Rate in the United States, 2004). In 2004, Asian/Pacific Islander students had the lowest dropout rate of all racial groups, at 3.8 percent, as compared to 27.8 percent for Hispanics, 13.1 percent for African Americans, and 6.9 percent for European Americans (Dropout Rate in the United States, 2004). Between October 2003 and October 2004, students from low-income families dropped out of school at six times the rate of students from high-income families, low-income families displayed a dropout rate of 10 percent, while high-income families showed a dropout rate of 1.6 percent, with students from middle-income families dropping out at a rate of 5.9 percent (The Condition of Education 2002).

Students who dropout of school are unlikely to have the minimum skills and credentials to function successfully in an increasingly complex society. A high school diploma is required for post secondary education as well as for most jobs. High school dropouts are more likely than those who complete high school to be unemployed (The Condition of Education 2002). Studies have shown that they are also more likely to live in poverty and receive public assistance (The Condition of Education 2002). High school dropouts, moreover, are likely to stay on public assistance longer than those with a high school diploma, and they are more likely to be involved in criminal activity (The Condition of Education 2002).

The importance of a high school diploma, furthermore, has increased significantly over the past half century in our society. During the 1950s, a high school diploma, while an asset in the labor force, was only held by 50 percent of the population aged 25 to 29 (Dropout Rate in the United States, 2004). By the 1970s, approximately 83 percent of the population ages 18 through 24 had a high school diploma. A high school diploma has come to serve as a key entryway to a number of career paths. Technological advances have increased the demand for skilled labor, and

a high school diploma today represents a minimum requirement to enter the work force (Dropout Rate in the United States, 2004).

There are a number of negative outcomes correlated with dropping out of school . For example, the median yearly income in 2003 for a high school dropout aged 18 or older was \$12,184, while the median income of those who completed high school was \$20,483. High school dropouts are more likely to be unemployed. In addition, regardless of income, dropouts 24 years and older reported being in worse health than those who had completed high school. A disproportionate number of high school dropouts are also in prison and on death row (Dropout Rate in the United States, 2004).

*Employment outlook.* According to The Employment Policy Foundation, over a ten-year period, from March 1993 to March 2003, employment of persons age 25 to 64 with master's degrees or higher increased by more than 3.2 million. On the other hand, employment of persons age 25 to 64 with no more than a high school diploma increased by fewer than 460,000. The National Center for Educational Statistics states that all full time earners aged 25-34 with less than a bachelor's degree had lower annual earning in 2002. Additionally, the average unemployment rate for high school dropouts in 2003 was almost three times higher than the rate for college graduates (8.8% compared to 3.1%) and more than 1.5 times higher than the unemployment rate for non-college graduates with high school diplomas (8.8 % compared to 5.5 %; Bureau of Labor Statistics, 2004). In addition, the 2000 U.S. Census reported that the unemployment rate for African Americans 16 years or older currently looking for employment was 15 percent, three times that for European Americans, at 5 percent (U.S. Census Bureau, 2000). This employment gap may actually be much wider than reported, since many African

Americans may simply give up on looking for employment, a possibility not included in these statistics.

*Health.* The National Center for Health Statistics survey people annually about their health and has found health and education to be positively correlated, independent of income and age. The more educated a person, the more likely it is that that person will report he or she is in excellent or good health. In 2001, 78 percent of adults age 25 and older who have a bachelor's degree or higher reported being in excellent or good health, as compared to 66 percent with some education above high school, 56 percent of high school completers, and 39 percent of those with less than a high school completion (National Center for Health Statistics, 2001).

*Crime.* In December 2003, 2,085,620 prisoners were held in federal and state prisons (1 out of 142 United States residents). Forty four percent of all inmates were African Americans compared to 19 percent of Hispanics, and 35 percent of European Americans inmates (Bureau of Statistics Bulletin; Prisoners in 2003). The U.S. Department of Justice also estimated that 12 percent of African American males in their 20s and early 30s were in jail in 2003, as compared to 1.6 percent of European American males in the same age group. In 2000, the Census Bureau reported that the overall U.S. population was 281,421,906, with an estimated 3.3 percent increase in the year 2003 (290,809,777). The population was 75.1 percent European American, 12.3 percent African American, 12.5 percent Hispanic, 3.6 percent Asian, and 0.9 percent American Indian (U.S. Census Bureau, 2000). (Percentages do not add up to 100 percent due to rounding and because Hispanics may be of many races and are therefore counted under more than one category.)

*Poverty.* As mentioned earlier, students who drop out of school or do not perform well academically have a tough time obtaining adequate employment. When they do find

employment, their wages are usually at or near minimum wage, which is at or below the federal poverty level. These low wages can last throughout an individuals' lifetime, therefore, as parents they will also raise their children in poverty. One of the most salient risk factors to academic success is poverty. Poor children are likely to have inadequate health care and nutrition, possess fewer educational resources in the home and neighborhood, move frequently, have less educated parents, and are more likely to reside in single parent homes. Poor children are also more likely to be taught by under-qualified teachers. The affects of poverty, moreover, can last for generations, even after one breaks the cycle (U.S. Department of Education, 2003).

In 2000-2001, 822,000 children entered prekindergarten. Of these, 81 percent of European American students attended public schools where there was a low percentage of students at or below the federal poverty level, as compared with 4 to 8 percent of African Americans and Hispanic students. Also, only 20 percent of European American students attended schools where there was a high percentage of students at or below the federal poverty level, as compared to 36 and 39 percent of African American and Hispanic students, respectively. (National Center for Educational Statistics, 2004).

Schools with a high percentage of students on free and reduced lunch are statistically more likely to be low performing schools. Free and reduced lunch provides a proxy for low-income status and is an indicator of the percentage of students at or below the poverty level. Seventy percent of African American fourth grade students and 71 percent of fourth grade Hispanic students were eligible for free and reduced lunch in 2003, as compared to 21 percent of fourth grade European American (The Condition of Education, 2004). In correlation with being from low-income families, African Americans and Hispanic students were more likely to live in concentrated high poverty neighborhoods and schools. Minority students were also more likely

to attend school with a high minority enrollment. For example, 38 percent of African American fourth graders and 39 percent of Hispanic fourth graders attended schools where at least 90 percent of the students were minorities (National Center for Educational Statistics, 2004).

### *Possible Causes of the Achievement Gap*

Researchers have identified several possible causes of the achievement gap. These causes include poverty, non-academically resilient at-risk children, low academic performing students, low parent involvement, low teacher quality and expectations, and low parent expectations (U.S. Department of Education, 2003). Studies have demonstrated that at-risk students with low academic resilience perform poorly in school throughout their academic career. Other studies have demonstrated that low performing students, teacher expectations, parent involvement and parent expectation have an effect of students' success.

*Non-academically resilient at-risk children.* Academic resilience can be defined as the likelihood of academic success despite adversity in the form of early traits, poor environmental conditions, and negative experiences (Wang, Haertal, & Walberg, 1994). Academically resilient students, in other words, are those who demonstrate a high level of performance and achievement motivation despite the presence of stressful events that place them at risk for performing poorly in school and dropping out (Alva, 1991)

Entwisle and Alexander (1988) found that African American children not only received lower grades in the first grade than European American children, but also that these low grades were more likely to persist for African American students throughout their academic career. Blair, Blair, and Madamba (1999) found that children with low social economic status (SES) performed worse than expected and children with high SES performed better than expected. Research has demonstrated that students performing poorly in elementary school tend to



continue to perform poorly through high school. However, not all children who begin their school career with poor achievement remain on that trajectory; some children who were initially low achievers seem to change trajectories, turning their academic achievement around. These children can be considered academically resilient (Catterall, 1998). In contrast, students with low academic resilience are at risk for failing courses, dropping out of school, and exhibiting behavioral problems.

*Low academic performing students.* A large portion of students who do not perform well in school do not benefit from classroom interventions. For example, in one study, students were selected for an intervention based on economic disadvantage and scores below the 18<sup>th</sup> percentile on a literacy survey. After one year of intensive instruction, approximately 30 percent of the students did not score over the 30<sup>th</sup> percentile on a standard reading exam (Foorman et al, 1997). Another study found that 30 percent of children in kindergarten performing below the 16<sup>th</sup> percentile in phonological abilities did not reduce their risk level after 2 years and 340 hours of code-oriented interventions (Torgense, 2000). Evidence from prior research has indicated that there is a group of students whose needs are not met by traditional classroom interventions. These students are also at risk for low self-esteem, low self-efficacy, and low internal locus of control.

*Low parent involvement.* Research has demonstrated that parents play an integral role in assisting student learning. Student learning increases when parents are invited into the process by helping at home. Enlisting parents' involvement provides educators and administrators with a valuable support system, creating a team that is working for each child's success. The vast majority of parents are willing to assist their students in learning, but many times they are not sure what assistance is most helpful and appropriate (San Diego County, Office of Education,

2003). Helping parents connect to their children's learning enables parents to communicate in powerful ways that they value what their children achieve. Whether it's working together on a computer, displaying student work at home, or responding to a particular class assignment, parents' actions communicate to their children that education is important (Shortt & Wellesley, 2002).

Studies have shown that schools where parents are involved in decision-making and advocacy have higher levels of student achievement and greater public support (Shortt & Wellesley, 2002). Effective partnerships develop when each partner is respected and empowered to participate fully in the decision-making process. Schools and programs that actively enlist parent participation and input communicate that parents are valued as full partners in the educating of their children. The positive impact of parent involvement is well documented. Research also indicates that children benefit from parental involvement in the following ways: better grades and test scores, better attendance, higher homework completion rates, higher graduation rates, greater involvement in extra-curricular activities, more positive attitudes and better all-round behavior (Garrett, 2000).

The San Diego (Calif.) County Education Department offers the results of a number of studies that examine the relationship between parent involvement and student achievement. Among other things, the research showed that one of the most accurate predictor of a student's achievement in school is not income or social status, but the extent to which that student's family is able to participate (San Diego County, Office of Education, 2003). The Impact of School, Family, and Community Connections on Student Achievement (a synthesis of 51 studies about the impact of family and community involvement on student achievement) found that students with involved parents, "no matter what their income or background," were more likely to

succeed in school, attending school regularly, earning higher grades, passing their classes, and graduating and going on to postsecondary education (The Condition of Education, 2004).

Research as shown that decreased parent involvement can have a negative effect on children's cognitive functioning and academic performance. For example, children with low parent involvement have been found to score lower than other children on measures of academic achievement and cognitive abilities, and are more likely to drop out of school (Sandefur, & Wells, 1999).

*Teacher quality and expectations.* In 1999-2000, high poverty and high minority public schools were more likely to employ out-of-field teachers in science, English and mathematics than their peers in low minority and low poverty schools (The Condition of Education, 2004). Many researchers and educators hypothesize that teachers' subject matter knowledge is directly associated with learning in the classroom. These researchers have found that students learn more from teachers who majored in mathematics, English and science than from teachers who did not (The Condition of Education, 2004).

Research shows that teacher expectations also affect students' achievement and performance. Studies demonstrate that teachers behave differently toward various students. This treatment tells the student how he or she is supposed to behave and perform academically in the classroom. If the teacher's behavior remains consistent over time, students are likely to conform to the teacher's expectations. Teachers' high expectations of their students contributes to students achieving at or near their potential, while students receiving low expectations will not gain as much as they could have if taught differently (Good, 1987). Numerous factors can lead teachers to hold different expectations of their students, including race.

Students from minority ethnic groups are sometimes viewed as less capable than European American students (Baksh & Martin, 1984). The various types of differential treatment from teachers may include: giving low expectation students less time to learn new material; providing inappropriate reinforcement; giving low-expectation students more criticism and less praise than high expectation students; paying less attention to low expectation students; seating low-expectation students further from the teacher; conducting less friendly responses and feedback to low expectation students (e.g., including less smiling, positive head nodding, forward leaning, and eye contact); and asking high expectation students more stimulating and cognitively higher level questions than low expectation students (Good & Brophy, 1984).

*Parent expectations.* Parents' expectations of their children's academic performance are positively correlated with school performance (Amato & Ochiltree, 1986). Parent expectations may also have an effect on their child's academic performance through such parental behaviors as contact with the school, along with positive reinforcement of schoolwork and performance (Seginer, 1986). Steinberg, Dornbusch, and Brown (1992) found ethnic differences in students' beliefs about the consequences of school failure. Asian American and European American students believed a bad education would have negative effects on finding a good job; African-American and Hispanic students predicted fewer negative consequences of a bad education. Although all students reported that their parents valued education, African-American and Hispanic students devoted less time to homework, perceived their parents as having lower standards for them, and were less likely to believe academic success comes from working hard (Steinberg, Dornbusch, & Brown, 1992).

*The Achievement Gap*

As mentioned earlier, the achievement gap can be defined as the difference in academic performance between ethnic groups. It is one of the most significant problems facing educators, researchers, and society today. A study of the kindergarten class of 1998-99 revealed that African American students had lower mean achievement scores in both reading and math than any other racial group at the start of kindergarten. These achievement gaps grew wider from the beginning of kindergarten to the end of third grade. African American students demonstrated smaller gains in reading and math than European American, Hispanic, and Asian/Pacific Islander students, and families with risk factors had lower achievement scores than their peers with fewer risk factors (National Center for Education Statistics, 2004). In 2002, European Americans and Asian/Pacific Islanders outperformed American Indian, Hispanics, and African Americans in writing, reading and math, while American Indian and Hispanics outperformed African Americans in grades 4, 8, and 12. For both reading and math scores, the number of books in the home and the level of parent education correlated positively with on students' academic performance; free and reduced lunch had a negative correlation (National Center for Educational Statistics, 2004).

Although all racial groups in North Carolina have improved their academic scores over the past several years, there remains an achievement gap between European Americans, African Americans, Hispanics, and Native Americans. The drop-out rate, disciplinary rate, percentage of students in Behavioral-Emotional Disabled (BED) classes, percentage of students in Educable-Mentally Disabled (EMD) classes, and the percentage of students in academically gifted classes are especially disproportionate between African American and European American students (North Carolina Justice and Community Development Center, 2000).

In the State of North Carolina, the achievement gap between European Americans and African Americans is 25.5 points on reading performance and 57.9 points on math performance. Seventy-nine percent of European American students are performing at grade level in both reading and math, compared to 48 percent of the African American students (North Carolina Justice and Community Development Center, 2000). There is also an enormous gap between European Americans and African Americans in Scholastic Achievement Test (SAT) scores. SAT scores are important indicators of college acceptance. In 1999, the mean SAT scores for European Americans were 1031 compared to 837 for African Americans, a 194-point gap (North Carolina Justice and Community Development Center, 2000).

In Wake County, North Carolina, the achievement gap between European Americans and African Americans is 30.9 points on reading performance and 30.8 points on math performance. In addition, 79 percent of European American students are performing at grade level both in reading and math compared to 49 percent of African Americans (State Board of Education Department of Public Instruction, 2004). There is also a disproportionate rate for African Americans in the number of dropouts (43%), suspensions (61%), those placed in BED classes (65%), those placed in EMD classes (68%), and those placed in academically gifted classes (6%) (North Carolina Justice and Community Development Center, 2000). The State Board of Education and the Department of Public Instruction (2004) (DPI) reported that there has been an overall improvement among End of Grade (EOG) and End of Course (EOC) scores for all students over the past several years; yet there remains an obvious gap between European Americans and minority students. North Carolina schools are, incidentally, becoming increasingly diverse: by the year 2010, 40 percent of the student body will be comprised of minorities

In an attempt to solve the achievement gap problem, President George Bush promoted the No Child Left Behind initiative. The 21st Century Community Learning Centers Program (21st CCLC) is a key component of the No Child Left Behind Act. The 21st CCLC was established by Congress and is overseen by the U.S. Department of Education to award grants to rural and inner-city schools for new or expanding programs that benefit the educational, health, social services, cultural and recreational needs of the community. The No Child Left Behind Act promotes expanded academic enrichment opportunities for children attending low-performing schools (U.S. Department of Education, 2003). The initiative puts a special emphasis on implementing educational programs and practices that have been clearly demonstrated to be effective through rigorous scientific research.

#### *Definition of Terms*

The following list provides working definitions of the key terms used in the present study:

- (a) The achievement gap: the difference in academic performance between ethnic groups
- (b) At risk: possessing the risk factors of race (African Americans), low social economic status (as defined by free and reduced lunch), or low academic performance (as defined by EOC scores)
- (c) African Americans: individuals of African descent who define themselves as African American, Black or Negro
- (d) European Americans: individuals of European descent who define themselves as European American, White, or Caucasian
- (e) Risk factors: psychological or environmental issues that increase the risk or harm to a child's normal development

(f) Protective factors: psychological or environmental factors that reduce the risk or harm to a child's normal development

(g) North Carolina End of Course Scores (NCEOC): standardized tests used in North Carolina to assess students' course knowledge of subject-related concepts and provide a global estimate of students' mastery of material in core subjects

(h) North Carolina End of Course expected scores: derived from formulas utilizing previous test scores

(i) Free and reduced: free and reduced lunch provides a proxy for low-income status and can be used to indicate the percentage of students at or below the poverty level

(j) Out of school time: any time children are not attending school during traditional school hours

(k) Federal poverty level: a measure of the poverty thresholds for administrative use, for example, in determining financial eligibility for certain federal programs; such thresholds are used mainly for statistical purposes, as in preparing estimates of the number of Americans living in poverty.

In Chapter 2, the author will discuss relevant research and theories related to resilience, self-efficacy and after-school programs used to enhance at-risk students academic success.

Chapter 3 is a discussion of the methods used to conduct the present research study, including research questions and hypotheses, description and analyses of participants, procedures used, data collections, and instruments used in this study. In Chapter 4, results of the analyses will be presented, and finally in Chapter 5, the author will present a discussion of the findings, limitations of the study, and suggestions for future research.



## CHAPTER II: REVIEW OF THE LITERATURE

Research has showed that enhancing children's academic resilience can increase the academic success of at-risk students. In addition, research has demonstrated that enhancing a student's self-efficacy also promotes academic success. Resilience and self-efficacy have been shown to represent different constructs, but they are highly correlated with one another. Research has demonstrated that a comprehensive after-school program developed to enhance participants' resilience and self-efficacy, and simultaneously promote cohesiveness between the community and the schools and increase parental involvement, could facilitate academic success.

### *Resilience*

In the early 1970s, studies of resilience emerged from research on children at risk for behavioral problems, academic failure, social problems and psychopathology. Researchers began to study children they believed to be at risk for serious problems because of life adversities such as environmental factors (e.g., poverty), biological heritage (e.g., parents with schizophrenia) and traumatic events (e.g., maltreatment). These researchers were astounded by the observation that some children developed quite well despite their high risk for psychopathology (Masten & Reed, 2002).

In the early publications of resilience research, successful children who were at high risk for developing psychopathology were referred to as resilient kids, super kids, invincible, invulnerable, stress-resilient, or resilient children. Early images of children who displayed resilience implied that there was something special or extraordinary about them. One of the first articles about resilient children was published in the *APA Monitor*, and described these children as invulnerable (Masten & Reed, 2002).

Further examples of the idea of the super kids could be found in the March 7, 1976 *Washington Post*, in an article titled, “Trouble: a Bubble to Some Kids,” and in a book review on resilience in inner-city children, titled “Super Kids of the Ghetto” (Masten, 2001, p. 227). Eventually, *resilience* became the most prominent term used by researchers to describe this phenomenon (Masten & Reed, 2002).

Current research has changed the perception of resilience. Resilience appears to be a common phenomenon, which results in an at-risk child operating at a basic level of human development and adaptation. If the normal development of a child is robust, and the child has good, normal protective factors in place, the risk for developmental problems may be reduced, even in the face of severe adversity and risk, particularly if the environmental risk factors such as maltreatment are not prolonged (Masten & Reed, 2002).

Children are not considered resilient if there has never been a significant threat to their development. In general, resilience is defined by a “good adaptation under extenuating circumstances and from a developmental perspective, meeting age salient developmental tasks in spite of serious threats to development” (Masten & Reed, 2002, p. 75). For example, a child is resilient to maltreatment if he or she displays competent functioning in certain areas despite past or present maltreatment (Heller, Larrieu, Imperio, & Boris, 1999). Cicchetti, Rogosch, Lynch, and Holt (1993) describe resilience as a child’s success in meeting societal expectations or performing developmental tasks. Others consider resilience to be the absence of psychopathology in a child.

Studies that examine resilience in children consider protective factors and risk factors. Protective factors are psychological or environmental factors that reduce the risk or harm to a child. Risk factors are psychological or environmental factors that increase the risk or harm to a

child. Often, protective and risk factors are examined on a continuum of the same variable. For example, intellectual skills can be either a risk factor or a protective factor, depending on whether they are effective or ineffective. Self-efficacy can also be a protective or risk factor, depending on whether the efficacy is strong or weak. Protective factors have been described in the literature can be divided into two categories: individual and environmental.

*Individual protective factors.* Individual protective characteristics include highly developed cognitive skills, average or above average IQ, positive responsiveness to others, alertness, enthusiasm, multiple interests, goal-setting behavior, high self-esteem, positive temperament, high self-efficacy, an internal locus of control, and well-developed interpersonal relationships. Academic individual protective factors include higher educational aspirations, high achieving academic performance, social competence, good physical health, effective problem solving abilities, and a positive view of the future (Heller et al., 1999).

*Environmental protective factors.* Environmental protective factors can also play a valuable and important role in helping at-risk children buffer the effects of severe adversity. In general, environmental protective factors include: having a caring, supportive relationship with a responsible adult; living in a stable home environment; living in a supportive community; having positive parent or caregiver involvement; living above the poverty line; growing up in a stable two parent home; and having other positive supportive role models. In addition, a feeling of safety and security, social support, positive relationships, and social connectiveness, can serve as environmental protective factors, buffering a child from life's adversities and challenges. Table 1 presents risk and protective factors based on location or context as presented in an article written by Nash and Fraser (1998).

**Table 1***Common Childhood Risk and Protective Factors.*

Location	Risk Factors	Protective Factors
City or community	Concentrated poverty	Robust economy
	Unemployment	Racial harmony
	High crime rate	Equal opportunity for employment, education, etc.
	Racial discrimination	
School	Inadequate funding	Strong teachers
	Crowded classrooms	Family/school partnerships
	Lack of security	Specialized curricula for problem-solving
	Unsafe facilities	Cross-age tutoring and mentoring
Neighborhood	High crime rate	Neighborhood ties
	Presence of gangs	Safe playgrounds
	Isolated neighborhoods	Varied recreational opportunities
	Inadequate recreational opportunities	Positive role models
Family	Low-income	Positive parent-child attachment
	Child abuse or neglect	Social support
	Parent substance abuse	Strong parenting skills
	Family conflict	Economic security
Child	Deficient parenting skills	
	Biomedical condition	Easy temperament
	Gender	Good health
	Low IQ	Self-esteem and self-efficacy
City or community	Deficient social information processing	Good problem-solving skills
	Inadequate supervision	Attachment with prosocial peers and adults
		Robust economy
	Concentrated poverty	

*Lack of a theoretical foundation for resilience.* To date, there are no formal theories of resilience and no current research explicitly examining a theory of resilience, although there are several well-developed models concerning resilience constructs. The definition of resilience has been refined over the years by researchers, but there is no universal operational definition. Resilience has been recently described as at-risk individuals showing better than expected outcomes, where positive adaptation is maintained despite the occurrence of stressful experiences (Masten, 2001). In addition, when variations of resilience and competent functioning differ across studies, it is difficult to compare methods and results.

*Academic resilience.* Research has shown that academic achievement is relatively stable and predictable throughout a student's career, beginning with the first grade and persisting through high school. Most children who perform poorly at the start of their schooling continue to perform poorly as they progress through the grade levels. Researchers have examined demographic characteristics as risk factors for academic failure; these characteristics include low social economic status (SES), minority status, belonging to a single parent family, racial discrimination, poor access to resources, and low academic expectations. All seem to project children toward a negative academic trajectory.

