A COMPARISON OF A GIFTED EDUCATION PROGRAM AMONG EIGHTH GRADE GIFTED STUDENTS AT A GEORGIA JUNIOR HIGH SCHOOL

by

Jerry Clark Harden

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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APPROVED BY:

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ABSTRACT

Jerry Clark Harden. A COMPARISON OF A GIFTED EDUCATION PROGRAM AMONG EIGHTH GRADE GIFTED STUDENTS AT A GEORGIA JUNIOR HIGH SCHOOL. (under the direction of Dr. Kathie Morgan) School of Education, Liberty University, March, 2012.

The purpose of this study was to investigate the relationships that may exist among mean scores on the math and reading portions of the *Iowa Test of Basic Skills* (ITBS) of eighth grade gifted students of different gender, race, and socioeconomic status. Significant changes have been made to Georgia's gifted identification procedures over the last few decades to lessen the underrepresentation of minorities and students of low socioeconomic status. However, issues still exist in the referral process, the identification process, and the performance of gifted students. Although the referral process and identification procedures have been and continue to be researched, questions related to the differences in academic performance of gifted students have not been adequately examined. Is there a difference in the mean ITBS scores of gifted students based on the identification method used? What differences in mean ITBS scores exist among gifted students of different gender, race, and socioeconomic status? This study used a casual comparative design to examine a gifted program at a junior high school located in Georgia and answer the research questions mentioned above. Statistical analysis was conducted using measures of central tendency and two-way analysis of variance (ANOVA) procedures.

Descriptors: Gifted Education, Psychometric Approach, Multiple Criteria Approach, Gender, Race, Socioeconomic Status.

DEDICATION

To my most cherished earthly possessions: Sam, Jaycee, and Camden. Sam you are my soul mate given to me by God. Jaycee and Camden, I thank God daily for blessing me with two wonderful boys. I love each of you so much. It is with great pleasure that I dedicate to you my hardest educational project.

Although at times we are apart
We always remain at heart
Our love, it's one of a kind
You're always on my mind
Into the day, through the night
At times removed from my sight
Still, no treasure could greater be
Than what God gave me: my family
Our journey together, high or low
As through this life together we go
At times in a frantic pace
Thankful for the days kissed by His grace
When we fail, the tears may roll
And pain may come to collect her toll
Still, no treasure could greater be
Than what God gave me: my family

C. Harden

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I am grateful for my immediate family and the support they have willingly afforded to me during this process. To my wife, Sam; thank you for always supporting me. Thank you for understanding when I was frustrated, overly excited about my study, and all the times in between. To my boys, Jaycee and Camden; thanks for helping me juggle our time and my school work. The quick games of basketball, baseball, or football were fuel for me to make it through some long nights. To my parents, thank you both for your love, support, and instilling in me a work ethic that enabled me to accomplish this personal goal. To my father, thank you for never letting me quit. There were times I thought about that first trailer I worked on. I don't know which was worse, the trailer or my dissertation. To my mother, thank you for showing me what a true educator is. You are the greatest teacher I have ever had. Thank you for teaching me to set goals and trust God to enable me to meet them.

I am thankful for the guidance and support that each of my committee members provided to me. Dr. Kathie Morgan, I truly believe God joined us. Your professionalism, demeanor, and Christian principles have strengthened me. Thank you for always being available to assist and listen. I am grateful you were willing to serve as my dissertation chair. Dr. Todd Cason, thank you for your willingness to serve on my

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List of Abbreviations

ABC– ABC Junior High School

ANOVA – Analysis of Variance

CogAT – *Cognitive Abilities Test*

Project CLUE – Clustering Learners Unlock Equity

CRCT – *Criterion Referenced Competency Test*

ESL – English as a Second Language

GRS – *Gifted Rating Scale*

ITBS – *Iowa Test of Basic Skills*

NNAT – *Naglieri Nonverbal Abilities Test*

PACT – *Palmetto Achievement Challenge Test*

PBL – Problem Based Learning

SAT – *Scholastic Achievement Test*

TTCT – *Torrance Tests of Creative Thinking*

ZPD – Zone of Proximal Development

CHAPTER ONE: INTRODUCTION

Background

Over the past few decades all arenas of education have been in a reformation process to better meet the needs of an exceedingly diverse student population. The field of gifted education has been included in this change. One initial challenge the field of gifted education faced was to develop a definition of giftedness that included more than just intelligence. Intelligence based definitions of giftedness, grounded in the work of early researchers such as Binet and Terman, remained the operational definition of giftedness for decades (Brown, Renzulli, Gubbins, Siegle, Zhang, & Chen, 2005; Reis & Renzulli, 2010). Current research now supports broader definitions of giftedness that integrate intellectual and non-intellectual abilities. Included in these integrated definitions are traits such as creativity, motivation, heightened interests, and humor (Reis & Renzulli, 2010).

Even with broadened definitions of giftedness, proper identification of gifted students remained an issue. For decades the field of gifted education has struggled to adequately identify students for gifted services (McBee, 2006; Reis & Renzulli, 2010; Sternberg & Davidson, 2005). Almost 75% of school districts use standardized measures to ascertain the cognitive abilities of students during the gifted identification process (Oakland & Rossen, 2005). Historically, minority and low socioeconomic students have been those underrepresented in gifted education programs (Briggs, Reis, & Sullivan, 2008; Oakland & Rossen, 2005). However, measures have been taken in gifted education programs all across the nation to ensure that students of various gender, race, and socioeconomic status are properly identified for gifted services (Briggs et al., 2008;

Heinfield, Moore, & Wood, 2008; McBee, 2006). A vast amount of research has focused on creating and using multiple criteria identification procedures to increase the diversity of gifted education programs (Briggs et al., 2008; Lawrence, 2009; Pendarvis, 2009; Reis & Renzulli, 2010).

Identification procedures used in Georgia gifted education programs have undergone a great transformation during the past two decades in order to properly identify gifted students. This transformation has involved adapting identification procedures that once only included IQ scores, to now include mental ability, achievement, creativity, and motivation. In 1991, gifted educators in Georgia began developing the multiple criteria approach to more effectively identify gifted students (Krisel & Cowen, 1997). This multiple criteria approach examines giftedness based upon four criteria: mental ability, achievement, creativity, and motivation (Georgia Department of Education, 2010). Students must meet the requirements in three of the four areas to be identified as gifted using the multiple criteria approach (Georgia Department of Education, 2010).

These changes in Georgia's gifted identification approach were established to obtain a more ethnically diverse population of students qualifying for gifted programs. The population of gifted students achieved through the psychometric approach was not a reflection of the ethnically diverse population of Georgia. Instead, Caucasian students were unduly identified as gifted while students of other races and those from low socioeconomic backgrounds were not properly identified (Krisel & Cowan, 1997). However, in order to sufficiently identify all gifted students, Georgia had to first change

from only a sole psychometric identification rule to procedures involving the multiple criteria approach (Krisel & Cowan, 1997).

Gifted educators in six Georgia school districts participated in one of the early identification reform projects in 1991 led by the National Research Center on the Gifted and Talented (Krisel & Cowan, 1997). Soon after, two Atlanta area school districts received Javits grants aimed at targeting underrepresented populations for their gifted programs (Krisel & Cowan, 1997). These grants were provided under the Javits Act, a federal program which provides funding for research aimed at enhancing gifted education. These two early initiatives began a reformation movement all across Georgia's school systems. Gifted educators revealed that they were able to better identify students from underrepresented populations who exhibited gifted characteristics. Researchers hoped that these endeavors would lead to improvements in identification and programming practices in all of Georgia's schools (Krisel & Cowan, 1997).

The Georgia Association for Gifted Children (GAGC) discussed the results and findings of research initiatives with Georgia legislators in 1994 (Krisel & Cowan, 1997). Legislators heard how this research had helped address equity issues in the identification of underrepresented student populations and provided the analytical information to better serve all gifted students. A bill requiring the multiple criteria approach was passed by legislators, and the governor signed HB 1768 into law shortly after (Krisel & Cowan, 1997).

The above mentioned work by many Georgia educators helped develop the multiple criteria approach that is presently used in all Georgia school districts. Using this approach allows students to be identified as gifted by meeting the stated criteria in three

of the four following evaluated areas: intelligence, academic achievement, creativity, and motivation (Georgia Department of Education, 2010). It is important to note that students can still be identified as gifted using the psychometric approach if they meet Georgia's stated criteria in both the areas of mental ability and achievement (Georgia Department of Education, 2010). However, the psychometric approach is no longer the sole method of gifted identification.

Multiple criteria approaches that examine more than intelligence and achievement have shown promise in better identifying students for gifted services. Georgia is considered to be a national leader in the area of gifted identification procedures. The state of Georgia is one of only six states in the United States that mandates gifted education and fully funds the program (Andrews 2008). Linda Andrews, Georgia Department of Education's Gifted Education Specialist, provided the keynote address at the annual 2008 Georgia Association of Gifted Children convention. In her address, she provided statistics that revealed a dramatic increase in the identification of gifted populations over an eleven year period. The gifted population in Georgia has increased more than 100% over this time period. Caucasian student participation has increased more than 60%, but other racial groups are even more impressive. African American participation in gifted programs increased over 200%, and the increase of Hispanic participation increased by almost an astonishing 800% (Andrews, 2008). Unfortunately, the statistical data was not disaggregated according to the identification method used. Thus, comparisons could not be made among students based the gifted identification approach used. Furthermore, achievement gains reported for students in eighth grade

were based upon the *Criterion Referenced Competency Test* (CRCT) which is not norm referenced.

The use of multiple criteria approaches in gifted identification has received a suitable amount of national research (Briggs et al., 2008; Ford, 2010; McBee, 2010; Pendarvis, 2009; Reis & Renzulli, 2010; VanTassel-Baska et al., 2007). Most of this research has focused on the effectiveness of using the multiple criteria approach to increase the enrollments and diversity of gifted education programs. Of this research, some has shown multiple criteria approaches can increase the enrollment of minority and low socioeconomic students in gifted education programs (Briggs et al., 2008; McBee, 2010; Pendarvis, 2009; VanTassel-Baska et al., 2007).

Mandelman, Tan, Aljughaiman, and Grigorenko (2010) examined various aspects of the field of gifted education in their national study. In their synopsis of gifted identification methods, they concluded that most researchers support the use of multiple criteria approaches in the gifted identification process. Mandelman et al. (2010) suggest that during the identification process both strengths and weaknesses of the gifted students should be discovered. Using these discoveries, educators can support gifted students as they utilize their strengths and advance their weaknesses. Moreover, the authors point to one of the critical issues that this study was founded upon. This issue being the disparity of research that exists in which the impact of being identified and participating in a gifted education program is carefully examined (Mandelman et al., 2010).

A critical area mentioned above, the performance of gifted students identified using multiple criteria approaches, has received little research attention. One group of researchers has examined gifted student's performance in South Carolina (Van Tassel-

Baska, Feng, Quek, & Stuck, 2004; Van Tassel-Baska, Feng, Quek, & de Brux, 2007; Van Tassel-Baska, Feng, Quek, & Evans, 2007). However, this research examined the performance of gifted students identified using performance tasks. In Georgia, students identified for gifted services using the multiple criteria approach are tested in the areas of mental ability, achievement, creativity, and motivation using standardized measures in most cases (Georgia Department of Education, 2010). Moreover, the grade level included in the above studies was not eighth grade students.

In a quantitative study conducted by Stephens (2009), the relationship between academic performance and the method of gifted identification was examined. The sample of this study was third, fourth, and fifth grade gifted students in suburban Georgia. Unfortunately, the data was not disaggregated according to race, gender, or socioeconomic status to determine what differences might exist among these categories. Instead, only an examination of the academic performance of gifted students identified using Georgia's two identification procedures was conducted. The limited comparisons of the study examined CRCT scores of students in each academic area. Furthermore, the differences in academic performance on each subtest were examined to determine if any statistical significance existed. National comparisons could not be made among the students because the CRCT is not a norm referenced exam.

When searching for national and regional studies related to the performance of gifted students, the researcher found that most studies examined only identification procedures and how to acquire more diverse gifted populations. Studies aimed at comparing the performance of gifted students identified using the two approaches are scarce. Of those found, data was not disaggregated to determine differences among

gender, race, and socioeconomic status. Moreover, middle school gifted students were not the focus of the found studies. Last, no studies in which the performance of Georgia's middle grades gifted students was compared based on identification methods were found. It is clear after multiple searches that a gap in the literature exists in this area. Research is needed that examines the performance of middle grades gifted students on a nationally normed referenced exam. Furthermore, the results of this research need to be disaggregated based on gender, race, socioeconomic status, and identification methods.

Problem Statement

The problem to be studied is that limited research has been conducted to examine the relationships that exist among gifted identification criteria, academic performance, gender, race, and socioeconomic status. Most research related to gifted identification focuses only on methods of gifted identification (Briggs et al., 2008; Ford, 2010; Pendarvis, 2009; Reis & Renzulli, 2010; VanTassel-Baska et al., 2007). Existing research examines only the effectiveness of identification procedures in creating more diverse gifted populations. The performance of the identified gifted students is rarely compared. Furthermore, little research exists in which middle grade gifted students were studied (Pendarvis, 2009). A critical gap exists in the literature related to the academic performance of gifted students of a particular gender, race, or socioeconomic status (Ford, 2010). Moreover, the identification methods used in identifying these gifted students needs to be examined. Research is needed to determine if any relationships can be found among the variables mentioned above. This research will allow school systems to evaluate the academic performance of all their gifted students identified using both the

multiple criteria and psychometric approach. Comparisons of the performance on national normed referenced exams need to be made between Georgia gifted students of different gender, race, and socioeconomic status who are identified using the multiple criteria and psychometric approach.

Purpose Statement

The purpose of this study was to determine what relationships exist among its variables: mean scores on the *Iowa Test of Basic Skills* (ITBS), gifted identification approach, gender, race, and socioeconomic status of eighth grade gifted students. The eighth grade gifted students included in this study have participated in the gifted education program at a junior high school located in a small, Georgia community. Relationships found among the study's variables can be used by the research site's school district and other school systems to evaluate both diversity and performance in their gifted education programs. Gifted identification approaches have been enhanced to better identify more diverse gifted populations. A careful examination is needed to determine if ABC Junior High School's district is indeed identifying a gifted population that is diverse. According to recent research, the academic performance of students of a particular gender, race, or socioeconomic status for gifted services needs to be examined (Briggs et al., 2008; Ford 2010; McBee, 2006; McBee, 2010; Reis & Renzulli, 2010; Pendarvis, 2009). This examination will aid in determining how the mean ITBS scores of gifted students identified using the multiple criteria approach compare to those identified using the psychometric approach. A casual comparative research design was used in this study to examine the relationships among the study's variables.

Significance of the Study

After many decades of research, one would believe that a functioning definition of giftedness and research proven identification methods would exist for gifted students. Furthermore, it seems that some national standards for identification would have been created by now. Regrettably, for the students who often possess the most academic promise, this is not the case (Reis & Renzulli, 2010). However, educators all across the nation are still charged with properly identifying and serving gifted students. Magnifying this issue is the underrepresentation of students of certain race and socioeconomic status (Reis & Renzulli, 2010). To lessen the issue of underrepresentation in gifted programs, many states, including Georgia, have incorporated multiple criteria approaches in their gifted identification process (Reis & Renzulli, 2010). However, the performance of gifted students identified using Georgia's two identification approaches has rarely been examined. State reports exist that provide gifted student performance collectively, but not disaggregated according to identification method, gender, race, and socioeconomic status. Moreover, these reports related to performance use Georgia's state mandated test, the *Criterion Referenced Competency Test* (CRCT). Nationally normed referenced tests such as the *Iowa Test of Basic Skills* (ITBS) have not been used to measure the performance of Georgia's gifted students.

Most gifted education research focuses on improving identification methods or reducing underrepresentation which has plagued the field of gifted education for decades. Multiple criteria approaches have been proven to better identify underrepresented populations (Briggs et al., 2008; Lawrence, 2009; Pendarvis, 2009; Reis & Renzulli, 2010). The multiple criteria approach opens the lens of gifted identification to include

characteristics such as high intellectual ability, task commitment, creativity, and multiple intelligences (Reis & Renzulli, 2010). However, the perception that students identified using the multiple criteria approach will not perform as well academically as gifted students traditionally identified still exists among some educators. This misconception can only be dispelled by evidence of studies that examine the performance of the various groups of gifted students (Briggs et al., 2008; Ford 2010; McBee, 2006; McBee, 2010; Reis & Renzulli, 2010; Pendarvis, 2009). Results of this study could prove beneficial in assisting school systems locally, regionally, and nationally, as they address issues in identification, underrepresentation, referral processes, and academic performance of their gifted education program.

When testing students to determine if they qualify for gifted services, Georgia school systems use either the multiple criteria approach or the psychometric approach (Georgia Department of Education, 2010). Although mental ability and achievement are used in both approaches, the multiple criteria approach also evaluates a student based on creativity and motivation (Georgia Department of Education, 2010).

Several decades have passed since Georgia adopted identification measures created to better identify gifted students. This study will examine the relationships among mean ITBS scores, gifted identification criteria, gender, race, and socioeconomic status. These relationships are pertinent in ensuring that gifted education programs effectively identify gifted students of different gender, race, and socioeconomic status. More importantly, the mean ITBS scores of eighth grade gifted students will be examined to determine if identified students are performing comparably to other gifted students.

Gifted studies related to identification found by the researcher rarely involved one characteristic of this study: grade level. In Georgia, the eighth grade is a critical year in determining a student's future academic path. Academic performance is measured using both the *Iowa Test of Basic Skills* (ITBS) and the *Criterion Referenced Competency Test* (CRCT). The ITBS is a normed referenced exam that allows student performance to be evaluated on a national level. The CRCT examines mastery of state standards, and students in the eighth grade must pass the math and reading potions in order to be promoted to the ninth grade. Moreover, classes to be taken in the ninth grade are typically chosen during a student's eighth grade school year. For most gifted students these choices involve advanced placement (AP) classes that require summer work before the ninth grade year. Moreover, participation in AP classes is based on the academic performance of the gifted student. These academic choices make it imperative that identification procedures have identified gifted students by the eighth grade. Unidentified gifted students will most likely choose college preparatory ninth grade classes. In Georgia, once a student begins a certain academic pathway, it can often be difficult to change.

This study analyzed the differences in mean ITBS scores of eighth grade gifted students of different gender, race, and socioeconomic status identified using Georgia's two identification methods. Data analysis was performed using measures of central tendency and two-way analysis of variance (ANOVA) procedures. These statistical tests were used to help determine if there were any significant differences in the ITBS mean scores of the identified eighth grade gifted students who attend a Georgia junior high school.

Research Questions

Research Question 1: *Is there a significant difference in mean ITBS scores (math portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?*

Research Question 2: *Is there a significant difference in mean ITBS scores (math portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?*

Research Question 3: *Is there a significant difference in mean ITBS scores (math portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?*

Research Question 4: *Is there a significant difference in mean ITBS scores (reading portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?*

Research Question 5: *Is there a significant difference in mean ITBS scores (reading portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?*

Research Question 6: *Is there a significant difference in mean ITBS scores (reading portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?*

Research Hypotheses

H_o1a: There is no significant difference in the mean ITBS scores (math portion) of male and female eighth grade gifted students.

H_o1b: There is no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach.

H_o1c: With respect to mean ITBS scores (math portion), gender and identification method do not interact.

H_o2a: There is no significant difference in the mean ITBS scores (math portion) of minority (African American and Hispanic) and non-minority (Caucasian) eighth grade gifted students.

