Multiple Intelligences and the Gifted Identification of African-American Students

Oscar Scott Jr.
Old Dominion University

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A N D  T H E

by

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ABSTRACT

MULTIPLE INTELLIGENCES
AND THE
GIFTED IDENTIFICATION OF AFRICAN-AMERICAN STUDENTS

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Chairperson: Dr. Maurice R. Berube


Traditionally, African-American students have not performed well on standardized tests and, as a consequence, have not been selected to participate in gifted and talented programs proportionate to their representation in the student population. This exacerbates and perpetuates the underrepresentation of African-American students in gifted and talented programs.

Pluralistic assessment (PA), in which criteria in addition to
standardized intelligence and achievement tests (portfolios, inventories, product evaluation, norming for subpopulations, case studies, etc.) are used to identify gifted students, has been advocated as a possible supplement to, or alternative to standardized tests. An assessment instrument based on Howard Gardner's multiple intelligences (MI) theory, the Teele Inventory of Multiple Intelligences (TIMI) may assist in meeting PA goals and may be a possible alternative to traditional intelligence and achievement tests for identifying gifted African-American students.

Generally, this study addressed the use of standardized tests to identify African-American urban fourth grade students who may possess the potential to participate in gifted and talented programs. Specifically, it sought to determine, through cross-validation of a multiple intelligences instrument, whether the subscales of a MI instrument could identify a statistically significant greater number of potentially gifted African-American urban fourth grade students than the subscales of a general intelligence (g) instrument. The TIMI was the MI instrument used in this study. And, the Otis-Lennon School Ability Test (OLSAT) was the (g) factor instrument used in this study.

This study found that there was no statistically significant difference in the ability of the TIMI or OLSAT to identify gifted students in general. However, the TIMI consistently identified more gifted students than the OLSAT. Also, there was a statistically significant difference in the ability of the TIMI's TIMI 3 subscale (intrapersonal intelligence) and the OLSAT to identify gifted African-American students and to identify gifted students as a function of race. Because of the small subject size, caution should be utilized in interpreting these results. There was a statistically significant difference in the ability of the TIMI's TIMI 4 (spatial intelligence) and TIMI 6 (bodily-kinesthetic intelligence) subscales and the OLSAT to identify gifted students as a function of sex.
ACKNOWLEDGEMENTS

I would not be at this stage of my Ph.D. pursuits if it were not for my wife Gloria. It had been nineteen years since I had been a student in anyone's classroom. And, I know that I never would have returned to school without Gloria's encouragement. So, I would like to take this moment to say, "THANK YOU GLORIA."

Many others have been pivotal points of influence for me while I persevered toward this critical stage of "near departure" from the Darden College of Education. I will attempt to name them. However, please forgive me if I inadvertently omit anyone.

Certainly Dr. Maurice R. Berube is included as a "pivotal point". He has been a mentor and friend for over five years. I certainly understand the sacrifices that he has made in support of me and my beliefs. Thank you Dr. Berube!

Another friend, mentor, and "pivotal point" in my life is Dr. Ulysses Van Spiva. He is a man who has demonstrated--to me--through his deeds what the word "friend" truly means. Dr. Spiva is the same man whether he is in the company of the exalted or the homeless street urchin. Thank you Dr. Spiva!

Dr. Berhanu Mengistu is yet another friend, mentor, and "pivotal point" in my life. A conversation that I had with Dr. Mengistu my first semester at Old Dominion University is a major reason why I am at this point in my educational career. His quiet strength, logic, and reasoning remain a source of solace to me. Thank you Dr. Mengistu!
To Dr. Eleanor Handerhan and Dr. George Bradley, I say "thank you" for the encouragement and dedication shown me through your close scrutiny of my dissertation efforts. You helped me to grow and stretch as a researcher and scholar. Again, thank you!

And, I would certainly be remiss if I did not thank the members of the Concerned African-American Students (CAAS) for their "courage" and support through often difficult times. The test of a true friend is a test in which the friend can lose a great deal. My friends and comrades in CAAS, I again say thank you!

To my children, Shelley, Scotty, Adrienne, DuBois, Jaclyn, and Joy, I say never give up. For, even in the face of seemingly insurmountable odds, truth and justice "sometimes" triumphants. Your dad did!
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CHAPTER I
INTRODUCTION

Gifted children of color are too frequently underrepresented among those labeled "America's best and brightest". A Better Chance, Inc., a national academic talent search agency, has found more than 8,000 minority children and provided them with access to an excellent college preparatory education. Detecting, estimating, and evaluating "intelligence" is still typically based on test data and IQ scores. ABC has learned to use additional yardsticks: a strong sense of self, an independent mind, a questioning attitude, a willingness to take risks and to persevere. If educators are sincerely interested in identifying gifted children from all parts of American society, multiple assessment procedures, including objective and subjective data from a variety of sources, must be used. Within every classroom in this country, including those enrolling minorities and the disadvantaged, the proportion of gifted students is the same as that found in the nation's most affluent communities. It is our challenge as educators to find these gifted children. And we must find them quickly, before inertia and indifference immobilize their minds. (Griffin, 1992, Abstract, p. 126)