To examine this phenomenon, Reis, Colbert and Thomas (2005) conducted a 3-year study to examine resilience in 35 economically disadvantaged, ethnically diverse, academically talented high school students who either achieved or underachieved in their urban high school. Both risk factors and protective factors were explored to examine the pathways toward either positive or negative outcomes. This was a qualitative, comparative, cross-case study of the 35 participants. The cross-case analysis was used to collect and analyze data over the 3-year period, as well as background data from participants' preschool, elementary school, and middle school.

The two research questions were (1) what factors do high achieving students in an urban high school identify as contributing to their resilience?, and (2) what factors may contribute to the inability to display resilience in underachieving students who are at risk in an urban high school?

The study defined high ability students as those demonstrating well above average potential as measured by a score above the 90<sup>th</sup> percentile (using local norms) on standardized intelligence or achievement tests during his or her school career, as well as superior performance at some point in their elementary or middle school years. Underachieving students represented 17 participants out of the 35, who were defined as students with high potential, but who were not achieving at a level that was expected based on their potential.

For a total of 180 school days, three researchers in participants' homes and communities collected observation data. In-depth interviews were also conducted with participants on a continual basis, as well as with their teachers, administrators, school counselors, coaches, parents, siblings and other relatives, community members, and other significant parties that emerged during the data collection. The data collection continued for the 3 years, until data saturation was reached. Data saturation occurred when the information yield became redundant and no longer offered any additional information.

The results indicated that despite numerous risk factors, 18 high achieving students in the study developed resilience. Several protective factors seem to contribute to resilience in high achieving students, including: belief in self, determination to succeed, appreciation of culture, presence of a support system, participation in extracurricular activities, and involvement in summer enrichment programs. Protective factors also included association with other high achieving peers and family members, supportive teachers, and other supportive adults. All of the high achieving resilient students were involved in extracurricular activities, which were held

both during and after school hours. The authors stated that some underachieving students experience of risk factors might have proven too difficult to overcome. Although both groups experienced risk factors, many of the underachieving students reported different types and severity of problems.

The authors further stated that the results suggest that these risk factors may have been simply too difficult or that the risk factors were not accompanied by key protective factors, such as having a teacher or a counselor as a role model, having peer support for academic achievement, or being involved in extracurricular activities. This was a good exploratory study, which not only demonstrated factors associated with academic resilience, but also demonstrated that it may be important to examine the number of risk factors compared to the number of protective factors. It should be noted that number of factors, both risk and protective, may not be as important as the severity of risk factors and the strength of protective factors. The researchers began exploring data and allowed the data to determine further data collection. This study seems like it set out to collect every conceivable variable that could be related to resilience.

To examine educational and psychological correlations of academic resilience, Martin and Marsh (2006) conducted a study using within network and between network validity approaches. For the purpose of this study, resilience was defined as “the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances” (Martin and Marsh, 2006 p. 267). Academic resilience was defined as the heightened likelihood of success in school and other life accomplishments despite environmental adversities brought about by early traits, conditions, and experiences. The within-network approach explores the internal structures of a construct. Between-network approaches attempt to establish a logical, theoretically consistent pattern of relationships between constructs.

The purpose of the study was to explore the link between academic resilience and a more expansive number of psychological and engagement dimensions that have been currently researched in the resilience literature. To examine the network of dimensions, this study used a model developed by Martin (2001), which consisted of a Student Motivation and Engagement Wheel. This model separated motivation into two factors, those that enhance motivation and those that reduce motivation. Consistent with Martin's model, this study proposed three between-network constructs that provided theoretical relevance for examining the academic resilience measure: class participation, enjoying school, and general self-esteem. Therefore, it was hypothesized that students who did not deal with challenges effectively were less likely to participate in class, less likely to enjoy school, and more likely to experience general negative effects in relation to the self.

Participants included 402 high school students in grades 11 and 12 from two schools. The authors stated that academic resilience is relevant to all students because at some point all students may experience some form or level of challenge, poor performance, or academic pressure. Teachers administered the instruments to the students during class. Three sets of measures were employed: academic resilient items, between-network motivation and engagement predictors, and between-network educational and psychological outcome measures. After analyzing data from the between-network constructs, the within constructs characteristics were explored to determine links between constructs and the hypothesized between-network validity measures. To determine the psychometric properties of the unidimensional measures of academic resilience, a number of within measures were analyzed.

The between-network validity showed five factors predicting academic resilience: self-efficacy, control, planning, low anxiety, and persistence. The path analyses also demonstrated



that academic resilience predicts three psychological and educational outcomes: enjoyment of school, class participation, and general self-esteem. Consistent with the research findings, the authors proposed a 5-C model of academic resilience, composed of confidence (self-efficacy), coordination (planning), control, composure (low anxiety), and commitment (persistence). A path analysis showed that academic resilience subsequently predicts three psychological and educational outcomes.

The predicted outcomes were enjoyment of school, participation, and general self-esteem. The authors suggest that interventions designed to target student's academics should include self-efficacy, control, persistence, planning, and anxiety reduction. The concept of this study was important; researchers should continue to expand the psychological and engagement dimensions of academic resilience, but generalizability of the findings to risk children was questionable. The authors did not define a particular at-risk population, but included high school students that may or may not have been considered at risk. Further research should be conducted in this area with an at-risk group.

To examine protective factors across multiple domains, such as demographics, psychological variables, behavioral variables, and the school environment, Cappella and Weinstein (2001) conducted a study utilizing a national longitudinal database and examined reading achievement by the time of high school graduation. The researchers hypothesized that high family SES, European American ethnic group membership, and female gender would positively predict academic resilience in the 12th grade; that self-concept, locus of control, and future aspirations would positively predict academic resilience in the 8th grade; that classroom preparation and extracurricular involvement would positively predict academic resilience for 10th grade students; and that academic curriculum, and student support during the transition into

high school, along with students' reports of having peers who value education, would positively predict academic performances for 12th grade students (Cappella & Weinstein, 2001).

Resilience was operationalized as a dichotomous categorical factor: low achieving students who progressed from the lowest proficiency academic level to the intermediate or advanced proficiency level and were compared to a larger group that had made little or no change in their academic proficiency. Within the entire national sample, 85 percent of the low achieving students remained in the low or basic reading levels. In contrast, 15 percent of the low achieving students turned around their negative trajectory to graduate from high school with intermediate or advanced levels of reading proficiency (Cappella & Weinstein, 2001).

The factors that buffered children from the negative trajectory and enabled them to develop academic resilience were: being a member of the European American majority ethnic group, being female, taking an academic curriculum in high school, and possessing an internal locus of control before their transition into high school. Gender and race predicted academic resilience without any known mediation; therefore, being female and European American was an advantage in turning around a negative academic trajectory in reading achievement in high school and demonstrating academic resilience (Cappella & Weinstein, 2001).

To examine academic resilience among disadvantaged Black youth in South Africa, Dass-Brailsford (2005) conducted a study to examine how Black youth in South Africa who experienced poverty achieved academic success and demonstrated resilience. The author writes that even though apartheid in South Africa ended in 1994, the wealth in the country is greatly skewed, with 10 percent of the population, mostly of European descent, controlling 80 percent of the wealth. As a result of this disproportion between Black South Africans and White South Africans, Black South Africans continue to experience poverty, homelessness, and

unemployment. For example, one out of every eight Black children dies before the age of 5 years (Dass-Brailsford, 2005). The author used academic achievement as an indicator of resilience. The aim of the study was to gain an understanding of the stressors that were faced by participants, explore how participants achieved academic success, gain an understanding of how participants viewed school, and examine levels of support provided by their families and their communities.

This study used a qualitative research design, utilizing interviews, case studies, and observation methods to collect data. Random sampling was used to obtain 16 high achieving students attending their first year of college who demonstrated academic excellence. The research showed that poverty was reported by all participants to be a major stressor in their lives, one that affected all aspect of their lives. Support of participants came from family members and was evidenced by the family atmosphere, family characteristics, and role models. Schools also supported participants. Participants in the study were also high achievers; they were goal oriented, exhibited initiative, were motivated, and experienced the self as possessing a measure of agency. Participants' motivation was demonstrated in their narrative writing, for example, "I can do just about anything if I put my mind to it," "I'll show you ...." These children did not give up easily in the face of adversity or setbacks, and were flexible in the developmental range of strategies, skills, and ideas about pursuing their education.

All participants had viewed themselves as having the freedom to select a different path or direction. Participants were also able to make an adequate cognitive appraisal of negative circumstances, assess their capacity for action, and predict its effects. Participants took responsibility for the direction of their lives and the choices that they made. Education was viewed as vital and a form of protection from poverty. Role models came mostly from

participant's families and schools. All participants viewed school positively and viewed their teachers as role models and sources of encouragement. Finally, participants viewed faith in a higher power as giving meaning to their lives and perceived that the higher power provided comfort in challenging times. They perceived their difficulties as opportunities to change their life trajectory.

This particular study demonstrated that resilience is a human construct and not simply a Western construct. Many Blacks living in South Africa are under extreme adversity and stress. The research support Bandura's contention that even those under extreme adversity can overcome and succeed. Research has shown that poverty is highly correlated with many negative variables in this country. Although not directly mentioned, the authors implied that poverty is also highly correlated with negative variables in South Africa. Further research in this area should attempt to compare and contrast resilience cross-culturally, examining resilience in different countries and cultures.

Another study examining students living in poverty was conducted by Bormab and Overman (2004), focused particularly on academic resilience in mathematics among poor and minority students. The objective of their study was to understand better the differences between academically successful students and their low socioeconomic, non-resilient counterparts. In the study, outcomes were contrasted across three ethnic groups, African Americans, Hispanics and European Americans. This was a longitudinal study, tracking low SES student's mathematics progress from the third grade to the sixth. The researchers hypothesized that a theoretical model with clear links to fostering psychological resilience would predict academic resilience outcomes. They also hypothesized that school effect would be stronger for African American and Latino students than for European American students, since research suggests that teachers'

expectations and behaviors may affect African American students more than European American students.

Data analyzed in the study was obtained from *The Congressionally Mandated Study of Educational Growth and Opportunity* database, which contained standardized achievement scores for 40,000 students from three cohorts. The sample was reduced to contain only African Americans, Latinos, and European American students from low SES backgrounds. After applying certain criteria, the sample was reduced to 925 students; 26 percent were African American, 32 percent were Latino, and 43 percent were European American. Participants were first grade, third grade, and seventh grade students. Students completed a questionnaire each year over a four-year period.

Questions were administered to participants' parents, teachers, school principals, and school district personnel. Standardized residual scores were obtained for each student by subtracting the achievement score predicted by a regression analysis from the student's actual score and expressing the resulting residual as a z-score. Students with a standardized residual score of 0.33 or greater were considered as performing better in mathematics than expected and defined as resilient; in contrast, students with a standardized residual score below -0.33 were defined as performing worse in mathematics than expected and non-resilient. The goal of the study was to reveal school effects and the role of students' attitudes in relation to these resilience constructs.

The authors developed four categories of school characteristics related to resilience, which were: peer group composition variables, school resource variables, effective school measures, and supportive school environment measures. Individual characteristics of resilience were also developed, which included: self-esteem, self-efficacy, engagement in school, and a

positive disposition. Results indicated that low SES European American students had greater self-efficacy than Latino students, and that low SES students who achieved resilience demonstrated greater engagement in academic activities, a positive outlook toward school, and higher self-esteem. In terms of the peer group characteristics, the results indicated that race was the only significant variable. A post hoc test revealed that low SES European American students attended schools with smaller proportions of minorities, fewer free and reduced lunch eligible students, and fewer low achieving classmates than did low SES African American and Latino students.

The findings also suggested that low SES African American and Latino students were consistently more likely than low SES European American students to attend schools with a high proportion of low achieving students from a low SES and minority background. After examining school records, the results indicated that low SES Latino students were more likely to attend larger classes than low SES African American students and European American students. Low SES European American students also had an advantage over low SES African American students, in that the low SES European American students attended schools in which teachers reported that they more closely monitored student's progress. European American low SES students also attended safer schools with a more orderly environment than did minority students. The support of parent involvement was greater for European American students over African American and Latino students. A more supportive school environment was associated with the academic resilience of students. A safe and orderly environment and a positive student teacher relationship mattered most in terms of resilience.

This study supported the previous study that low SES European American students had greater self-efficacy, higher self-esteem and enjoy greater resilience than low SES African

American and Latino students. Unlike the previous study, though, this study attempted to explain why these differences may exist. For example, low SES European American students attended schools with fewer minorities, fewer students on free and reduced lunch, and higher achieving classmates. They lived in safer environments, had more involved parents, had teachers who reported that they more closely monitored their students, and had a positive teacher-student relationship.

These are important findings for intervention programs attempting to enhance students' self-efficacy and academic success. Many of the above variables need a societal change to be made different, but there are others that could be changed within the schools and communities: for example, closely monitoring students, making students feel safe, facilitate parent involvement, and reassign students to reduce high proportion minority schools.

In the previously study discussed, standardized residual scores were obtained by subtracting scores predicted by a regression analysis from the student's actual scores. This procedure is similar to the present study. Although unlike the present study, which examined eight core subjects of students, this particular study only examined mathematics. The present study examined an after-school program for which one of the components was to improve student's self-efficacy. Attempting to increase student's academic competence, sense of belonging, sense of usefulness, and personal potency are all components of enhancing self-efficacy.

Participants in the present study may have also increased their self-efficacy through vicarious learning. Vicarious learning can alter self-efficacy beliefs through a transmission of competencies and a comparison with the attainment of others, as well as verbal persuasions and associated types of social influences assuring that one possesses certain capabilities (Bandura,

1997). It would seem reasonable that at-risk participants who achieve academic success would also have a high sense of self-efficacy. Self-efficacy seems to be a core protective factor for at-risk youth. One must have the belief that one has the capabilities to overcome adversity to achieve success. Unless people believe that their actions can produce the outcomes they desire, they have little incentive to act to persevere in the face of difficulties (Bandura, 1997).

The present study did not measure self-efficacy in participants, but research supports the belief that academic success and self-efficacy are highly correlated. Assessing the present after-school program is important to support the research that a comprehensive after-school program based on empirical research can improve at-risk and African Americans students' academic success, which would help close the achievement gap between African Americans and European Americans.

#### *Self-efficacy*

Self-efficacy has been shown to correlate with academic success. Empirical research suggests that academic self-efficacy is a critical factor for school success. Although they are different constructs, self-efficacy has also been demonstrated to correlate with self-esteem and self-worth in students.

*Bandura's self-efficacy theory.* Bandura (1997) states that people have always strived to control events that affect their lives. By exerting an influence over events they can control, people are better able to predict desired and undesired outcomes. In primitive times, people appealed to the supernatural gods or agents, who were believed to have control over their lives. During this time people had little understanding of their environment and few ways to alter or control that environment. Over time, supernatural belief systems gave way to the concept that people have the power to shape their own destiny (Bandura, 1997).



Striving for control over one's environment or life circumstances provides personal and social benefits. Uncertainty about life's events is very disturbing, because the inability to exert influences over events breeds apprehension, apathy, and despair. In contrast, the extent to which people can bring about significant predictable outcomes fosters adaptive preparedness (Bandura, 1997). Predictability is one's ability to bring about desired outcomes and prevent undesirable ones, provides a powerful incentive to exercise control over events in life. This environmental control is created both individually and in concert with others. Through this collective effort, people are able to improve their lives by modifying the characters and practices of their social system (Bandura, 1997). This control over events is essential in human lives, individually and collectively in a social system.

Because control over events is essential to humans, belief in one's own efficacy is an important concept in human behavior and motivation. Peoples' lives are guided by their beliefs in personal efficacy (Bandura, 1997). Bandura states, "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the course of action required to produce given attainment" (Bandura, 1997, p.3). This influence may include regulating one's motivation, thought processes, affective states, and actions. It may also involve changing environmental conditions. The theory of self-efficacy is not concerned with how many skills one has, but with what one believes he or she can do with those skills under a variety of circumstances.

The theory of self-efficacy is constructed from four principles of information: enactive mastery experiences that serve as indicators of capability; vicarious experiences that alter efficacy beliefs through transmission of competencies and comparison with the attainment of others; verbal persuasion and allied types of social influences that one possesses certain

capabilities; and physiological and affective states from which people partly judge their capableness, strength, and vulnerability to dysfunction (Bandura, 1997).

Self-efficacy theory addresses many sub-processes at the individual and collective level, which provide guidelines on how to enable people to exercise control and some influence over how they live their lives. Self-efficacy seems to be a core protective factor for at-risk youth. One must have the belief that one has the capabilities to execute the course of action necessary to manage adverse situations (Bandura, 1997). In addition, one needs self-efficacy to have the power to produce an effect by evaluating one's control over actions and environment. Self-efficacy beliefs are some of the most influential arbiters of human activity and behavior; they provide the foundation for human motivation, well-being, and personal accomplishment (Bandura, 1997). Unless people believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties. Self-efficacy is both an individual and social construct, which may partly account for the disproportionate number of minorities performing poorly. Social systems can also develop a sense of collective efficacy (Bandura, 1997).

Cultural stereotypes affect the sense of collective efficacy. People who are devalued on the basis of their ethnicity, race, sex, or physical characteristics, and get treated in terms of social stereotypes rather than individual characteristics, often suffer losses in self-esteem and self-efficacy. Societal assessment of the devalued group usually blames that group for its own mistreatment, which can have a more devastating effect on the group's collective self-worth and self-efficacy. When fault is assigned to the devalued group, many of the members of that group may eventually believe the devalued characteristic of themselves (Bandura, 1997). Bandura (1995) further states that people who possess attributes that are socially devalued by others and

who accept those negative stereotypes will hold themselves in low regard, regardless of their talents.

*Relinquishing personal control.* Having a low sense of efficacy can also foster dependence on others. Rather than strive for personal control, some individuals place their well-being in the hands of others. Those individuals will attempt to get others who have influence and power to act on their behalf to bring about desired changes. Another form of relinquishing control is when individuals are assigned inferior labels and are placed in subordinate roles. These individuals perform activities less well than individuals not cast in subordinate roles or labeled negatively, even though they may be highly skilled (Bandura, 1997).

Racism and stereotypes impede the effective use of cognitive skills. In one study, African American students performed more poorly on standardized college exams when they were asked to state their race than those who were not. Similarly, women performed worse than men on math tests when the test was characterized as sensitive to gender difference, but they performed as well as men on the same tests when the tests were described as insensitive to gender (Steele, 1997).

People are not the sole cause of their destiny; there are numerous other factors involved, such as geographical, institutional, and social influences. If people exercise influence over areas in which they have some control, they can improve their lives. People can also improve their lives by collective efforts and by changing institutional and social practices. If the social system hinders the personal development of some individuals, then part of the solution lies in collective efficacy in changing the adverse or negative practices of that social system (Bandura, 1997). This concept was demonstrated during the Civil Rights Movement in the 1960s and '70s, when African Americans persevered for social changes under extreme adversity. To improve the future

for others, individuals must believe that they are capable of accomplishing significant social change. The important process here is enablement, empowering people to make changes--rather than assigning personal blame

*Academic self-efficacy.* Since the development of self-efficacy theory, its constructs have been examined in many different contexts, and numerous studies have shown the importance of academic self-efficacy with regards to academic performance and academic success. Academic self-efficacy refers to an individual's belief in his or her ability to successfully achieve an academic goal (Bandura, 1997). Academic self-efficacy has been shown to be a significant predictor of academic success. The development of academic self-efficacy can entail a restructuring of students' learning to maximize their opportunities for academic success, through individual tasks, enhancing students' positive beliefs about themselves and their academic capacity, and developing effective goal setting, along with skills that are likely to lead students to succeed (Locke & Latham, 2002).

Research has demonstrated that children with high academic self-efficacy have greater success in school because they try different strategies and persevere in the face of difficulties. In contrast, children with low academic self-efficacy doubt their abilities and give up early in the face of difficulties; they exhibit less effort, resulting in low school performance and lower academic success, which leads to lower self-efficacy (Jinks & Morgan, 1999). Perceived self-efficacy is an important construct that influences the relationship between knowledge and performance. Once a strong sense of self-efficacy is established, it may be generalized to other situations, with the strongest effects occurring in the activities similar to those in which the self-efficacy had been improved (Jinks and Morgan, 1999).

To test the relationship of self-efficacy to academic performance and persistence,

a meta-analytic investigation was performed by Multon and Brown (1991). Self-efficacy played a central role in learning motivation. As a result of educational experiences, children developed efficacy and outcome expectations from different cognitive tasks. These expectations influenced the student's motivation, which in turn influenced and determined performance outcomes. The performance feedback from the particular task affected subsequent efficacy and outcome expectations. This process is an ongoing, continuous loop (Schunk & Rice, 1985).

Multon and Brown (1991), utilizing a meta-analytical approach, hypothesized that self-efficacy beliefs would relate positively to academic performance and academic persistence. The researchers also explored possible moderators for these relationships. An initial sample of 68 published and unpublished papers was used. Twenty-eight studies were eliminated for not meeting the study criteria. Each of the remaining 39 studies was rated on design quality, sample size, and reliability of measures. The total sample of the meta-analysis consisted of 4,998 participants with an average age of 16.6. The majority of the sample consisted of elementary school students (60.6%); 28.8 percent were college students. Approximately 55 percent of the sample was normal achieving students, while 42 percent were low achieving students (Multon & Brown, 1991).

Examination of the studies supported the hypothesis that there is a relationship between self-efficacy beliefs and academic performance and persistence. The results suggested that self-efficacy beliefs accounted for approximately 14 percent of the variance in students' academic performance and approximately 12 percent of the variance in their academic persistence (Multon & Brown, 1991). The overall effect size of the meta-analysis demonstrated significant heterogeneity among effect size estimates, indicating that the relationship of self-efficacy to academic performance and persistence may vary across types of students, study characteristics,

and measures. The analysis of the moderator variables did not yield an adequate model of effect size variability. The authors suggest that enhancement manipulation used in the studies such as guided mastery, modeling, and feedback may not only be associated with a change in self-efficacy belief, but also may serve to enhance self-efficacy performance relationships (Multon & Brown, 1991).

Lane and Lane (2001) set out to test the predictive effectiveness of the relationship between self-efficacy and performance in an academic setting. The researchers attempted to identify measures of self-efficacy present in the behaviors of interest and to investigate whether self-efficacy levels can predict academic performance months after they are measured. Seventy-six postgraduate students enrolled in a management program participating in the study. Researchers attempted to develop a self-efficacy measure that assessed confidence intervals predictive of the competence needed to become successful in the course. Participants were asked to complete a number of self-efficacy measures, including, for example, ranking how confident they felt on a scale of 1 through 10 that they could cope with the intellectual demands of the program.

Results of the study showed that self-efficacy measures were associated with 11.5 percent of the variance in confidence to cope with the intellectual demands of the program, which was the only significant predictor. The authors noted that no conditions were set to maximize the self-efficacy and performance relationship during the 13-week period between the time the students completed the self-efficacy measure and the performance measure. In addition, judgments of self-efficacy toward coping were particularly difficult in the early stages of the program. The researchers concluded that significant relationships between the self-efficacy measure and the performance criteria must be present for self-efficacy to be used as an effective intervention tool

and that the longer the time period between the measuring self-efficacy and the actual performance, the greater the scope and time needed for the intervention to be effective (Lane & Lane, 2001).

Other researchers have examined academic self-efficacy as a predictor of college success. Gore (2006) conducted two incremental validity studies to determine the amount of variance academic belief could account for in college outcome, using multiple measures of academic self-efficacy to predict multiple outcome measures. In study 1 participants were first-year college students enrolled in an orientation class at a Midwestern university. In study 2, the author used a stratified sample of four-year degree granting institutions. Participating institutions agreed to administer a self-efficacy measure to a minimum of 200 first-year students. Results suggested academic self-efficacy beliefs measures are relatively weak predictors of academic performance for first year college students. Academic self-efficacy beliefs did not account for a significant proportion of the variance in GPA beyond what was accounted for by ACT scores. After the first year, academic self-efficacy did make a significant contribution to the variance in predicting GPA. This suggests that experienced college students' beliefs are more strongly related to college performance than inexperienced new students. The author further suggests that students need feedback on their social and academic performance before they can accurately assess their ability to achieve their academic goals (Gore, 2006).