H_o2b: There is no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach.

H_o2c: With respect to mean ITBS scores (math portion), race and identification method do not interact.

H_o3a: There is no significant difference in the mean ITBS scores (math portion) of high and low socioeconomic eighth grade gifted students.

H_o3b: There is no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach.

H_o3c: With respect to mean ITBS scores (math portion), socioeconomic status and identification method do not interact.

H_o4a: There is no significant difference in the mean ITBS scores (reading portion) of male and female eighth grade gifted students.

H_o4b: There is no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach.

H_o4c: With respect to mean ITBS scores (reading portion), gender and identification method do not interact.

H_o5a: There is no significant difference in the mean ITBS scores (reading portion) of minority (African American and Hispanic) and non-minority (Caucasian) eighth grade gifted students.

H_o5b: There is no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach.

H_o5c: With respect to mean ITBS scores (reading portion), race and identification method do not interact.

H_o6a: There is no significant difference in the mean ITBS scores (reading portion) of high and low socioeconomic eighth grade gifted students.

H_o6b: There is no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach.

H_o6c: With respect to mean ITBS scores (reading portion), socioeconomic status and identification method do not interact.

Identification of Variables

The following list of terms and variables has been provided to help the reader better understand some of the terminology commonly used in the field of gifted education. To ensure clarity, an operational definition is provided for each. These terms and variables are presented throughout the current study.

Achievement: A criterion tested in both of Georgia's gifted identification procedures. A norm referenced exam, the *Iowa Test of Basic Skills* (ITBS), is used to measure student achievement (McBee, 2006).

Creativity: One of the criteria measured in the multiple criteria identification approach. In Georgia, the *Torrance Tests of Creative Thinking-Figural* (TTCT) is used to determine if a student meets the gifted criteria in this area (McBee, 2006). Students are examined in five areas: fluency, originality, elaboration, abstractness, and resistance to premature closure (Kim, 2006).

Gender: For purposes of this study, gender refers to male and (or) female.

Gifted Student: Two methods are used in Georgia when determining if a student is gifted. One requires a student to be exceptional in three of the following four areas: mental ability, achievement, motivation, or creativity. The other method requires a student to be exceptional in both mental ability and achievement (McBee, 2006).

Mental Ability: Mental ability is synonymous with Intelligence Quotient. A psychometric assessment such as the *Cognitive Abilities Test* (CogAT) is used to test this criterion in both of Georgia's gifted identification procedures by using (McBee, 2006).

Minority Student(s): For purposes of this study, minority includes African American and Hispanic students.

Motivation: One of the four criteria examined using the multiple criteria identification measures. A student's grades are used to in determining if this criterion is met (McBee, 2006).

Multiple Criteria Approach: One of the two approaches used in Georgia to identify gifted students. Eligibility is based upon a student meeting the state mandated criteria in three of the four categories: mental ability, achievement, creativity, and motivation (Georgia Department of Education, 2010).

Non-minority Student(s): For purposes of this study non-minority is comprised of Caucasian students.

Psychometric Approach: One of the two approaches used in Georgia to identify gifted students. Students are required to meet the state mandated criteria in two areas: mental ability and achievement (Georgia Department of Education, 2010).

Race: For the purposes of this study, race includes African American, Caucasian, and Hispanic.

Socioeconomic status: The amount of resources available to a student, as well as if a student receives government assistance for the school lunch program is used in determining a student's socioeconomic status (McBee, 2010). For the purposes of this study, students of high socioeconomic status will be those who pay for their lunch, and students of low socioeconomic status will be those who receive free or reduced lunch.

Underrepresentation: The trend that exists in gifted education due to students of a particular race or socioeconomic status not being identified for gifted services. These students have historically been African American, Hispanic, or economically disadvantaged (McBee, 2010).

Independent Variables. The independent variables in this study were the two gifted identification methods, gender, race, and socioeconomic status. The two approaches used in identifying gifted students in Georgia are the psychometric approach and the multiple criteria approach. When using the psychometric approach, a student's gifted eligibility is based only on mental ability and achievement (Georgia Department of Education, 2010). The multiple criteria approach bases a student's eligibility for gifted services on meeting three out of four criteria: mental ability, achievement, creativity, and motivation (Georgia Department of Education, 2010). Male and female students were examined in this study. The races of the students included in this study were African American, Caucasian, and Hispanic. Socioeconomic status was comprised of high and low.

Dependent Variable. The dependent variable in this study was gifted students mean scores on the math and reading portions of the *Iowa Test of Basic Skills* (ITBS). Student scores in math and reading were examined due to the critical nature of these subject areas in Georgia. One criterion used in Georgia for placement in certain high school classes is student scores on the ITBS. Moreover, the ITBS was used because it is a nationally normed referenced exam. This provided the researcher the prospect of making comparisons of the eighth grade gifted students' performance to other gifted students across the nation.

Research Plan

This study utilized a causal-comparative research design which is useful when the independent variables cannot be manipulated. This type of research is appropriate when a researcher wants to determine "relationships by forming groups of individuals in whom

the independent variable is present or absent-or present at several levels-and then determining whether the groups differ on the dependent variable" (Gall et al., 2007, p. 306). In this study, the independent variables were the two approaches used in identifying gifted students in Georgia, gender, race, and socioeconomic status. These independent variables could not be manipulated by the research. The dependent variable in this study was gifted students' mean scores on the ITBS (math and reading portions). The differences found to exist in the mean scores of gifted students identified using the two identification methods, gender, race, and socioeconomic status were used to determine if any significant difference existed in the mean scores of the various groups of gifted students.

The researcher examined the gifted testing records of all eighth grade gifted students [n= 192] who have participated in the gifted education program at a junior high school located in Georgia during the past two school years. These students, currently enrolled in the gifted program, were identified as gifted at some point before entering the eighth grade.

Data obtained from ABC's gifted records were disaggregated based on the study's independent variables. The gifted students were separated into two groups: those identified using the psychometric approach and those identified using the multiple criteria approach. These two groups were further disaggregated based on the gender, race, and socioeconomic status of the gifted students. The gender, race, and socioeconomic status of each eighth grade gifted student were provided in the school's gifted records. Mean scores on the ITBS of each gender (male and female), race (African American, Caucasian, and Hispanic), and socioeconomic status (high and low) represented in each

identification approach were found. Generalizations were drawn among the various groups related to their achieved mean scores. Using multiple two-way ANOVA tests, comparisons were made among the groups to determine if the groups differed on the dependent variable: mean scores on the math and reading portions of the ITBS. Statistical analysis was conducted by the researcher to determine if results were statistically significant (Gall et al., 2007).

A review of the literature pertinent to the history of gifted identification, applicable theoretical frameworks, gifted identification approaches, prevalent issues in gifted education, and relevant research studies is presented in the following chapter. This culmination of literature and the ideas presented therein aided in the formulation of the design and execution of this study.

CHAPTER TWO: REVIEW OF LITERATURE

Introduction

A great deal of reform aimed at better meeting the needs of a diverse student population has occurred in the field of gifted education. Over the last several decades, researchers have proven that the identification procedures for gifted education must include more than an IQ test (Sternberg & Davidson, 2005). In Georgia, academic achievement and mental ability are used as criteria for identifying students for gifted services under the psychometric approach. More importantly, the multiple criteria approach was created to better identify gifted students from underrepresented populations. This approach examines the mental ability, achievement, creativity, and motivation of students as criteria for participation in a gifted program. Georgia school systems determined that these changes were needed and began using both approaches in the identification of gifted students in the early 1990's (Georgia Department of Education, 2010).

As with any educational reform, careful examination is required of critical areas that are being impacted by the reformation. The critical areas are comprised of gifted students' needs, identification procedures, and gifted student performance. This review of literature examines key theoretical concepts related to gifted education and the critical areas of gifted education mentioned above. These critical areas will shape the proposed research study that will examine a gifted education program in a junior high school located in Southwest Georgia.

Gifted students have unique needs that must be considered by educators in order for these students to be properly challenged academically and meet their academic

potential (Reis & Renzulli, 2010). Georgia's definition of intelligence and gifted identification practices have changed over the last few decades to better align with best research practices. Although the traditional gifted identification procedure, the psychometric approach, is still used in Georgia, there are certain limitations to this approach. The newer identification method, the multiple criteria approach, has clear advantages in better identifying a more diverse gifted population (Georgia Department of Education, 2010). However, the relationship between identification method and student performance is a critical area yet to be adequately examined. Insufficient research exists that can be used to determine which method best identifies the highest performing gifted students of a particular gender, race, or socioeconomic status. Moreover, careful examination is needed related to the performance of gifted students on nationally normed standardized tests (Lawrence, 2009; Mandelman et al., 2010; Reis & Renzulli, 2010). This will allow researchers to determine if identification methods used in Georgia are identifying gifted students capable of achieving scores comparable to other gifted students across the nation. Comparisons made using CRCT scores allow comparisons to be made only among other Georgia gifted students. These critical areas related to gifted students' performance were the focus of this casual comparative study.

Conceptual or Theoretical Framework

Diverse populations make up many schools across the nation today, and with this diversity come challenges. Throughout the years, theoretical models of giftedness have been presented that have focused on the concept of transcending traditional barriers framed by race, culture, and social strata. Some of these models have had a greater impact on our understanding of giftedness and gifted education than others.

"Multifaceted approaches such as those of Sternberg (1997b), Gardner (1983), and Renzulli (1978) are more consistent with present day theory and research" (Renzulli, 2002, p. 68). The following theoretical models of giftedness demonstrate the growing complexity of gifted education. Moreover, these theoretical frameworks were what this study was formulated upon.

Renzulli's three-ring conception of giftedness. In his theory, Renzulli contends that giftedness can be explained as an interaction among three attributes: high intellectual ability, task commitment, and creativity (Renzulli, 2005; Renzulli 2011). These traits should not be viewed as separate elements, but instead as characteristics that work collectively and are of similar importance. "One of the major errors that continue to be made in identification procedures is the overemphasis on superior abilities at the expense of the other two clusters of traits" (Renzulli, 2011, p. 83).

In Renzulli's three-ring conception, above average general ability refers to the upper ranges of performance, as measured by standardized tests. Generally, these upper ranges are defined by scores in the top 5^{th} percentile, and students performing at these levels are identified as gifted. However, Renzulli (2011) states that this practice could be a hindrance to gifted education. Instead of standardized test scores being used as the sole measurement for academic potential, they should be used to identify what range students score, either above or below the 95^{th} percentile. After this screening process, other criteria should be incorporated into a system's gifted identification process to measure academic potential. "More creative/productive persons come from below the 95^{th} percentile than above it, and if such cutoff scores are needed to determine entrance into

special programs, we may be guilty of actually discriminating against persons who have the greatest potential" (Renzulli, 2011, p. 84).

The second cluster of traits includes task commitment, an attribute common among most creative and productive students. Traits included in this cluster most often manifest themselves in a student's level of motivation to complete problems, tasks, or assignments. "One of the key ingredients that has characterized the work of gifted persons is the ability to involve oneself totally in a problem or area for an extended period of time" (Renzulli, 2011, p. 84).

The third ring, creativity, includes aspects used to recognize students for their creative accomplishments (Renzulli, 2005). Creativity is viewed as an important component of giftedness by most researchers. However, it has been a struggle for researchers to develop tests that they feel accurately measure creativity. Some have proposed using tests which measure divergent thinking to assess creativity because of the relationship most believe divergent thinking and creativity share. Still, there are those that question if divergent thinking can be directly linked with creativity.

Gardner's multiple intelligences. Howard Gardner first introduced the ideas of multiple intelligences over 25 years ago. At that time he identified seven intelligences: "logical-mathematical, linguistic, bodily-kinesthetic, interpersonal, intrapersonal, musical, and special" (Christodoulou, 2009, p. 2). However, naturalistic intelligence has since been added, and existential intelligence could be added in the future. The aim of Gardner's multiple intelligences was to provide multiple dimensions of intelligence. Thus, the concept of employing multiple criteria approaches during the gifted identification is supported by this theory. Moreover, throughout the educational process

students may utilize various intelligences in distinct ways to adapt to challenges according to Gardner's theory (Christodoulou, 2009). All students possess some ability in each of the intelligences. Educators must determine what degree and combination of intelligences each student has and tailor lessons and assessments in a manner that capitalizes on each student's strengths (Christodoulou, 2009). "The theory of multiple intelligences highlights that intelligence is not fixed, but rather is a dynamic capacity amenable to change via good teaching, high motivation, and adequate resources, including those provided by technology" (Christodoulou, 2009, p. 5).

Supportive Gifted Theoretical Frameworks

Although the theories of Renzulli and Gardner were the frameworks of this study, other theories show the complexity of giftedness. The following theories discuss the essential principles of gifted education programs, needs of gifted students, and critical components vital to the development of gifted learners.

Bandura's social cognitive theory. Bandura's theory encompasses foundational principles which any gifted educational program should be built upon. While consensus on the definition of giftedness has still not been reached after many decades, some foundational issues are agreed upon by researchers. "There is agreement that highly able learners need appropriately challenging and interesting learning experiences in order to develop their potential" (Burney, 2008, p. 130). Gifted programs can foster the development of their students by providing an accelerated pace, increased complexity in the curriculum, and appropriate modifications.

A key principle of Bandura's theory is the belief that self-reflection is a major contributor to a student's behavior (Burney, 2008). Clearly, the social environment in

which students interact and learn influences how they view themselves. Subsequently, these views aid in determining the level of motivation a student possesses which directly affects their performance (Burney, 2008). "Schools and educators could use this social cognitive model as a framework to plan programs that enhance student self-beliefs (personal factors), academic skills and self-regulation (behaviors), and social context (environment) to facilitate positive student engagement and development" (Burney, 2008, p. 131).

Some researchers have questioned the use of general education curriculums in gifted programs. They feel these curriculums are not suitable in providing both opportunities and appropriate learning strategies to gifted learners. Thus, by implementing the principles of Bandura's Social Cognitive Theory, gifted education programs can implement a curriculum that better meets the needs of gifted learners.

According to Burney (2008), there are several implications of Bandura's theory in relation to planning gifted education services. Gifted students should be taught using an advanced curriculum, and instructional strategies that require higher order thinking should be utilized. A social environment should be in place that promotes adjustment and achievement. Rigorous activities and assignments should be given to allow students to learn that their learning is a merger of ability and effort. Engaging performance tasks should be provided which allow gifted students to experience the joys of learning (Burney, 2008).

Vygotsky's sociocultural theory. Vygotsky's theory entails the blending of both social and cultural aspects. As related to education, the social facet involves a student's interaction with other students, teachers, or school staff. These interactions aid in the

growth process of students. The cultural attribute "consists of an individual's way of being in the world, which is of course based on that which he or she has observed" (McGlann-Nelson, 2005, p. 50).

One principle of Vygotsky's theory pertinent to gifted education is the Zone of Proximal Development (ZPD). Under this concept students are assessed to determine their actual developmental stage and their level of potential development (McGlann-Nelson, 2005). A student's actual developmental stage is determined by allowing the student to work independently on an assignment. When determining the student's potential development level, assistance is provided by either a teacher or competent peer. Effective instruction involves activities that require skills just beyond a student's actual development stage (McGlann-Nelson, 2005). The ZPD "offers profound guidance to the field of gifted education in terms of assessment, individualizing learning, monitoring progress, and addressing the social and emotional needs of gifted children" (McGlann-Nelson, 2005, p. 50). Of course proper measures must be taken by school systems to ensure that gifted educators have the means to assess, instruct, and provide guidance to their students in this manner.

Sternberg's triarchic model of giftedness. The triarchic theory divides intellectual activity into componential, experiential, and contextual elements, which work together to produce intelligent behavior. This model of giftedness makes a distinction between analytical, synthetic, and practical giftedness (Sternberg & Davidson, 2005). An important concept that emerges from Sternberg's Triarchic model is that a student can be gifted in terms of their abilities and in terms of managing their abilities. Sternberg and Davidson (2005) indicated that giftedness is as much a balance of these three abilities as

it is a high score on any one or more of them.

Gagne's differentiated model of giftedness and talent. Gagne's model provides a clear distinction between giftedness and talent. Within this model, giftedness includes four aptitude domains: intellectual, creative, socio-affective, and sensorimotor (Gagne, 2004). This model further denotes that talent develops when a student engages in systematic learning, training, and practicing. This developmental process is facilitated by two types of catalyst: intrapersonal catalysts and environmental catalysts. Intrapersonal catalysts include motivation, temperament, and personality. Environmental catalysts include personal surroundings, people in the student's life, and significant events that occur (Gagne, 2004).

Meeting the Needs of Gifted Students

The purpose of gifted programs is to serve students "who display exceptional qualities, whose needs are not sufficiently served in regular education programs, and are likely to benefit from special education and related services" (Oakland & Rossen, 2005, p. 56). In today's era of *No Child Left Behind*, many school systems often leave one group of students, the gifted, without adequate support. In some cases, gifted students find themselves waiting for their peers to catch up, for their teachers to provide challenging content, and for their schools to address their unique needs (Badley & Dee, 2010). Most researchers agree that gifted students are those testing in the 98^{th} or 99^{th} percentile. These gifted students come from all racial, ethnic, and cultural backgrounds and possess unique educational needs (Ford, 2006; Lawrence, 2009; Reis & Renzulli, 2010). Moreover, they have an increased sense of intellectual curiosity, a strong need to excel, determination to persevere, and often a preference to lead or control (Reis &

Renzulli, 2010; Lawrence, 2009; VanTassel-Baska, 2005). It is imperative that educational institutions nurture inventiveness, creativity, discipline, research skills, inquisitiveness, and aspirations in its students (Lawrence, 2009).

Increased rigor. Scholastic rigor must be present in a school's learning environment to stimulate the students intellectually and enhance their academic growth. Educators can obtain this needed rigor by integrating critical thinking skills into their daily lessons (McCollister & Sayler, 2010). When integrating critical thinking skills, educators must consider the interest, readiness, and learning styles of their students. Furthermore, the academic instruction used must engage and inspire students though complex curricula that is presented at the appropriate pace (McCollister & Sayler, 2010). Last, educators must be aware that gifted students often have an advanced level of development that makes grade appropriate curriculum inappropriate. The academic needs of these students often far exceed the norm (Lawrence, 2009).

According to McCollister and Sayler (2010), there are four useful ways to integrate critical thinking into the curriculum: problem solving, questioning that involves critical analysis, evaluating sources, and decision making. Appropriately challenging problem solving opportunities allow gifted students to apply critical thinking within any content area. These students are able to acquire new knowledge by using logical thought and clear reasoning (McCollister & Sayler, 2010). Appropriate questioning is an important means of differentiation and infusing critical thinking in academically rigorous learning environments. Questions can stimulate deeper thinking, provoke interest and inquiry, and spark additional questions. Moreover, the intellectual level of thinking in a classroom is raised through critical questioning (McCollister & Sayler, 2010).

McCollister and Sayer (2010) indicate that students can enhance academic rigor by evaluating the sources of information they are using. This evaluation allows students to check for source validity and credibility. Decision making is used by students to select from among choices and evaluate opportunities both academically and in daily life. Students analyze the options available and then evaluate and weigh the merit of each option, enabling them to make decisions based on evidence (McCollister & Sayler, 2010).

Individual differences. When planning instruction, educators must be cognizant of differences that exist among their gifted students and plan individualized instruction that will meet the needs of their students (Lawrence, 2009). Many teachers have become frustrated as they attempt to meet the needs of students who have varying ability levels. One of the contributors to this frustration is an existing attitude that gifted students can do without special services (Lawrence, 2009).

The Mustard Seed Project involved qualitative research of gifted students in rural settings. Students involved in the study were from various ethnic backgrounds and most were economically disadvantaged (Davalos & Griffin, 1999). Although the study involved rural students, many of the study's findings are applicable to all gifted students. The aim of the study was to evaluate individualized instructional methods (Davalos & Griffin, 1999).

Davalos and Griffin (1999) found that even minor modifications are beneficial to gifted students. For example, minor adjustments such as rearrangement of a room to facilitate student interaction and offering student choice in assignments proved beneficial to gifted students. Some teachers encouraged gifted students to explore their interests

and developed challenging research projects that required in-depth thinking (Davalos & Griffin, 1999).

Acceleration. Another initiative that school districts can adopt to meet the unique needs of gifted students is acceleration. This initiative is based upon the understanding that students of the same age differ in their ability to learn. Furthermore, differences exist among students in various curriculum areas (Lee, Olszewski-Kubilius, & Peternel, 2010; VanTassel-Baska, 2005). Acceleration involves diagnosing students' learning ability and then designing educational tasks that are slightly above the ability of the students. This ensures that school systems have an effective curriculum and that its gifted students are receiving effective instruction (Steenbergen-Hu & Moon, 2010; VanTassel-Baska, 2005). Lee, Olszewski-Kubilius, and Peternel (2010), found that acceleration led to classes being more exciting, beneficial, and challenging for gifted students. Moreover, the effectiveness of any academic strategy or program is contingent upon the degree of student motivation present (Chapman, 2009).

Content acceleration. It is imperative that school systems offer acceleration across all curriculum areas and at all grade levels (VanTassel-Baska, 2005). School systems are generally comfortable with acceleration in mathematics, but this comfort level dissipates in other content areas. This reluctance is harmful to gifted students whose giftedness is present in other areas (VanTassel-Baska, 2005). Moreover, some systems are hesitant to provide acceleration beyond one school year because of traditional school policies such as naturally occurring school years or age appropriateness (VanTassel-Baska, 2005). However, years of research prove that these acceleration practices can positively impact the academic achievement of gifted learners (Lee et al.,

2010; Steenbergen-Hu & Moon, 2010; VanTassel-Baska, 2005).

Grade acceleration. For gifted students who are academically advanced in all content areas, grade acceleration can be beneficial (Van Tassel-Baska, 2005). However, this practice does require school systems to modify traditional stages of schooling. VanTassel-Baska (2005) points out that grade level acceleration is very beneficial for gifted students who show more than two years of advancement in all content areas, but warns that all students should be evaluated individually.

Increased engagement. Most would agree that student engagement is concurrent to a student's level of motivation. A student's educational setting must stimulate them conceptually, or the student will quickly become an unmotivated student (Chapman, 2009; Lee et al., 2010; Steenbergen-Hu & Moon, 2010; VanTassel-Baska, 2005). For this reason, many parents and educators view acceleration as a means of increasing motivation for gifted learners. According to Chapman (2009), self-efficacy, interest, and membership are three elements vital to ensuring that gifted students are effectively engaged in their learning environments. Self efficacy refers to the belief one has in themselves to accomplish a specific task. Interest can be defined as the significance a student places on the learning requirements. Membership is the degree of connectedness a student senses in regards to their learning environment. Acceleration affords educators the opportunity to target the above mentioned areas which in turn can create highly motivated gifted students (Chapman, 2009).

Instruction differentiation. One instructional approach that fosters differentiated responses among gifted students is problem based learning (PBL). This approach requires students to first deal with a real world problem created by the

instructor that is related to a particular subject's core standards (VanTassel-Baska, 2005). Next, the students must address the issue and develop an effective plan to research it. Last, pertinent information must be gathered by the students from appropriate sources (VanTassel-Baska, 2005). PBL allows an instructor to successfully deliver core standards of a particular curriculum to gifted students in a differentiated manner (VanTassel-Baska, 2005).

Assessment differentiation. When appropriate assessment is conducted, it can reveal the level of learning obtained by gifted students resulting from differentiated instruction (VanTassel-Baska, 2005). Currently, high stakes testing is a part of all educational systems, and the results obtained on these tests should be used to compare gifted students with other students of the same age. These comparisons provide pertinent data that can be used in evaluating the effectiveness of instructional programs. However, it is more prevalent that gifted students score in the upper percentiles on nationally normed instruments (VanTassel-Baska, 2005). These levels of student performance can only be obtained by using differentiated assessments to carefully plan instruction for gifted students. Furthermore, it is crucial that student growth is measured using performance based tools (VanTassel-Baska, 2005). Last, instructors should provide rubrics for students' use when beginning units of study. This allows gifted students to fully understand the instructor's expectations (VanTassel-Baska, 2005).

Prevalent Issues in Gifted Education

Over the years a vast amount of reform and research efforts have centered on alleviating some recurring issues in the field of gifted education. As discussed earlier, researchers have historically struggled to construct a definition of giftedness accepted by

all. "Giftedness needs to be redefined to include three elements: above average intelligence, high levels of task commitment, and high levels of creativity" (Renzulli, 2011, p. 81). Furthermore, since the inception of gifted education, intelligence tests have been utilized when assessing students' intelligence. However, there are individuals who have raised concerns regarding intelligence tests and their use in the gifted identification process. A critical issue, underrepresentation, has plagued the field of gifted education for many years. Despite the best efforts of researchers and educators across the nation, certain groups of students continue to be underrepresented in gifted education. Last, some researchers have pointed to the referral process as being a critical area in need of reformation.

Underrepresentation. Gifted education has made advancements in certain aspects over the last 100 years, but one shortcoming still exists, underrepresentation. Across the nation, immense disparity exists among states and school systems in their policies regarding identification for gifted educational services. Because national standards regarding gifted identification do not exist, each school district essentially has the right to enact their own identification policies (McGlann-Nelson, 2005). Who is assessed, what screening instruments are most effective, and which criteria should be employed for gifted identification vary from state to state. In some instances, variation exists among systems in the same state. These procedures have significantly hindered progress in reducing underrepresentation in gifted education (McGlann-Nelson, 2005).

In Georgia, eligibility for gifted services was determined using only the psychometric approach until the early 1990's. Researchers have cited the psychometric approach as a root cause for underrepresentation (Callahan, 2005; Ford, Grantham, &

Whiting, 2008; Ford, 2010; Lawrence, 2009; McBee, 2010). However, even with improved identification measures, many students continue to not be identified as gifted. Ford (2010) found that underrepresentation accounted for almost 500,000 African American and Hispanic students not being served in gifted education programs across the nation. Additionally, the hindrances responsible for the underrepresentation of African American and Hispanic students in gifted programs have changed little over the past twenty years (Ford et al., 2008; Ford, 2010).

Callahan (2005) argues that underrepresentation is a complex issue that cannot be dealt with using a single method. Instead, she explains that school systems should examine the opportunities they afford for talent development, discontinue the practice of single assessments for identification, and strengthen policies aimed at identifying underrepresented gifted populations.

A greater number of gifted students can be identified when systems adopt expanded conceptions of giftedness. An awareness of the concepts framed by Sternberg allows schools to understand that gifted students may be talented in only one subject, not all (Callahan, 2005). Additionally, Renzulli (2011) argues that definitions of giftedness can be restrictive and impede a school system's identification process. In these cases, accepted definitions either place restrictions on performance areas or levels used in determining gifted eligibility. Equally important is the need for teachers to be provided with training in recognizing gifted behaviors and manifestations of giftedness. "There are very few educators who cling to a 'straight IQ' or purely academic definition of giftedness. 'Multiple talent' and 'multiple criteria' are almost bywords of the present-day gifted students' movement" (Renzulli, 2011, p. 82). Still, school systems must develop

gifted programs that are interesting, relevant, and motivating. Last, gifted identification must occur early and often. If gifted students are identified early, achievement gaps can be lessened. Furthermore, educators must continuously look for signs of emerging talent that needs to be developed (Callahan, 2005).

The use of one assessment to judge students has long been frowned upon by researchers in the field of measurement. Still, intelligence tests are used extensively as the sole instrument in the identification of gifted students (Callahan, 2005). School systems can better identify gifted students by using multiple identification tools that have been proven to be both reliable and valid. Furthermore, systems should ensure that assessments used in the identification process are authentic (Callahan, 2005).

Gifted enrollment should never be hindered by policies that mandate the number of students that can be served. School systems should "begin to consider a continuum of gifted services and to modify the curriculum according to student needs" (Callahan, 2005, p. 102). This will allow both traditional and non-traditional gifted students to be served. Policies regarding nomination, screening, and identification should be founded upon an expanded definition of giftedness. These policies should also be flexible to allow for change when needed (Callahan, 2005).

Intelligence tests. There are indeed limitations to only using the psychometric approach when identifying potential gifted students. When using this approach, eligibility for gifted education services is based solely on a student's intelligence and academic achievement. Although multiple criteria approaches examine more than intelligence, intelligence tests are still routinely used in the gifted identification process.

In an in-depth analysis of articles focusing on giftedness, Ziegler and Raul (2000) discovered that more than 60% of gifted identifications involved intelligence tests as an identification tool. In 2008, eight years later, Ziegler found in a similar analysis that gifted identification tools based solely on intelligence had declined some. More than 50% of gifted identifications were still based exclusively on intelligence or a combination of intelligence and achievement (Ziegler & Stoeger, 2010). This marks improvement in identification procedures, but additional strides are needed. Critics of intelligence tests argue that these tests are socially biased and lack theoretical foundations. Others suggest that when results of intelligence tests are used, factors such as concentration levels, self-concept, and motivation should be considered (Ziegler & Stoeger, 2010). These considerations are needed to account for the fundamental weaknesses of intelligence tests so that results can be used in a beneficial way.

Intelligence tests cannot be mentioned without examining the very controversial topic of intelligence and racial differences. Naturally, there are various viewpoints that represent the broad spectrum of beliefs regarding this topic. Hunt and Carlson (2007) discuss these varying beliefs, but then arrive at some socially acceptable conclusions regarding intelligence and the use of intelligence tests. First, all people are born with genetic potential. Cognitive skills are developed through interaction between one's genetic potential and environment, and by acquiring knowledge concerning one's surroundings (Hunt & Carlson, 2007). "A person's actual accomplishments will be determined by interactions between cognitive abilities and the opportunities offered and the limits imposed by the environment" (Hunt & Carlson, 2007, p. 199). Second, intelligence tests measure important theoretical processes and provide evidence which

can be used to predict relevant societal norms. Hunt and Carlson (2007) affirm that intelligence "refers to individual differences in cognitive abilities" (p. 199). Regardless of one's stand on intelligence and racial differences, the issue of underrepresentation still plagues the field of gifted education.

Ziegler and Stoeger (2010) conducted a study in which the cognitive abilities and fine motor skills of students were measured. Almost 800 fourth grade students who attended a German school were included in the study. Two different intelligence tests and a test of fine motor skills were employed during the study (Ziegler & Stoeger, 2010). One intelligence test, the Culture Fair Intelligence Test (CFT), places little demand on the students' fine motor skills during assessment. The other intelligence test, the Prüfsystem für Schul – und Bildungsberatung (PSB), is a demanding test in regards to fine motor skills. Fine motor skills were assessed by asking students to reproduce letters in the Greek alphabet (Ziegler & Stoeger, 2010). "This measure is commonly applied in research in the assessment of visual-motor integration" (Ziegler & Stoeger, 2010, p. 204).

Results of this study showed the importance of using various intelligence tests during the identification process. Certain non-cognitive limitations of a student could result in IQ scores below the range of giftedness. In this study the limitation was fine motor skills. The researchers provided empirical evidence that scores on intelligence tests can be influenced by a student's fine motor skills (Ziegler & Stoeger, 2010). More importantly, this evidence shows that weaknesses in fine motor skills could cause gifted students to underachieve and not be identified as gifted. Only 25% of students identified as gifted by one of the intelligence tests were identified using both intelligence tests (Ziegler & Stoeger, 2010).

Referral process. Some researchers believe that the disparity in identified underrepresented students is a result of the gifted education referral process (Ford et al., 2008; McBee, 2010; Peters & Gentry, 2010). Students must first be referred for gifted testing, and this burden often rests on teachers. If teachers are not properly trained to identify students of all races and socioeconomic statuses, all gifted students are not identified (McBee 2010). Although the referral process has long been a known issue in the field of education, according to McBee (2010), limited research exists.

McBee (2006) examined Georgia's gifted referral process using a sample that consisted of Georgia's elementary gifted students [n=705,074] in first through fifth grades. Georgia's gifted referral process was investigated to determine if equity among racial and socioeconomic groups existed (McBee, 2006). Results of the study showed that most students entered the referral process automatically (scores on intelligence and achievement test) or by teacher referral. After comparing referral sources by race and socioeconomic status, the researcher suggested the referral process could be one cause for underrepresentation (McBee, 2006). However, he cautioned that these results can be interpreted differently depending on one's view of the nature of ability. Some believe ability is evenly distributed among students, while others believe it is not (McBee, 2006).

Many researchers understand the significant impact that the referral process has on gifted education. This understanding led Peters and Gentry (2010) to develop and evaluate a new gifted identification instrument. The HOPE Scale was designed to aid educators in identifying low-income gifted students in elementary grades. It was not designed to be used exclusively, but instead as a supplemental identification tool along with other intelligence and achievement tests (Peters & Gentry, 2010).

The HOPE Scale is used to rate students by 349 teachers in five school districts located in a Midwestern state. The participating teachers received no specific training and were asked to simply rate their students using directions included on the HOPE Scale (Peters & Gentry, 2010). Thirteen gifted characteristics are listed on the Hope Scale, and teachers are asked to rate the students manifestations of the characteristics using a Likert scale. Teachers' observation scores of students' behavior range from a 6 for always to a 1 for never (Peters & Gentry, 2010). Almost 6000 students were rated in the five districts identifying 59% were from low income families. Regrettably, only two of the five school districts rated racially diverse student populations. Three of the districts rated student populations comprised of more than 90% Caucasian students.

Peters and Gentry (2010) examined the reliability and validity of the Hope Scale using numerous statistical tests. These tests showed that the new identification tool was a valid instrument in measuring the various characteristics of giftedness. Based upon the findings of this study, the Hope Scale could be used as a supplemental tool in the identification of gifted students.

Gifted Identification

A considerable amount of research has been conducted to improve gifted identification procedures (Briggs et al., 2008; Pendarvis & Wood, 2009; Pierce et al., 2007; Sternberg, 2010; VanTassel-Baska et al., 2004; VanTassel-Baska et al., 2007). Intelligence was the sole criterion used for many years to determine gifted qualification. Traditionally, written assessments and visual reasoning have been the instruments used to measure intelligence. "These instruments can assess a wide variety of capabilities, aptitudes, or scholastic abilities, including abstract thinking skills, academic skills, artistic

abilities, creative thinking/creativity, general acquired knowledge, intellectual ability, leadership, motivation, nonverbal/verbal reasoning, and problem-solving ability" (McGlann-Nelson, 2005, p. 51). The multiple criteria approach examines a student's mental ability, achievement, motivation, and creativity. This approach has shown some success in better identifying minority and low socioeconomic status students. Moreover, "nontraditional assessment involves trying to tap into fluid rather than crystallized abilities" (VanTassel-Baska et al., 2007, p. 10). However, even with improved identification measures the issue of underrepresentation continues to exist in gifted education programs across the nation.

Models of Identification. Sternberg (2010) states he and other researchers, such as Renzulli, Gardner, and Kaufman, have worked to develop new models of identification for gifted students that evaluate more than intelligence. However, the tests being used to measure intelligence continue to focus primarily on general ability (Sternberg, 2010). Sternberg's augmented theory of successful intelligence equates both ability and achievement (Sternberg, 2010). Therefore, according to Sternberg (2010), tests examining these traits are also similar and differ only in measurement of skill and knowledge development. Based on the aforementioned conclusions, Sternberg and his colleagues conducted three research projects that explored the effects of quantitatively based assessments. Although gifted identification was not the studies' primary aim, each study is relevant to better understanding how assessments can more adequately identify gifted students (Sternberg, 2010).

Rainbow project. The *Rainbow Project* was designed to assist universities in their selective university admissions processes. Although its original intent was to

supplement the *Scholastic Achievement Test* (SAT), the measures included in the *Rainbow Project* are very applicable to gifted education programs because they can supplement any achievement or ability test (Sternberg, 2010). Based on this finding, these measures could be implemented in systems' gifted identification procedures to produce a more equitable and diverse student population (Sternberg, 2010).

For this study, data were collected from over 1000 students in 15 schools across the United States. Of these schools, 8 were four-year institutions, 5 were community colleges, and the other two were high schools. Analytical, creative, and practical skills were measured in this project (Sternberg, 2010). The SAT was the choice of instruments for measurement of analytical skills. Multiple choice items as well as performance based items were used to measure creative skills. Three situational inventories were used to measure the practical skills of the students (Sternberg, 2010).

One of the underlying goals of the *Rainbow Project* was to identify ways in which to reduce group differences of minority groups on standardized ability assessments (Sternberg, 2010). Results of this study suggest that the methods used in the *Rainbow Project* tests reduced group differences among different groups. Moreover, the results of this project suggest that it is possible to provide fair and equal academic treatment for members of diverse groups (Sternberg, 2010). The procedures used in the *Rainbow Project* can be used to make gifted identification procedures better and decrease the underrepresentation of racial and ethnic groups in gifted programs (Sternberg, 2010).

Kaleidoscope project. The *Kaleidoscope Project* was conducted at Tufts University using the ideas of the *Rainbow Project*, but in this project the construct of wisdom was added in the assessment of students (Sternberg, 2010). Tufts University

maintains a rigorous admissions process whereby students who are admitted usually rank in the top 10% of their class. The application process of more than 15,000 students involved traditional admissions assessments and the addition of essay questions used for the *Kaleidoscope Project*. Questions on the essays were designed to assess wisdom as well as analytical, creative, and practical intelligence. According to Sternberg (2010), the main advantage of the *Kaleidoscope Project* was that assessment swayed from the sole use of pressured standardized testing. Instead, essays were incorporated into the admissions process to allow students to display their abilities in the various intelligences being assessed. Moreover, students were encouraged to answer only one essay question in hopes of alleviating undue pressure (Sternberg, 2010). "In the theory of successful intelligence, successful intelligent individuals capitalize on strengths and compensate for their weaknesses. Our format gave students a chance to capitalize on a strength" (Sternberg, 2010, p. 332). The goal of this project was not to replace traditional admission processes, but to provide supplemental measures of student achievement. Results of the *Kaleidoscope Project* indicated that academic quality and diversity can be enhanced concurrently. Furthermore, these advancements can be made in large populations of students, not only small groups. Sternberg (2010) further explains that the *Kaleidoscope Project* verifies there is much more to students than a score obtained on a standardized exam.

Aurora project. The *Aurora Project* consists of one pertinent component, an augmented assessment, and a supplemental component, which is a general intelligence exam. Assessments are traditional paper and pencil exams which are intended to be administered in elementary and middle grades (Sternberg, Grigorenko, & Jarvin, 2006).

The *Aurora Project* is comprised of nine subtests that together can be used in assessment. Implementation of this design attains three goals: "to anchor the assessment securely in the theory of successful intelligence, to allow students balanced opportunities to demonstrate multiple and varied abilities, and to serve as a clear guide for assessing abilities across and between domains and modes" (Sternberg et al., 2006, p. 20). The measures of the *Aurora Project* allow school systems to improve the span of their identification procedures in order to better meet the needs and goals of the system. Moreover, these measures may be used when traditional instruments do not provide desired results or when the assessment of a particular skill is desired (Sternberg, 2006).