Another study to assess the relation between first year college self-efficacy and academic performance was conducted by Chemers, Hu, and Garcia (2001). These investigators examined the effects of academic self-efficacy and optimism on students' academic performance, commitment to remain in school, stress, and health. The authors suggest that students high in academic self-efficacy make greater use of cognitive learning strategies, manage their learning

environment, manage their time more effectively, and are able better able to monitor and regulate their own effort (Chemers, et al., 2001). The authors hypothesized that academic self-efficacy would have a profound affect on academic performance and personal adjustment; that students with a high sense of efficacy would make better use of analytical strategies to manage their learning environment; that self-efficacy and optimism would influence challenges and threats in their environment; and that these strategies in turn would have an effect on academic expectation, which would predict academic performance.

The results of the study demonstrated that self-efficacy showed both a direct and indirect relationship to academic performance and personal adjustment. Optimism was related to academic performance and adjustment, and academic self-efficacy was significantly related to academic expectations and performance. Academic expectations were also related to performance. These results suggest that students entering college with a confidence that they will succeed do perform well academically and that they perform significantly better than less confident students (Chemers et al., 2001).

In conclusion, the above studies suggest that empirical evidence has shown a strong relationship between self-efficacy, resilience and academic success.

### *After-school Programs*

After-school programs have been defined as programs for protecting children, for caring for children, and for giving children an opportunities for enrichment, including acculturation, skills training and remediation (Halpern, 2002). Some have found it easier to define after-school programs in contrast with what they are not: namely, family, regular school, or the streets.

*History of after-school programs.* After-school programs emerged in the United States during the late 1800s, in the form of boys clubs held in churches, local buildings, or storefronts.



Two trends contributed to the growth of after-school programs: the decline of child labor and the growing size and number of public schools for children, fueled in turn by new education laws (Halpern, 2002). During this time, many children had been attracted to the streets, which were unhealthy for them, in exposing them to illegal activities and dangerous adults and thereby risking serious injury or death to the child (Halpern, 2002).

During the depression in the early 1930s, after-school programs were forced to cancel many activities (i.e., art, music, manual training, and physical education) due to the lack of resources. By the end of the 1930s, social programs such as the New Deal, the Federal Act Projects, and the National Youth Administration provided new funds for after-school programs (Halpern, 2002).

During World War II, administrators of after-school programs were asked to help children deal with the stressors associated with the war. During this period, after-school programs possessed three principle roles: (1) providing supervision and care of children of working mother; (2) helping children cope with the psychological stressors of the war; and (3) providing a medium for children to help with the war effort (Halpern, 2002). Many women had to work while their husbands were serving in the military. They also enjoyed the independence of working outside the home and escaping domestic duties (Halpern, 2002).

After the war, after-school programs helped children return to a state of normality and traditional routines, but the debate continued on how best to work with children. After-school programs also had difficulties attracting and retaining children (Halpern, 2002). During the 1950s, after-school programs developed a new rationale for their work, attempting to help low-income children who felt that they were excluded from mainstream society. In school, low-income children were treated like failures and consequently believed that they in fact were

(Halpern, 2002). In their community they were harassed by police, pushed off street corners, and they were unwilling or unable to organize recreational resources for themselves, which they perceived as belonging to a society that was rejecting them (Halpern, 2002). These low-income children were alienated from mainstream society, and were apt to be labeled juvenile delinquent. They quickly learned to reject opportunities before opportunities rejected them. Society began to become concerned about these low-income children and a national movement was created to reduce juvenile delinquency (Halpern, 2002).

After-school providers declared themselves as the first line of defense against juvenile delinquency; they began to help these children feel valued and recognized as a positive asset to society (Halpern, 2002). Many after-school programs provided a sense of security and belonging, a quality many of these low-income children did not possess. Most importantly, after-school providers would reach out to these low-income children, regenerating their interests, motivation, curiosity, and sense of efficacy (Halpern, 2002).

By the 1960s, neighborhoods in America began to change; African Americans and Puerto Rican families replaced European American families in many neighborhoods across the country. After-school programs began to struggle with the question of whether their commitment was with the neighborhood or a specific population (Halpern, 2002). After-school programs reluctantly began the task of building trust to a new population of children and families, particularly African Americans, Latinos, Puerto Ricans, and Mexicans (Halpern, 2002). Low-income neighborhoods began to change in a negative fashion; they became less supportive of, emotionally harmful to, and physically dangerous for children. These changes included a decline in social control, with resultant increases in gang activities and drug related violence (Halpern, 2002). After-school programs had a new role and rationale to address these poverty related

problems, but funding for this was sporadic. Although after-school programs had to fight for funds from federal programs, they were able to offer arts and crafts, music, dance, tutoring, home work help, and other educational enrichment programs (Halpern, 2002).

Prior to the 1970s, mothers working in the home usually provided after-school care. When the mother was not available, neighbors and family members often provided the care. With the economic shift in the 1970s, with both parents now working outside the home, and the growing number of single parent homes, parents found it increasingly difficult to provide after-school care, particularly given that a typical school day ends between 1:30 pm to 3:30 pm, while a typical workday ends between 4:30 pm to 6:30 pm (Seligson, 1991). Most employers in the United States did not take into account the need for parents to be home when children arrive from school. Parents therefore had to seek out other arrangements (Seligson, 1991). The 1970s and 1980s brought a renewed interest in after-school programs as a response to the growth of parental employment.

According to the 2000 Census data, there are approximately 60 million children ages 5-17 living in the United States; 68.6 percent are European American, 17 percent are Hispanic, 15.1 percent are African American, 7.6 percent reported other, 3 percent are Asian, 1 percent are American Indian, and 2 percent chose two or more races. In the United States, approximately 12 million children (17%) live below the federal poverty level for a family of four. Five million children live in extreme poverty, defined as less than half the federal income poverty level. The District of Colombia has the highest rate of children living in extreme poverty (19.2%), followed by Louisiana (13.3%), Mississippi (11.6%), Arkansas (10.5%), New Mexico (9.7%), and North Carolina (9.7%) (National Center for Children Living in Poverty).

Poverty is especially prevalent among African American and Latino children. Thirty-three percent of African American children live in poverty, ranging from 22 percent in New Jersey to 44 percent in Illinois; while 28 percent of Latino children live in poverty, ranging from 17 percent in Michigan to 35 percent in New York and Texas. This compares to 10 percent of European American children living in poverty, ranging from, 4 percent in New Jersey to 10 percent in Georgia, Michigan, New York, Ohio, and Pennsylvania (National Center for Children Living in Poverty).

In the United States, approximately 60 percent of families have two parents in the home, where both work outside the home. In 2004, 72 percent of female single parents worked outside the home and 83 percent of single parent males worked outside the home. Research shows that an estimated 4 million children between the ages of 5 and 12 regularly spend time without adult supervision (National Institute on Out-of-School Time, 2006). In addition, approximately 6.5 million children (11%) are in after-school programs and 14.3 million (25%) care for themselves in the afternoon. A study by Duffett and Johnson (2004) showed that 36 percent of American children reported spending time alone at home at least once a week. Sixteen percent spend at least three to four days at home alone, and 13 percent spend five days alone at home each week. The National Child Survey estimated that approximately 3.4 million children under the age of thirteen were taking care of themselves after school on a regular basis; and approximately 10 percent of eight to ten year-olds and 32 percent of eleven and twelve year-olds were taking care of themselves after school on a regular basis (Hofferth, Brayfield, Deich, and Holcomb, 1991).

Although there has been after-school care for many years, the No Child Left Behind (NCLB) Act of 2001 has recently brought new focus and attention to improving low academically achieving students school success through children's out-of-school-time. Out-of-

school-time is defined as any time children are not attending school during traditional school hours, Monday through Friday. Schools that fail to help all children reach proficiency are eligible to receive supplemental funds for educational services. To receive these funds, services must occur outside the school day and be based on evidence that the services are effective in raising students' academic achievement (No Child Left Behind Act of 2001, section 1116[e]). The NCLB law attempts to ensure that all children receive a high quality education and that the achievement gap closes between European Americans, minorities and at-risk children.

To accomplish this, the NCLB act subscribes to four principles: (1) holding schools accountable, (2) giving States and Districts the flexibility needed to spend federal money, (3) involving parents by giving them information and allowing them to make choices concerning their child's education, and (4) using scientific research to guide programs and classroom practices (No child Left Behind Act of 2001, section 1116[e]). Academic achievement is a protective factor for many at-risk children and after-school programs can improve academic performance (Fraser, 1997).

The Elementary and Secondary Education Act (ESEA), passed by Congress in 1965, was the first attempt to provide significant federal funds for K-12 education. The first title of ESEA, often called Title I, provides funds to improve academic achievement of the disadvantage student. ESEA has been renewed several times, most recently by the NCLB act. For the first time, public schools were held accountable for their student's academic results, including results from children who typically don't perform well. Many of these low performing students are from racial minority groups, live in poverty, have disabilities, and do not speak English as a first language (No Child Left Behind Act of 2001). In addition, Title I was created in part because the

data indicated that low-income children are at-risk for academic failure and are in need of additional educational time to supplement regular school hours.

In 2003, there was approximately \$325 million available for new grants, which are allotted to each state based on their allocation of Title I, Part A funds. The focus of the above program, re-authorized under Title IV, Part B of the No Child Left Behind Act, is to provide expanded academic enrichment opportunities for children attending low performing schools (U.S. Department of Education, 2003). The NCLB initiative also puts a special emphasis on implementing educational programs and practices that have been clearly demonstrated to be effective through rigorous scientific research. Federal funding was targeted to support such programs (Hall, Vleck, and Peach, 2004). For example, the Reading First program makes federal funds available to help teachers in the early grades strengthen old skills and gain new ones in instructional techniques where scientifically based research has shown to be effective.

Stemming from concerns for the need of after-school care, there has been a rise in the number of after-school programs developed. Approximately 6 million of the 60 million children in the United States attend after-school programs, which are either school based or community based. Since 1994, the number of school based after-school programs has doubled (De Kanter, 2001). Kuger (2001) states that the recent growth of after-school programs can be attributed to three societal concerns: (1) the lack of caregivers in the home; (2) the underachieving economically disadvantaged child; and (3) the belief that at-risk children can improve their academic performance if given more time and opportunities (Kuger, 2001). Many parents seek out-of-school activities to care for and improve their child's academic performance. One program that was created to improve academic performance of low-income at-risk students was

the Wake County, Super Opportunities with After-School Resources (SOAR) program, which began in 2000 and ended in 2004.

As mentioned earlier, underlying causes of the achievement gap are the lack of resilience in some at-risk youth, inadequate paternal involvement and parenting skills of at-risk youth, relatively low parent expectation, and at-risk youth performing poorly in school. SOAR was developed to address these problems. Other possible causes of the achievement gap are poverty and teacher quality and expectations.

Some possible consequences of the achievement gap include the disproportionate drop out rate of African Americans and at-risk youth, as compared to European American children, the disproportionate percentage of unemployed African Americans and at-risk youth, the disproportionate percentage of African Americans and people living in poverty and poor health, and the disproportionate percentage of African Americans serving time in prison.

*Wake County, Super Opportunities with After-School Resources (SOAR)*

The Wake County Public School Systems (WCPSS) is the second largest school district in the state of North Carolina and the 27th largest in the nation. Twenty-eight percent of all households in Wake County are headed by females with an income less than \$15,000 (below the federal poverty guideline), and 21,316 (22.6%) of Wake County students were eligible for free and reduced lunch in 2000. Overall, the students in WCPSS are 64.7 percent European American, 26.0 percent African American, 3.8 percent Hispanic, 3.8 percent Asian/Pacific, 0.3 percent American Indian/Alaskan Native, and 1.5 percent Multi-racial (Project S.O.A.R., 2000). Although WCPSS students' aggregated test scores are at or above the national average, there remain thousands of students who do not meet state competency standards. For example, 25.8 percent of the students in grades three through eight taking the tests performed below grade level,

and 29.6 percent of ninth through twelfth grade students performed below grade level. Many of these are minority students from low-income families (Project S.O.A.R., 2000).

Also in Wake County, 1,226 students (3.08 percent) dropped out of school during the 1998-99 school year, and this percentage is projected to increase. One reason for the increase may be that North Carolina's curriculum standards are becoming increasingly challenging; if provisions are not made to assist struggling students to meet these higher standards, many more students will fail (Project S.O.A.R., 2000). In 2001, fifth graders were required to pass the End of Grade (EOG) Reading and Mathematic exams, along with the fourth grade writing exam, to be eligible for promotion to the sixth grade; and in 2003, North Carolina required students to pass an exit exam to be eligible for graduation. As noted previously, the gap between low-income students and middle- to high-income students is increasing. To address these and other problems, WCPSS proposed an after-school program, Super Opportunity with After-school Resources (SOAR).

Seven Wake County public schools, five high schools, one middle and one elementary school participated in the SOAR program. Each had at least one site coordinator (Appendix A details the site coordinators responsibilities). Each site coordinator completed a training program for the position that included workshops and a weekend retreat with community partners and other site coordinators. Training at the retreat included information regarding establishing groups, diversity, exploring concepts of youth/adult partnership, power differential, adults as coaches and advisers, building an adult youth partnership from the youth perspective, involving parents, and issues of trust.

The SOAR program was developed to bridge the gap between low-income and low achieving students and their family by providing after-school centers. The intervention program



focused on increasing students' resilience through enhancing their academic skills, their sense of belonging, their sense of usefulness, and their personal potency. These interventions may have also increased self-efficacy by increasing mastery experiences, for example, vicarious experiences that alter efficacy beliefs, social influences, and positive physiological and affective states via role models who judge their capableness, strengths, and vulnerabilities. Program components included academic assistance in core subjects, computer skills, Nova NET (an on-line computer application for skill remediation and recovery of high school course credit), SAT prep, and life skills training. Each high school program conducted after-school sessions three or four days a week, with each session ranging from 2 to 3 1/2 hours a day.

The program was designed to increase students' resiliency using four resiliency factors, (1) academic competence, (2) a sense of belonging, (3) a sense of usefulness and (4) personal potency. Appendix B shows a resiliency model developed by Sagor (1996) that was adopted and implemented by the SOAR program. The program offered intensive academic assistance to help students meet state competency standards, recreational enrichment activities, health and nutrition programs, and expanded media centers. Parent education programs included parenting skills, literacy training, technology and workplace skills, and health and social services.

The purpose of the program was to offer low income and low achieving students and their families a high quality after-school program; to decrease the number of students failing the state mandated end of course tests, end of grade tests and writing exams; and to join the school and community together in offering support for students in the prevention of drug use and violence. The program provided parenting skills educational programs. At each site, parents participated in parent education workshops, discussion groups, and student/parent learning activities. The program was also designed to decrease the number of dropouts. Although any

student could have attended the SOAR program, students performing below grade level in core subjects, low-income inner city student, and ninth grade students who were at-risk for dropping out of school were specifically targeted.

In the academic school year 1998-99, there were 5,014 out of school suspensions for drug violations (50 incidents per 1,000 students in high school); and during academic school year 1997-98, there were 947 substantiated cases of child abuse and neglect among 15-19 year olds (56.5 per 1,000). To address this problem, parenting programs also included information regarding early child development, supporting your student, parenting the adolescent, anger management, preventing substance abuse, and developing a career while supporting a family.

The SOAR program also attempted to build a bridge between school, home, and community. A 1998 Gallup poll found that 74 percent of Wake County respondents placed a high priority on improving communication between school, community, and family. In addition, each site also worked with community partners, such as Wake County Human Services, Food Bank of North Carolina, 4-H, Parent to Parent, Wake County Cooperative Services, YMCA, and the PTA. Finally, there were goals to facilitate the development, coordination, and enhancement of after-school programs throughout the school district, bringing greater cohesion to the entire district, thereby impacting the entire community.

To improve resilience in students, project SOAR implemented activities to increase academic competence by enhancing students academic resilience., Students' sense of belonging was augmented by providing enrichment activities that expose students to new interests, allow them to apply skills in new ways, and provide opportunities for recreation and socialization. Students' sense of usefulness was increased through their participation in service learning projects designed to help youth. In addition, a sense of personal potency was created in students

by giving them opportunities to make choices, set goals and priorities, and assess how well they are doing. Additional details for these activities are outlined in Appendix C.

*Program evaluations.* At the end of the academic year 2004, EDSTAR, Inc., was contracted by the Wake County Public School System to conduct an evaluation of the SOAR program. During the 2003-2004 school year, 1180 students participated in the SOAR program; an additional 331 who were asked to participate declined. To study the effects of SOAR, evaluators used the participating students as the treatment group and the students who were asked to attend but declined as the control. Outcome measures were examined on behavior and academic achievement.

High school students comprised both groups, and the control group and the treatment group had similar demographics: approximately 50 percent African Americans, 40 percent European Americans, and 10 percent other, with 33 percent of the students on free and reduced lunch. The control group had a significantly higher percentage of students with special needs, and the treatment group had a significantly higher percentage of students with limited English proficiency. Appendix D shows the demographics of the control and treatment group. The control group had a higher percentage of males (61% vs. 46%), and a higher percentage of ninth grade students (54% vs. 29%). Approximately 50 percent of students in both the control and treatment group were on the Instructional Assistance List. This list was created to identify those students who were in need of instructional assistance. To be placed on the list, students had at least one academic risk factor, which included failed courses, failed standardized tests, grade retention, and failed competency tests.

*Program evaluation results.* Comparing the 2003-2004 school year suspensions to the numbers in 2002-2003, students in both groups showed increases; however, these suspensions

were significantly higher for the control group. The table in Appendix D shows these results. The control group also had a significantly higher dropout rate compared to the treatment group: in the treatment group 2.5 percent of the participants dropped out of school compared to 6.4 percent of students in the control group ( $\alpha > .05$ ). The dropout rate for the treatment group and the control group were higher for at-risk students (Hall, Vleck, & Peach, 2004).

Participants in the treatment group took significantly more advanced level course (i.e., Algebra I, Geometry, Algebra II, Biology, Chemistry, and Physics) than the control group; and the pass rate of the End of Course test trended higher for the treatment group, but did not reach statistical significance. Analysis of the comparison test for the Competency exams showed no significant difference between the control group and the treatment group, however, significantly more students in the treatment passed the Computer Performance test.

This study demonstrated that students in the SOAR program had significantly fewer suspensions, lower dropout rates, and improved test scores. In addition, data from the second year of SOAR showed that SOAR students who regularly attended the program 30 or more times surpassed expected growth on the End of Course test. This finding supports past research by Posner and Vandell (1994), demonstrating that greater attendance in after-school programs is more beneficial. SOAR students obtained higher expected growth and exemplary growth scores on standardized test than any public high school in Wake County.

In part, SOAR's success was due to faculty and administration support; faculty members formed most of the SOAR staff. Community members, college students, parents, youth development workers, and members of the business community also volunteered time with SOAR. Most sites had the strong backing and support from school administrators. Administrators' support included allotting funds, paying for after-school transportation, and

making faculty at their school aware of the program. Appendix E lists some important comments made by SOAR coordinators and SOAR participants, which were extracted from the study performed by EdStar.

### *Research on After-school Programs*

Research has shown that a properly designed after-school program can yield positive results, improving children's academic, social and emotional success. This is especially true for children at-risk for academic failure (National School Board Association, 2005). To examine the impact of two after-school recreational programs, Baker and Witt (1996) conducted a study using program participants and non-participants in grades 3 to 6; of the 307 students participating in the after-school program, 237 students participated in the research study. The researchers used a variety of outcome measures, including students' academic grades, attendance, tardiness, self-esteem, and problematic behaviors. Two research questions guided the study: (1) is there a relationship between the level of participation in the after-school program for participants and non-participants, and (2) is there a relationship between participation and number of absences from school, school tardiness, self-esteem, and behavior at home and school? The risks associated with the students attending the two schools were low-income communities, higher rate of single parent families, lower rate of adult education, lower rate of high school graduation, and a higher rate of unemployment than other schools in the area.

Participation in the after-school program was free and voluntary, with schoolteachers at both schools paid extra to lead activities. Participants attended the program one to four times a week for 6 to 9 weeks, lasting 45 minutes to 2 hours per day, Monday through Friday. Activities in the program ranged from purely academic to purely recreational. Data to evaluate the students was obtained from students, parents, teachers and school records.

Participants in the after-school program had higher post-test scores for math, science, language, and reading. There were no significant differences on parents and teachers behavior rating scale between the two groups. There was a significant difference on the self-esteem scale, with participants scoring significantly higher than non-participants. There were no significant differences in the number of absences or school tardiness between participants and non-participants. Results of this study also demonstrated that the after-school program in the two schools impacted academic performance and a measure of general self-esteem for those students most involved (greater attendance) with the after-school programs. These results also support past research by Posner and Vandell (1994), demonstrating that greater attendance in after-school programs is more beneficial.

A program evaluation was conducted of the Los Angeles' Better Educated Student for Tomorrow Program to examine performance and attitudes, students' effort and achievement in school, students' attitude toward school, their self-esteem, their personal goals and aspiration, and their experience of close relationships with peers and adults. Participants consisted of two groups; fifth and sixth graders who participated in the program for at least two years ( $N = 80$ ) and a comparison group who had not participated in the program ( $N = 66$ ). Interviews were conducted with students who participated in the program and the comparison group. Parents of both groups were also interviewed.

In addition to interviews, data on students' academic grades were also obtained. Initially, participants scored lower than the comparison group on achievement and effort in five subject areas, but after participation in the program, participants scored higher than the comparison group. There was a significant difference among participants and the comparison group on attitudes toward school, with participants reporting that they "like school a lot more."

Participants scored significantly higher than the comparison group in having higher expectations of how far they would go in school. There was a significant difference between the two groups' parents in how far they saw their children's knowledge about specific subjects; with participants' parents reporting that their children had changed positively. Finally, while both groups felt equally unsafe in their neighborhoods, program participants felt significantly safer than did the comparison group during their after school hours.

Fourth graders in the Foundations, Inc., Before and After-School Enrichment Program outperformed comparison groups in reading, language, arts, and math (Hamilton & Klein, 1998). The Boys and Girls Club of America conducted a study and discovered that the youth involved in their after-school programs increased their grade average and improved school attendance and study skills beyond those not involved in the after-school programs (Schinke, 1999). Fourth graders who participated in the Ohio Urban School Initiative School-Age Child Program exceeded the statewide percentage of students meeting proficient standards in math, writing, reading, citizenship and science (Partners Invested in Our Community of Kids, 1999).

According to a University of California study, students in citywide after-school programs made academic gains far beyond those in the comparison group (Brooks & Mojica, 1995). McComb and Scott-Little (2003) conducted a review of 27 studies of after-school programs. Their review indicated that low-achieving students benefited more than higher achieving students entering the programs and those students who attended the programs more frequently benefited more than students who attended less frequently.

To synthesize current research on Out-of-School time (OST) programs assisting at-risk students in reading and mathematics, Lauer, Akiba, Wilkerson, Apthorp, Snow and Martin-Glenn (2006) conducted a meta-analysis on 35 research studies that employed a control or

comparison group and met the authors' criteria. The authors defined at-risk as performing low on standardized tests, classroom assessments or teacher assigned grades, together with other characteristics typically associated with low student achievement, including low social economic status, racial or ethnic minority status, single parent households, and students with mothers with low education and limited English proficiency. Results of the meta-analysis indicated that (a) out-of-school programs had a positive effect on academic achievement in math and reading for at-risk students, (b) timeframes (after-school vs. summer school) of OST programs do not influence the programs' effectiveness, (c) elementary and secondary school students can both benefit from OST programs for improvements in reading (in contrast, there were indications from the studies that mathematics achievement primarily occurred in secondary grades), (d) OST programs need not only focus on academics to have a positive effect on student's academic achievements, (e) administrators should monitor implementation of the program and student learning to determine the appropriate strategies and activities, (f) programs that provided one-on-one tutoring had a positive effect on student's reading achievements, (g) future studies on OST programs should examine both published and unpublished research, and (h) OST programs should document characteristics of the programs and their implications. Examining unpublished research is particularly important. There are unpublished program evaluations that contain valuable information, although, locating these studies may prove challenging.

Posner and Vandell (1994) conducted a study to examine whether formal after-school programs were associated with low-income student's social and academic functioning. The researchers' hypothesized that low-income students involved in formal after-school programs would participate in activities that would otherwise not be available to them, and that the activities would be related to grades and socioeconomic adjustment and that formal after-school



programs would be positively associated with academic performance, work habits, and emotional adjustment. Subjects were recruited by sending letters to third grade parents in nine elementary schools; 216 students were selected to participate in the study (Posner & Vandell, 1994).

Approximately 60 percent of the participants qualified for free and reduced lunch, 46 percent of the families reported annual incomes of \$15,000 or lower, and approximately 50 percent of participants were African Americans and 55 percent were from single parent households. Researchers used multiple assessments to examine aspects of participants' family environment that may serve as a selection factor for after-school care, student's activities and experiences during after-school hours, and student's performance. Type of after-school care was found to be associated with race, maternal education, and family income: European American families, for example, were more likely than African American families to rely on adult supervision after school (Posner & Vandell, 1994).

Mothers who used formal after-school programs were better educated than mothers whose children returned home after school. Income levels were also correlated: lower income families were associated with formal after-school care, while higher income families were associated with adult supervision or self care. Examining students' performance with respect to after-school care attendance, the study demonstrated that students' math grades, reading grades, and conduct grade were correlated with the type of after-school care. Students attending formal after-school programs had better grades in reading, math and conduct than students in their mothers' care after school or other adult supervision.

Those attending formal after-school programs had better work habits and peer relation than students who were informally supervised after school (Posner & Vandell, 1994). This study

demonstrated that low-income children who attend formal after-school programs will experience positive effects. Attending a formal after-school program was also positively associated with better grades and conduct, as well as better peer relations and social adjustment. This study supports other research on after-school care suggesting that formal after-school programs are one way to reduce the effects of poverty, in helping low-income students achieve academic success, as well as research showing that comprehensive after-school programs that promote resilience in students produce positive results.

After-school programs have been shown to improve academic performance of at-risk migrant Latino children. Riggs and Greenbern (2004) conducted a study examining the use of an after-school program which reduces the level of academic risk in migrant Latino children to determine if the after-school program serves a protective function for the children from relatively low functioning families and families with less school involvement. The authors hypothesized that higher levels of acculturation could be expected to enhance children's outcomes resulting from participation in the after-school program; that children with higher functioning families would demonstrate greater increases in their academic outcome than children from lower functioning families; that the number of parent-teacher contacts would be correlated with children's academic problems; and that children whose parents report greater engagement in school activities would demonstrate greater academic gains (Riggs & Greenberg, 2004).

The sample consisted of 94 Latina children participating in the G-10 after-school program located in three sites. One interesting aspect of this study is that questions regarding resident status, SES, or length of U.S. residence were intentionally not asked. The staff believed that participating families would not be comfortable answering these questions, which would therefore probably yield unreliable results. This is a good example of a culturally sensitive

design. To be selected for this study, participants had to have poor academic performance or performance below grade level, especially in reading and writing; poor classroom conduct; or low parent participation or involvement in school (Riggs & Greenberg, 2004).

Results from several assessments from students, parents, and teachers, together with student records demonstrated that children involved in the program had significantly increased their academic achievement scores, by approximately one-half standard deviation in each academic subject. The pretest of the participants had shown that they were one standard deviation below the norm for reading and spelling, and two thirds of a standard deviation below the norm for mathematics. These students had been involved in the program for 9 months (Riggs & Greenberg, 2004). Attendance rates for the program showed very little variance in children's achievement. The authors stated that this result was somewhat surprising, given the expectation that participation in the program would yield greater gains in achievement. Although social development results did show that children who had greater attendance demonstrated greater gains in social competence, as well as decreased behavior problems (Riggs & Greenberg, 2004).

In addition, parent-teacher involvement did not appear to influence children's academic achievement when considering the entire sample; however, younger children whose parents were less likely to have contact with their child's teacher made significantly lesser gains in their reading and spelling than did children whose parents had higher rates of parent-teacher contact. The authors believe that these gains may be due to the program's ability to offset any negative consequences that may occur as a result of the parent's unwillingness or inability to participate in their child's academic involvements. The findings from this study support other findings that after-school programs may buffer at-risk children from developmental difficulties, and that after-

school programs may help most those children who are in greatest need, specifically children from relatively poorer functioning families (Riggs & Greenberg, 2004).

A summary of four after-school evaluations was conducted by Kane (2004). The four evaluations examined the 21<sup>st</sup> Century Community Learning Center (21<sup>st</sup> CCLC), The After-School Corporation (TASC), the Extended-Service School Initiative (ESS), and the San Francisco Beacons Initiative (SFBI). The 21<sup>st</sup> CCLC evaluation focused on elementary and middle school centers. The middle school evaluation used statistical controls to compare participants and non-participants, while the elementary school evaluation used random assignment, utilizing 18 centers in the study. The TASC evaluation focused on 96 after-school centers in New York City. This evaluation used statistical control to compare participants and non-participants. The ESS evaluation focused on ten after-school programs in 6 cities; this evaluation design was non-experimental. The SFBI evaluation, finally, focused on five after-school programs in San Francisco, and utilized a quasi-experimental design, also comparing participants and non-participants. These after-school programs were typically located in neighborhoods serving mostly disadvantage students.

The author stated that among these centers, which operated on a drop-in basis, attendance was sporadic, with most participants attending on average one to two days a week. Second, none of the evaluations found statistical significance on achievement test scores after the first year, but some did report a positive impact after two to three years of participation. Third, all of the after-school evaluations reported greater parent involvement in their child's school, greater student engagement in school, and a greater commitment to homework. Finally, the author states that given the amount of time devoted to academics and the amount of resources devoted to after-school programs, it seems unrealistic to expect significant impacts on academic achievement. In

contrast to these four evaluations conducted by the author, attendance in the present study was not sporadic. In the present study, those participants in the after-school program who had the lowest scores had greater attendance in the program (30 or more times).

### *Conclusion*

Research as shown that some of the underlining causes of the achievement gap are the lack of resilience in at-risk youth, possessing one or more risk factors, inadequate paternal involvement and parenting skills of at-risk youth, parent and teacher expectations, and at-risk youth performing poorly in school. The achievement gap has been linked to various negative outcomes, including high school dropout rates, unemployment, poverty, high crime, and living in an unsafe environment, but not all students who are on a negative academic trajectory continue on that path. Some students overcome adversity and setback, and succeed academically. These students are considered academically resilient. Research has also determined that a well designed after-school program developed to buffer risk factors and enhance protective factors of at-risk children can enhance resilience and promote academic success.

## CHAPTER III: METHOD

### *Research Questions and Hypotheses*

Due to the limited research on closing the achievement gap between African Americans and European Americans, the lack of research examining after-school programs that are supported and run by the school district the participants attended, the lack of research utilizing the same measures used in assessing all students for promotion in their core subjects, and the lack of research examining if attendance has a positive effect, the follow research questions are examined in the present study.

*Research Questions*

1. Will participants in an after-school program make significantly greater gains on standardized test than demographically similar students not involved in the program?
2. Does students' performance on standardized tests correspond with their rate of attendance in an after-school program?
3. Do African American students involved in an after-school program significantly outperform African American students not involved in the program, located within the same school district?
4. Can African American students involved in an after-school program outperform European American students not involved in the program, located within the same school district; thereby closing the achievement gap in core subjects?

*Research Hypotheses*

The present study examined the SOAR after-school program to determine its effectiveness in contributing to students' success. Group 1 are those students who were ask to attend SOAR but did not attend or attended once. Group 2 are those students who attended SOAR 2 – 9 times. Group 3 are those students who attended SOAR 10 – 29 times; and groups 4 are those students who attended SOAR 30 or more times. It was hypothesized that:

(1) Students involved with the SOAR after-school program would perform significantly better than students not involved with the program (Group 1 vs. Groups 2, 3, and 4) as measured by North Carolina End of Grade Course (NCEOC) scores.

(2) Rate of group attendance will significant yields correspondingly greater gains in academic achievement, as measured by NCEOC scores. For example, Group 2 will significantly outperform group 1. Group 3 will significantly outperform groups 1 and 2. Group 4 will significantly outperform groups 1, 2, and 3.

(3) African American students involved in the SOAR program would perform significantly better than other African American students in the same school district (Wake County), as measured by NCEOC scores; and

(4) African Americans students involved in the SOAR program will significantly outperform European Americans students in the same school district (Wake County), as measured by NCEOC scores.

### *Participants*

Participants consisted of 1204 Wake County high school students, 940 who participated in the SOAR after-school program and 264 students who were asked to attend but did not. The SOAR racial breakdown was 601 African Americans (50%), 493 European Americans (41%), 52 Hispanics (4.3%), 34 Asians (2.7%), 19 Multicultural (1.6%), and 5 classified as American Indian (0.4%). The SOAR gender breakdown was 589 females (49%), and 615 males (51%). The SOAR students' ages ranged from 14.5 to 22.2 years ( $M = 16.3$  years,  $SD = 1.0$ ). The Wake County participants were 18,407 Wake County students who neither attended the SOAR programs nor were asked to attend, consisting of 5,343 African Americans students and 13,064 European American students.

*Descriptive Data.* Comparing the SOAR to the Wake County students, Chi-Squares were performed on grade levels, parent education, and free and reduced lunch; comparisons were also conducted on means and standard deviations scores of school absences. Results showed that there was a significant difference in grade level, with SOAR students representing lower grades,  $p = .0002$  (see Table 2). There was a significant difference in parent education, with SOAR students' parents having lower education levels than those of Wake County students,  $p < .0001$ , (see Table 3). There was a significant difference in students receiving free and reduced lunch,

with SOAR students representing more students eligible for free and reduced lunch,  $p < .0001$  (see Table 4). The means and standard deviations for school absences were similar between SOAR students and Wake County students, at 6.5 and 5.9 respectfully, with corresponding standard deviations of 8.6 and 7.4.

**Table 2**

*Grade Levels of SOAR Students and Wake County Students*

<i>Grade Level</i>	<i>SOAR N (percent)</i>	<i>Wake County N (percent)</i>
9 <sup>th</sup>	129 (51.8%)	6890 (37.4%)
10 <sup>th</sup>	56 (22.1%)	5491 (29.8%)
11 <sup>th</sup>	43 (16.9%)	3887 (21.1%)
12 <sup>th</sup>	26 (10.2%)	2139 (11.6%)

**Table 3**

*SOAR and Wake County Students' Parent Education*

<i>Parent Education</i>	<i>SOAR</i>	<i>Wake County</i>
1	12 (6.3%)	297 (2.4%)
2	33 (17.3%)	1508 (12.2%)
3	32 (16.8%)	1224 (9.9%)
4	5 (2.6%)	429 (3.5%)
5	26 (13.6%)	1520 (12.3%)
6	63 (33.0%)	4800 (38.9%)
7	20 (10.5%)	2573 (21.8%)



Note: 1 = did not finish high school, 2 = high school graduate, 3 = some additional education after high school, but did not graduate, 4, = trade or business school, 5 community, technical or junior college, 6 = four-year college graduate, 7 = graduate school degree.

**Table 4**

*SOAR and Wake County Students Eligibility for Free and Reduced Lunch*

Levels of Lunch	SOAR	Wake County
2	71 (28.0%)	2057 (11.2%)
3	20 (7.9%)	487 (2.7%)
4	163 (64.2%)	15861 (86.2%)

Note: 2 = free lunch, 3 = reduced lunch, 4 = full pay lunch (not participating or not eligible)

Descriptive data considered by race for SOAR and Wake County students' parent education, school grade, number of school absences, and free and reduced lunch, are shown in Table 5 and Table 6. The SOAR students attended five Wake County high schools. The percentage of African Americans from each school who participated the SOAR program was twice the overall percentage of African American students attending that particular school (see Table 7). The total number of Wake County participants used in the present study is the total number used by Wake County Public School System to calculate the expected scores for all Wake County students (i.e., this is all the students, not just a representative sample).

**Table 5***Descriptive Data for SOAR and Wake County Participants*

Source	Race	Variable	N	Mean	Std Dev	Minimum	Maximum
SOAR	AA	grade	159	9.82	1.06	9.0	12.0
		parent ed.	123	4.06	1.86	1.0	7.0
		absences	159	6.16	8.10	0	65.0
	EA	grade	95	9.95	1.00	9.0	12.0
		parent ed.	68	5.03	1.88	1.0	7.0
		absences	95	7.11	9.39	0	60.0
Wake	AA	grade	5343	10.05	1.05	9.0	12.0
		parent ed.	3624	4.37	1.89	1.0	7.0
		absences	5343	7.47	9.56	0	109
	EA	grade	13064	10.07	1.01	9.0	12.0
		parent ed.	8727	5.42	1.62	1.0	7.0
		absences	13064	5.21	6.16	0	87

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Note: Parent ed = parent education; AA = African American; EA = European American

**Table 6***Free and Reduced Lunch by Race and Source*

Source	Race	2	3	4
SOAR	A A	67 (42%)	17 (11%)	75 (47%)
	EA	4 (4%)	3 (3%)	88 (93%)
Wake	A A	1717 (32%)	325 (6%)	3301 (62%)
	EA	340 (3%)	162 (1%)	12560 (96%)

Note: 2 = Free lunch, 3 = reduced lunch, and 4 = full pay; AA = African American; EA = European American; Source is either Wake County or SOAR participation

**Table 7***Comparison of African American and European American SOAR Students to the Total School**Population of African American and European American Students (listed by school)*

Source	African Americans	European Americans	Total
Athens (Student body)	423 (28%)	1089 (72%)	1521
Athens (SOAR)	75 (64%)	43 (36%)	118
FVHS	400 (25%)	1206 (75%)	1606
FVHS (SOAR)	79 (55%)	66 (45%)	145
Sanderson	644 (38%)	1057 (62%)	1701
Sanderson (SOAR)	104 (64%)	58 (36%)	162
SRHS	1343 (66%)	689 (34%)	2032
SRHS (SOAR)	228 (52%)	213 (48%)	441
Wake Forest	501 (26%)	1416 (74%)	1971
Wake Forest (SOAR)	102 (53%)	91 (47%)	193

Note: FVHS = Fuquay-Varina High School, SRHS = South Raleigh High School

*Instrument*

The present study used the North Carolina End of Course data (NCEOC) as the outcome measure. The data for the NCEOC includes: predictive and actual scores in Algebra I; Algebra II; Biology; Chemistry; English I; Geometry; Physical Science; and Physics. The NCEOC is a six year old accountability program designed to improve student achievement, reward school excellence, and provide assistance to schools that need extra help. At the elementary school level, the formula takes into account scores on reading, writing, and mathematics (end of grade test). At the middle school level, the eighth grade Computer Skills Test results are also included (also end of grade test), and at the high school level the NCEOC results are based on the performance of the same students over time in eight End-Of-Course indicators (five of the NCEOC courses are required for graduation). Data from the NCEOC reflect the progress made in the key high school subjects.

Since 1998, all North Carolina students attending public schools and enrolled in courses were mandated to take the NCEOC tests. The latest norming years for the NCEOC were between 1994 and 1997. The means ranged from 53.1 in English to 58.8 in Algebra II; standard deviations range from 8.3 in U.S. History to 10.5 in Algebra II; and reported scale scores were between 23 and 102. The data from each course are reported by scale scores, percentiles, and achievement levels 1 through 4. NCEOC prediction formulas were first used in 2000-2001 to determine growth (North Carolina Department of Public Instruction. Technical Report #1, 1996).

The NCEOC prediction formulas rely on previous test scores as predictors for the NCEOC computation. The NCEOC expected scores system utilizes an equation to calculate the goals or predicted scores for each school on each NCEOC subject test. Each expected average score for a group is determined by the average scores of the students in that group on a variety of

tests taken in previous years. For example, to predict Algebra I expected scores, previous math scores were used; for Biology, previous reading and math scores; for English, previous reading scores; for Algebra I, previous reading and Algebra I scores; for Chemistry, previous Algebra I, Biology, and English scores; for Geometry, previous Reading, Math, and Algebra I scores; for Physical Science, previous Reading and Math scores; and for Physics, previous Math, Biology and English scores were used (North Carolina Department of Public Instruction. Technical Report #1, 1996). In Wake County students are grouped by schools, and in the present study students are grouped by attendance and race.

*Content validity.* Content validity of the NCEOC tests was evaluated in 1994 during the development of the tests. North Carolina teachers wrote and reviewed items on the test. In the developmental stage, six form tests were prepared and administered to students in each subject area. Item pools were randomly split in half, and the second items pools were stored and not used during the development of the first set of the three forms. Items within the tests were selected using a modified domain-sampling model. In the modifications, the domain of items was limited to those items that had psychometric characteristics that were satisfactory and approved by the review team. After each test was completed, ten to fifteen area teachers and curriculum supervisors reviewed it. They were instructed to take the tests and provide feedback as to how well the test met certain criteria. The ratings of the test were aggregated for review by the North Carolina Department of Public Instruction (North Carolina Department of Public Instruction, 1996); see Appendix F for descriptive statistic.

The first three tests, forms A, B, and C, were first administered in 1994. One third of the students received test A, one-third received test B, and one third received test C. The remaining three forms, tests D, E, and F, were administered in the fall of 1995. Comparison of students'

scores across time and scores in general across time demonstrated that the tests contained adequate content validity (North Carolina Department of Public Instruction. Technical Report #1, 1996).

*Criterion related validity.* Criterion related validity relates to the effectiveness of a test in predicting an individual's behavior in a specific situation (predictive validity) or the correlation between a new test and other tests reported to measure the same domain (concurrent validity). The North Carolina Standard Course of Study outlines the content standard for North Carolina schools, in that it describes the skills and knowledge needed for students to attain a high level of competency in their subject matter. North Carolina Educators determined that performance standards should be developed to identify a student's level of competency expected in each content subject (North Carolina Department of Public Instruction. Technical Report #1, 1996).

These achievement levels are used to describe the scores on the tests and are based on evidence about the relative skills of students. Achievement levels were categorized into groups by expert judges who were knowledgeable of students' achievements outside the domains of the testing situation. North Carolina Department of Public Instruction (NCDPI) believed that teachers were better able to make informed judgment about students' achievements because they observe the breadth and depth of the work of each student and their accomplishment during the school year. Teachers were asked to categorize each student into one of four categories based on their absolute achievement throughout the school year (North Carolina Department of Public Instruction. Technical Report #1, 1996).

In Level I, students do not have sufficient mastery of knowledge and skills to be successful in a more advanced level of the content area. In Level II, students demonstrate inconsistent mastery of the knowledge and skills in the subject matter and are minimally

prepared to be successful in a more advanced content area. In Level III, students consistently demonstrate mastery of the subject matter and are well prepared for a more advanced level of the content area. Finally, in Level IV, students consistently perform in a superior manner clearly beyond what is required to be proficient in the subject matter, and their skills are very well prepared for a more advanced level of the content area (North Carolina Department of Public Instruction. Technical Report #1, 1996).

During the initial assessment, more than 650 teachers judged the performance of approximately 50,000 students statewide. Percentages of students in each level judged by teachers were approximately similar across subjects. These percentages were used in conjunction with a frequency distribution of scores from the first administered End of Course test to determine the cut-off point for each achievement level (North Carolina Department of Public Instruction. Technical Report #1, 1996; see Appendix F).

*Construct validity.* Construct validity reflects the extent to which a test measures a theoretical construct or trait. Evidence of construct validity may be demonstrated by a new test correlating with other similar tests of the same general area. To examine construct validity on Biology, English I, and US History, approximately 1,000 students were randomly selected from across the state to examine how each open-ended item performed. Open-ended tests were designed to measure broad higher level thinking skills by requiring the student to apply skills and knowledge beyond recall, so that the quality of a students' response will determine their score (North Carolina Department of Public Instruction. Technical Report #1, 1996).

In addition to the answers given, students were asked to explain how they arrived at the answer. Scoring rubrics were utilized based on the content area to judge specific items within that content area. The items were tested a second time to verify the scoring rubric. Results of the

scoring rubric were analyzed and examined for each item. Decisions were made to retain or delete the item for future test development. The same students were administered an open-ended test and a multiple choice test months later (North Carolina Department of Public Instruction. Technical Report #1, 1996).

The correlation for biology between the open-ended test and the multiple-choice test ranged from 0.24 to 0.51, with a mean of 0.40. The correlation in English I between the open-ended test and the multiple-choice test ranged from 0.32 to 0.57, with a mean of 0.44. The correlation for US History between the open-ended test and the multiple-choice test ranged from 0.28 to 0.55, with a mean of 0.43. In 1995, students' English I and Algebra I End of Course scores were matched with their End of Grade test scores for reading, comprehension and mathematics in grade 8. A total of 43,194 students had scores on both English I and grade 8 end-of-grade reading scores, showing a correlation of 0.81 between these two tests. A total of 27,076 students had scores on both Algebra I and grade 8 mathematics scores, with a 0.73 correlation between these two sets of scores (North Carolina Department of Public Instruction. Technical Report #1, 1996).

In 1994, additional information was also collected at the time these tests were first administered. Teachers were asked to indicate the expected final grade for each student in their class. Algebra I tests were administered to 68,581 students; the correlation between expected grades and test scores was 0.62. The Biology tests were administered to 62,241 students, with a correlation between teachers expected scores and test scores of 0.54. English I tests were administered to 67,213 students, with a correlation between teacher's expected scores and test scores of 0.54. In US History, the correlation of 52,929 students' scores with teachers' expected



scores revealed a 0.53 correlation (North Carolina Department of Public Instruction. Technical Report #1, 1996).

*Reliability.* NCDPI used the coefficient alpha procedure to determine internal consistency reliability. Internal consistency reliability examines the extent to which a test measures a single basic concept. The procedure used Spearman-Brown Prophecy Formula to determine the coefficient alpha for the pretest and posttest. NCDPI wanted to obtain at least a coefficient alpha of 0.85, because the information obtained from these test would be used to make decisions about individual students, for example, with respect to placement or instructional program decisions. Algebra I obtained a posttest alpha of 0.94 and a pretest alpha of 0.89; Biology obtained an alpha coefficient of 0.94 for posttest and 0.88 for the pretest; English I obtained a 0.92 alpha coefficient for the posttest and a 0.84 alpha coefficient for the pretest; and US History obtained a 0.92 for the posttest and a 0.85 alpha coefficient for the pretest (North Carolina Department of Public Instruction. Technical Report #1, 1996).

### *Procedure*

To test hypothesis 1 and 2, participants were distributed into four groups. Group 1 was those students who were asked to attend SOAR but did not attend or attended only once (N = 304). Group 2 were those students who attended SOAR 2 to 9 times (N = 615). Group 3 were those students who attended SOAR 11 to 29 times (N = 208). Group 4 were those students who attended SOAR 30 or more times (N = 169; see Table 8).

To test hypotheses 3 and 4, participants were also placed into four groups. Group 1 was African American SOAR students who had attended 10 or more times. Group 2 was European American SOAR students who had attended the program 10 or more times. Group 3 was African

American Wake county students who neither attended SOAR nor were asked to attend. Finally, Group 4 was European American students who neither attended SOAR nor were asked to attend.

Federal regulation for 21st Century grants defines regularly attending an after-school program as attending 30 or more times. SOAR records indicate that hundreds of students attended 1-10 times and the progress for students attending 10 or fewer times were questionable. Therefore, it was decided to examine these two populations to determine if 10 or fewer days would differ from 30 plus days.