Verbal or nonverbal assessments. Some researchers have questioned the effectiveness of traditional assessments used during the gifted identification process. In one study, Lewis et al. (2007) analyzed the merit of three assessment tools in identifying students of diversity for gifted educational services. Two of the assessments, the *Raven's Standard Progressive Matrices* (Raven's) and the *Naglieri Nonverbal Abilities Test* (NNAT) are nonverbal assessments. The other identification tool, the *Iowa Test of Basic Skills* (ITBS), is a traditional verbal exam (Lewis et al., 2007).

The authors offered several reasons that traditional assessments may not be the most effective instruments to use for identifying gifted students. First, they point to the cultural bias that other researchers agree these examinations may have. This bias is present because these identification tools primarily examine verbal aptitude (Lewis et al., 2007). Second, they contend that students of diversity may not be adequately prepared academically. "Many of the under-represented students can be considered educationally disadvantaged as a result of educational, linguistic, cultural, and other environmental

factors, causing disparity in test performance" (Lewis et al., 2007, p. 38). Last, the authors affirm the need for alternate methods of selection concerning gifted education. Of course, extended measures must be employed to locate these students who otherwise will not be identified. "Students could be assessed using universal reasoning and problem-solving skills. Ideally, this form of assessment would be free of bias against race, gender, ethnicity, and socioeconomic status" (Lewis et al., 2007, p. 38). Once identified, interventions may be necessary to close educational gaps and prepare the students for participation in a gifted program.

A small school district located in the Midwest was the site for this study. The sites chosen in the school district had a large population of Hispanic and low income students. A total of 175 students in grades 3-8 were chosen as participants. Archival data was used from previous administrations of the Raven's, the NNAT, and the ITBS. Scores from all tests were compared to see which assessment best identified students at or above the 80^{th} percentile (Lewis et al., 2007).

Results of the study yielded a significant difference among the three tests in relation to identifying ethnically diverse and Caucasian students (Lewis et al., 2007). The NNAT and ITBS were proven to be much more effective in identifying Caucasian gifted students. Tests of correlation revealed that the NNAT and the ITBS had the most similarities. However, the importance of this study was to discover which test was most proficient in identifying students of diversity. The Raven's proved to be more effective in identifying gifted students of diversity than the other two tests (Lewis et al., 2007). According to this study, the Raven's is far superior in identifying students of diversity for gifted services (Lewis et al., 2007). Significant differences among mean percentile

scores on all three tests were found for the Caucasian and students of diversity. The ITBS had the most prominent difference among the two groups of students (Lewis et al., 2007). "Results of this study indicated that the Raven's Standard Progressive Matrices was a more effective means of selecting for ethnically diverse children who may be gifted" (Lewis et al., 2007, p. 42).

Warne (2009) agrees with many researchers that underrepresentation is indeed an issue in gifted education. However, he argues that the results of the above study may be inconsistent due to theoretical, testing, and statistical issues not considered by the researchers. These issues must be examined and carefully considered before the implications of this study are used in guiding change in any gifted educational program. After pointing out these issues, Warne (2009) discussed strategic aspects that should be considered in future research and practice related to underrepresentation.

First, the authors allowed the results of their study to define giftedness as obtaining a score in the 80^{th} percentile on one of the identification tests used in their study. Specific areas of giftedness were not discussed or examined by the authors (Warne, 2009). Moreover, the authors attempted to separate intelligence and culture. These paradigms cannot be separated, but instead exist concurrently. Last, the researchers attempted to view intelligence as either a verbal or nonverbal component. "Theorists agree that intelligence has two major facets – a verbal component and a nonverbal component. By only measuring one of these major facets, a nonverbal test only presents half of the picture of someone's intellectual ability" (Warne, 2009, p. 49).

Second, the authors chose to compare three tests, two of which measure nonverbal intelligence and one which measures academic intelligence. According to Warne (2009),

the comparisons are not valid because the tests measure different concepts. He further argued that Lewis et al. (2007) should have determined how each test correlates with accepted measures of intelligence, such as school grades.

Last, Warne (2009) contended that Lewis and her coauthors did not consider some statistical measures that are widely accepted as best research practices. Reliability of the scores obtained on the three tests was not reported. Therefore, it cannot be determined if "the different proportions of each ethnicity that each test identified as gifted in the study is due to the different nature of the tests or low score reliability" (Warne, 2009, p. 51). Lewis and her coauthors' use of percentile scores for statistical analysis is also not commonly accepted. Instead, standardized scores should be used for descriptive and inferential statistics during the data analysis (Warne, 2009).

Although the use of nonverbal measures is important, these instruments should not be the exclusive means of identifying gifted learners. A consortium of procedures should be employed in the identification process that account for verbal and nonverbal skills. Gifted programs by nature are highly verbal; therefore, not accounting for this in the identification process could identify students that are not capable of being successful. "The greatest predictor of future academic success is current academic success, and the second strongest predictor is verbal ability. This is true for all ethnic groups and all levels of English mastery" (Warne, 2009, p. 51).

Two additional practices that have proven to be beneficial in increasing the participation of diverse students in gifted education programs are front loading and mentorships (Warne, 2009). Front loading involves the identification of potentially gifted students of diversity who do not meet the normal gifted criteria. These students are

then offered intensive intervention programs aimed at increasing the students' skill levels needed for success in a gifted education program. Participation continues until the student can meet the criteria needed to qualify for gifted services. Additionally, front loading has proven effective in enabling diverse gifted students to remain in gifted programs (Warne, 2009). Mentorships allow diverse gifted students to be partnered with a fellow student of diversity that has achieved success. This practice has also helped reduce the attrition rate of diverse gifted students (Warne, 2009).

Reducing underrepresentation. The identification processes used for gifted education have received a substantial amount of consideration from researchers over the last few decades. Much of this research has focused primarily on new initiatives to broaden identification methods in order to increase the enrollment of underrepresented students in gifted education programs. Researchers have suggested the use of performance tasks, recommendations, interviews, student grades, portfolios, and rating scales in the identification process (Briggs et al., 2008; Ford & Milner, 2005; Pendarvis & Wood, 2009; Pierce et al., 2007; Sternberg, 2010; VanTassel-Baska et al., 2004; VanTassel-Baska et al., 2007). However, little research has been directed at evaluating the effectiveness of new identification measures and their impact on students, teachers, and the overall school climate (VanTassel-Baska et al., 2004). Significant research related to the effectiveness of identification measures has been conducted in South Carolina school districts by VanTassel-Baska and her colleagues (VanTassel-Baska et al., 2004; VanTassel-Baska et al., 2007). The series of research projects spanned the course of six years and not only examined South Carolina's new identification initiative, but also analyzed the feelings of teachers and students toward the initiative (VanTassel-Baska et

al., 2004; VanTassel-Baska et al., 2007).

Based upon a need to decrease underrepresentation of low socioeconomic and minority students, South Carolina developed a performance based assessment for gifted identification known as Project STAR. Project STAR is a nontraditional assessment that examines the fluid abilities of students by using performance tasks. In its first year of implementation, almost 24% of the students who qualified for gifted services were from low socioeconomic backgrounds (VanTassel-Baska et al., 2004).

A few years after Project STAR's implementation, research was conducted to validate the instrument. The sample consisted of 68 coordinators, 214 teachers, and 136 students (VanTassel-Baska et al., 2004). Of particular interest is the variations found in the grade levels taught by the teachers. Teachers in the sample taught at both the elementary and middle school level, thus giving some of the results application to both levels of education (VanTassel-Baska et al., 2004). Qualitative research procedures were used to gather the desired data by examining student progress and collecting teachers' opinions (VanTassel-Baska et al., 2004).

In this study, more than half of the school districts saw an increase in the identification of underrepresented students. Moreover, Project STAR proved effective in identifying students who were gifted in a specific academic area and underachieving students (VanTassel-Baska et al., 2004). It was noted by the researchers that the students identified by Project STAR were students who had almost qualified for gifted services using South Carolina's older identification measures. Results revealed that a large majority of coordinators felt Project STAR was a successful implementation.

In another study, VanTassel-Baska and her colleagues examined gifted identification processes and student performance over a six year span in South Carolina. A total of 30,526 gifted students representing 20 school districts in South Carolina made up the sample for this study. Of this sample, almost three-fourths were students identified using a traditional approach with the remaining students being identified using performance tasks (VanTassel-Baska et al., 2007). Alternative identification measures have proven to increase the number of gifted students identified. Still, the educational goals of the gifted programs must continue to be met despite these increases (VanTassel-Baska et al., 2007). With these concerns in mind, the researchers initiated this research project to examine the demographical makeup and performance of gifted students identified using performance based measures compared to those students identified using traditional intelligence and achievement tests (VanTassel-Baska et al., 2007).

VanTassel-Baska and her colleagues found that most gifted students came from middle and high class families regardless of the method of identification used during the six years being examined. Still, performance tasks proved effective in identifying a greater percentage of low socioeconomic and African American students during this period. Most of these students qualified using scores in the nonverbal area. In relation to gender, neither method of identification proved to be significantly more effective (VanTassel-Baska et al., 2007).

This study involved one facet that is routinely absent in other studies, a comparison of student performance based on the identification method used. Performance tasks have proven over time to better identify low socioeconomic and minority students (VanTassel-Baska et al., 2007). However, do these groups of students

perform comparably to other gifted students identified using traditional measures? VanTassel-Baska and her colleagues used South Carolina's state assessment test, the *Palmetto Achievement Challenge Test* (PACT), to compare performance among the groups of gifted students (VanTassel-Baska et al., 2007). The PACT assesses students in core content areas and is given to all students in grades 3 to 8 each year. Four levels of proficiency exist: below basic, basic, proficient, and advanced. For purposes of this study, the researchers only examined student scores in the areas of language arts and mathematics (VanTassel-Baska et al., 2007).

Results of this study related to performance revealed that traditionally identified students outperformed students identified using performance tasks. These results are not surprising considering that performance tasks identified students were admitted with lower ability or achievement scores (VanTassel-Baska et al., 2007). However, in focus group studies the researchers "found remarkable similarities between traditionally identified and performance-tasks identified students in terms of their academic performance (GPAs), work ethic, self-esteem, program impact, and creative outlets" (VanTassel-Baska et al., 2007, p. 26). Still, several areas of concern exist regarding South Carolina's gifted identification measures. Students identified using performance tasks may be weak in verbal areas; therefore, schools must ensure that these deficiencies are addressed. Interventions are critical in ensuring these students have success in the regular classroom and on high stakes tests (VanTassel-Baska et al., 2007). More disturbing was the performance of traditionally identified students on the PACT who were expected to at least obtain proficient level scores. Instead, 10-20% of these students scored at the basic level in language arts or math. This "suggests a potential problem or

mismatch between gifted programs in the state and the major content areas deemed important on these high-stakes measures" (VanTassel-Baska et al., 2007, p. 28).

Underrepresentation affects all school systems; however, it often is more prevalent in urban schools. Although the population of minority students has increased in most systems, this increase has not been mirrored in gifted education programs (Pierce, Adams, Neumeister, Cassacy, Dixon, & Cross, 2007). Instead, obtaining equivalence in the representation of minorities in gifted education continues to be an unattainable goal. Clustering Learners Unlocks Equity (Project CLUE) is one initiative used in Indianapolis Public Schools (IPS) that has shown promise in reducing underrepresentation (Pierce et al., 2007).

IPS is a large urban school district comprised of more than 40,000 students of which many are minorities. "Urban schools typically have a high percentage of students who have been traditionally underserved in gifted programs" (Pierce et al., 2007, p. 113). This trend led IPS to closely examine all aspects of its gifted program and begin making changes in areas of concern. One endeavor, Project CLUE, employs nontraditional measures during the gifted identification process of second grade students in an attempt to better identify minority gifted students.

Under guidelines of Project CLUE, gifted eligibility is based upon a student meeting one of four criteria (Pierce et al., 2007). The first two criteria involve a traditional standardized assessment, the TerraNova Comprehensive Test of Basic Skills (TerraNova). All students who obtain a 90th percentile score or better on the Total Battery are eligible for gifted services. Additionally, students are eligible who score at or above the 90th percentile in two of the following areas: reading comprehension, math

problem solving, and science (Pierce et al., 2007). All English as a Second Language (ESL), low socioeconomic, and teacher referred students who do not meet eligibility requirements under criterion one or two are given the Ravens Colored Progressive matrices (CPM-C). Eligibility is based upon obtaining a score in at least the 90th percentile. Last, the Adams-Pierce Checklist (APC) is used to further identify minority, ESL, and low socioeconomic students who are gifted. Students must score at least 8 points on the APC to be eligible for gifted services (Pierce et al., 2007).

Results of Project CLUE's first year of implementation proved promising for increasing the number of eligible minority gifted students. A total of 322 students or 9% of second graders were identified as gifted learners (Pierce et al., 2007). The racial composition of the gifted population was approximately 46% Caucasian, 36% African American, 13% Hispanic, 4% Multiracial, and 1% Other. Additionally, seventy-six percent of the students were from low socioeconomic backgrounds. Gender composition of the group was almost half male and half female (Pierce et al., 2007).

In another study, a rural West Virginia school district developed a new gifted education policy which implemented alternative identification assessments for historically underrepresented students. Despite a true commitment to education, issues related to underrepresentation of minority gifted students existed in the district (Pendarvis & Wood, 2009). School officials made the West Virginia Department of Education (WVDE) and the U.S. Office for Civil Rights (OCR) aware of these issues. "According to the OCR, West Virginia showed inequities in special education programs in that children from racial minority groups were overrepresented in programs for students with

learning or behavior problems and underrepresented in gifted programs" (Pendarvis & Wood, 2009, p. 497).

The alternative identification measures used in this study were the Universal Nonverbal Intelligence Test (UNIT) and the Gifted and Talented Evaluation Scales (GATES). These measures "are often used to provide alternative or supplementary evaluations for students who may not demonstrate their abilities on verbal intelligence or achievement tests" (Pendarvis & Wood, 2009, p. 508). In this study a total of 57 students in elementary or middle school were referred and evaluated for gifted services. Of the underrepresented students referred, 29% were identified as gifted (Pendarvis & Wood, 2009).

Lovett (2011), in her narrative of a gifted minority student, Jay, discussed the issues and challenges encountered by most underrepresented gifted students. Educators must be cognizant that identifying students of diversity is only the first step in reducing underrepresentation (Lovett, 2011). Certain perceptions of school and gifted educational programs are held by many gifted minority students and their families. Additionally, underrepresented students may have unique academic and cultural needs that must be met by the gifted program. Last, measures must be taken to ensure that minority gifted students are retained in the gifted education program (Lovett, 2011).

In gifted programs, diverse students can sometimes feel isolated, inadequate, or overwhelmed. Often gifted minority students are forced to balance academic and social demands when they first begin participating in a gifted program (Lovett, 2011). A more demanding curriculum is sometimes viewed by students as unfavorable in comparison to the less rigorous curriculum they were accustomed to in their regular education classes.

Moreover, these diverse gifted students must gain acceptance from their non-gifted friends and develop friendships with their new gifted classmates (Lovett, 2011). Unfortunately, without sufficient support systems these students sometimes decide the new demands are not worth it. They become underperformers or exit the gifted program. To lessen the occurrence of this issue, educators of gifted students can create differentiated learning environments in which students feel connected and can achieve success (Lovett, 2011).

The unique needs of underrepresented gifted students must be discovered by gifted educators to ensure the students are successful. This can be accomplished by determining the students' academic and cultural proficiencies and assessing their emotional needs (Lovett, 2011). Assessments, both formative and summative, can reveal what instructional methods will be most effective in enabling the gifted students to reach their academic potential. Counseling and mentoring programs have also proven effective in ensuring the success of diverse gifted students (Lovett, 2011). Gifted students of diversity can be successful in programs comprised of "high-quality curriculum, tutoring, homework help, counseling options, mentoring, parent support programs, English language development, multicultural education, significant models, effective communication and presentation strategies, cultural competence, and caring teachers who accept responsibility for their students' academic success and personal growth" (Lovett, 2011, p. 59).

Georgia's Identification Approaches

With the understanding gained from previous research, school systems must employ identification procedures that properly identify gifted students. The identification

procedures used must properly identify students from all racial, ethnic, and socio-economic backgrounds. Over the last few decades, Georgia educators have relied heavily on the work of Marland, Renzulli, Gardner, and Sternberg as they have worked to redefine giftedness. These theorists share the philosophy that giftedness is multifaceted, and no single measure can identify all of the gifted children in a specific population (Reis & Renzulli, 2010; Sternberg & Davidson, 2005). Based upon the ideas of the above mentioned researchers, Georgia now employs two methods of gifted identification: the psychometric approach and the multiple criteria approach (Georgia Department of Education, 2010).

Psychometric approach. Georgia students must meet the state criteria in two areas, mental ability and achievement, in order to qualify for gifted education services using the psychometric approach (Georgia Department of Education, 2010). Students in kindergarten, first, or second grade are required to score in the 99th percentile on a nationally normed mental ability test to meet the mental ability requirement. A percentile score in at least the 96th percentile is acceptable for students in the third grade or higher (Georgia Department of Education, 2010). All students, regardless of grade level, can meet the achievement requirement by satisfying one of two benchmarks. First, a student can obtain a total reading, math, or battery score in the 90th percentile on a nationally normed achievement test. Second, the student can produce a product that is rated superior (90 or above) (Georgia Department of Education, 2010).

Multiple criteria approach. Qualification for gifted education services using the multiple criteria approach requires that a student meet Georgia's mandated criteria in three of four areas (Georgia Department of Education, 2010). Similar to the

psychometric approach, mental ability and achievement are evaluated. However, students are also evaluated in the areas of creativity and motivation.

Under the multiple criteria approach, students in all grades can meet the required criteria for mental ability by achieving a score in at least the 96th percentile on a nationally normed mental ability test (Georgia Department of Education, 2010). Achievement standards used in the multiple criteria approach are identical to the standards used in the psychometric approach. Again, a student can meet the achievement criteria in one of two ways. They can obtain a total reading, math, or battery score in the 90th percentile on a nationally normed achievement test or obtain a superior rating on a student generated product or performance (Georgia Department of Education, 2010). Creativity criteria can be met in one of three ways by Georgia students. A student can score in at least the 90th percentile on a nationally normed creativity test or a standardized gifted rating scale. Last, the student can produce a product that receives a superior rating to meet the creativity criteria (Georgia Department of Education, 2010). Similar to the creativity criteria, a student has three options to meet the motivation criteria. A student must score in at least the 90th percentile on a standardized gifted rating scale, obtain a superior rating on a student generated product or performance, or have a cumulative grade point average over the last two years of at least 3.5 (Georgia Department of Education, 2010).

Summary

For decades the field of gifted education has struggled to overcome certain critical issues. Reform efforts have and continue to occur across the nation focused on meeting the needs of gifted students, reducing underrepresentation, and achieving high academic

performance levels. Although progress has been made, it is possible that our brightest students, the gifted, are continuing to suffer due to these lingering issues.

Gifted students possess unique characteristics and abilities that must be effectively recognized by educators. School systems must effectively train and equip educators who work in gifted educational programs to identify these qualities. If these characteristics go unnoticed, students are not properly identified leading to arguably the greatest issue in gifted education: underrepresentation. The recognition of gifted characteristics and abilities must begin during the referral process. However, its continuation is essential throughout the educational process. Once recognized, these special needs must be nurtured in the educational setting to ensure that gifted students reach their full academic potential. Additionally, educational programs must be constructed in a manner that effectively targets students' abilities. The foundational keys of theoretical frameworks such as Vygotsky's Sociocultural Theory must be the premises which identification measures, curriculum development, and instructional strategies are built upon. This will aid school systems and educators in effectively analyzing gifted students' actual development and insuring these students reach their full academic potential.