Participation in the SOAR program was voluntary; students were either encouraged to attend SOAR by their teachers and counselors or they attended SOAR on their own volition. At least half of all students were on the instructional assistance list; this list identifies students who are in need of instructional assistance (Hall, Vleck, & Peach, 2004). In addition, preliminary analyses determined that Groups 1 and 2 were similar; both groups did not improve their test scores significantly, and it was therefore decided to exclude these two groups in the analyses of hypotheses 3 and 4.

**Table 8***SOAR Demographics by Groups*

Groups	Non-participants	2 – 9	10 – 29	30 or more
AA	126	256	126	91
American Indian	1	2	1	1
Asians	4	21	5	4
Hispanics	9	21	14	8
Multicultural	3	3	7	3
European Americans	124	242	84	41
Males	142	289	117	70
Female	125	266	120	78

Note. AA = African American

*Data collection.* Three equivalent forms of the EOC tests were administered in each classroom. The questions on the EOC tests were written and reviewed by trained North Carolina teachers and educators. A portion of the EOC tests was aligned to the North Carolina Standard Course of Study, and the remaining tests were standardized from randomly selected students statewide. The number of students in the norm groups ranged from 7,000 students for Physics to 21,500 students for Biology and Chemistry. Test scores for all qualifying students were collected, analyzed, and stored in the Wake County School District's database. The linear regression model developed by the North Carolina Department of Public Instruction (NCDPI) and utilized by Wake County Public School System (WCPSS) calculated students' predicted scores. The NCEOC consists of 60 to 100 multiple-choice questions administered during a fixed

block of time within the last week of school, for schools that are block scheduled, and the last two weeks of school for traditional yearlong schools.

The NCEOC tests use an equation to calculate expected scores for each school and for each NCEOC test. Each expected score is based on the students' proficiency when they were in a previous grade or course. Proficiency is determined by students' average performance on the NCEOC tests, which serves as the predictor of that students' performance in the course in which they are currently enrolled. The NCEOC serving as predictors are calculated by a regression formula, while the NCEOC tests scores are the score each student receives from taking that particular test. For example, to calculate a school's predictor score for Algebra I, the formula is Algebra I expected Score =  $b_0 + (b_{imp} \times IMP)$ , where  $b_0$  is the state average performance of schools (scale scores) for the EOC (60.4);  $b_{imp}$  is the value used to estimate the effects of the school's average math proficiency on the expected average EOC test scores (0.88); IMP is the index of mathematics proficiency (it equals the school's average EOC grade 8 math scale scores for students in Algebra I minus 176.1). Substituting the values in the formula gives us; Algebra I Expected Score =  $60.4 + (0.88 \times [\text{math} - 176.1])$ .

Second, only students who have NCEOC math scores from grade 8 will be included in the analysis. Some students may not have grade 8 Math scores for several reasons, including students who have transferred from other states, and students who were absent when tests were given and failed to complete a make-up.

For example, if the average NCEOC Math Score for the matched group of students was 178, the expected Algebra I scores would be given by the following formula: Algebra I Expected Score =  $60.4 + (0.88 \times [178 - 176.1]) = 62.07$ . This means that for a school to meet expected

growth, they must have an average Algebra I North Carolina End of Course score that equals or exceeds 62.07. The present study utilized the Wake County Public School District's database.

*Data analyses.* Data were first screened for problems such as out-of-range values, reasonable means and standard deviations, outliers, non-linear relationships, and other problems that may effect the outcome of the data. After examining the skewness and kurtosis, it would appear that the assumption of normality is reasonable. After examining the extreme value table and the matrix scatter plot, there do not seem to be any extreme scores or outliers. Next, Levene's Test of Equality of Error Variances shows that the assumption of homogeneity of variance is reasonable (see Table 9). Residual scores were used to analysis the data. Appendix G shows bar graphs of variance and normality for Algebra I and Algebra II. Appendix H shows bar graphs of variance and normality for Geometry and Biology. Appendix I shows bar graphs of variance and normality for Chemistry and English. Appendix J shows bar graphs of variance and normality for Psychical Science and Physics. And Appendix K shows bar graphs of variance and normality for the entire population of participants.

**Table 9**

*Data Analyses of Participants Using Residual Scores*

	<i>N</i>	<i>Range</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>Variance</i>	<i>Skewness</i>	<i>Kurtosis</i>
Algebra1	5417	58.00	-25.24	32.76	4.73	8.29	68.76	.033	.067
Algebra2	4852	63	-33.00	30.00	.53	9.66	93.49	.035	.070
Geometry	5511	60.0	-34.8	25.2	-1.04	8.03	64.57	.033	.066
Biology	6151	55.00	-31.61	23.39	1.72	7.05	49.70	.031	.062
Chemistry	3253	49.00	-23.14	25.86	2.44	7.51	56.41	.043	.086
English	6966	51.66	-27.02	24.64	2.58	6.25	39.07	.029	.059
PhysicalSci.	2099	42.00	-20.53	21.47	1.11	5.83	33.99	.053	.107
Physics	1020	49.00	-23.09	25.91	3.33	8.07	65.21	.077	.153
Mean	18661	63.00	-33.00	30.00	1.20	7.21	52.03	.018	.036

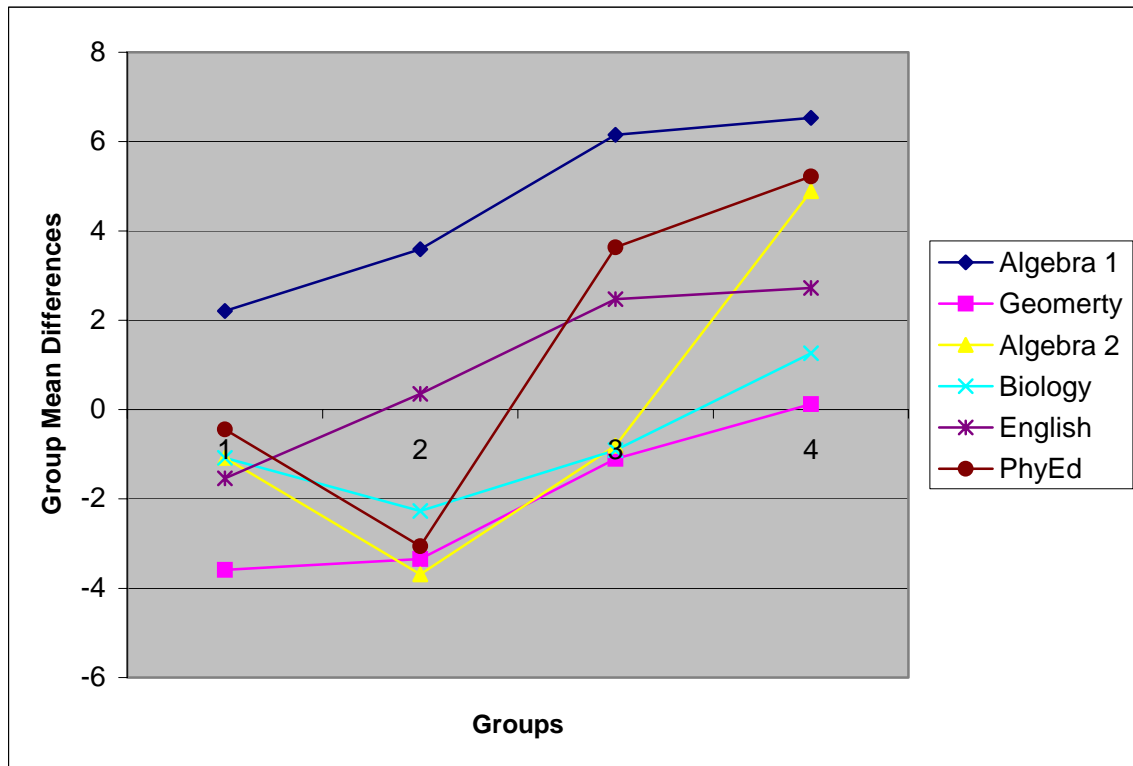
Note: PhysicalSci = physical science

*Hypotheses 1 and 2.* To test the first and second hypotheses, three control variables were included in the data analysis model: group, race, and free and reduced lunch. Participants were

placed in four groups based on their attendance in the SOAR after-school program. Predicted scores were generated for each group on each subject (i.e., Algebra I, Algebra II, Geometry, English, Biology, Chemistry, Physical Science, and Physics). Individual predicted scores could not be obtained from the linear regression model, as the model was developed to assess schools progress, not individual students' success. It was decided that there were no obvious problems using group predicted scores, therefore, the analysis preceded using these scores. Furthermore, group predicted scores had to be used for the analysis, the regression model calculate group predicted scores not individual scores.

These predicted test scores were generated with a linear regression model developed by the North Carolina Department of Public Instruction, used in predicting scores by school and assessing performance improvement for Wake County schools over time. Each subject has a different prediction formula. The dependent variable was the difference between each student's actual score and the subject predicted test score (see Figure 1 for group mean difference scores).

First an overall Analysis of variance (ANOVA) was run to evaluate the effects of the SOAR program attendance on student achievement, including the main and interaction effects. Next, a general linear model with multiple contrasts was run to examine group, race, free and reduced lunch, and their interactions on various subjects. Finally, follow-up analyses were conducted to address (a) subject specific test differences scores, and (b) comparisons between the four attendance groups.



Note: Group means are the difference in predicted and actual NCEOC scores

**Figure 1.** *SOAR Participants Group Means Differences*

*Hypotheses 3 and 4.* To test hypothesis 3 and 4, participants were placed into four groups: African Americans and European American SOAR participants who had attended 10 or more times (groups 3 and 4), and African American and European American Wake County students who had not attended the SOAR after-school program. Groups 3 and 4 were chosen because preliminary data analysis showed students who attended 10 or more times significantly performed better than students who attended fewer than 10 times. In other words, Group 2 looks similar to Group 1, students who were asked to attend but did not, and Group 3 looks similar to Group 4, those students who seemed to have benefited from the SOAR program. Predicted test scores were generated for all 4 groups, again using the linear regression model developed by the

North Carolina Department of Public Instruction for use in predicting scores by schools and assessing performance for schools over time.

The dependent variable was the difference between each student's actual score and the predicted test score. Two control variables and their interactions were included in the data analysis: race and free and reduced lunch. An ANOVA was conducted on the four groups. The predicted scores were generated for each group; every student in that group had the same predicted score for each subject. An ANOVA was conducted to evaluate the relationship between differences in EOC predicted and actual scores.



## CHAPTER IV: RESULTS

To test hypothesis 1 and 2, an ANOVA was conducted which included six EOC tests scores for individual students and EOC predictive scores for each of the four groups. Physics and Chemistry were excluded due to a low number of participants. A MANOVA was not performed also due to the low number of participants in the analysis, since every case must have scores on all indicators to be considered in a MANOVA analysis. The analyses were performed using both a group attendance and a continuous attendance variable. Both analyses were the same; therefore, it was decided to use the categorical variable for parsimony of interpretation.

The model was run to include group as an outcome variable and race, and free and reduced lunch as explanatory or control variables, alone with all two-way interaction. The explanatory variables were used to increase the precision of estimated program effect, to control for confounding variables, to estimate interactions between individual characteristics, and to improve the understanding of the program effect. For example, if subjects were randomly assigned to groups, then differences in outcomes between groups that are not due to the effects of the SOAR program are random. SOAR participation was voluntary and not randomly assigned; therefore, the differences may be due to systematic differences in the characteristic of the participants, for instance, race or income levels.

First an overall Analysis of variance (ANOVA), was run to evaluate the effects of the SOAR program attendance on student achievement, including the main and interaction effect, demonstrating a significant  $F$  statistic on several dependant variables (see Table 10).

Significance was found in Algebra I  $F(16, 761) = 12.51, p = < .0001$ , Geometry  $F(16, 407) = 8.28, p = < .0001$ ; Algebra II  $F(16, 264) = 4.78, p = < .0001$ , Biology  $F(16, 532) = 11.69, p = < .0001$ .

.0001, English ( $F(16, 929) 18.61, p = < .0001$ , and Physical Science  $F(16, 304) 12.19, p = < .0001$ .

Next, a general linear model, with multiple contrasts, was run which demonstrated significance in group, race, free and reduced lunch, and their interactions on various subjects; Table 11 displays mean scores for all significant variables and their interactions. Follow-up analysis was conducted to address (a) subject specific test differences scores and (b) comparisons between the four attendance groups.

**Table 10**

*Significance Test for SOAR Groups and Explanatory Variables Including Two-way Interactions.*

Subjects	N	Race	Group	Race* Group	Lunch	Race* lunch	Lunch * Group
Algebra 1	778	<.0001**	0.0005*	0.7844	0.8051	0.1486	0.2025
Geometry	424	<.0001**	0.0993	0.9037	0.1325	0.1253	0.1898
Algebra 2	281	0.0830	0.0555*	0.7609	0.7312	0.1531	0.7362
Biology	549	<.0001**	0.0014*	0.0557	0.0212*	0.0548*	0.2736
English	946	<.0001**	<.0001**	0.8419	0.0014*	0.2792	0.054*
Phy. Sci	321	0.0036*	<.0001**	0.3591	0.9953	0.4512	0.0305*

Note: \* = significance at the 0.05 alpha level; \*\* = significance at the .001 alpha level

**Table 11***Means of Significant Variables and Their Interactions*

Effect	RACE	Groups	Lunch	alg1	geom	alg2	bio	Eng	PhSci
Lunch			0	4.75	-0.97	0.26	<b>0.78</b>	<b>2.19</b>	1.34
Lunch			1	4.50	-2.98	-0.60	<b>-1.37</b>	<b>-0.18</b>	1.33
Lunch_Groups		1	0	3.46	-1.02	-0.25	0.44	0.76	<b>0.93</b>
Lunch_Groups		1	1	0.97	-6.16	-1.91	-2.60	-3.83	<b>-1.81</b>
Lunch_Groups		2	0	4.05	-1.33	-1.65	-0.34	1.96	<b>-1.56</b>
Lunch_Groups		2	1	3.12	-5.34	-5.74	-4.20	-1.26	<b>-4.57</b>
Lunch_Groups		3	0	5.06	-0.81	-0.99	0.92	3.08	<b>2.58</b>
Lunch_Groups		3	1	7.24	-1.39	-0.63	0.90	1.87	<b>4.68</b>
Lunch_Groups		4	0	6.41	-0.71	3.92	2.09	2.94	<b>3.42</b>
Lunch_Groups		4	1	6.65	0.95	5.87	0.44	2.50	<b>7.01</b>
Groups		1		<b>2.21(A)</b>	-3.59	<b>-1.08</b>	<b>-1.08(B)</b>	<b>-1.54</b>	<b>-0.44</b>
Groups		2		<b>3.59(A)</b>	-3.34	<b>-3.69(A)</b>	<b>-2.27(A)</b>	<b>0.35</b>	<b>-3.06</b>
Groups		3		<b>6.15(B)</b>	-1.10	<b>-0.81</b>	<b>0.91 (A)</b>	<b>2.47</b>	<b>3.63</b>
Groups		4		<b>6.53(B)</b>	0.12	<b>4.89(B)</b>	<b>1.26(B)</b>	<b>2.72</b>	<b>5.22</b>
RACE	BLCK			<b>1.77(A)</b>	<b>-4.51(A)</b>	-2.44	<b>-2.67(A)</b>	<b>-1.16</b>	<b>-1.63</b>
RACE	WHTE			<b>7.48(A)</b>	<b>0.56 B)</b>	2.10	<b>2.08(B)</b>	<b>3.16</b>	<b>4.30</b>
RACE_Lunch	BLCK		0	1.19	-4.45	-3.73	<b>-2.46</b>	-0.36	-2.36
RACE_Lunch	BLCK		1	2.34	-4.57	-1.16	<b>-2.88</b>	-1.96	-0.89
RACE_Lunch	WHTE		0	8.30	2.52	4.25	<b>4.02</b>	4.73	5.04
RACE_Lunch	WHTE		1	6.66	-1.40	-0.05	<b>0.15</b>	1.60	3.55
RACE_Groups	BLCK	1		-1.13	-6.65	-4.52	<b>-4.76</b>	-3.87	-3.46
RACE_Groups	BLCK	2		0.71	-5.98	-6.33	<b>-4.54</b>	-1.97	-4.87
RACE_Groups	BLCK	3		3.19	-3.50	-2.66	<b>-1.62</b>	0.16	0.23
RACE_Groups	BLCK	4		4.29	-1.92	3.74	<b>0.23</b>	1.06	1.59
RACE_Groups	WHTE	1		5.56	-0.53	2.36	<b>2.60</b>	0.80	2.58
RACE_Groups	WHTE	2		6.47	-0.69	-1.06	<b>-0.01</b>	2.68	-1.26
RACE_Groups	WHTE	3		9.11	1.30	1.04	<b>3.44</b>	4.79	7.02
RACE_Groups	WHTE	4		8.78	2.16	6.05	<b>2.30</b>	4.39	8.85

Note: alg1 = algebra 1; geom = geometry; alg2 = algebra 2; bio = biology; Eng = English; and PhSci = physical science.

*Subject Specific Test Differences Scores*

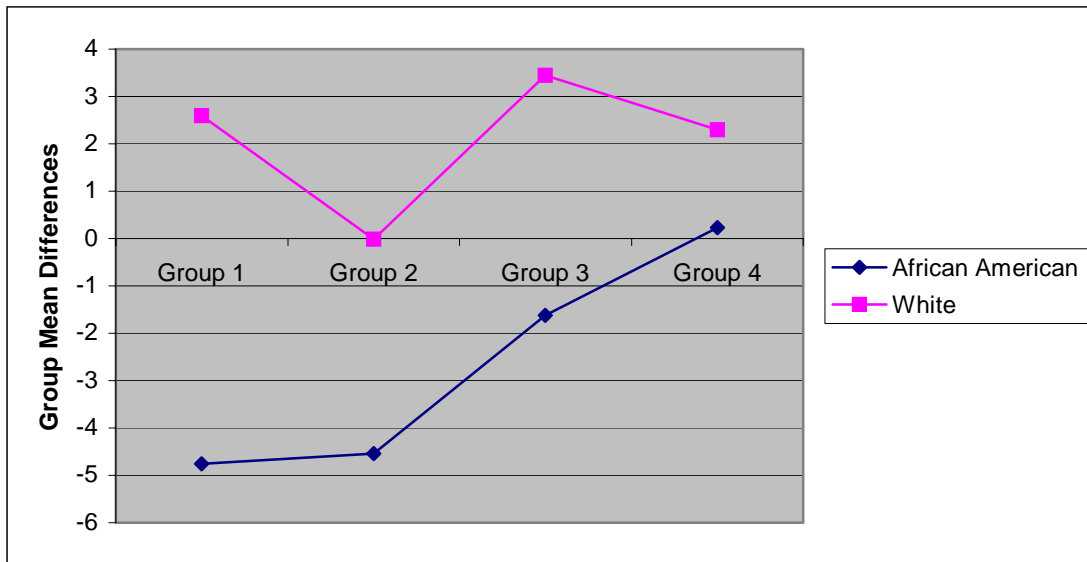
*Algebra I.* To control for a Type I error across the simple main effects, we adjusted for multiple comparisons using a post hoc Tukey-Kramer procedure. The main effect for group differences and race were both significant, at  $p < .0001$ . European Americans performed significantly better than African Americans,  $p < .0001$ , and Group 3 and 4 performed significantly better than Group 1 and 2.  $p < .0001$ . Therefore, race and attendance were

predictors for academic success in Algebra I; no interaction was found. Participants who had higher attendance in SOAR demonstrated improved test scores in Algebra I for both African Americans and European American students, since there were no interactions. In addition, the preplanned comparison showed that Groups 3 and 4 significantly performed better than Groups 1 and 2,  $p < .0001$ ; and those students who attended SOAR (Groups 2, 3, and 4), performed significantly better than students who did not attend SOAR (Group 1),  $p < .0005$ . Significance was not found in free and reduced lunch, free and reduced lunch \* group, race \* free and reduced lunch, or race \* group.

*Geometry.* To control for a Type I error across the simple main effects, we again adjusted for multiple comparisons using post hoc Tukey-Kramer multiple comparison procedure. In geometry, the main effect for race was the only predictor for academic success with European Americans significantly performing better than African Americans,  $p < .0001$ . In addition, the preplanned comparisons showed that Groups 3 and 4 significantly performed better than Groups 1 and 2,  $p = .0130$ . Significance was not found in free and reduced lunch, group \* free and reduced lunch, groups, race \* free and reduced lunch, or race \* group.

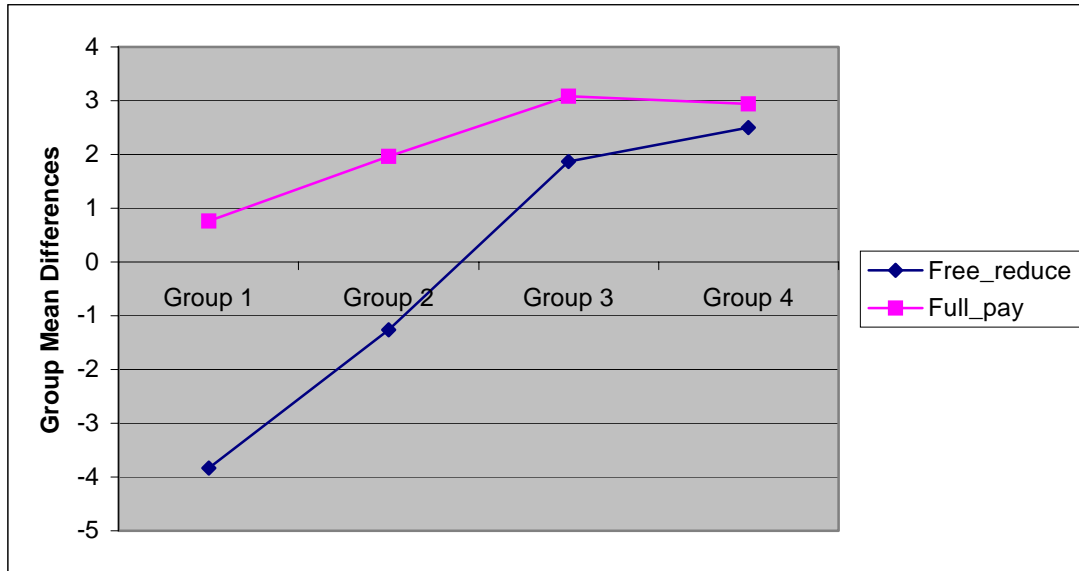
*Algebra II.* To control for a Type I error across the simple main effects, we adjusted for multiple comparisons using post hoc Tukey-Kramer procedure. In algebra II, there was a significant main effect in the difference among groups, with Group 4 significantly performing better than Group 2,  $p = .0066$ . No interaction was found. In addition, the preplanned contrast demonstrated that Groups 3 and 4 significantly performed better than Groups 1 and 2,  $p = .0312$ . Significance was not found in free and reduced lunch, group \* free and reduced lunch, race, race \* free and reduced lunch, or race \* group.

*Biology.* To control for a Type I error across the simple main effects, we adjusted for multiple comparisons using a post hoc Tukey-Kramer procedure. In Biology, the main effect for race,  $p < .0001$ , and group,  $p = .004$ , both showed significance. Also, there was a significant interactions between race \* free and reduced lunch,  $p = .0242$ . Because the interaction between race and free and reduced lunch were significant, we chose not to interpret the main effect, and instead examined the simple main effect. By examining the interaction means between race\* free and reduced lunch, the effect of SOAR is not clear. African Americans seem to comprise a homogeneous group, while European Americans comprise a heterogeneous group. In other words, free and reduced lunch was a better indicator for score improvements for African Americans, but not for European Americans. It should be noted that although an interaction exists, there continues to be a groups effect for African Americans, but not for European Americans (see Figure 2). In addition, the preplanned comparisons demonstrated that Groups 3 and 4 significantly performed better than Groups 1 and 2,  $p = .0005$ . No significance was found for free and reduced lunch \* group and race \* group.