Gifted identification procedures based entirely on intelligence and achievement can be ineffective in many ways. Deserving students are unidentified and gifted populations often lack the diversity of the school population in which they are housed. Multiple criteria approaches have been implemented in many systems, but underrepresentation of minority gifted students remains an issue for the field of gifted education. In Georgia, multiple criteria identification procedures have been implemented

for almost twenty years, but improvements are still needed regarding the gifted identification process.

One area of concern for all school systems should be the performance of their gifted students. However, the performance of gifted students remains a sparsely researched area. Existing research related to the performance of Georgia's gifted students exclusively uses the CRCT, a state criterion exam. Even greater is the absence of research focused on middle grade gifted students. Although these years of education are viewed by many as foundational years for high school, little research has examined how these gifted students perform on nationally normed standardized assessments. Additionally, research has failed to examine the relationships among gender, race, socioeconomic status, gifted identification measures, and academic performance.

The methodology of this study is discussed in the following chapter. Vital components of the study such as the participants, setting, instrumentation, research procedures and design, and the methods used for data analysis are addressed.

CHAPTER THREE: METHODOLOGY

Introduction

This study examined the performance of eighth grade gifted students who have attended a junior high school located in Georgia during the past two years. The *Iowa Test of Basic Skills* (ITBS), a nationally normed referenced exam, was used to determine if differences existed in the mean scores of the gifted students in relation to the study's independent variables. These variables consist of Georgia's two identification methods (the psychometric and multiple criteria approach), gender, race, and socioeconomic status. Research procedures were followed to gather data and form groups among the gifted students based upon the independent variables. A causal comparative approach was applied to identify possible relationships among the groups of gifted students. Measures of central tendency were found, and two-way analysis of variance tests were performed so that the differences among the study's independent and dependent variables could be analyzed.

Participants

The sample used in this study was a convenience sample because it was already available and could be easily accessed by the researcher. Participants in this study were the 192 eighth grade gifted students who have participated in the gifted program at ABC Junior High School since its inception (2009 and 2010 school years combined). ABC's gifted population consists of male and female students who are African American, Caucasian, or Hispanic. Both high and low socioeconomic statuses are represented in ABC's gifted education program. A study consisting of three to five years was originally considered. However, the researcher chose to only study the two year period in order to

avoid introducing unwanted variables to the study. The study site was a junior high school located in a small town in South Georgia. The gifted students who were included in the study were identified prior to the eighth grade as gifted based on state and local district standards using either the psychometric approach or the multiple criteria approach.

Setting

The setting for this study was ABC Junior High School which is located in a small town in South Georgia. The community is rural and highly dependent on the agricultural sector. ABC serves all eighth and ninth grade students in the county it is located in. For the 2009 school year, 1338 students were enrolled at ABC. Out of the 1338 students, 684 were eighth graders and 654 were ninth graders. The gender makeup of the school is about half and half. ABC's racial composition was approximately 51% Caucasian, 28% African American, 17% Hispanic, and 4% of students were of another race. School statistics indicated that 66% of ABC's student population qualified for the free or reduced lunch and breakfast program during this school year (ABC 2010).

For the 2010 school year, 1362 students were enrolled at ABC. A total of 691 students were eighth graders with the remaining 671 students being ninth graders. Again the gender composition of ABC was about half male and half female. The racial composition of the school was approximately 52% Caucasian, 27% African American, 18% Hispanic, and 3% of students were of another race. School statistics indicated that 70% of ABC's student population qualified for the free or reduced lunch and breakfast program during this school year (ABC 2010). Table 3.1 offers a comparison of the school's population for the 2009 and 2010 school years based on demographical

information.

Table 3.1

ABC Junior High School's Demographical Information

	2009		2010	
	n	%	n	%
Female	682	51	695	51
Male	656	49	667	49
Af. American	375	28	368	27
Hispanic	227	17	245	18
Caucasian	682	51	708	52
Other	54	4	41	3
High SES	455	34	409	3
Low SES	883	66	953	7

Note. SES = socioeconomic status.

ABC prides itself in providing a least restrictive environment for all students with disabilities. An inclusion model ensures that all students with disabilities are provided the highest level of instruction. The gifted department at ABC challenges gifted students through AP Prep content classes in the areas of math, language arts, social studies, and science. Each of the content areas is taught by only one gifted teacher. This aids in ensuring that sound instructional practices are implemented, curriculum is differentiated appropriately, and academic challenges are in place. Students must qualify for AP Prep classes based on criteria developed by the school system (ABC, 2010).

Gifted students in ABC's district are identified for gifted services using either the psychometric or multiple criteria approach. The identification approaches collectively measure four criteria: mental ability, achievement, creativity, and motivation. Research proven instruments are used to measure the criteria when determining if a student is eligible for gifted services. The following instruments are used to identify gifted students at ABC Junior High School.

Mental ability is examined using the *Cognitive Abilities Test* (CogAT) in ABC Junior High School's district (G. Akridge, personal communication, April 28, 2011). This abilities test is group administered and allows gifted programs to use national comparative data in the assessment of mental ability. The CogAT assesses a student's ability to reason and solve problems by using verbal, quantitative, and nonverbal methods (Riverside Publishing CogAT).

Achievement is measured using the *Iowa Test of Basic Skills* (ITBS) in the gifted identification process (G. Akridge, personal communication, April 28, 2011). The validity of this test is supported by over 80 years of research. The ITBS evaluates achievement in the following content areas: vocabulary, word analysis, listening, reading comprehension, language, math, social studies, science, and sources of information (Riverside Publishing ITBS).

Two instruments, the *Gifted Rating Scale* (GRS) or *Torrance Tests of Creative Thinking* (TTCT) are used to measure creativity (G. Akridge, personal communication, April 28, 2011). The GRS uses norm referenced scales that are completed by a student's teacher. Teachers complete the forms involving domains based on their observation. These forms contain domains that are relevant to giftedness. When the TTCT is used in identification, students are examined in five areas: fluency, originality, elaboration, abstractness, and resistance to premature closure (Kim, 2006).

The GRS is used to measure motivation until a student reaches the fifth grade. In fifth grade and higher, a student's grade point average is used in measuring motivation (G. Akridge, personal communication, April 28, 2011).

During the 2009-2010 school years at ABC Junior High, the effective teaching of

Georgia Performance Standards in all subjects continued to be emphasized. Strong emphasis is placed on attending both regional and state workshops aimed at increasing the effectiveness of instruction. The workshop model is implemented throughout the school as a framework for instruction. Vertical and collaborative planning, as well as professional learning communities, support continuous efforts to improve standards based instruction and learning. The leadership team comprised of administrators and department heads provide guidance and support in this initiative (ABC, 2010).

Instrumentation

The mean scores of the eighth grade gifted students in this study were measured using the *Iowa Test of Basic Skills* (ITBS). The main purpose of the ITBS is to provide information to educators that can be used to analyze instruction and enhance student learning (Lane, 2007). With more than 80 years of supportive research, the ITBS is one of the oldest and most respected norm-referenced achievement test in use today (Engelhard, 2007; Warne, 2009). All eight grade students at ABC Junior High School are required to take the ITBS in the fall. Students take the complete battery, Level 14, which consists of thirteen achievement tests. These tests examine a vast collection of skills and processes related to each subject area (Lane, 2007; Warne, 2009). For purposes of this study, mean scores on the math and reading portions of the ITBS were examined. The math portion assesses the following areas: math concepts and estimation, math problem solving and data interpretation, and math computation (Engelhard, 2007). The reading portion evaluates students in the areas of vocabulary and reading comprehension (Engelhard, 2007).

Standard scores were used to obtain the means for the various groups formed in this study. A standard score of 291 is considered to be in the 90th percentile on the math portion of the ITBS. Students who obtain a math standard score of at least 300 are considered to be in the 95th percentile. For the reading portion of the ITBS, the percentile scores are lower. A standard score of 285 is considered to be in the 90th percentile on the reading portion of the ITBS. Students in the 95th percentile must have a standard reading score of at least 295 (Dunbar, Hoover, Frisbie, & Oberley, 2008).

The ITBS has been developed, revised, and maintained by scholars at the University of the Iowa. Many of these scholars are viewed as experts in the field of educational measurements (Engelhard, 2007). Revised national norms are created for the ITBS every seven years. Several scoring frameworks are provided with the ITBS: raw scores, developmental scores, and status scores (Engelhard, 2007). Educators and school systems are provided both individual and group score reports that allow students to be compared within a school, district, or nationally (Lane, 2007). These comparisons, a priority of school systems and parents, are accurately provided by the ITBS (Engelhard, 2007).

To ensure that the ITBS is a valid testing instrument, continuous research and revision is employed by the Iowa Testing Program (Engelhard, 2007). The content of the ITBS was developed to be compatible with common instructional goals shared across the nation (Lane, 2007). National test design standards such as curriculum reviews, item testing, fairness reviews, and form design are adhered to by the authors of the ITBS (Lane, 2007). Moreover, several guides are available for school systems that provide relative information regarding the content of the ITBS. The authors of the ITBS

encourage the use of these guides by school systems during the test implementation decision process.

The Kuder-Richardson Formula 20 is used to determine reliability of the ITBS. Most of the internal consistency estimates for subtests are in the .80s and .90s. Estimates for math totals are in the .90s which is respectable (Lane, 2007). Administration of the ITBS involves using several different forms; therefore, the reliability of forms is also examined. The correlations between forms A and B for levels 9-14 was found to be between .811 and .942 (Lane, 2007). According to Engelhard (2007), the reliability coefficients of the ITBS are among the best for any achievement test.

Procedures

After submitting an IRB packet and obtaining approval, research for this study began. Approval for obtaining student related data was gained by sending a letter requesting the needed data to the system's Assistant Superintendent of Instruction. Once approval was granted, the data was obtained from the gifted center which oversees gifted services in the study's school system. This process involved requesting the needed information in writing. For this study, scores on the math and reading portions of the ITBS, gender, race, and socioeconomic status of each gifted student were requested. Additionally, the identification approach used to identify the gifted students was requested. The needed information was collected at the system's gifted center and an electronic copy was made for the researcher. To protect the identity of the study's sample, student names and identification numbers were not included in the data.

The gifted data of all eighth grade gifted students [n = 192] who participated in ABC's gifted program during the 2009 and 2010 school years were carefully examined.

The aim of this study was to examine the gifted data for the two school years collectively. The data was disaggregated according to the study's variables: gifted identification approach, gender, race, and socioeconomic status. First, the eighth gifted students were separated into two groups: those identified using the psychometric approach and those identified using the multiple criteria approach. Next, the two groups formed above were further disaggregated according to gender, then race, and finally socioeconomic status. These groupings produced data sets in which the dependent variable, mean scores on the math or reading portion of the ITBS, was associated with two independent variables: the gifted identification method used combined with gender, race, or socioeconomic status.

Research Design

This study was non-experimental in design; therefore, the researcher studied data as it existed (Gall et al., 2007). Unlike experimental design, non-experimental design does not require manipulation of the variables by the researcher. Instead, the researcher uses existing data to determine if groups differ in regards to the dependent variable (Gall et al., 2007). The focus of this study was to determine if possible differences in mean scores on the ITBS were present among eighth grade gifted students of different identification approach, gender, race, and socioeconomic status. This study specifically used a causal comparative approach. This approach is appropriate when the researcher seeks to identify relationships by forming groups of individuals in whom the independent variable is present or absent. Then the researcher determines whether the groups differ on the dependent variable (Gall et al., 2007).

One disadvantage of causal comparative research is that any inferences made relating to causality are tentative, at best (Gall et al., 2007). However, this type of

research can suggest relationships between variables. Because the intent of this study was not to examine cause, but instead relationships, this approach was deemed appropriate. In this study, the independent variables are the two gifted identification methods, gender, race, and socioeconomic status, while the dependent variable is mean scores on the math and reading portions of the ITBS.

Research Question 1: *Is there a significant difference in mean ITBS scores (math portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* Data was disaggregated from ABC's gifted records using two categories: students identified through the psychometric approach and students identified through the multiple criteria approach. The data was then disaggregated using two categories: male and female. The groups formed using the above criteria were then compared to see what relationships, if any, existed based upon the gifted students' math mean scores on the ITBS.

Research Question 2: *Is there a significant difference in mean ITBS scores (math portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* Data was disaggregated from ABC's gifted records using two categories: students identified through the psychometric approach and students identified through the multiple criteria approach. The data was then disaggregated using two categories: minority (African American and Hispanic) or non-minority (Caucasian). The groups formed using the above criteria were then compared to see what relationships, if any, existed based upon the gifted students' math mean scores on the ITBS.

Research Question 3: *Is there a significant difference in mean ITBS scores (math portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* Data was disaggregated from ABC's gifted records using two categories: students identified through the psychometric approach and students identified through the multiple criteria approach. The data was then disaggregated using two categories: high socioeconomic status and low socioeconomic status. The groups formed using the above criteria were then compared to see what relationships, if any, existed based upon the gifted students' math mean scores on the ITBS.

Research Question 4: *Is there a significant difference in mean ITBS scores (reading portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* Data was disaggregated from ABC's gifted records using two categories: students identified through the psychometric approach and students identified through the multiple criteria approach. The data was then disaggregated using two categories: male and female. The groups formed using the above criteria were then compared to see what relationships, if any, existed based upon the gifted students' reading mean scores on the ITBS.

Research Question 5: *Is there a significant difference in mean ITBS scores (reading portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* Data was disaggregated from ABC's gifted records using two categories: students identified through the psychometric approach and students identified through the multiple criteria approach. The data was then

disaggregated using two categories: minority (African American and Hispanic) or non-minority (Caucasian). The groups formed using the above criteria were then compared to see what relationships, if any, existed based upon the gifted students' reading mean scores on the ITBS.

Research Question 6: *Is there a significant difference in mean ITBS scores (reading portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* Data was disaggregated from ABC's gifted records using two categories: students identified through the psychometric approach and students identified through the multiple criteria approach. The data was then disaggregated using two categories: high socioeconomic status and low socioeconomic status. The groups formed using the above criteria were then compared to see what relationships, if any, existed based upon the gifted students' reading mean scores on the ITBS.

Data Analysis

The Statistical Program for the Social Sciences (SPSS) allowed both descriptive and inferential statistics to be conducted during the data analysis stage of this study. Descriptive statistics were used to organize and summarize the gifted data related to mean scores on the ITBS. Standard scores on the ITBS were used for both the math and reading portions to examine student performance. The use of inferential statistics allowed for generalizations to be drawn from the sample and applied to other populations (Gall et al., 2007).

Descriptive statistics were computed using measures of central tendency. The original intent of this study was to compare the mean scores of gifted students who

attended ABC Junior High both separately based on year attended and collectively. However, when the data was disaggregated based upon the study's independent variables some sample sizes were not large enough. According to Gall et.al (2007), sample size for casual comparative research should be at least 15 participants. Based upon this criterion, the decision was made by the researcher to analyze the gifted data collectively for the two years that ABC has been in existence. First, the mean scores were calculated using the standard scores for the math and reading portions of the ITBS for the 2009 and 2010 gifted students combined. Groupings of the independent variables shown in Table 3.2 were formed. These combinations allowed the scores to be easily examined and differences in mean scores among the gifted students were found. The standard deviation was also computed to determine the deviation of the scores from the mean (Gall et al., 2007).

Table 3.2

Grouping of Independent Variables

	Combination of Variables
Gender	Female, Multiple Criteria
	Female, Psychometric
	Male, Multiple Criteria
	Male, Psychometric
Race	Minority, Multiple Criteria
	Minority, Psychometric
	Non-minority, Multiple Criteria
	Non-minority, Psychometric
SES	High SES, Multiple Criteria
	High SES, Psychometric
	Low SES, Multiple Criteria
	Low SES, Psychometric

Note. SES = socioeconomic status.

After employing descriptive statistics, test of statistical significance were

conducted. A significance level of $p < .05$ was determined to be appropriate for this study in order to control Type I errors. Two-way analysis of variance (ANOVA) procedures were utilized because the comparison of means involved three or more groups (Gall et al., 2007; Yount, 2006). According to Yount (2006), t-tests should not be used when a study involves the comparison of multiple means because in this situation the probability of committing a Type I error is great. This effect is directly affected by the number of means being compared. Therefore, multiple t-tests should not be utilized to compare multiple means as was required in this study (Yount, 2006). Two-way ANOVA procedures were used to determine if any differences existed among the mean scores of the gifted students on the math and reading portions of the ITBS for the groups formed using gender and socioeconomic status. These procedures allowed the main effects and interaction effect to be properly assessed (Howell, 2008). The two-way ANOVA procedures provided the researcher the option to run post hoc tests if significant differences were found. These tests allow a researcher to determine which group among the independent variables is statistically significant (Howell, 2008; Yount, 2006).

According to Howell (2008), before using two-way ANOVA the following assumptions should be met: normality, equal variances, and independent observations. The Kolmogorov-Smirnov test was used to check for normality in this study. Leven's Test for Equality of Variance was used to evaluate variance. The last assumption, independent observations, was met due to the nature of the study. Each gifted student's mean score on the ITBS was independent of the other gifted students.

Research Question 1: *Is there a significant difference in mean ITBS scores (math portion) of male or female eighth grade gifted students identified using the psychometric*

approach verses the multiple criteria approach? The mean scores of each gender represented in ABC's eighth grade gifted program were compared using descriptive statistics. Statistical significance was determined by using two-way ANOVA procedures. Results of these tests of statistical significance enabled the researcher to determine if the two main effect null hypotheses and the one interaction null hypothesis for research question one should be rejected.

Research Question 2: *Is there a significant difference in mean ITBS scores (math portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* The mean scores of each group represented in ABC's eighth grade gifted program were compared using descriptive statistics. Statistical significance was determined by using two-way ANOVA procedures. Results of these tests of statistical significance enabled the researcher to determine if the two main effect null hypotheses and the one interaction hypothesis for research question two should be rejected.

Research Question 3: *Is there a significant difference in mean ITBS scores (math portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* The mean scores of each socioeconomic status represented in ABC's eighth grade gifted program were compared using descriptive statistics. Statistical significance was determined by using two-way ANOVA procedures. Results of these tests of statistical significance enabled the researcher to determine if the two main effect null hypotheses and the one interaction hypothesis for research question three should be rejected.

Research Question 4: *Is there a significant difference in mean ITBS scores (reading portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* The mean scores of each gender represented in ABC's eighth grade gifted program were compared using descriptive statistics. Statistical significance was determined by using two-way ANOVA procedures. Results of these tests of statistical significance enabled the researcher to determine if the two main effect null hypotheses and the one interaction hypothesis for research question four should be rejected.

Research Question 5: *Is there a significant difference in mean ITBS scores (reading portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* The mean scores of each group represented in ABC's eighth grade gifted program were compared using descriptive statistics. Statistical significance was determined by using two-way ANOVA procedures. Results of these tests of statistical significance enabled the researcher to determine if the two main effect null hypotheses and the one interaction hypothesis for research question five should be rejected.

Research Question 6: *Is there a significant difference in mean ITBS scores (reading portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?* The mean scores of each socioeconomic status represented in ABC's eighth grade gifted program were compared using descriptive statistics. Statistical significance was determined by using two-way ANOVA procedures. Results of these tests of statistical significance

enabled the researcher to determine if the two main effect null hypotheses and the one interaction hypothesis for research question six should be rejected.

Chapter four provides the results related to each research question for this study. First, the demographical composition of ABC Junior High School's gifted population is presented. Second, the research questions and null hypotheses for the study are provided. Last, the results of both the descriptive and inferential statistics are also provided.

CHAPTER FOUR: FINDINGS

Introduction

This study used a casual comparative approach to examine the differences among the mean scores on the *Iowa Test of Basic Skills* (ITBS) of eighth grade gifted students identified using the psychometric or multiple criteria approach. These differences were further examined using students' gender, race, and socioeconomic status. Although a great deal of emphasis has been placed on the identification of underrepresented students, seldom has the performance of gifted students in relation to gender, race, and socioeconomic status been emphasized. Thus, a critical point of this study was to conduct an examination of the ITBS mean scores of eighth grade gifted students of different gender, race, and socioeconomic status.

One component used in determining gifted eligibility in the study's school district was scores on the ITBS. Moreover, the use of these scores to measure the academic performance of gifted students is continued throughout a student's educational years. Scores on the ITBS, along with other measures, are used for placement of ninth graders in advance placement classes. Recent developments in Georgia's HOPE scholarship have created an even greater requirement that students in Georgia maintain certain academic criteria needed to qualify for advance placement classes in high school. A certain number of advanced placement classes must be completed with a passing grade to qualify for the HOPE scholarship.

This chapter presents both the critical components and results of this study. The demographic composition of the study's sample is first described. Results of the analysis in which descriptive statistics were utilized to obtain and compare mean ITBS scores of

the eighth grade gifted students are shared. Additionally, results of the two-way analysis of variance (ANOVA) procedures are discussed as related to the existence of any significant differences found among the mean scores of the eighth grade gifted students. Standard scores obtained on the ITBS were the criterion used in evaluating differences. Last, a summary of the results of this study is provided.

Demographics

The sample of this study consisted of 192 eighth grade gifted students. All the students met gifted eligibility requirements prior to beginning eighth grade. Demographical information for the sample of gifted students included in this study for each year, and collectively, is presented in Table 4.1.

Table 4.1

Gifted Population by Gender, Race, and Socioeconomic Status

	2009		2010		2009 & 2010	
	n	%	n	%	n	%
Female	47	55	64	60	111	58
Male	38	45	43	40	81	42
Af. American	5	6	14	13	19	10
Hispanic	7	8	9	8	16	8
White	73	86	84	79	157	82
High SES	63	74	71	66	134	70
Low SES	22	26	36	34	58	30

Note. SES = socioeconomic status

One comparison of interest to the researcher was the percentages of each demographical group of the gifted sample compared to the percentages of the school's total population. The percentages of male and female gifted students were very similar to the percentages of ABC's total population. Additionally, the percentages of socioeconomic statuses were similar among the gifted population and total school

population. However, stark differences existed in the percentages of racial groups of the gifted sample and the total school population. For example, African Americans accounted for about 28% of ABC's total population, but only about 10% of the gifted population. The total population was comprised of about 18% Hispanic students. However, only 8% of the gifted population was Hispanic. Although ABC's total population consisted of about 52% Caucasian students, the gifted sample was 82% Caucasian (ABC, 2010).

Another point of interest is the increase in gifted education enrollment. In one year, enrollment increased from 85 students to 107 students. This represents a 26% increase. The number of gifted students increased in all categories represented by the study's variables. African American gifted students represented the greatest change in percentage of the population served. In 2010, the percentage served increased from 6% to 13% (ABC, 2010).

Research Questions and Null Hypotheses

The mean scores of eighth grade gifted students on the *Iowa Test of Basic Skills* (ITBS) were carefully examined in this study. This investigation considered the differences in mean scores of the gifted students based on gifted identification approach, gender, race, and socioeconomic status. The execution of this study was guided by the following research questions: 1) Is there a significant difference in mean ITBS scores (math portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach? 2) Is there a significant difference in mean ITBS scores (math portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the

psychometric approach verses the multiple criteria approach? 3) Is there a significant difference in mean ITBS scores (math portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach? 4) Is there a significant difference in mean ITBS scores (reading portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach? 5) Is there a significant difference in mean ITBS scores (reading portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach? 6) Is there a significant difference in mean ITBS scores (reading portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?

In relation to the above research questions, the researcher hypothesized the following: (1a) There is no significant difference in the mean ITBS scores (math portion) of male and female eighth grade gifted students. (1b) There is no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach. (1c) With respect to mean ITBS scores (math portion), gender and identification method do not interact. (2a) There is no significant difference in the mean ITBS scores (math portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students. (2b) There is no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach. (2c) With respect to mean ITBS scores (math portion), race and identification

method do not interact. (3a) There is no significant difference in the mean ITBS scores (math portion) of high and low socioeconomic eighth grade gifted students. (3b) There is no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach. (3c) With respect to mean ITBS scores (math portion), socioeconomic status and identification method do not interact. (4a) There is no significant difference in the mean ITBS scores (reading portion) of male and female eighth grade gifted students. (4b) There is no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach. (4c) With respect to mean ITBS scores (reading portion), gender and identification method do not interact. (5a) There is no significant difference in the mean ITBS scores (reading portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students. (5b) There is no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach. (5c) With respect to mean ITBS scores (reading portion), race and identification method do not interact. (6a) There is no significant difference in the mean ITBS scores (reading portion) of high and low socioeconomic eighth grade gifted students. (6b) There is no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach. (6c) With respect to mean ITBS scores (reading portion), socioeconomic status and identification method do not interact.

Descriptive Statistics

Descriptive statistics were applied to determine mean scores of the gifted students that were grouped according to the study's independent variables. This allowed the researcher to make generalizations regarding the mean scores of the individual groups of the sample. Moreover, the standard deviation was calculated along with the lower and upper bounds of the mean at a 95% confidence level. Math scores were first examined and then reading scores were analyzed.

The mean math scores for female and male students are given in Table 4.2. The data provided is also disaggregated based upon the gifted identification method used: multiple criteria or psychometric. The gifted population at ABC Junior High School is comprised of 58% females and 42% males. These percentages are somewhat reflective of the overall gender makeup of the school's population.

Table 4.2

Mean Math Scores by Gender

				95 % CI	
Group	n	M	SD	LL	UL
Female, MC	44	261.43	19.442	255.16	267.71
Female, Psych.	67	268.70	20.834	263.62	273.79
Male, MC	25	270.28	14.208	261.96	278.61
Male, Psych.	56	266.43	24.851	260.87	271.99

Note. CI = confidence interval; LL = lower limit; UL = upper limit; MC = Mulitple Criteria; Psych. = Psychometric

A greater number of both female and male eighth grade gifted students were identified at ABC using the psychometric approach. Sixty percent of female students and sixty-nine percent of male gifted students were identified using the psychometric approach. Female students identified using the psychometric approach had a greater

mean score (M = 268.70) on the math portion of the *Iowa Test of Basic Skills* (ITBS) than female students identified using the multiple criteria approach (M = 261.43). Scores for male gifted students were the opposite. Those identified using the multiple criteria approach had a mean score of 270.28 compared to a mean score of 266.43 obtained by males identified using the psychometric approach. The standard deviation of scores was the smallest for both female and male gifted students identified using the multiple criteria approach. Additionally, scores for male gifted students identified using the multiple criteria approach had the smallest standard deviation, 14.208.

Comparisons were also made concerning the gender of the gifted students. All students identified using the psychometric approach regardless of gender had comparable mean scores on the math portion of the ITBS. The mean score of 268.70 for females was only 2.27 points greater than the mean score obtained by males. However, the difference in mean scores for students identified using the multiple criteria approach was greater. Among these groups, male students had a higher mean score (M = 270.28) than females (M = 261.43).

Mean math scores for gifted students disaggregated by race and identification method are presented in Table 4.3. At ABC Junior High School the gifted population is comprised of three races: African American, Caucasian, and Hispanic. African American and Hispanic students were combined into one group, minority, in order to create an appropriate sample size. The non-minority group consisted of ABC's Caucasian gifted students.

Table 4.3

Mean Math Scores by Race

				95 % CI	
Group	n	M	SD	LL	UL
Minority, MC	13	269.54	16.024	258.01	281.07
Minority, Psych.	22	260.95	21.120	252.09	269.82
Non-minority, MC	56	263.50	18.258	257.94	269.06
Non-minority, Psych.	101	269.13	22.847	264.99	273.27

Note. CI = confidence interval; LL = lower limit; UL = upper limit; MC = Mulitple Criteria; Psych. = Psychometric

As noted earlier, the number of minority gifted students at ABC Junior High School is not comparable to the overall percentage of minority students who attend ABC. This disparity is easily seen in the number of minority gifted students. Of the total 192 gifted students, 157 or 81.8% are non-minority. The participation of minority students (African American and Hispanic) in ABC's gifted program has increased, but still only accounts for 18% of the total gifted population. However, the total population of ABC is comprised of about 48% minority students. The psychometric approach is responsible for identifying more than 50% of minority and non-minority gifted students at ABC.

Mean scores for non-minority gifted students were highest among those students identified using the psychometric approach. These students had a mean score of 269.13 compared to the mean score of 263.50 obtained by students identified using the multiple criteria approach. However, for minority gifted students the multiple criteria approach identified students who gained the highest mean score. These students had a mean score of 269.54 compared to the mean score of 260.95 obtained by students identified using the psychometric approach.

Minority students identified using the multiple criteria approach earned the highest mean score (M = 269.54) among all gifted students. The group of students identified using the psychometric approach with the highest mean score was non-minority gifted students (M = 269.13).

The standard deviation of mean scores was lowest for each group of those students identified using the multiple criteria approach. Non-minority students identified using the multiple criteria approach had a standard deviation of 16.024 which was the lowest among all groups. Non-minority gifted students identified using the psychometric approach had the greatest standard deviation, 22.847.

Mean math scores for gifted students disaggregated by socioeconomic status and identification method are presented in Table 4.4. At ABC Junior High School, students from both high and low socioeconomic backgrounds are represented in the gifted population. Although almost 70% of ABC Junior High School's population is from low socioeconomic backgrounds, only 30% of the gifted population is represented by low socioeconomic students. The psychometric approach was responsible for identifying 67% of low socioeconomic gifted students.

Table 4.4

Mean Math Scores by Socioeconomic Status

				95 % CI	
Group	N	M	SD	LL	UL
High SES, MC	50	262.62	17.042	256.78	268.46
High SES, Psych.	84	270.45	23.622	265.95	274.96
Low SES, MC	19	269.95	20.242	260.48	279.42
Low SES, Psych.	39	261.67	19.470	255.06	268.28

Note. CI = confidence interval; LL = lower limit; UL = upper limit; MC = Mulitple Criteria; Psych. = Psychometric

For students of high socioeconomic status, about 63% were identified using the psychometric approach. Roughly 67% of low socioeconomic students were identified using the same identification approach. The psychometric approach identified students with the highest mean score among students of high socioeconomic status. These students had a mean score of 270.45 compared to the mean score of 262.62 achieved by students identified using the multiple criteria approach. However, for students from low socioeconomic backgrounds the highest mean score was obtained by students who were identified using the multiple criteria approach. In this case, students had a mean score of 269.95 which was 8.28 points higher than the score achieved by students identified using the psychometric approach. The highest mean score (M = 270.45) among all socioeconomic backgrounds was achieved by gifted students from a high socioeconomic status who were identified using the psychometric approach.

High socioeconomic students identified using the multiple criteria approach had the lowest standard deviation of mean scores (17.042). High socioeconomic gifted students identified using the psychometric approach had the greatest standard deviation, 23.622. The standard deviation was very similar among mean scores of both groups of low socioeconomic students.

After examining mean scores for the math portion of the ITBS, reading mean scores were studied to determine what relationships existed among the study's variables. Similar to comparisons made regarding math scores, the reading mean scores were used to determine what identification method identified students with the highest mean score. Moreover, comparisons were made among the mean scores obtained by the various groups of students. Last, careful examination allowed the researcher to determine if any

trends were consistent among the math and reading scores obtained by students identified using both identification methods. Table 4.5 presents the mean scores, standard deviation, and confidence interval for reading scores achieved by the gifted female and male students at ABC Junior High School.

Table 4.5

Mean Reading Scores by Gender

				95 % CI	
Group	n	M	SD	LL	UL
Female, MC	44	270.61	18.732	264.51	276.72
Female, Psych.	67	273.70	20.529	268.76	278.65
Male, MC	25	274.04	16.989	265.95	282.13
Male, Psych.	56	268.88	23.079	263.47	274.28

Note. CI = confidence interval; LL = lower limit; UL = upper limit; MC = Mulitple Criteria; Psych. = Psychometric

Female students identified using the psychometric approach gained a slightly greater mean score (M = 273.70) on the reading portion of the *Iowa Test of Basic Skills* (ITBS) than females identified using the multiple criteria approach (M = 270.61). A greater difference in mean scores was present among males. For males, the multiple criteria approach identified students with the highest mean score, 274.04. This score was 5.16 points higher than the mean score achieved by males identified using the psychometric approach. The standard deviation of scores was the smallest for both genders when the multiple criteria approach was used for identification. Scores for male gifted students identified using this approach had the smallest standard deviation, 16.989, among all gender groups. The greatest standard deviation of mean scores occurred for males identified using the psychometric approach (SD = 23.079).

Comparisons were also made among the female and male gifted students. Females identified using the psychometric approach obtained a higher mean score (M = 273.70) than males (268.88) identified using the same approach. Among groups identified using the multiple criteria approach, male students had a higher mean score (M = 274.04) than females (M = 270.61).

The trends related to mean scores in relation to gender were similar for the math and reading portions. Females identified using the psychometric approach obtained higher mean scores on both the math and reading portions of the ITBS. Furthermore, males identified using the multiple criteria approach achieved the highest mean scores on both portions of the ITBS

Mean reading scores for gifted students disaggregated by race and identification method are presented in Table 4.6. At ABC Junior High School the gifted population is comprised of three races: African American, Caucasian, and Hispanic. African American and Hispanic students were combined into one group, minority, in order to create an appropriate sample size. The non-minority group consisted of ABC's Caucasian gifted students.

Table 4.6

Mean Reading Scores by Race

				95 % CI	
Group	n	M	SD	LL	UL
Minority, MC	13	267.92	15.179	256.75	279.09
Minority, Psych.	22	264.23	20.681	255.64	272.81
Non-minority, MC	56	272.77	18.679	267.39	278.15
Non-minority, Psych.	101	273.09	21.776	269.08	277.1

Note. CI = confidence interval; LL = lower limit; UL = upper limit; MC = Mulitple Criteria; Psych. = Psychometric

Mean scores for non-minority gifted students identified using the psychometric approach were only slightly higher than the group identified using the multiple criteria approach. The students identified using the psychometric or multiple criteria approach had a mean score of 273.09 and 272.77 respectively. A greater difference occurred in mean scores among the minority gifted students. A higher mean score of 267.92 was earned by minorities identified for gifted services using the multiple criteria approach. Minority students identified using the psychometric approach attained a mean score of 264.23.

Minority gifted students identified using the multiple criteria and psychometric criteria approach obtained the highest mean reading scores. The students identified using the multiple criteria or psychometric approach gained mean scores of 272.77 and 273.09 respectively.

The standard deviation of mean scores was lowest for each group of those students identified using the multiple criteria approach. Minority students identified using the multiple criteria approach had a standard deviation of 15.179 which was the lowest among all groups. Non-minority gifted students identified using the psychometric approach had the greatest standard deviation, 21.776.

There were some trends present among the mean scores of the various groups included in the study. The difference in mean scores of each subgroup in math was far greater than reading for minority and non-minority students. Minorities identified using the multiple criteria approach earned the highest mean math score. The multiple criteria approach also identified non-minority gifted students who achieved the greatest math mean score. Non- minorities identified using the psychometric approach earned the

highest mean reading score. For both the math and reading portions of the ITBS, the standard deviation was the smallest for all groups who were identified using the multiple criteria approach.

Mean reading scores for gifted students from both socioeconomic backgrounds (high and low) are presented in Table 4.7. These mean scores also include both identification methods: multiple criteria and psychometric.

Table 4.7

Mean Reading Scores by Socioeconomic Status

				95 % CI	
Group	n	M	SD	LL	UL
High SES, MC	50	272.32	18.907	266.57	278.07
High SES, Psych.	84	272.13	21.258	267.69	276.57
Low SES, MC	19	270.63	16.067	261.3	279.96
Low SES, Psych.	39	270.15	23.06	263.64	276.67

Note. CI = confidence interval; LL = lower limit; UL = upper limit; MC = Mulitple Criteria; Psych. = Psychometric

The mean scores achieved on the reading portion of the ITBS were very similar regardless of socioeconomic status or identification procedure. In fact, for high socioeconomic gifted students the difference in mean scores was only 0.19. Those students identified using the psychometric approach achieved the higher mean score of 272.32. Additionally, the difference in mean scores of low socioeconomic students was only 0.48. For this group, those students identified using the multiple criteria approach had the higher mean score of 270.63.

Of those students identified using the multiple criteria approach, high socioeconomic students earned the highest mean score (M = 272.32). Similarly, among students identified using the psychometric approach the highest mean score (M = 272.13)

was achieved by students from high socioeconomic backgrounds. Additionally, this group of students earned the greatest mean score of all groups.

Trends between math and reading mean scores of the gifted students from high and low socioeconomic backgrounds were present. The lowest mean score for both portions was gained by low socioeconomic students who were identified using the psychometric approach. However, this identification approach also identified the high socioeconomic students who achieved the highest mean score on both portions. For the math portion, there was a greater difference in mean scores among the students of different socioeconomic class.

Two-Way Analysis of Variance Results

Before conducting two-way analysis of variance (ANOVA) tests, careful examination of the data for extreme outliers was conducted. No extreme mean scores were observed; therefore, all mean scores of the sample were used. Next, several statistical procedures were completed to insure that the required two-way ANOVA assumptions were met. Normality was examined using the Kolmogorov-Smirnov test. Results from the Kolmogorov-Smirnov test are presented in Appendix D. Normality was assumed for all gifted subgroups except one due to significance levels greater than the .05 level. The one group, low socioeconomic students identified using the psychometric approach, had a significance level of .024. However, based upon a histogram of the data it was determined that the data was only slightly skewed to the left. The two-way ANOVA is sufficiently robust in regards to assumption violations (Gall et al., 2007; Gay, Mills, & Airasian, 2008).

Variance among the population distributions was examined using Levene's Test for Equality of Variance. Results of the equality of means test are presented in Table 4.8. For all reading subgroups, significance levels larger than the .10 level were found. Therefore, equal variance was assumed for all reading groups. The significance level for all math subgroups was less than the .10 level; therefore, equal variance for these groups could not be assumed. However, the two-way ANOVA is sufficiently robust in regards to assumption violations (Gall et al., 2007; Gay, Mills, & Airasian, 2008).

Table 4.8

Results for Levene's Test of Equality of Variances

Subgroup	Levene Statistic	Sig.
Math - Gender	5.391	.001
Math - Race	2.521	.031
Math - SES	3.272	.022
Reading - Gender	0.730	.535
Reading - Race	0.624	.681
Reading - SES	1.166	.324

Once normality and variance were studied, inferential statistics were employed as the final stage of statistical examination. Two-way analysis of variance (ANOVA) procedures were utilized to answer the study's research questions and determine if the null hypotheses should be rejected. A significance level of $p < .05$ was chosen as the criteria that null hypothesis rejection was based upon. The following sections discuss the decisions related to null hypothesis rejection and offer the related two-way ANOVA results.