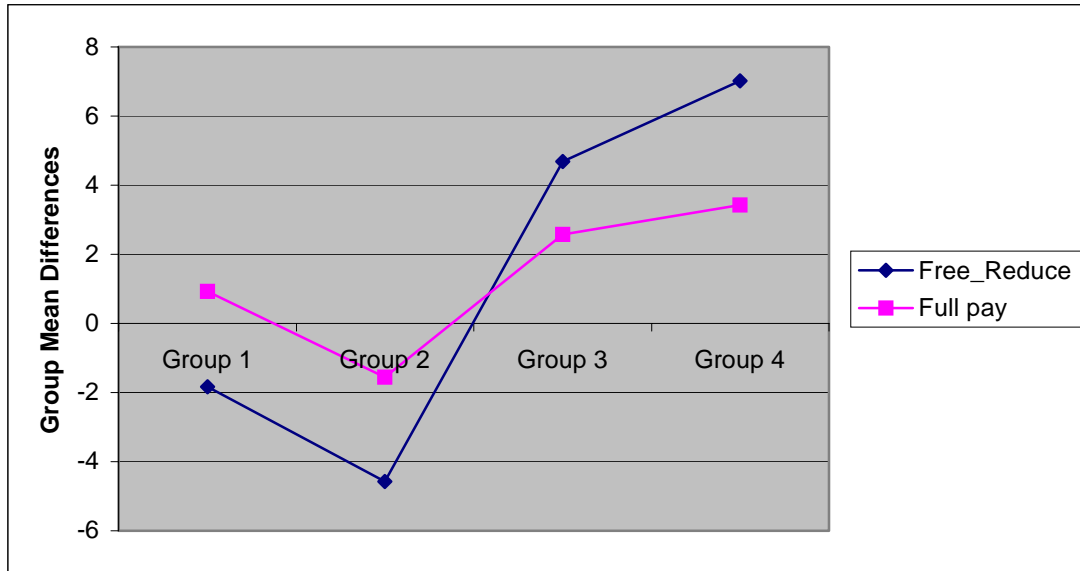
**Figure 2.** *Biology Interaction with Group and Free and Reduced Lunch*

*English.* To control for a Type I error across the simple main effects, we adjusted for multiple comparisons using a post hoc Tukey-Kramer multiple comparison procedure. In English, there were significance main effects in race,  $p < .001$ , group,  $p < .001$ , and free and reduced lunch,  $p = .0014$ , with an interaction between free and reduced lunch \* group,  $p = 0.0540$ . European Americans performed significantly better than African Americans on test scores, and the interaction between group \* free and reduced lunch had a group effect (see Figure 3). Those students paying full lunch performed significantly better than those on free and reduced lunch. In addition, preplanned comparisons demonstrated that Groups 3 and 4 significantly performed better than Groups 1 and 2,  $p < .0001$ , and those students who attended SOAR (Groups 2, 3, and 4), performed better than students who did not attend SOAR (Group 1),  $p < .0001$ . As shown in Figure 3, attendance in SOAR closed the gap between those students on free and reduced lunch and those students who did not qualify for free and reduced lunch. No significance was found for race \* free and reduced lunch, and race \* group.



**Figure 3.** *English Interaction with Free and Reduced lunch and Full Pay Lunch Across Groups*

*Physical science.* To control for a Type I error across the simple main effects, we adjusted for multiple comparisons using a post hoc Tukey-Kramer procedure. In Physical Science there was significance in the main effect for race,  $p = .0036$ , and group,  $p < .0001$ , with a significant interaction between free and reduced lunch \* group,  $p = .0300$ . European Americans performed significantly better on test scores than African Americans, while students taking free and reduced lunch outperformed full pay students. There was also a group effect for the students who participated in SOAR (Groups 2, 3, and 4) see Figure 4. In addition, preplanned comparisons demonstrated that Groups 3 and 4 significantly performed better than Groups 1 and 2,  $p < .0001$ , and those students who attended SOAR (Groups 2, 3, and 4) performed better than students who did not attend SOAR (Group 1),  $p = .0219$ . No significance was found for free and reduced lunch, race \* free and reduced lunch, and race \* group.



**Figure 4.** *Physical Science Interaction for Group and Free and Reduced lunch*

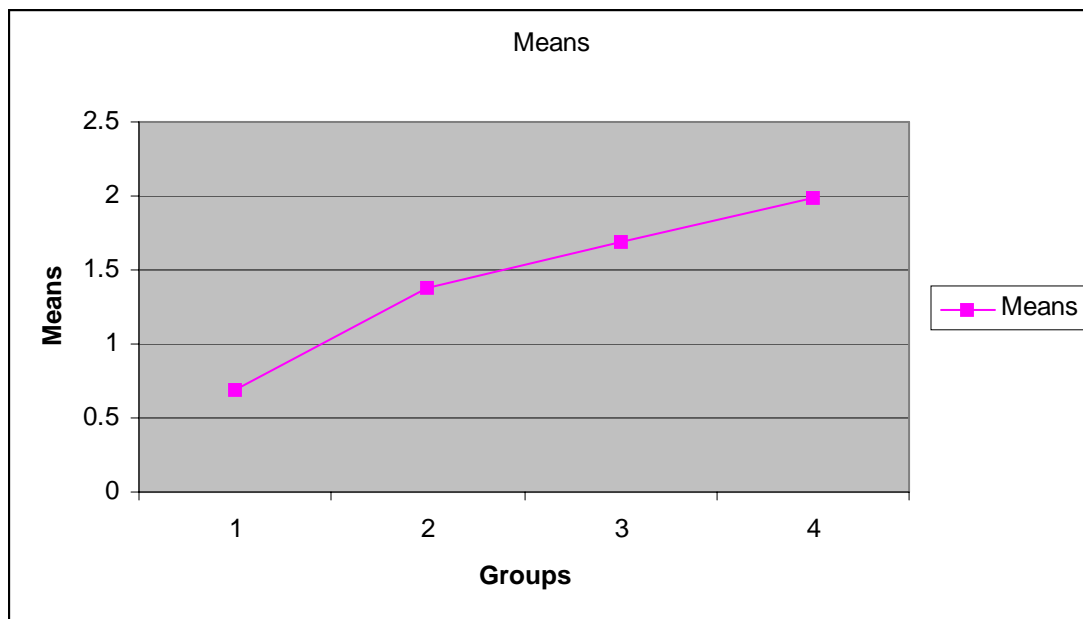
#### *Composite Comparisons Between the Four SOAR Groups*

First, a mean difference contrast was performed by combining all six subjects and running an ANOVA to test the contrasts between Group 1 (participants not attending SOAR), and Groups 2, 3, and 4 (participants attending SOAR), and the contrast between Groups 1, 2, 3, and 4 across all six subjects. Means were calculated for all cases. To control for a Type I error across the simple main effects, we adjusted for multiple comparisons using a post hoc Tukey-Kramer procedure. The main effects for race,  $p = .0065$ , group,  $p = .0010$ , free and reduced lunch,  $p = .0507$ , were all statistically significant. There were also significant interactions between race \* free and reduced lunch and group \* free and reduced lunch,  $F(16, 997) = 24.75, p < .0001$ .

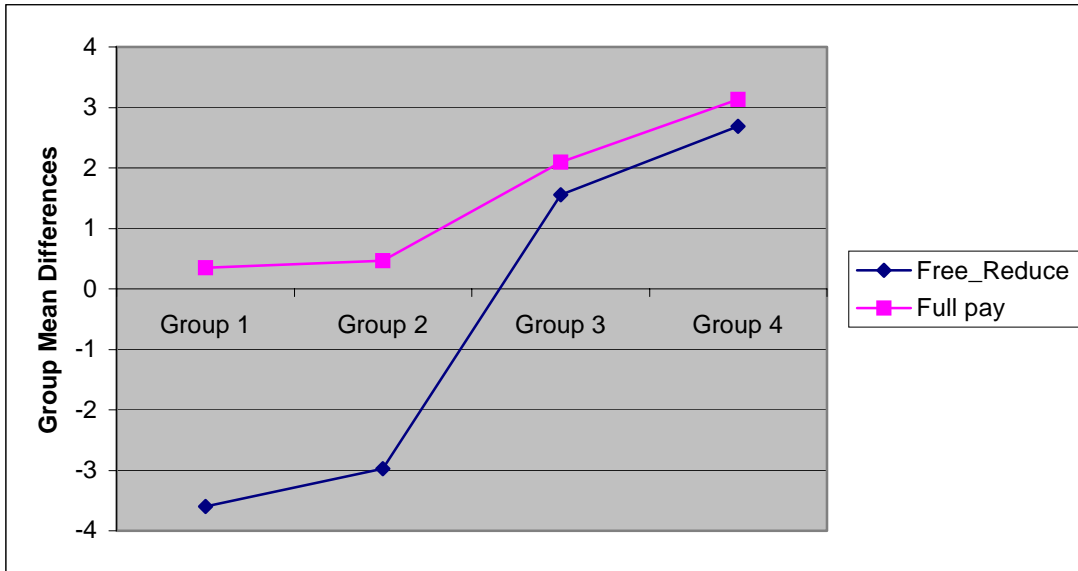
Participants who attended SOAR significantly outperformed participants who did not.  $F(3, 1) = 33.18, p < .0001$ . Group 2 did not significantly outperform Group 1  $F(3, 1) = 2.99, p = .0838$ . Group 3 outperformed Group 1,  $F(3, 1) = 28.79, p < .0001$ , and Group 2  $F(3, 1) = 20.08, p < .0001$ . Group 4 outperformed Group 1,  $F(3, 1) = 34.47, p < .0001$ , and Group 2,  $F(3, 1) = 24.71, p < .0001$  (see Figure 5 for general group effect). European Americans significantly



outperformed African Americans, and students not qualifying for free and reduced lunch significantly outperformed student on free and reduced lunch. Although there was an interaction between group \* free and reduced lunch, there appears to be a group effect (see Figure 6). In addition, students that attended SOAR (Groups 2, 3, and 4) performed significantly better on test scores than students not attending SOAR (Group 1)  $t(1125) = -5.76, p < .0001$  (see Table 8). As shown in Figure 6, attendance in the SOAR program closed the gap between students not eligible for free and reduced lunch and students eligible for free and reduced lunch.



**Figure 5.** *Group Mean Difference*



**Figure 6.** Contrast Across All Six subjects for Interaction Between Group and Free and Reduced lunch

#### *Comparisons Between SOAR Students and Wake County Students*

To test hypotheses 3 and 4, EOC actual scores were obtained for European American and African American SOAR participants in Groups 3 and 4, and European American and African American Wake County students who had not participated in the SOAR program. Predicted EOC scores were calculated on all six subjects, again using the linear regression model developed by the North Carolina Department of Public Instruction used in predicting scores by school and assessing performance improvement for Wake County schools over time. In other words, each group was treated as a school, since the linear regression model used by North Carolina Department of Public Instruction does not predict individual students' scores, only school predicted scores.

As in the SOAR only analysis, residual scores were used by calculating differences between actual and predicted scores for all 4 groups. An overall analysis of variance (ANOVA) was run to evaluate the effects of the SOAR program on student achievement, using Wake

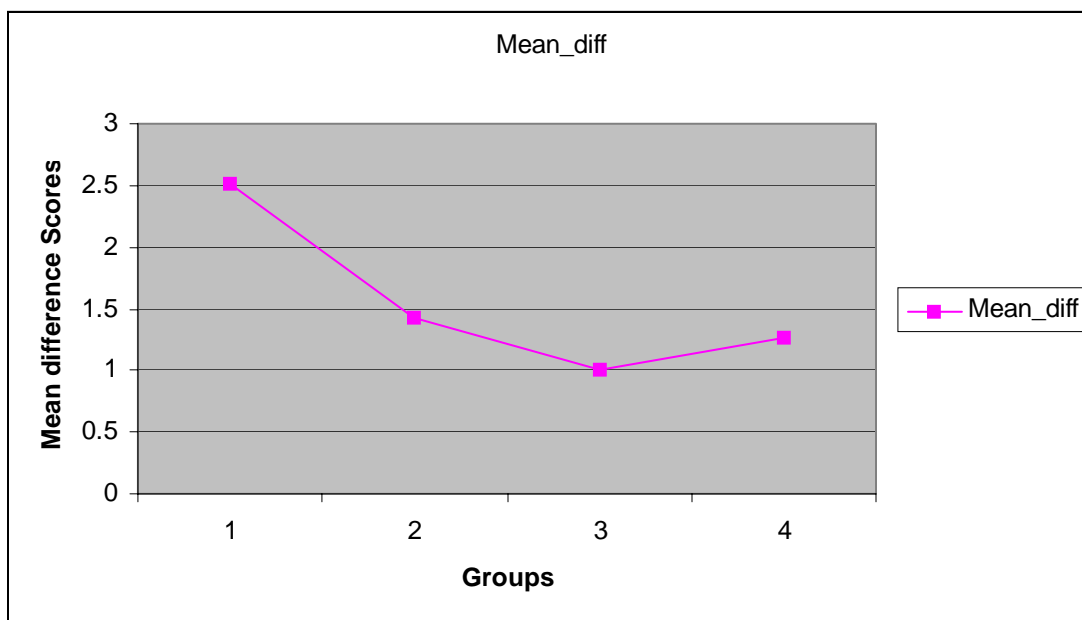
County students who had not participated in the program as a control group. Significance was found in Algebra I,  $F(7, 5409) = 4.07, p < .0002$ ; Geometry,  $F(7, 5503) = 7.58, p < .0001$ ; Algebra II,  $F(7, 4844) = 3.91, p < .0001$ ; Biology,  $F(7, 6143) = 54.02, p < .0001$ ; English,  $F(7, 6958) = 40.34, p < .0001$ ; and Physical Science,  $F(7, 2092) = 4.48, p = .0002$ . Next a general linear model was run including race and free and reduced lunch as control variables to reduce confounds. To control for Type I error across the simple main effects, we adjusted for multiple comparisons using a post hoc Tukey-Kramer multiple comparison procedure. A mean difference contrast was performed by combining scores across all six subjects and obtaining their mean. An ANOVA was performed to test the contrasts between: group 1 SOAR African American participants; group 2 SOAR European American participants; group 3 African American Wake County students not involved in the program; and group 4 Wake County European American students not involved in the SOAR program. Contrast between groups 1, 2, 3, and 4 across all six subjects; means were calculated for all cases

Means were obtained for each subject and for each participant. An overall ANOVA was performed demonstrating significance  $F(7, 18,653) = 28.25, p < .0001$ . Next the general linear model was run including race and free and reduced lunch as control variables. There was significance in race  $p = .0065$ , free and reduced lunch,  $p = .0010$ , and an interaction between race \* free and reduced lunch,  $p = .0507$ . A multiple comparison follow up test was performed. To control for a Type I error across the simple main effects, we adjusted for multiple comparisons using Tukey-Kramer post hoc procedure. Group 1 (African American SOAR participants) significantly outperformed group 2 (SOAR European Americans)  $p = .0404$ ; group 3 (African American Wake County students),  $p = .0028$ , and Group 4 (European American Wake County students),  $p < .0001$ . Group 4 (European American Wake County students) significantly

outperformed Group 3 (African American Wake County students),  $p < .0001$  (see Figure 7).

There was a significant difference in free and reduced lunch. Participants not eligible free and reduced lunch significantly outperforming participants eligible for free and reduced lunch,  $p = .0010$ .

Also, the interaction between race and free and reduced lunch demonstrated that SOAR African American not eligible for free and reduced lunch outperformed European American eligible for free and reduced lunch,  $p < .0012$ . SOAR African American students eligible for free and reduced lunch outperformed Wake County European American students eligible for free and reduced lunch,  $p = .0118$ , and Wake County Students not eligible for free and reduced lunch outperformed Wake County students eligible for free and reduced lunch,  $p = .0045$ .



Note: Group 1 = SOAR African Americans; Group 2 = SOAR European Americans; Group 3 = Wake County African Americans; and Group 4 = Wake County European Americans.

**Figure 7.** Mean Difference Scores for SOAR African and European Americans and Wake County African and European Americans

## CHAPTER V: DISCUSSION

The present study builds on previous research examining after-school programs in determining if the programs promote academic success in at-risk students. This study demonstrated that a comprehensive after-school program designed to enhance protective factors and reduce risk factors that are integrated into the regular school program and other family support systems within the community can yield positive outcomes for at-risk students. The present study provides evidence that 10 or more days of attending the SOAR program is more beneficial than attending less than 10 days. As hypothesized, students who attended SOAR outperformed those who did not attend; attendance corresponded with students' performance on standardized tests and; African Americans attending the SOAR program significantly outperformed European Americans attending the SOAR, and African Americans and European Americans in Wake County public schools who had not participated in the SOAR program. It should be noted that when examining the entire sample of SOAR students, African Americans attending the SOAR program did not outperform European Americans attending the SOAR program, which adds support to the overall positive effectiveness of SOAR for all students; but when participants who had attended SOAR fewer than 10 times were excluded, SOAR African Americans outperformed SOAR European Americans.

### *SOAR Participation*

Research has shown that after-school programs have difficulties attracting and maintaining participants, especially for high school students. For example, Kane (2004) conducted a study on four after-school programs, in which participation was voluntary and found that attendance in the after-school programs was sporadic, with most participants attending on average one to two days a week. During the development of SOAR, school administrators had

also expressed concerns about students' lack of attendance, believing that most students will not voluntarily attend an after-school program. Although there were a considerable number of students in group 1 and 2, who had either not attended SOAR and were asked to attend or attended less than 10 times. It was not clear from the research why some students who were asked to attend but did not or attended only a few times. These students should be examined to determine what actions could have been taken to increase their attendance. Contrary to previous research, the present study did show that students in need of academic intervention will seek out help and regularly attend an after-school program that promotes self-efficacy and resilience. Over the program's four-year period, attendance in the program steadily increased (see Table 12). In addition, students who had the lowest predicted EOC scores had greater attendance (attended 30 or more times).

As explained earlier, predicted EOC scores use previous test scores in their calculations. Therefore, these students had low scores in previous years on previous standardized tests (see Table 13). This is an important finding, considering that there is a 25.5 point gap between African Americans and European Americans on reading performance, a 57.9 point gap on math performance, and a 194 point gap in SAT scores in Wake County.

**Table 12***SOAR Attendance at Seven Schools, Years 1 through 4*

<i>Schools</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>
Athens Drive HS	63	95	86	137
Fuquay-Varina HS	64	101	197	159
Lead Mine Elementary	151	131	92	47
Leesville Road MS	115	154	221	250
Sanderson HS	64	254	236	166
Southeast Raleigh HS	47	298	89	248
Wake Forest-Rolesville HS	44	172	111	215
Total	548	1205	1032	1222

Note: HS = high school; MS = middle school

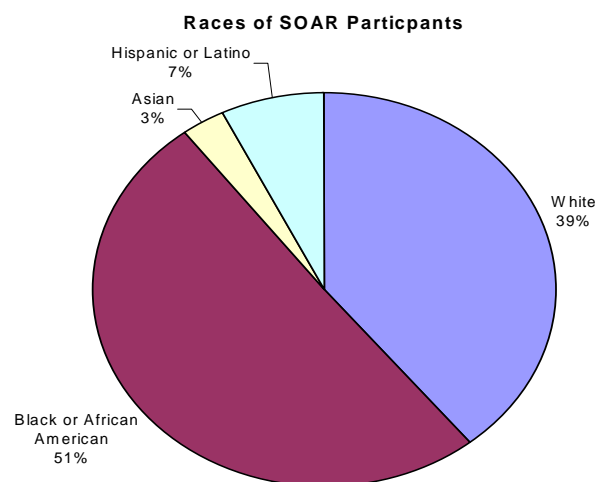
**Table 13***Mean EOC scores by Groups*

<i>Subject</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>Group 4</i>
Algebra I	59.61	60.47	57.04	56.09
Algebra II	65.66	69.55	65.92	60.60
Biology	56.09	58.63	55.51	53.39
Chemistry	60.63	59.76	58.97	59.36
English	55.31	56.80	52.88	52.08
Geometry	63.27	64.04	61.48	58.19
Physical Science	53.99	57.66	52.98	52.44
Physics	61.39	56.91	56.44	N/A
Total Mean	59.49375	60.4775	57.6525	56.02143

Group 1 = students who were asked to participate in SOAR but did not or attended once; Group 2 = students who attended in SOAR 2 -9 times; Group 3 = students who attended SOAR 10 – 29 times; and Group 4 = students who attended SOAR 30 or more times.

There has also been a concern among educators about the disproportionate rate of African Americans in the number of dropouts (43%), suspensions (61%), those placed in Behaviorally Emotionally Disabled (BED) classes (65%), those placed in Educable Mentally Disabled EMD classes (68%), and those placed in academically gifted classes (6 %) in Wake County. In the year 2000, there were in Wake County, overall, 72 percent European American, 19 percent African American, 5 percent Hispanic, 0.34 percent Native American, 3.38 percent Asian, 0.03 percent Pacific Islander, 2 percent from other races, and 2 percent from two or more races.

The present study demonstrated that African Americans will seek out academic help after school if given the opportunity. In the present study, there was a positive disproportionate rate of African Americans attending the Soar program (see Figure 8). In addition, the percentage of African Americans attending the SOAR program was twice the percentage attending their respective participating school (see Table 14). The current findings demonstrated that, if given the opportunity, African American students will voluntarily seek out help to improve their academic standing. Also, of the five high schools in the present study, African Americans had the lowest percent of students passing the EOC tests of all ethnic groups (see Table 15).



**Figure 8.** Race of SOAR Participants



**Table 14**

*Comparison of African American and European American SOAR Students to African American and European American Total Student Body*

Source	African Americans	European Americans	Total
Athens	423 (28%)	1089 (72%)	1521
SOAR (Athens)	75 (64%)	43 (36%)	118
FVHS	400 (25%)	1206 (75%)	1606
SOAR (FVHS)	79 (55%)	66 (45%)	145
Sanderson	644 (38%)	1057 (62%)	1701
SOAR (Sanderson)	104 (64%)	58 (36%)	162
SRHS	1343 (66%)	689 (34%)	2032
SOAR (SRHS)	228 (52%)	213 (48%)	441
Wake Forest	501 (26%)	1416 (74%)	1971
SOAR (Wake Forest)	102 (53%)	91 (47%)	193

Note: FVHS = Fuquay-Varina High School, SRHS = South Raleigh High School

**Table 15**

*Percent of Students Passing the End-of-Course Tests in 2005 by Schools*

Schools	European American	African American	Hispanic	American Indian	Asian	Multi-racial
Athens	1,799 (94%)	418 (71%)	109 (65%)	6 (83%)	175 (85%)	31 (84%)
Fuquay	1,472 (90%)	356 (67%)	68 (77%)	5 (80%)	14 (93%)	42 (79%)
Sanderson	1,683 (90%)	823 (54%)	157 (61%)	1 N/A	64 (84%)	50 (80%)
Southeast Raleigh	1,253 (93%)	1,718 (69%)	41 (90%)	9 (89%)	77 (95%)	42 (88%)
Wake Forest	1,635 (91%)	476 (70%)	67 (87%)	6 (95%)	39 (87%)	38 (87%)

Note: numbers presented in each cell represents total student body and percent of passing EOC test

*Subject Specific Test Differences Scores*

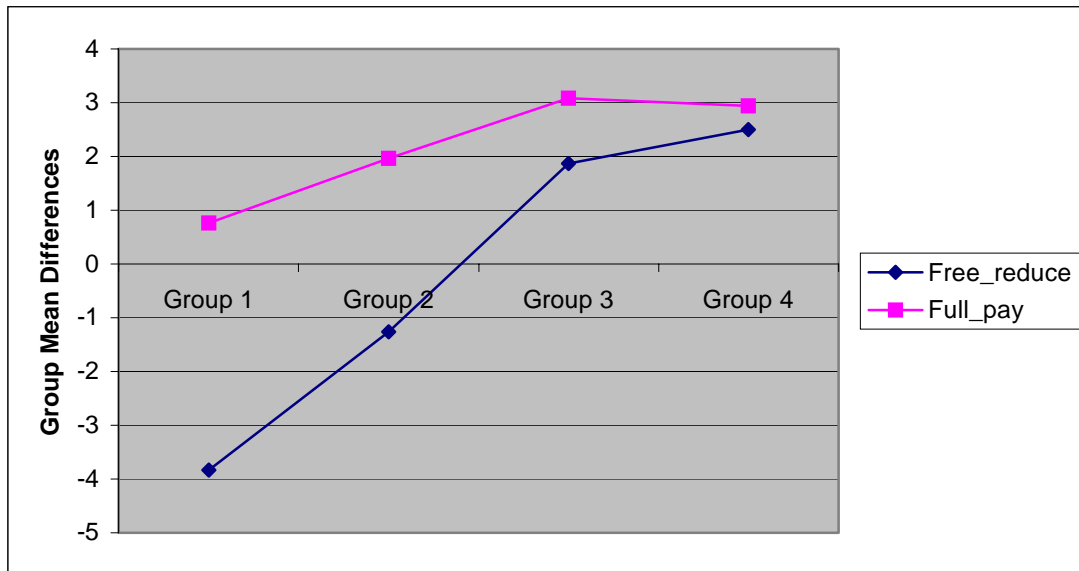
*Algebra I.* In Algebra I, attendance corresponded with performance on the standardized EOC tests; those who had greater attendance exceeded their predicted score more than those with lesser attendance. Algebra I is an important core subject for all high school students. To graduate, students must pass Algebra I. In addition, Algebra I is a gateway course to higher mathematics (i.e., Algebra II, Geometry, Chemistry, and Physics). Although both African Americans and European Americans demonstrated improved test scores with greater attendance, European Americans significantly outperformed African Americans in Algebra I. There were no significant difference between those students eligible for free and reduced lunch and those students who were not eligible. Because students were not randomly assigned to groups, differences in students eligible for free and reduced lunch and those who were not eligible would seem reasonable. Previous studies have shown that income level is a strong predictor for academic success. One would expect that students not eligible for free and reduced lunch (families with higher income) would perform better than students eligible for free and reduced lunch (families with incomes at or below the federal poverty income level).

*Geometry.* In geometry, students who attended 10 or more times significantly outperformed students attending less than 10 times. Although both groups had improved test scores, European Americans outperformed African Americans. Geometry is an important core subject for high school students who plan to attend college. Similar to Algebra I, there were no significant difference between those students eligible for free and reduced lunch and students who were not eligible. It would also seem reasonable to expect significant differences, because students were not randomly assigned to groups.

*Algebra II.* Similar to Algebra I and Geometry, students who attended 10 or more times significantly outperformed students attending less than 10 times. There were no significant differences found between race or free and reduced lunch. Algebra II is also an important core subject for high school students planning to attend college.

*Biology.* In Biology there was a significant difference in race and group, but there was an interaction between race \* free and reduced lunch. Because there was an interaction, the main effect should not be interpreted; instead the simple main effect should be examined. By examining the interaction between race \* free and reduced lunch, the effects of SOAR in Biology is not clear. For African Americans, those who attended 10 or more times outperformed those who attended less than 10 times, but for European Americans the effects are inconsistent. Again no significance was found between students eligible for free and reduced lunch and those who were not, which is a positive finding.

*English.* Similar to previous subjects, European Americans outperformed African Americans; attendance corresponded with performance on the EOC tests. Students not eligible for free and reduced lunch outperformed students eligible for free and reduced lunch. In addition, there was an interaction between free and reduced lunch and group. As can be seen in Figure 9, this gap decreased between those eligible for free and reduced lunch and those not eligible as attendance increased. English is also an important core subject for high school students, especially those who plan to attend college.



**Figure 9.** *English Interaction with Free and Reduce Lunch and Full Pay Lunch Across Groups (attendance)*

*Physical science.* In physical science, European Americans performed significantly better than African Americans, attendance had a positive effect on EOC scores, and there was an interaction between free and reduce lunch and group, with students eligible for free and reduced lunch outperforming students not eligible for free and reduced lunch. Again, these findings are promising, with those on free and reduced lunch outperforming those students not eligible for free and reduced lunch. In the present study, students eligible for free and reduced lunch are considered at risk for academic failure.

#### *Comparison Between Participants Who Attended SOAR and Those Who Were Asked To Attend But Did Not*

Participants who attended SOAR significantly outperform on all academic indicators those students who were asked to attend but did not. Although resilience was not measured, participants in the program may have outperformed non-participants because of environmental protective factors, including having a caring supportive relationship with a caring adult. Such

supportive relationships include, for example, the SOAR teachers and parents who participated in the program; having positive parents or caregivers involvement; having other positive role models such as SOAR teachers and administrators; a social and academic consecutiveness with other SOAR participants; mentoring; and parents enhancing their parenting skills. Individual protective factors may have included positive responsiveness to others, enthusiasm as measured by students participation in a voluntary program, goal setting behavior as promoted by SOAR, enhanced self-esteem as promoted by SOAR, internal locus of control as promoted by SOAR, higher educational aspirations as measured by participation in a voluntary program, and a positive view of the future as measured by students improved test scores. These are all constructs of self-efficacy. These at-risk participants also demonstrated academic resilience, namely, the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances—by changing their trajectory of poor grades and improving their End of Course scores beyond what was predicted by The North Carolina Department of Public Instruction.

Participants may have also possessed a greater sense of self-efficacy as enhanced by the SOAR program. Self-efficacy seems to be a core protective factor for at-risk youths. One must have the belief that one has the capabilities to overcome adversity to achieve success. Unless people believe that their actions can produce the outcomes they desire, they have little incentive to act to persevere in the face of difficulties (Bandura, 1997). Research has also demonstrated that self-efficacy is highly correlated with resilience and academic success. Participants may have enhanced their self-efficacy through striving to control events that affect their lives, such as academic success. Bandura (1997) states that by exerting an influence over events that people can control, people are better able to predict desired and undesired outcomes. Participants may have voluntarily participated in the SOAR program to enhance their ability to predict their

academic outcomes, believing that if they apply themselves they would achieve positive academic outcomes and control over academic events.

Another self-efficacy factor may be direct experience, which is a strong contributor to self-efficacy belief. Self-efficacy theory suggest that earlier negative academic performance is likely to lessen a students' belief in their ability to achieve academically, and past positive performance is likely to strengthen their belief in their ability to achieve. As SOAR participants' academic confidence increases through positive outcomes, so would their belief in future positive academic outcomes. Modeling and encouragement are additional elements in self-efficacy. The SOAR teachers and administrators who provided academic encouragement and positive modeling may have increased SOAR participants' sense of self-efficacy.

Research has shown that academic success is affected by the perceived rewards a student has about doing well in school (Ryan & Deci, 2000). The rewards for the SOAR participants may have been important to the students personally (intrinsic), or important to some external goal (extrinsic). SOAR participants may have also increased their academic self-efficacy and performance to achieve some future goal by exploring their intrinsic and extrinsic rewards. Finally, participation in the SOAR program may have increased participants' mastery experiences that served as indicators of capability, vicarious experiences that alter efficacy beliefs through transmission of competencies together with comparison with the attainment of other SOAR participants and verbal persuasion given by SOAR teachers and administrators.

#### *Composite Comparison Between the Four SOAR Attendance Groups Across Subjects*

Mean scores were calculated for all students across all subjects. European Americans significantly outperformed African Americans, students not eligible for free and reduced lunch significantly outperform students eligible for free and reduced lunch, and group 3 significantly

outperformed group 1 and 2, while group 4 significantly outperforming group 1 and 2. Again, although not significant, attendance in the SOAR program seem to have closed the gap between students eligible for free and reduced lunch and students who were not eligible for free and reduced lunch.

Overall, European Americans in the SOAR program significantly outperformed African Americans in the SOAR program and attendance in the SOAR program had a positive effect on EOC scores. Contrary to previous research, there was no significant difference on several subjects between those students eligible for free and reduced lunch and students not eligible for free and reduced lunch. Where there were a significant difference, free and reduced lunch seem to have a group effect, as attendance increased, the gap between free and reduced lunch students and students not eligible for free and reduced lunch closed. As mentioned earlier, free and reduced lunch is used as a proxy for poverty, and poverty is a risk factor for academic failure.

The present study demonstrated that success in the SOAR program was more beneficial for participants who attended 10 or more times. This finding suggests that to enhance self-efficacy and resilience in at-risk students they must at least moderately participate in a program similar to SOAR. The fact that European Americans in the SOAR program significantly outperformed African Americans in the SOAR program, gives support to the program overall positive affect for all students.

#### *Comparison Between SOAR Students and Wake County Students*

Hypotheses 3 and 4 were also support by the findings. African Americans in the SOAR program significantly outperformed European Americans in the SOAR program, and African Americans and European Americans in Wake County public schools who had not participated in the program. It should be noted that European Americans in Wake County significantly

outperform African Americans in Wake County (the achievement gap); there were no significant difference between European Americans in the SOAR program and European Americans in Wake County public schools. Interestingly, when group 1 and 2 (not attending or attending less than 10 times) was included in the SOAR analyses, European Americans outperformed African Americans. This suggests that attendance had a greater affect on SOAR African Americans than it did on SOAR European Americans.

This study demonstrated that low-achieving students benefited more than higher achieving students entering the programs and those students who attended the programs more frequently benefited more than students who attended less frequently. These higher performing students may be considered academically resilient after attending the SOAR program. For the purpose of this paper, academic resilience is defined as the likelihood of academic success despite adversity in the form of earlier traits, poor environmental conditions, and negative experiences (Wang, Haertal, & Walberg, 1994). These students seem to demonstrate a high level of performance and achievement motivation despite the presence of stressful events that place them at risk. African American participants that attended the SOAR program 10 or more times may have changed their academic trajectory. Entwisle and Alexander (1988) found that African Americans not only received lower grades in the first grade than European Americans students, but these low grades persisted throughout their academic career.

### *Summary*

In contradiction to Blair, Blair, and Madamba (1999), who found that children with low SES performed worse than expected and children with high SES performing better than expected, the present study did not support these findings. Although some higher SES students performed better than lower SES students the gap closed as attendance increased. In some



subjects, lower SES students outperformed higher SES students as measured by free and reduced lunch. This study did support Shortt & Wellesley (2002), where the authors found that helping parents connected to their children's learning, enable parents to communicate to their children the importance of education. As in the SOAR program, Shortt & Wellesley (2002) found that parents working together with their children on computers, displaying students' school work at home, positively responding to their children's class assignment, help at-risk children succeed in school.

### *Limitations*

The present study had several limitations. First, expected scores for students were standardized scores computed for groups. There were no individual expected scores. Individual expected scores may be more accurate in calculating individual differences. Second, there was no random assignment to groups because all participation was voluntary. Studies, as this one, with no random assignment are potentially confounded; group differences may be due to other factors, although it would be difficult to randomly assign students to attendance group in a voluntary program. There could be something special about these students, for example, they may have been more motivated, but one would question why these students would be motivated in the SOAR program and not in regular classes. Therefore, conclusions about differences among groups are limited.

### *Future Research*

Closing the achievement gap remains an important goal for teachers, school administrators, researchers, and American society. Continued efforts to determine whether or not after-school programs similar to SOAR are effective might focus on the following research questions. Do African Americans perform as well as their European American counterparts in an

after-school program similar to SOAR? Do the number of risk factors (i.e., poverty, low parent education, excessive school absences) reduce success in an after-school program similar to SOAR? Are there non-cognitive measures contributing to the success of students attending an after-school program similar to SOAR (i.e., family support, positive role models, school resources, and parent involvement). If the hypotheses in the present study continue to be supported by future research, educators would have an empirical supported intervention tool to help underachieving and at-risk students obtain academic success. Future studies on after-school programs should also focus on those students who choose not to attend or attend only a few times. There may be something unique about these students, is examined, we may discover better ways to retain all students.

The findings in the present study give support for a need to conduct similar research. Researcher should attempt to develop a program where they could randomly assign participants to attendance groups. Other risk factors should be considered in future research, for example, parent education, income levels, and school attendance. There are other ethnic groups that could be at-risk for academic failure, for example, Hispanics and Native Americans. Some Hispanics have limited English proficiency and are transient, which are also considered risk factors for academic failure.

### *Implications for Counseling*

*Increase positive direct academic experience.* Direct negative academic performance is likely to lessen students' belief in their academic ability (Ried, Saunders, Williams, Williams, 2005). Students with low academic performance usually come to the attention of school counselors. Counselors can promote academic success in students by planning attainable goals with that student. Instead of students attempting goals where they are likely to fail, counselors

could assess a student's academic ability and develop incremental goals to increase a positive direct academic experience. As the students increase their confidence and self-efficacy, goals could be gradually increased until they reach the student's full academic ability. Positive academic attainment may have other affects, such as increased self-esteem, internal locus of control, and allowing the student to experiences academic successes. Many students may have a self-fulfilling prophecy after many years of academic failures and lack of support from teachers and parents. Allowing these students to experience academic success may ignite future desires to succeed.

*Implement a modeling program for success.* An important construct of Bandura's self-efficacy theory is modeling and learning through vicarious experiences. Caring adults who provide encouragement and serve as a positive role model may increase self-efficacy, especially in at-risk students. Counselors can either serve as the caring adult, encourage other adults or to serve as a role model. Counselors can also implement programs in school, connecting needy students with either a caring adult or older successful students. For example, high school students heading for college can buddy with an elementary school student, serving as a role model throughout the elementary school student's academic career. The elementary school student can learn vicariously by experiencing the high school student's academic success. If possible, students should be matched by ethnicity. This would allow, for example, African American elementary school students to experience first hand another African American succeeding academically and socially.

Although mentors can play an important part in enhancing a student's self-efficacy, parents may be the ultimate mentor and role model. Parental support was shown to discriminate between low achieving and high achieving African American students (Gutman & McLoyd,

2000). Counselors can develop programs to improve parental support for students. This may take some creativity in developing a program that would be successful. Schools have unsuccessfully attempted to involve some uninvolved parents in their child's academic learning. A successful program may include: employment search for parents, computer training for parents and students, alternative ways to help their child with homework, group sessions for parents and students, informal enjoyable functions, athletic sports between teachers and parents, and reading groups for parents and students.

*Increase students' power and control.* Bandura states that a sense of power and control over one's environment affects their sense of self-efficacy. It may be difficult for a counselor to implement an intervention that affects certain portions of a student's power and control, for example, some environmental factors such as safety in their home or neighborhood. Counselors can facilitate other external factors of power and control, such as addressing other student's behavioral problems that may affect their student's ability to achieve (i.e., bullying and classroom behavior). Counselors can also help students deal with violence in their home, community, and school and to deal with racism. Increasing a student's sense of personal power and control may help enhance a student sense of self-efficacy (Bandura, 1997).

*Help students recognize and develop positive intrinsic and extrinsic rewards.* Many students have not made the connection between goal attainment and education, for example, when asked, "what do you want to be when you grow up" some students may answer "a doctor" or "a lawyer", but have little insight on what educational commitment is needed to attain this goal. Counselors can help students recognize their intrinsic and extrinsic rewards and distinguish between the two. Students should recognize whether they want to be a doctor because it would make their parents proud and because society hold medical doctors in such high regards

(extrinsic rewards), or they want to be a doctor because they enjoy helping people (intrinsic rewards). Intrinsic rewards may be more robust. Education must also be connected to some future goals, especially for some students, through a status mobility system that helps students understand how to move through school to a later career and social opportunities (Ogbu, 1988).

*Enhance students' academic resilience and self-efficacy.* Counselor should assess students to help them recognize and understand their risk and protective factors. For example, help the student recognize: What are my risks factors? What are my protective factors? What are the mediating mechanisms that help keep me on the developmental trajectory for positive outcomes? Counseling should focus on reducing the risks of maladjustment while strengthening the factors that enhance positive outcomes of at-risk children. School counselors and teachers should work closely to ensure that teaching styles are appropriate with students' abilities and learning styles.

School counseling team should be developed to gain a clearer idea of students' developmental needs and develop appropriate program activities that may reduce academic failure and risk factors of maladjustment while simultaneously strengthening the factors that enhance positive outcome and academic success. The team may consist of the counselor, teachers, mentors, and parents. Counselors monitoring of students' development might include guidance lessons and small groups for helping students make the connection between what they do in school and later life goals. Also, collaborative efforts with administrators and community members could provide after-school activities for talented students at risk for underachievement, and help to prevent them from establishing the habit of unproductive activities during unstructured times (Reis, Colbert, Thomas, 2005).

*Facilitate between after school teachers and regular school teachers.* There should be a triangle of communication between after school teachers, regular school teachers, and the school counselor. If possible, parents should be included as much as possible concerning their child's academics and future goals. If the after school teacher notice that a students can maximize his leaning via a particular learning style, the after school teachers can communicate this information to regular school teachers and then the school counselor. Regular school teachers can communicate any academic or behavioral changes in the student. Parents can also communicate any home situational changes which may affect the student's behavior or academic learning. This team of professionals and parents will demonstrate to the students that he or she has a circle of caring adults who want and expect him or her to succeed.

*Develop a counseling program to help at-risk students maintain their positive trajectory.* After a successful intervention has taken place and the student improves his academic standing, a plan should be implemented to help the student maintain that positive trajectory. For some students, academic resilience may not be robust. Effort should be made to insure that the student take advantage of their new found academic success. This could include an ongoing monitoring system that monitors the student throughout his or her academic career. There should be an open and ongoing communication between the student's previous teachers current teachers and his or her parents concerning the student's academic standing. In addition, mentors and caring adults in the student's life should maintain communication and offer continuing assistance. These interventions should demonstrate to the student that he or she was not just part of a temporary program or that they were only successful during the intervention, but their success can last a lifetime, and there are caring adults who will help make that possible.

*Conclusion*

The No Child Left Behind initiative seems to demonstrate the momentum of society to close the achievement gap, giving equal opportunity for all students to succeed in life. The No Child Left Behind initiative also requires empirical data to support for federally funded programs. Programs such as SOAR should evaluate to determine what was effective and what was not, allowing subsequent programs to build on previous programs. Empirically evaluating these programs will allow educators and researchers to add to the body of knowledge concerning students at-risk for academic failures achieve success.

As discussed earlier, African Americans suffer a negative disproportion rate in academia and society compared to other ethnic groups. Given the history of the African American race in this country, and their present place in society, efforts should be made to level the playing field or closing the achievement gap. This study demonstrated that African Americans in need of academic intervention will seek out help, even if they must remain after-school. Interestingly, students with the lowest EOC scores had a greater attendance and made the greatest gains. Further research should attempt to determine what was unique about this group of students and the percent of each group of SOAR participants that went on to college and maintained a positive academic trajectory. Efforts should be made to follow the students through life, implementing a longitudinal study to determine if this success continues throughout a student's life or at least years after they graduate. Success could be measured by completion of college, maintaining employment, and maintaining a healthy lifestyle. As we close the achievement gap, we would begin to work and live together, reducing the need for stereotypes, biases, and prejudices.

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## APPENDIX

## Appendix A

### Project SOAR Site Coordinator Responsibilities

#### *Program Development*

- Initiate and coordinate site specific activities
- Assist with instructional planning for students
- Facilitate sharing students' instructional needs and progress with regular day teachers and SOAR teachers
- Initiate and coordinate professional development for specific site needs

#### *Supervision responsibilities*

- Establish program expectations and responsibilities with staff
- Coordinate program staff (instructors, tutors, mentors, paid students helpers, etc)
- Establish staff schedules, coordinate arrangements, and facility issues
- Coordinate and supervise students' transportation

#### *Communication Responsibilities*

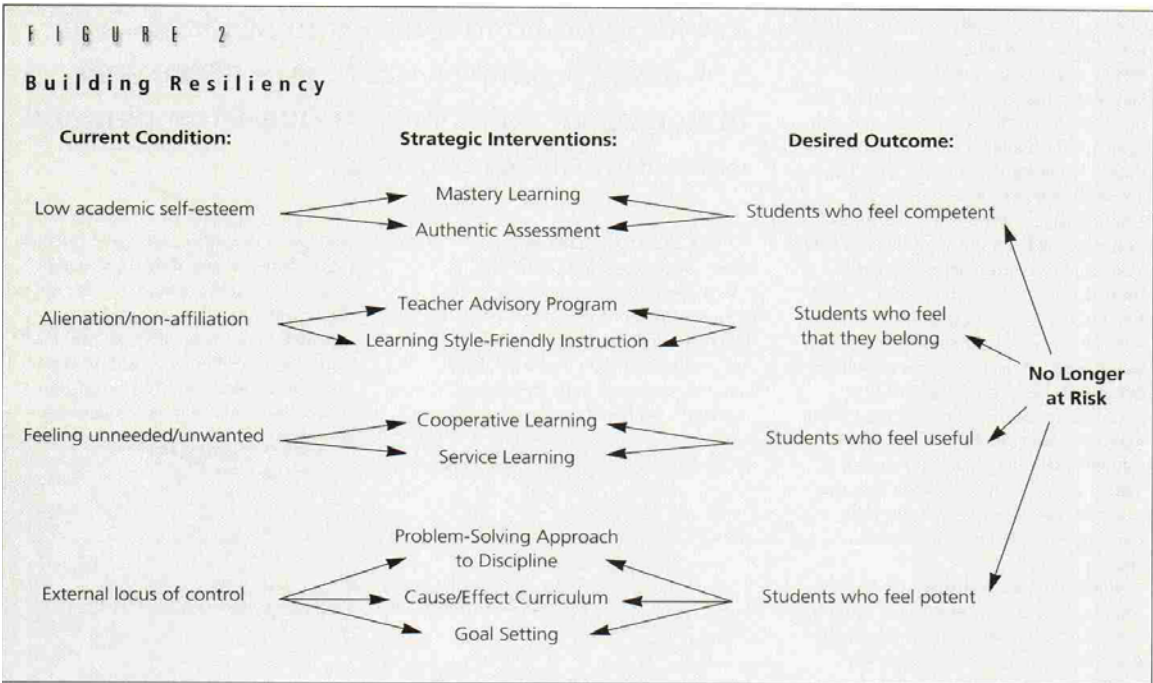
- Chair school site SOAR Advisory committees
- Communicate with parents and community partners
- Market project SOAR program within school community (internal and external customers)
- Communicate regularly with school administrators and project SOAR coordinators

#### *Program Management Responsibilities*

- Prepare and maintain site budget
- Prepare financial documents (purchase orders, payroll, time sheets, etc)
- Maintain program evaluation data (spreadsheet, surveys, student data, etc)
- Create and maintain program documents (files, equipment inventory, budget, etc)

Appendix B

Resiliency Model Developed by Sagor



**FIGURE 1**

**An Inventory of Resiliency-Building Practices**

Organizational/Instructional Practices	Trait Reinforced
Logical Consequences	Potency
Mastery Expectations	Competence
Service Learning	Usefulness
Cooperative Learning	Usefulness
Teacher Advisory Groups	Belonging
Authentic Assessment	Competence
Student-Led Parent Conferences	Potency
Learning Style-Appropriate Instruction	Belonging
Activities Program	Belonging
Portfolios	Competence

## Appendix C

### Programming for Resilience

#### Academic Competence

- Use of problem-based activities so students are engaged in real work for audiences for real outcomes
- Use computers to increase student academic skills (NovaNet for course credit recovery, for remediation, for SAT preparation, for career explorations); use computers for word processing, spreadsheets, database, PowerPoint presentations, etc
- Work with small groups tutoring, coaching, providing instructional strategies that cross subject areas so students can transfer skills sets from one discipline to another
- Use of academic strategies (CRISS and quality tools)

#### Sense of Belonging

- Cooking
- Using photography
- Discussing healthy lifestyle issues
- Learning crafts
- Using team building activities
- Participating in a service club
- Completing a group project

#### Sense of Usefulness

- Become leading in their communities
- Learn to apply skills and knowledge

Appendix C (continued)

- Learn job skills and career ideas
- See themselves as important members of the community
- Become active citizens

Sense of Personal Potency

- Using student data folders
- Goal setting activities
- Learning organization and leadership skills
- Decision-making opportunities
- Learning to self evaluate performance
- Setting priorities
- Participating in student led conferences

## Appendix D

## Control and Treatment Group Populations

Group	Subgroup	Control Group		Treatment	
		Count	Percent	Count	Percent
Total	TOTAL	329	100%	479	100%
Instructional Assistance List	No	162	49%	218	46%
	Yes	167	51%	561	55%
Gender	Female	128	39%	261	55%
	Male	201	61%	218	46%
Race	American Indian	2	1%	0	0%
	Asian	4	1%	18	3%
	Black	180	55%	250	51%
	Hispanic	9	3%	35	7%
	Multi-Racial	6	2%	5	0%
	White	128	39%	171	39%
LEP	No	322	98%	425	90%
	Yes	7	2%	46	10%
LUNCH	F	90	27%	142	30%
	R	20	6%	18	4%
	P	219	67%	319	67%
Special Needs	No	222	68%	368	77%
	Yes	107	33%	111	23%
Grade	9	178	54%	141	29%
	10	67	20%	106	22%
	11	50	15%	134	28%
	12	34	10%	98	21%

## Number of Students Suspended in SOAR Control and Treatment Groups

Group	Total Students	Suspensions During 2002-2003 School Year		Suspensions During 2003-2004 School Year	
		Count	Percent	Count	Percent
Control Group	329	65	19.8%	92	28.0%
Treatment Group	479	77	16.1%	92	19.2%

## Appendix E

### The Role of SOAR in Overall Support Services

- Anecdotal information gathered from SOAR site coordinators and administrators made it clear that in the majority of Project SOAR schools, SOAR was the sole source of after-school support for students.
- A SOAR site coordinator at Sanderson high school noted that, aside from a couple of student clubs sponsored by faculty members, SOAR was the sole after-school support service at her high school. In terms of after-school academic support for students, the coordinator stated: “SOAR is it.”
- A coordinator at Fuquay-Varina, characterized the SOAR program at his high school in such a way as to make it evident that, over the four-year life of the project, Fuquay-Varina high school was able to realize the SOAR goals. Site Coordinator 2 explained that: “We have a vision for the SOAR program. We hit hard on academics. Our motto here is: When you think you’re done, you’re just getting started. Some of our students come into SOAR thinking that when they’ve finished their homework, they’re done. They don’t have a concept of what study skills are and how to succeed. That’s why we see a lot of our students come into the program failing two or three courses and end up being A/B students. Nobody ever told them that you have to do more than fill in the blanks on your worksheets. Nobody ever told them that when they’re finished with their homework, they’re just getting started. They need to review their notes, study their texts, and quiz a partner for upcoming tests.” The site coordinator went on to note that community service/learning projects were an ongoing component of the Fuquay-Varina SOAR program. Fuquay-Varina SOAR students tutored children at an elementary school. They also built a playground at a local community center, working with a retired construction worker who



acted as their advisor. Field trips had also served as learning experiences as well as social events that gave students a sense of belonging.