Null hypothesis one. For null hypothesis one the mean math scores of both genders identified using the multiple criteria and psychometric approach were compared

to determine if a significant difference existed among the two main effects and the interaction effect. Included in this comparison were females identified using the psychometric approach, females identified using the multiple criteria approach, males identified using the psychometric approach, and males identified using the multiple criteria approach. The summary of the results is presented in Table 4.9 for the math portion.

Table 4.9

Two-Way ANOVA Results for Gender on Math Portion of the ITBS

Source	Type III Sum of Squares	df	F	P	Power
Gender	452.677	1	1.017	.315	.171
Ident.	122.337	1	0.275	.601	.082
Gender - Ident.	1294.935	1	2.908	.090	.396

Note. Ident. = identification.

Data was collected for each participant for the valuation of mean math scores between male and female gifted students identified using the multiple criteria and psychometric approaches. Two-way ANOVA procedures were used to test the effect of gender and identification method on mean math ITBS scores. The first factor was gender (male and female), and the second factor was identification method (multiple criteria and psychometric). The two-way ANOVA showed no significant main effect of gender, $F(1,188) = 1.017$, $p = .315$, $\eta_p^2 = .005$ or identification method, $F(1,188) = .275$, $p = .601$, $\eta_p^2 = .001$. Thus, the null hypothesis that there would be no significant difference in the mean ITBS scores (math portion) of male and female eighth grade gifted students was not rejected. In addition, the null hypothesis that there would be no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach was affirmed. The interaction

between gender and identification method was not significant, $F(1,188) = 2.098$, p = .090, $\eta_p^2 = .015$. Therefore, the null hypothesis that with respect to mean ITBS scores (math portion), gender and identification method would not interact was confirmed.

Null hypothesis two. For null hypothesis two the mean math scores of minority (African American and Hispanic) and non-minority (Caucasian) students identified using the multiple criteria and psychometric approach were compared to determine if a significant difference existed among the two main effects and the interaction effect. Included in this comparison were minority students (African Americans and Hispanics) identified using the multiple criteria and psychometric approach and non-minority students (Caucasians) identified using the multiple criteria and psychometric approach. Table 4.10 presents the two-way ANOVA results for the math portion.

Table 4.10

Two-Way ANOVA Results for Race on Math Portion of the ITBS

Source	Type III Sum of Squares	df	F	P	Power
Race	30.381	1	.068	.794	.058
Ident.	58.169	1	.131	.718	.065
Race - Ident.	1345.441	1	3.028	.083	.410

Note. Ident. = identification.

Data was collected for each participant for the valuation of mean math scores between minority and non-minority gifted students identified using the multiple criteria and psychometric approaches. Two-way ANOVA procedures were used to test the effect of race and identification method on mean math ITBS scores. The first factor was race (minority and non-minority), and the second factor was identification method (multiple criteria and psychometric). The two-way ANOVA showed no significant main effect of race, $F(1,188) = .068$, p = .794, $\eta_p^2 = .001$ or identification method, $F(1,188) = .131$, p =

.718, $\eta_p^2 = .000$. Thus, the null hypothesis that there would be no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students of different races was not rejected. In addition, the null hypothesis that there would be no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach was affirmed. The interaction between race and identification method was not significant, $F(1,188) = 3.028$, $p = .083$, $\eta_p^2 = .016$. Therefore, the null hypothesis that with respect to mean ITBS scores (math portion), race and identification method would not interact was confirmed.

Null hypothesis three. For null hypothesis three the mean math scores of students from both socioeconomic statuses identified using the multiple criteria and psychometric approach were compared to determine if a significant difference existed among the two main effects and the interaction effect. Included in this comparison were high socioeconomic students identified using the psychometric approach, high socioeconomic students identified using the multiple criteria approach, low socioeconomic students identified using the psychometric approach, and low socioeconomic students identified using the multiple criteria approach. The results of the two-way ANOVA for the math portion are presented in Table 4.11.

Table 4.11

Two-Way ANOVA Results for Socioeconomic Status on Math Portion of the ITBS

Source	Type III Sum of Squares	df	F	p	Power
SES	798.915	1	1.801	.181	.267
Ident.	2.821	1	.006	.937	.051
SES - Ident.	1426.319	1	3.215	.075	.430

Note. SES = socioeconomic status; Ident. = identification.

Data was collected for each participant for the valuation of mean math scores between high and low socioeconomic gifted students identified using the multiple criteria and psychometric approaches. Two-way ANOVA procedures were used to test the effect of socioeconomic status and identification method on mean math ITBS scores. The first factor was socioeconomic status (high and low), and the second factor was identification method (multiple criteria and psychometric). The two-way ANOVA showed no significant main effect of socioeconomic status, $F(1,188) = 1.801$, $p = .181$, $\eta_p^2 = .009$ or identification method, $F(1,188) = .006$, $p = .937$, $\eta_p^2 = .000$. Thus, the null hypothesis that there would be no significant difference in the mean ITBS scores (math portion) of high and low socioeconomic eighth grade gifted students was not rejected. In addition, the null hypothesis that there would be no significant difference in the mean ITBS scores (math portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach was affirmed. The interaction between socioeconomic status and identification method was not significant, $F(1,188) = 3.215$, $p = .075$, $\eta_p^2 = .015$. Therefore, the null hypothesis that with respect to mean ITBS scores (math portion), socioeconomic status and identification method would not interact was confirmed.

Null hypothesis four. For null hypothesis four the mean reading scores of both genders identified using the multiple criteria and psychometric approach were compared to determine if a significant difference existed among the two main effects and the interaction effect. Included in this comparison were females identified using the psychometric approach, females identified using the multiple criteria approach, males identified using the psychometric approach, and males identified using the multiple criteria approach. The results for the reading portion are presented in Table 4.12.

Table 4.12

Two-Way ANOVA Results for Gender on Reading Portion of the ITBS

Source	Type III Sum of Squares	df	F	p	Power
Gender	20.525	1	.049	.825	.056
Ident.	45.174	1	.107	.744	.062
Gender - Ident.	713.117	1	1.694	.195	.254

Note. Ident. = identification.

The mean reading scores between male and female gifted students identified using the multiple criteria and psychometric approaches were examined. Two-way ANOVA procedures were used to test the effect of gender and identification method on mean reading ITBS scores. The first factor was gender (male and female), and the second factor was identification method (multiple criteria and psychometric). The two-way ANOVA showed no significant main effect of gender, $F(1,188) = .049$, $p = .825$, $\eta_p^2 = .000$ or identification method, $F(1,188) = .107$, $p = .744$, $\eta_p^2 = .001$. Thus, the null hypothesis that there would be no significant difference in the mean ITBS scores (reading portion) of male and female eighth grade gifted students was not rejected. In addition, the null hypothesis that there would be no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric

approach and the multiple criteria approach was affirmed. The interaction between gender and identification method was not significant, $F(1,188) = 1.694$, $p = .195$, $\eta_p^2 = .009$. Therefore, the null hypothesis that with respect to mean ITBS scores (reading portion), gender and identification method would not interact was confirmed.

Null hypothesis five. For null hypothesis five the mean reading scores of minority (African American and Hispanic) and non-minority (Caucasian) students identified using the multiple criteria and psychometric approach were compared to determine if a significant difference existed among the two main effects and the interaction effect. Included in this comparison were minority students (African Americans and Hispanics) identified using the multiple criteria and psychometric approach and non-minority students (Caucasians) identified using the multiple criteria and psychometric approach. Table 4.13 presents the two-way ANOVA results for the reading portion.

Table 4.13

Two-Way ANOVA Results for Race on Reading Portion of the ITBS

Source	Type III Sum of Squares	df	F	P	Power
Race	1251.343	1	3.002	.085	.407
Ident.	75.849	1	.182	.670	.071
Race - Ident.	107.481	1	.258	.612	.080

Note. Ident. = identification.

Data was collected for each participant for the valuation of mean reading scores between minority and non-minority gifted students identified using the multiple criteria and psychometric approaches. Two-way ANOVA procedures were used to test the effect of race and identification method on mean reading ITBS scores. The first factor was race (minority and non-minority), and the second factor was identification method (multiple

criteria and psychometric). The two-way ANOVA showed no significant main effect of race, $F(1,188) = .3.002$, $p = .085$, $\eta_p^2 = .016$ or identification method, $F(1,188) = .182$, $p = .670$, $\eta_p^2 = .001$. Thus, the null hypothesis that there would be no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students of different races was not rejected. In addition, the null hypothesis that there would be no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach was affirmed. The interaction between race and identification method was not significant, $F(1,188) = .258$, $p = .612$, $\eta_p^2 = .001$. Therefore, the null hypothesis that with respect to mean ITBS scores (reading portion), race and identification method would not interact was confirmed.

Null hypothesis six. For null hypothesis six the mean reading scores of students from both socioeconomic statuses identified using the multiple criteria and psychometric approach were compared to determine if a significant difference existed among the two main effects and the interaction effect. Included in this comparison were high socioeconomic students identified using the psychometric approach, high socioeconomic students identified using the multiple criteria approach, low socioeconomic students identified using the psychometric approach, and low socioeconomic students identified using the multiple criteria approach. The results of the two-way ANOVA for the reading portion are presented in Table 4.14.

Table 4.14

Two-Way ANOVA Results for Socioeconomic Status on Reading Portion of the ITBS

Source	Type III Sum of Squares	df	F	p	Power
SES	185.019	1	.436	.510	.101
Ident.	.641	1	.002	.969	.050
SES - Ident.	33.194	1	.078	.780	.059

Note. SES = socioeconomic status; Ident. = identification.

Data was collected for each participant for the valuation of mean reading scores between high and low socioeconomic gifted students identified using the multiple criteria and psychometric approaches. Two-way ANOVA procedures were used to test the effect of socioeconomic status and identification method on mean reading ITBS scores. The first factor was socioeconomic status (high and low), and the second factor was identification method (multiple criteria and psychometric). The two-way ANOVA showed no significant main effect of socioeconomic status, $F(1,188) = .436$, $p = .510$, $\eta_p^2 = .002$ or identification method, $F(1,188) = .002$, $p = .969$, $\eta_p^2 = .000$. Thus, the null hypothesis that there would be no significant difference in the mean ITBS scores (reading portion) of high and low socioeconomic eighth grade gifted students was not rejected. In addition, the null hypothesis that there would be no significant difference in the mean ITBS scores (reading portion) of eighth grade gifted students identified using the psychometric approach and the multiple criteria approach was affirmed. The interaction between socioeconomic status and identification method was not significant, $F(1,188) = .078$, $p = .780$, $\eta_p^2 = .000$. Therefore, the null hypothesis that with respect to mean ITBS scores (reading portion), socioeconomic status and identification method would not interact was confirmed.

Summary

ABC Junior High School has only been in existence for two years. A merger of two middle schools formed the current school which serves students in a rural Georgia community. Today, all eighth grade gifted students receive gifted services in a common setting from the same instructors. As with all areas of education, the academic performance of ABC's gifted students is an area of concern. Moreover, any differences in mean scores of the gifted students related to identification are important to know.

The focus of this study was to determine if differences in mean scores on the *Iowa Test of Basic Skills* (ITBS) existed among gifted students identified using Georgia's two identification methods. Emphasis was placed on the gender, race, and socioeconomic status of the identified students. Overall the data suggested that all gifted students at ABC Junior High School, regardless of what identification method was used, had comparable mean scores on the ITBS. Insignificant differences were present among the gifted students identified using the multiple criteria or psychometric approach. This trend was found among the different genders, races, and socioeconomic statuses represented in the study. All null hypotheses, which stated there would be no significant difference in ITBS mean scores among the various groups of gifted students, were affirmed.

In the following chapter the conclusions, discussion, and recommendations are presented. A restatement of the problem which led to the execution of this study is first presented. Next, a summary of the findings is offered. The implications, assumptions, and limitations of the study are then given. Last, recommendations are made for future research.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

Introduction

Gifted programs have historically struggled to identify minority and economically disadvantaged students. A tremendous amount of research and reform has concentrated on improving the gifted identification measures used in Georgia school systems. However, the performance of gifted students identified using Georgia's two identification measures has seldom been analyzed. A summary of the current gifted education study is presented in this chapter. The underlying problem that resulted in this study being conducted is revisited. A synopsis of the research findings and results are also presented. Additionally, the implications and limitations related to the current study are discussed. Last, recommendations for future research are provided.

Statement of the Problem

For decades researchers, educators, and policy makers have debated over certain dynamics of gifted education. Much of this debate has encompassed what fundamental attributes should or should not be included in the definition of giftedness. For example, many once accepted that intelligence should be the sole criterion used for identifying giftedness. Only recently have researchers and educators in the field of education begun to define giftedness as a multifaceted attribute. This thinking considers aspects such as creativity and motivation to be a part of giftedness. Still, after decades have passed and much research has been conducted, consensus on a definition of giftedness does not exist.

An even greater issue prevalent among gifted educational programs across the nation is ineffective identification procedures. These insufficient procedures have created an issue, underrepresentation, which has plagued the field of gifted education for

years. Historically, minority and economically disadvantaged students have not been adequately identified for gifted services. However, improvements have been made concerning the identification process in school systems all across the nation (Briggs et al., 2008; Heinfield, Moore, & Wood, 2008; McBee, 2006). Additionally, substantial research associated with multiple criteria identification procedures has emerged in an effort to create diverse gifted education programs (Briggs et al., 2008; Lawrence, 2009; Pendarvis, 2009; Reis & Renzulli, 2010).

Georgia, considered to be a national leader in gifted identification procedures, has revamped its identification procedures during the past two decades to more effectively identify gifted students. Georgia's multiple criteria approach allows students to be identified as gifted by meeting the stated criteria in three of the four following evaluated areas: mental ability, achievement, creativity, and motivation (Georgia Department of Education, 2010). With these improvements, the psychometric approach is no longer the sole method of gifted identification. Thus, gifted eligibility is no longer based solely on intelligence.

Regrettably, insufficient research has been conducted aimed at examining the relationships among gifted identification criteria, academic performance, gender, race, and socioeconomic status. Most research related to gifted identification focuses solely on methods of gifted identification (Briggs et al., 2008; Ford, 2010; Pendarvis, 2009; Reis & Renzulli, 2010; VanTassel-Baska et al., 2007). Existing research examines only the effectiveness of identification procedures in creating more diverse gifted populations. The multiple criteria approach has proven to be an effective tool in identifying a more

diverse gifted population. Still, the issue of underrepresentation continues to plague the field of gifted education.

The performance of the gifted students is rarely compared based upon the identification method used to determine eligibility. Furthermore, little research exists in which middle grade gifted students were studied (Pendarvis, 2009). A critical gap exists in the available research related to the academic performance of gifted students of a particular gender, race, or socioeconomic status. Moreover, the identification method used in identifying these gifted students needs to be examined. Research is needed to determine if any relationships can be found among the variables mentioned above. These relationships will allow systems to properly assess the academic performance of their gifted students. Multiple criteria approaches increase diversity, but is performance being sacrificed? Comparisons of the performance on nationally normed referenced exams need to be made between Georgia gifted students of different gender, race, and socioeconomic status.

This study was guided by the following research questions during the examination of the mean scores of gifted students identified using the multiple criteria and psychometric approach.

1) Is there a significant difference in mean ITBS scores (math portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?

2) Is there a significant difference in mean ITBS scores (math portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted

students identified using the psychometric approach verses the multiple criteria approach?

3) Is there a significant difference in mean ITBS scores (math portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?

4) Is there a significant difference in mean ITBS scores (reading portion) of male or female eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?

5) Is there a significant difference in mean ITBS scores (reading portion) of minority (African American and Hispanic) or non-minority (Caucasian) eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?

6) Is there a significant difference in mean ITBS scores (reading portion) of high or low socioeconomic eighth grade gifted students identified using the psychometric approach verses the multiple criteria approach?

Summary of the Findings

This casual comparative study was conducted to examine what differences, if any, existed in mean scores on the math and reading portions of the *Iowa Test of Basic Skills* (ITBS) for eighth grade gifted students identified using the multiple criteria and psychometric approach. Additionally, differences were examined among the gifted students of different gender, race, and socioeconomic status. Descriptive statistics were utilized to make generalizations regarding the groups of gifted students. Statistical analysis was also conducted using inferential statistics.

Most researchers agree that the multiple criteria approach is central to the success of any gifted educational programs' identification process. A great deal of research has been conducted over the last few decades that helps solidify this thought (Briggs et al., 2008; Pendarvis & Wood, 2009; Pierce et al., 2007; Sternberg, 2010; VanTassel-Baska et al., 2004; VanTassel-Baska et al., 2007). Georgia began using the multiple criteria approach more than twenty years ago. Based upon results provided by Linda Andrews, Georgia Department of Education's Gifted Education Specialist, the multiple criteria approach has helped increase participation in gifted educational programs. Statistical evidence shows an increase of more than 100% has occurred in Georgia's gifted education programs over an eleven year period. Caucasian student participation has increased more than 60%, but other racial groups are even more impressive. African American participation in gifted programs increased over 200%, and the increase of Hispanic participation increased by almost an astonishing 800% (Andrews, 2008).

The math and reading scores of fourteen groups of gifted students were examined: females identified using the multiple criteria approach, males identified using the multiple criteria approach, females using the psychometric approach, males identified using the psychometric approach, African Americans identified using the multiple criteria approach, Caucasians identified using the multiple criteria approach, Hispanics identified using the multiple criteria approach, African Americans identified using the psychometric approach, Caucasians identified using the psychometric approach, Hispanics identified using the psychometric approach, high socioeconomic students identified using the multiple criteria approach, low socioeconomic students identified using the multiple criteria approach, high socioeconomic students using the psychometric approach, and low

socioeconomic students identified using the psychometric approach. The 192 gifted students included in the study participated in the gifted program at ABC Junior High School during the 2009-2010 or 2010-2011 school years.

Although the multiple criteria approach has been utilized for over twenty years in Georgia, a disparity in the number of minorities being served in the gifted program exists at ABC Junior High School. The racial composition of ABC's gifted population is not equally representative of the overall population. For example, the gifted population is 82% Caucasian, while the total population is only 52% Caucasian. African Americans accounted for roughly 28% of ABC's total population, but only 10% of the gifted population. Additionally, Hispanics accounted for 18% of the school population compared to 8% of the gifted population. It does appear that small improvements are being made to lessen this disparity. The percentage of African American gifted students increased from 6% to 13% during the 2010 school year. Unfortunately, there was no percentage change among Hispanic gifted students.

ABC Junior High School still relies heavily upon the psychometric approach to identify students for gifted services. The percentage of female and male gifted students identified using the psychometric approach is 60% and 69% respectively. More than 68% of African American gifted students are identified using this approach. The psychometric approach is responsible for identifying 64% of Caucasian gifted students and 56% of the Hispanic gifted students. This approach identifies almost 63% of the high socioeconomic status gifted students and 67% of the low socioeconomic gifted students.

Researchers have proven that the multiple criteria approach is an effective tool in identifying traditionally underrepresented students. Most cite that this gifted

identification approach aids in increasing the participation of African American, Hispanic, and low socioeconomic students in gifted educational programs (Briggs et al., 2008; Pendarvis & Wood, 2009; Pierce et al., 2007; Sternberg, 2010; VanTassel-Baska et al., 2004; VanTassel-Baska et al., 2007). However, the perception that students using this approach will not perform as well academically as gifted students identified using a psychometric approach still exists among educators. Educators sometimes misconstrue the multiple criteria approach as an easier method of qualifying for gifted services. However, this is not the case. The multiple criteria approach only opens the lens of gifted identification to include characteristics such as high intellectual ability, task commitment, creativity, and other intelligences (Christodoulou, 2009; Renzulli, 2005; Renzulli 2011). The findings of this study show that gifted students identified using the multiple criteria and psychometric approach have comparable mean scores on a nationally normed referenced exam.