A student who played on the Fuquay-Varina football team explained that SOAR helped him maintain a grade point average required to be eligible for football. He was quite frank in characterizing his previous lack of study skills, noting that before his involvement in SOAR, he would go home after school where he would, “sleep or watch TV” instead of doing his homework or preparing for upcoming reading assignments or quizzes.

- A pair of sisters echoed this awareness of their own lack of study skills, stating that after school they would, “play video games, talk on the phone, screw around outside,” ignoring their homework.
- A student who moved to Fuquay-Varina at the beginning of the school year from New Jersey explained that he didn’t have a problem with his grades. Getting involved with SOAR was, for him, a way to “fit in” at a new school where he had no friends. It was the social aspect of SOAR that attracted him, and his strategy worked.
- Another boy stated that SOAR had helped him raise his grades significantly. He was very clear in his opinion that his two-year participation in SOAR had given him a major boost in self-confidence that had vastly improved his high school experience.
- A sophomore girl explained that she was determined to keep her grades in the A/B/C range because, in her words: “My dad is in the Marines in Iraq. My mom has enough to worry about without having to deal with my bad grades.” She went on to note that she’d made a lot of friends through SOAR, and that the program was the only reason she passed her math class.
- A group of four girls who had participated in a Power Point presentation given by SOAR students to the Fuquay-Varina Rotary Club to raise funds for the program were very pleased with

their effort. It was clearly an empowering experience for them. One of them remarked that the presentation made them feel that, “We could do something to help ourselves and our after-school program.”

- A Sanderson freshman, noted that, “SOAR has been the greatest thing this year to me. I have loved attending. SOAR has helped me by giving me responsibility. I attend SOAR everyday while juggling other activities. It taught me how to get along with people and not be so shy. SOAR has helped me academically with big projects and assignments.”

- Sophomore at Sanderson explained that, “In SOAR I got a lot of help for my homework. The teachers of SOAR have always been here for us when needed. Reflections helped us think hard and pay attention to what matters most. We also had other events to choose from a particular day of the week. Art was fun while it lasted; it was a good way to socialize.”

- Another freshman stated that, “SOAR has helped me so much, especially the first semester. I improved in classes I really needed in order to pass. It helped me also second semester because I needed help in African-American History. A teacher has really inspired me to do my tests over when I got low grades. Another teacher has inspired me to do everything even when I said I didn’t know how. I’m going to miss SOAR next year but hope I can maintain the same grades.”

## Appendix F

## Descriptive Statistics of Content Validity

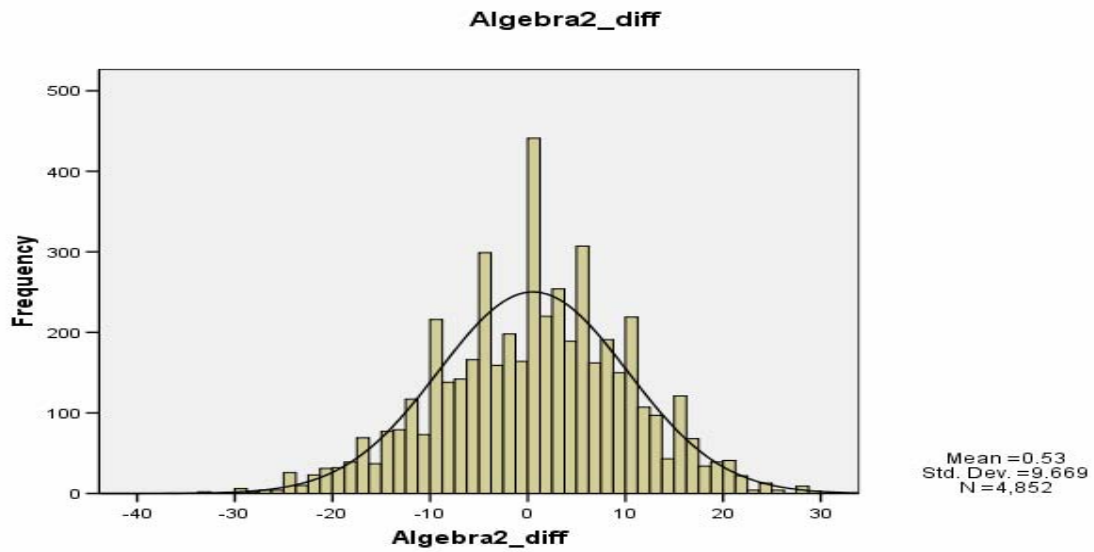
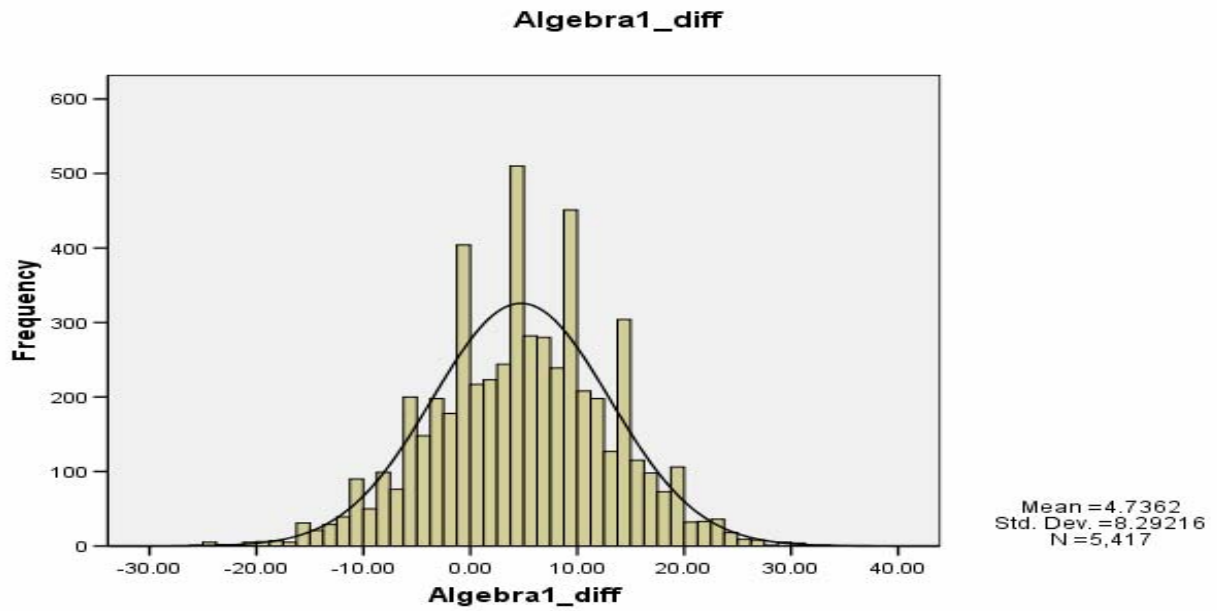
Subject Area	N	Mean Scale Scores	Mean Range	SD
Algebra	69,326	55.1	54.1 - 55.5	9.1
Biology	62,748	55.5	54.7 - 56.1	8.6
English I	67,748	53.1	52.6 - 53.6	8.9
US History	53,160	56.2	56.1 - 56.4	8.3

*Range of scores associated with achievement levels*

Subject	Level I	Level II	Level III	Level IV
Algebra I	23 – 44	45 - 54	55 - 65	66 - 87
Biology	26 – 46	47 - 54	55 - 64	65 - 87
ELP	23 – 44	45 - 53	53 - 62	63 - 85
English I	22 – 42	43 - 51	52 - 60	61 - 85
US History	27 – 47	48 - 56	57 - 64	65 - 88

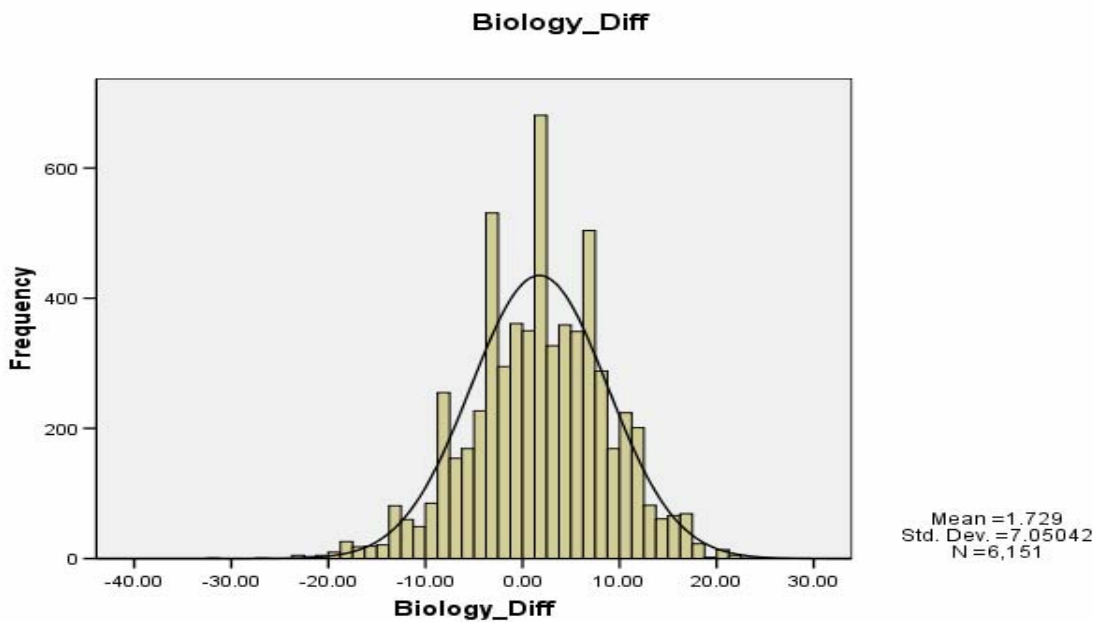
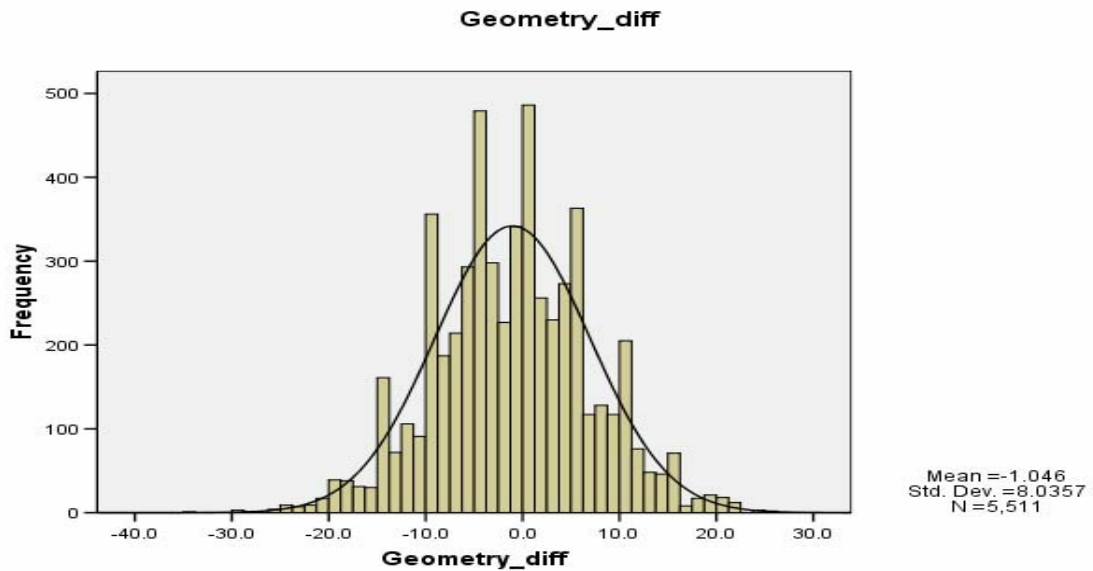
## Appendix G

### Variance and Normality for Subject Specific Test Scores



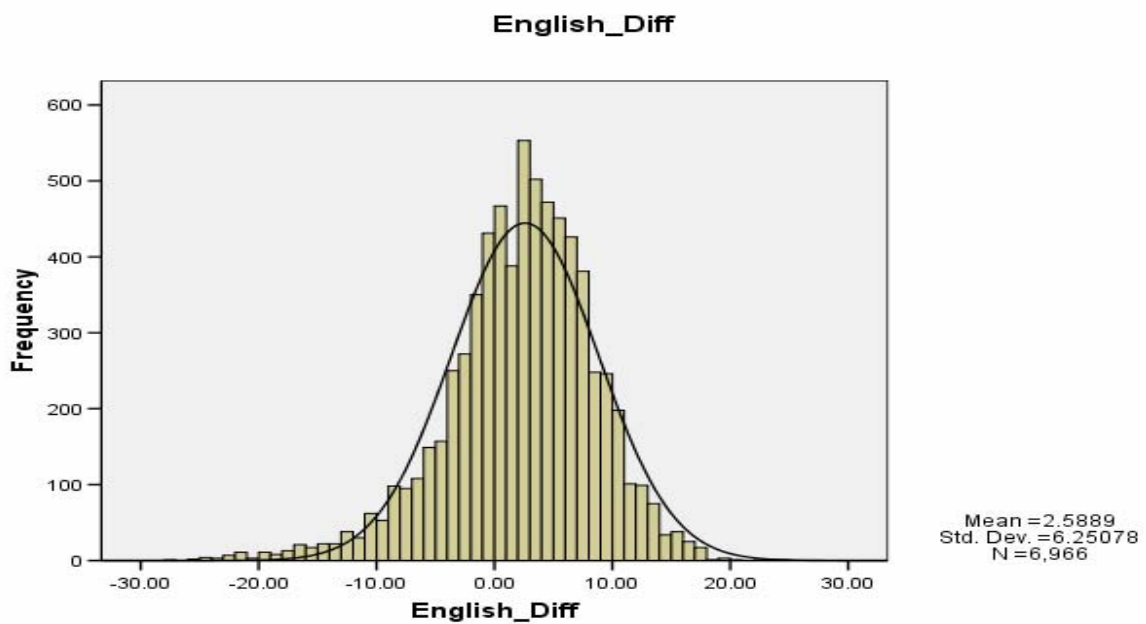
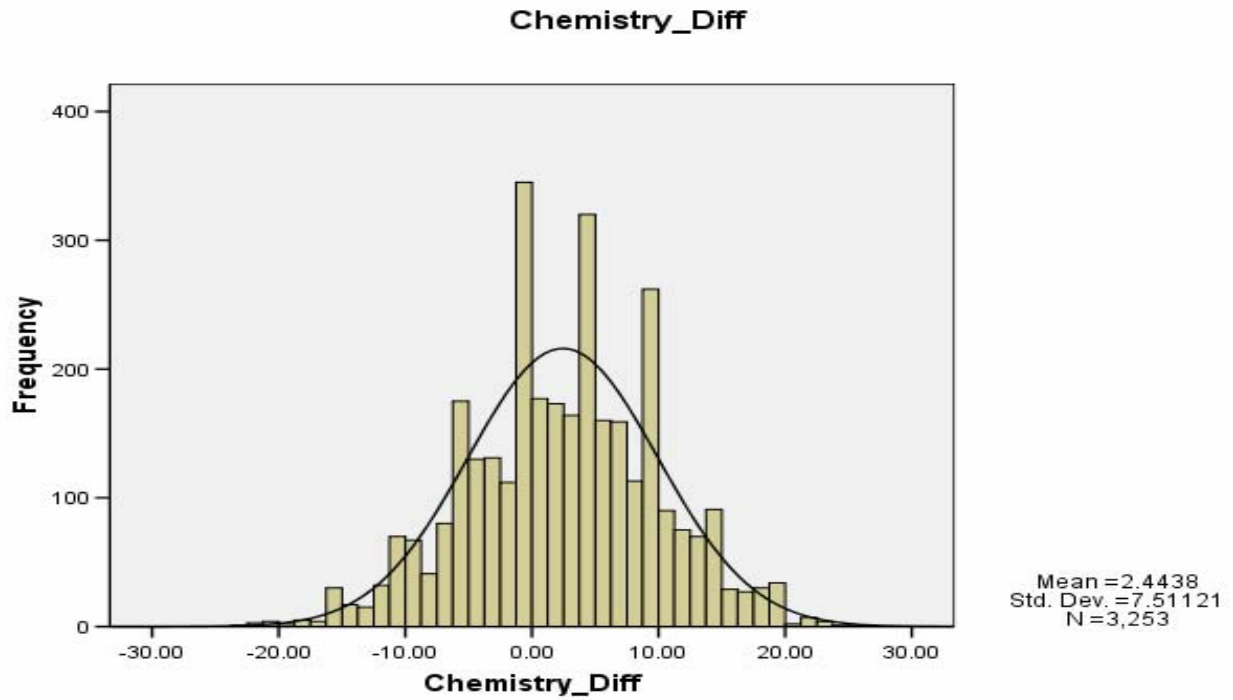
Appendix H

Variance and Normality for Subject Specific Test Scores



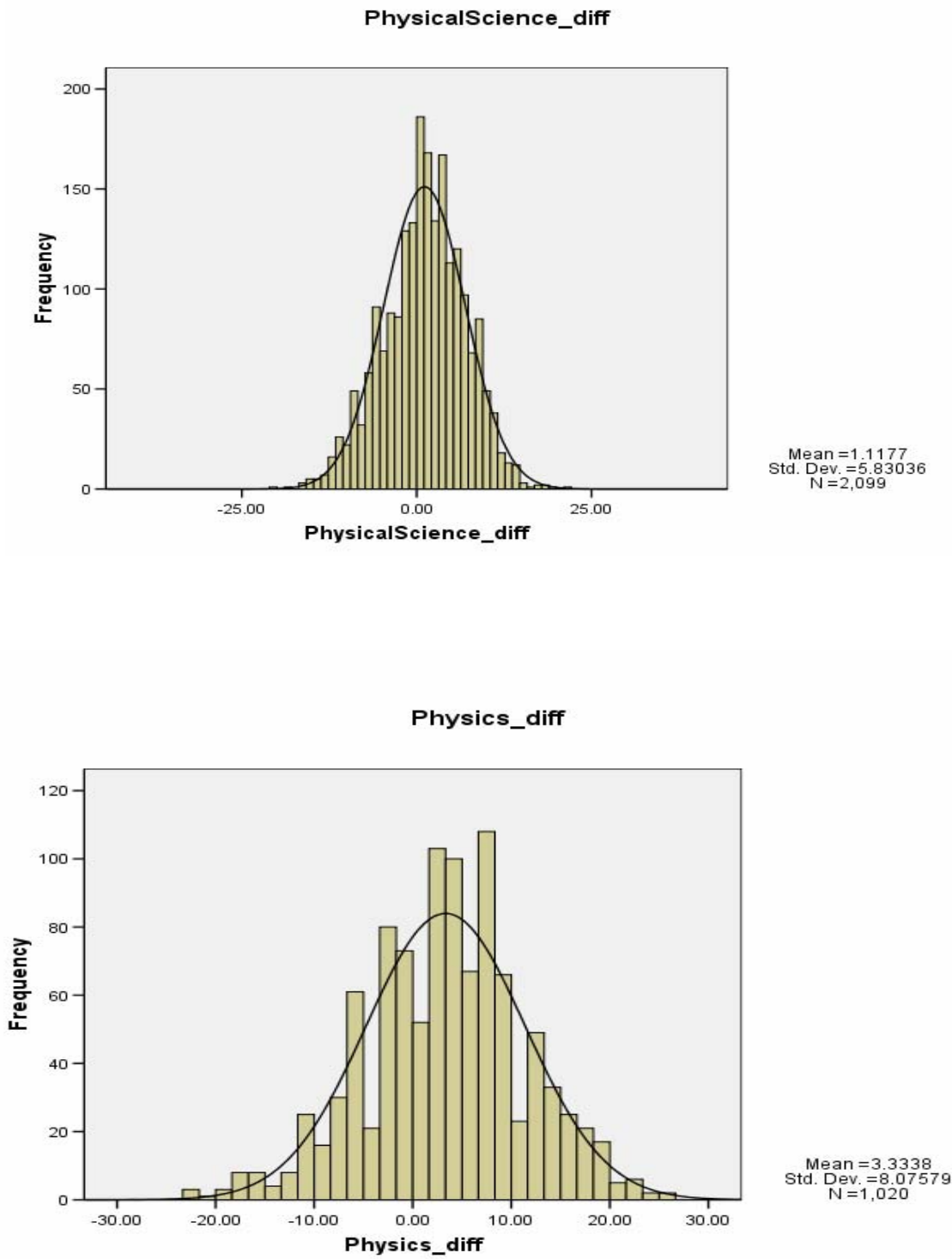
## Appendix I

### Variance and Normality for Subject Specific Test Scores



Appendix J

Variance and Normality for Subject Specific Test Scores



Appendix K

Variance and Normality for Subject Specific Test Scores