Two-way analysis of variance (ANOVA) results of this study revealed that there were no significant differences among the math and reading mean scores of gifted students at ABC Junior High School. Regardless of what identification method was employed, the mean scores of gifted students of a different gender, race, or socioeconomic status were not significantly different. Therefore, all null hypotheses regarding differences among mean scores of ABC's gifted students were affirmed. Research supporting the utilization of the multiple criteria approach is only solidified by the results of this study. Furthermore, any concern regarding the possible differences in performance of students identified using either approach was nullified by the results.

Implications

The multiple criteria and psychometric approaches are used to determine gifted eligibility in ABC Junior High School's district. In fact, Georgia school systems have been using the multiple criteria approach for gifted identification for almost twenty years. Additionally, a vast amount of research points to the effectiveness of multiple criteria approaches in reducing underrepresentation (Briggs et al., 2008; Pendarvis & Wood, 2009; Pierce et al., 2007; Sternberg, 2010; VanTassel-Baska et al., 2004; VanTassel-Baska et al., 2007). Therefore, one would expect that disparities in the number of minorities and economically disadvantaged gifted students would be insignificant. However, at ABC Junior High School this is not the case as shown and discussed earlier in chapter four.

One possible factor responsible for underrepresentation in ABC's gifted program could be the referral process, not identification measures. McBee (2010) found that in most school systems the majority of referrals are made by teachers. Proper training is essential to enable teachers to properly identify potentially gifted students of all races and socioeconomic backgrounds. Educators must be aware that there are various manifestations of giftedness. Furthermore, they must be adept in recognizing not only above average intelligence, but also creativity and motivation. Educators must understand that in most cases they are the advocate for ensuring that any student who they feel may be gifted must be referred. Ford (2010) found that underrepresentation accounted for almost 500,000 African American and Hispanic students not being served in gifted education programs across the nation. After reviewing the data and findings of this study, most would agree that there are issues of underrepresentation at ABC Junior

High. It is clear that future initiatives aimed at increasing teacher's effectiveness in identifying giftedness could prove beneficial to ABC's school district.

Another factor responsible for the lack of participation of minority and economically disadvantaged students may be the identification measures employed by ABC's gifted program. Evidence suggests that ABC's school district utilizes the multiple criteria approach, but an examination of these procedures and policies is needed. Callahan (2005) argues that school systems should examine the opportunities they afford for talent development, discontinue the practice of single assessments for identification, and strengthen policies aimed at identifying underrepresented gifted populations. Several effective alternative methods of gifted identification were presented in the review of literature section of this study. A few of these measures are discussed below and ABC Junior High's school district should carefully consider these measures.

In a series of three research projects, Sternberg (2010) provided assessments that should be considered for gifted identification. The *Rainbow Project*, *Kaleidoscope Project*, and the *Aurora Project* proved to be effective alternate methods of gifted identification. The *Rainbow Project* measured a combination of analytical, creative, and practical skills possessed by the participants. Based on findings, the measures used in the *Rainbow Project* could be implemented to produce a more equitable and diverse student population (Sternberg, 2010). One of the underlying goals of the *Rainbow Project* was to identify ways in which to reduce group differences of minority groups on standardized ability assessments (Sternberg, 2010). Results of this study suggest that the methods used in the *Rainbow Project* reduced group differences among different groups. Moreover, the results of this project suggest that it is possible to provide fair and equal

academic treatment for members of diverse groups (Sternberg, 2010). The procedures used in the *Rainbow Project* could be used to make gifted identification procedures better and decrease the underrepresentation of racial and ethnic groups in gifted programs (Sternberg, 2010).

Another endeavor, the *Kaleidoscope Project*, introduced the construct of wisdom in the assessment of students (Sternberg, 2010). Questions on essays were designed to assess wisdom as well as analytical, creative, and practical intelligence. According to Sternberg (2010), the main advantage of the *Kaleidoscope Project* was that assessment swayed from the sole use of pressured standardized testing. Instead, essays were incorporated to allow students to display their abilities in the various intelligences being assessed. Results of the *Kaleidoscope Project* indicated that academic quality and diversity can be enhanced concurrently. Furthermore, these advancements can be made in large populations of students, not only small groups. Sternberg (2010) further noted that the *Kaleidoscope Project* verifies there is much more to students than a score obtained on a standardized exam.

The *Aurora Project*, comprised of nine subtests, is another measure Sternberg suggested can be used to assess giftedness. A student's giftedness is based not on one, but multiple capabilities (Sternberg, 2006). Measures of the *Aurora Project* allow school systems to improve the span of their identification procedures in order to better meet the needs and goals of the system. Moreover, the *Aurora Project* may be used when traditional instruments do not provide desired results or when the assessment of a particular skill is desired (Sternberg, 2006).

Another research endeavor involving alternative gifted identification measures is Project CLUE. Gifted eligibility was based upon a student meeting one of four criteria (Pierce et al., 2007). The first two criteria involved a traditional standardized assessment, the TerraNova Comprehensive Test of Basic Skills. All English as a Second Language (ESL), low socioeconomic, and teacher referred students who did not meet eligibility requirements under criterion one or two were given Ravens Colored Progressive matrices (Pierce et al., 2007).

Results of Project CLUE's first year of implementation proved promising for increasing the number of eligible minority gifted students. A total of 322 students, or 9% of second graders were identified as gifted learners (Pierce et al., 2007). The gifted population was comprised of approximately 46% Caucasian, 36% African American, 13% Hispanic, 4% Multiracial, and 1% Other. Additionally, seventy-six percent of the students were from low socioeconomic backgrounds. Gender composition of the group was almost half male and half female (Pierce et al., 2007).

One strategy that could possibly help reduce the underrepresentation at ABC Junior High School is front loading. Front loading involves the identification of potentially gifted students of diversity who do not meet the traditional gifted criteria. These students are then offered intensive intervention programs aimed at increasing the students' skill levels needed for success in a gifted education program. Participation continues until the student can meet the criteria needed to qualify for gifted services. Additionally, front loading has proven effective in enabling diverse gifted students to remain in gifted programs (Warne, 2009). Of course, a school system must be willing to implement the necessary strategies and procedures designed to target and recruit

potentially gifted students. Furthermore, gifted directors, administrators, gifted program specialists, and gifted educators must also be willing participants in the front loading design.

ABC Junior High does not have a mentoring program for gifted students. Many underrepresented students have no advocate to aid in their academic advancement. Administrators, faculty members, and other staff members must be willing to fill this void and become advocates for students they feel may be gifted. Counseling and mentoring programs have proven effective in ensuring the success of diverse gifted students (Lovett, 2011). Moreover, effective student mentors must be recruited and trained to aid in alleviating some of the hardships often encountered by minority and economically disadvantaged gifted students. Mentorships allow diverse gifted students to be partnered with a fellow student of diversity that has achieved success. This practice has also helped reduce the attrition rate of diverse gifted students (Warne, 2009). In gifted programs diverse students can sometimes feel isolated, inadequate, or overwhelmed. Often gifted minority students are forced to balance academic and social demands when they first begin participating in a gifted program (Lovett, 2011). Unfortunately, without sufficient support systems, these students sometimes decide the new demands are not worth it. They become underperformers or exit the gifted program.

Mean scores at ABC Junior High among all groups of gifted students were comparable. Therefore, the multiple criteria should be used extensively to identify more students. ABC's school district still relies heavily on the psychometric approach when determining gifted eligibility as shown and discussed in chapter four. The use of one assessment to judge students has long been frowned upon by researchers in the field of

measurement. Still, intelligence tests are used extensively as the sole instrument in the identification of gifted students (Callahan, 2005). In 2008, Ziegler found that over 50% of gifted identifications were still based exclusively on intelligence or a combination of intelligence and achievement (Ziegler & Stoeger, 2010).

It is vital that ABC's school district vigorously attack the issue of underrepresentation. Researchers have shown that unidentified gifted students will not meet their intellectual capabilities. Unidentified gifted students at ABC Junior High are not receiving the needed educational resources to maximize their academic potential. Left unresolved, these deserving students will not receive gifted services and likely will never participate in rigorous Advanced Placement classes. As a result these students may miss out on opportunities to further their education at the college or university level.

Assumptions

There are several assumptions upon which this study was based. It was assumed that the gifted identification approaches used in ABC Junior High School's district were effective in identifying gifted students of different race, gender, and socioeconomic status. This threat to internal validity should have been minimized as a result of identification research and improved identification procedures in Georgia. According to researchers, identification methods have improved over the past decades, but there are issues in underrepresentation that still exist (Callahan, 2005; Ford, 2010; McBee, 2010). Another assumption of this study was that the sample size would be appropriate for this casual comparative study. This threat to internal validity was not known until the data was examined by the researcher. According to Gall, Gall, & Borg (2007), a minimum sample size of 15 participants for each group is appropriate for casual comparative

studies. It was assumed that all gifted records were accurate in relation to the identification approach used, race, gender, and socioeconomic status of the eighth grade gifted students. Additionally, it was assumed that the identification approach used was accurate in identifying a student as gifted. Last, it was assumed that all educators involved in the identification process in ABC Junior High School's district had received adequate training and were able to properly identify gifted students.

Limitations

Several limitations were present in the current study that must be considered. The researcher is not a gifted educator, but is employed as a math teacher in the school in which the study was conducted. This disassociation with the gifted program helped eliminate research bias that might have existed if the researcher was a gifted educator. ABC Junior High School has been in existence for only two years. Therefore, without introducing more variables into the study, the researcher had access to only two years of gifted data. Although the study was limited in this aspect, certain aspects were favorable. For example, one gifted teacher provides instruction for each academic content area. This reduced the variable of variations in instructional delivery methods. Also, the assurance of a common gifted service method was met in the current study.

Another limitation of the current study was the sample sizes of African American and Hispanic gifted students. According to Gall, Gall, & Borg (2007), a minimum sample size of 15 participants for each group is appropriate for casual comparative studies. This requirement was not met; therefore, analysis was completed regarding race by making two groups: minority and non-minority. African American and Hispanic students were combined to form the minority group and Caucasian students formed the

non-minority group. The threat of Type II errors was high due to low power levels. However, due to the nature of this study these threats were not as drastic as in some cases such as studies involving life and death or the expenditure of millions of dollars. The gifted database for the entire state of Georgia would provide large sample sizes for all groups examined in this study. Moreover, this could possibly lead to more significant differences being discovered among the various groups of gifted students examined in the current study.

ABC Junior High School's geographical location created another limitation for this study. ABC is located in a rural Georgia community whose economy is highly dependent on the agriculture sector. This could prevent implications of this study from being applied to some gifted education programs. Suburban and urban areas of Georgia and the United States could possibly have gifted populations with very different demographics.

The measures used in assessing gifted students can be chosen locally in the state of Georgia. Although Georgia requires systems to use the multiple criteria approach, the measures used to determine gifted eligibility can be chosen by each school system. Generalizations of the results of this study can be made to only those school systems with similar identification measures. This holds true also for generalizations made on a national scale.

Recommendations for Future Research

A need for continued research related to the performance of gifted students is needed in school systems all across the nation. Studies are needed that examine the differences in the performance of gifted students identified using psychometric and

multiple criteria. Furthermore, it is important that these studies use nationally normed exams when making comparisons to ensure comparable measures are examined. For example, state mandated exams typically measure state standards, not national standards. State standards will vary until current educational reform requiring the adoption of national standards is fully implemented.

A three and five year follow up study is needed to determine if improvements are being made concerning gifted identification in ABC's school district. The multiple year studies will eliminate the issue of sample size present in the current study. Furthermore, the larger sample sizes will increase the possibility of finding statistical differences among the performance of the groups of gifted students. As stated earlier, there are issues present in the gifted program in ABC's school district. A follow up study would allow the researcher to determine if improvements are being made in the system's gifted program.

Additional related studies need to be conducted both in the geographical region ABC is in and statewide. These studies would allow for comparisons to be made among the systems' gifted education programs. Successful systems could provide effective measures they have implemented. Moreover, the results of these studies would allow all the systems to see how they compare to other similar systems as well as to systems statewide.

Statistical evidence of the current study supports the need for future research needed to examine the referral process in ABC's district. Multiple criteria approaches are used, but a disparity in the number of gifted minority and economically disadvantaged students being served still exists. McBee (2010) found that issues were present in the

referral process when he examined all of Georgia's gifted elementary students. Any deficiencies of the district's gifted referral process need to be discovered and corrected. This will ensure that more deserving minority and economically disadvantaged students are participating in the gifted education programs in ABC's school district.

Future research is also needed to examine the identification measures used in ABC's district. These measures need to be analyzed to insure that the most effective measures are being used. A tremendous amount of research is available that identifies identification processes that have proven effective in identifying traditionally underrepresented students.

Conclusion

School systems all across the nation are, and have been, in the midst of educational reform due to mandates such as *No Child Left Behind* and *Race to the Top*. Federal and state mandates have caused school systems to analyze and revamp their educational programs. It is the hope of the researcher that gifted programs will not be excluded from this reform. Unfortunately, too often gifted students are assumed capable of achieving without little assistance. However, gifted students deserve to be considered when initiatives are implemented aimed at ensuring students meet their academic potential. Moreover, issues presented in this study make it clear that more examination is needed for the field of education. Policies regarding the referral process, identification measures, and performance of gifted students need to be analyzed to ensure that the needs of school systems and the students served are being effectively met.

Little research exists related to the differences in performance of gifted students identified using the traditional psychometric approach and the multiple criteria approach.

One goal of the current study was to contribute to this void. The mean scores of gifted students at a rural school, ABC Junior High, were examined in this casual comparative study. Results of this study provided evidence that gifted students achieve comparable scores on high stakes standardized exams such as the *Iowa Test of Basic Skills*. Furthermore, the evidence supports the existing research which calls for the implementation of multiple criteria approaches in gifted identification procedures.

Hopefully, this study will spur additional research to be performed regarding the performance of gifted students. Careful examination of the performance of gifted students is needed in school systems all across the nation. It is important not to exclude this group of students. Instead, systems must be resilient in providing the needed resources for these students to achieve the highest possible levels of academic achievement. Additionally, the needed research related to the gifted referral process hopefully will be conducted in the near future.

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APPENDIX A: DATA REQUEST LETTER

[redacted]

[redacted]
Principal

[redacted]
Assistant Principal

[redacted]
Assistant Principal

[redacted]
Assistant Principal

812 Eleventh Avenue NW

[redacted]

[redacted]
Counselor

[redacted]
Counselor

[redacted]
Counselor

October 4, 2011

Jerry Clark Harden, 8th Grade Math Teacher
[redacted]

Dear Dr. [redacted]:

I am requesting Iowa Test of Basic Skills (ITBS) data to complete research required for the completion of my doctoral dissertation. I will be using these data for a study entitled, "A Comparison of a Gifted Education Program Among Eighth Grade Gifted Students at a Georgia Junior High School." The purpose of this study is to determine relationships that may exist among performance of eighth grade gifted students on the ITBS, gender, race, and socioeconomic status.

I am requesting the following data files:

- **ITBS Scores – Math and Reading Portion** (All eighth grade gifted students 2009-2010)
- **For each student please include gender, race, socioeconomic status, and the gifted identification method used to determine eligibility. Please delete names and identification numbers from the data.**

Please send the requested data electronically in an excel document to the following email address:
jharden@[redacted]

Thank you in advance for your attention to this data request. If you have questions, I can be reached at [redacted] or jharden@[redacted].

Sincerely,

Clark Harden

APPENDIX B: SYSTEM APPROVAL LETTER FOR DATA

[redacted]

[redacted]
Superintendent

710-28th Avenue S.E.
P.O. Box 2708
[redacted]

[redacted], **Chairman**
1313 Bayleaf Drive
[redacted], **Vice Chairman**
1058 Hopewell Church Rd.,
[redacted], **Member**
P.O. Box 98, Moultrie, Ga. 31776
[redacted], **Member**
P.O. Box 63,
[redacted]
110 Holly Trail,
[redacted]

[redacted]
Assistant Superintendent
for Business and
Operational Services

[redacted]
Assistant Superintendent
for Instruction and
Learning Services

October 4, 2011

To: Jerry Clark Harden, 8th Grade Math Teacher
[redacted]

From: [redacted], Assistant Superintendent

Re: Research Approval

I approve your request to access Iowa Test of Basic Skills (ITBS) data to complete your research required for the completion of your doctoral dissertation. I understand you will use the data for a study entitled, "A Comparison of a Gifted Education Program Among Eighth Grade Gifted Students at a Georgia Junior High School." The purpose of this study being to determine relationships that may exist among the performance of eighth grade gifted students on the ITBS by gender, race, and socioeconomic status.

I will arrange for you to receive the following data, in electronic form, without any student names or identifying information:

ITBS Scores – Math and Reading Portion
(All eighth grade gifted students 2009-2010)

For each student - gender, race, socioeconomic status, and the gifted identification method used to determine eligibility.

[redacted] will send the requested data in an excel document to the following email address: jharden@[redacted].k12.ga.us

APPENDIX C: IRB APPROVAL LETTER

LIBERTY
UNIVERSITY

The Graduate School at Liberty University

October 21, 2011

Jerry Clark Harden
IRB Exemption 1186.102111: A Comparison of a Gifted Education Program among Eighth Grade Gifted Students at a Georgia Junior High School

Dear Mr. Harden,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and that no further IRB oversight is required unless your data collection extends past the one year approval granted by this memo, in which case you would submit the annual review form attached to your approval email.

Your study falls under exemption category 46.101 (b)(4), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:

> (4) Research involving the **collection or study of existing data**, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or **if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.**

Please note that this exemption only applies to your current research application, and that any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption, or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

Fernando Garzon, Psy.D.
IRB Chair, Associate Professor
Center for Counseling & Family Studies

(434) 592-5054

LIBERTY
UNIVERSITY
40 Years of Training Champions for Christ: 1971-2011

APPENDIX D: RESULTS OF THE KOLMOGROV-SMIRNOV TEST

ITBS Portion	Variable	Group	Kolmogorov-Smirnov Statistic	Sig.
Reading	Gender	Female, Multiple Criteria	0.091	.200
		Female, Psychometric	0.104	.071
		Male, Multiple Criteria	0.114	.200
		Male, Psychometric	0.092	.200
Math		Female, Multiple Criteria	0.112	.200
		Female, Psychometric	0.096	.200
		Male, Multiple Criteria	0.148	.163
		Male, Psychometric	0.094	.200
Reading	Race	African American, Multiple Criteria	0.180	.200
		African American, Psychometric	0.164	.200
		Caucasian, Multiple Criteria	0.074	.200
		Caucasian, Psychometric	0.060	.200
		Hispanic, Multiple Criteria	0.235	.200
		Hispanic, Psychometric	0.215	.200
Math		African American, Multiple Criteria	0.160	.200
		African American, Psychometric	0.205	.141
		Caucasian, Multiple Criteria	0.080	.200
		Caucasian, Psychometric	0.071	.200
		Hispanic, Multiple Criteria	0.147	.200
		Hispanic, Psychometric	0.127	.200
Reading	SES	High SES, Multiple Criteria	0.065	.200
		High SES, Psychometric	0.057	.200
		Low SES, Multiple Criteria	0.147	.200
		Low SES, Psychometric	0.109	.200
Math		High SES, Multiple Criteria	0.096	.200
		High SES, Psychometric	0.078	.200
		Low SES, Multiple Criteria	0.091	.200
		Low SES, Psychometric	0.152	.024