The above quotation addresses succinctly many of the issues that currently dominate the study of giftedness within the educational community: The paucity of minority and disadvantaged students participating in programs for the gifted and talented (Smith, LeRose, & Clasen, 1991); the need for an advocacy to aid in ameliorating this gifted and talented minority/disadvantaged dearth (Garrison, 1993); those selected to participate in gifted and talented programs (Ross, the dominance of standardized tests in measuring the intelligence of

The Publication Manual of the American Psychological Association (4th ed.) was the "Journal Model" used to determine format for this dissertation.
1993); the need for multidimensional assessment to identify students for participation in gifted and talented programs (Hadaway & Marek-Schroer, 1992); and the fact that giftedness is not limited to a particular socio-economic or racial/ethnic group (Griffin, 1992). Generally, this research addressed the use of standardized tests to identify African-American urban fourth grade students who may possess the potential to participate in gifted and talented programs and has more than tangential impact on the remaining gifted and talented issues listed above. Specifically, it sought to determine, through cross-validation of a multiple intelligences (MI) instrument, whether the subscales of a MI instrument could identify a statistically significant greater number of potentially gifted African-American urban fourth grade students than the subscales of a general intelligence (g) instrument.

**General Statement of the Problem**

There have been three national reports addressing giftedness: *Education of the Gifted and Talented: Report to the Congress of the United States by the U.S. Commissioner of Education* (1972) AKA the Marland Report; *The National Report on Identification: Assessment and Recommendation for Comprehensive Identification of Gifted and Talented Youth* (1982) AKA the National Report on Identification; and *National Excellence: A Case for Developing America's Talent* (1993) AKA National Excellence. The 1972 and 1993 reports were commissioned by the Commissioner of Education (Sidney P. Marland) and the Secretary of Education (Richard W. Riley) respectively--the 1982 report was published by the Educational Improvement Center-South after it won a contract let by the Department of Education. During the period of time
covered by these three reports, the term gifted has evolved into the phrase "children and youth with outstanding talent" (CYOT) (Ross, 1993, p. 26). The definition for CYOT used in this study is taken from the National Excellence report and is stated below:

Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment.

These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services not ordinarily provided by the schools.

Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (p. 26)

Researchers have documented that minority students in general, and African-American students specifically, are underrepresented in CYOT programs (Baldwin, 1985; 1987a, 1987b; Gallagher & Gallagher, 1994; Passow, 1989; Richert, 1985, 1987; Roberts, 1989; Rhodes, 1992; Ross, 1993; Smith, LeRose, & Clasen, 1991; Van Tassel-Baska, Patton & Prillaman, 1989, 1991). The latest national CYOT report, National Excellence, (1993) stated, "Several categories of talented children are particularly neglected in programs for top students. These include culturally different children (including minority and economically disadvantaged students..." (p. 16). This report also stated that, "...73 percent of school districts indicated that they have adopted the Marland definition (which advocated pluralistic assessment for selecting students to participate in CYOT programs); few said that they use it to identify and serve any area of giftedness other than high general intelligence as measured on IQ and achievement tests"
(p. 16). Selection, for participation in gifted programs, is weighted in favor of "qualifying" performance on standardized intelligence tests which measure general intelligence (g) as manifested in logical/mathematical and verbal domains (Ford & Harris, 1990; Griffin, 1992; Hadaway & Marek-Schroer, 1992; Harris & Ford, 1991; Hiebert & Calfee, 1989; Madaus, 1994; Mitchell, 1988; Ryan, 1983; Woods & Achey, 1990; Yancey, 1983). African-American students have not performed well on these tests and, as a consequence, have not been selected to participate in CYOT programs proportionate to their representation in the general population (Bailey & Harbin, 1980; Hadaway & Marek-Schroer, 1992; Hoffman, 1962; Johnson, 1987-88; Kamin, 1974; Madaus, 1994; Masten, 1985; O'Connor, 1989; Samuda, 1975).

Pluralistic assessment (PA), in which criteria in addition to standardized intelligence tests (portfolios, inventories, product evaluation, norming for subpopulations, case studies, etc.) are used to identify CYOT students, has been advocated as a possible supplement to, or alternative to standardized tests (Clasen, 1994; Clasen, Middleton & Connell (1994); Callahan, Lundberç & Hunsaker, 1993; Coleman, 1994; Hadaway & Marek-Schroer, 1992; Hansen & Linden, 1990; Harris & Ford, 1991; House & Lapan, 1994; MacRae & Lupart, 1991; Swanson, 1995; Tyler-Wood & Carri, 1991; Woods & Achey, 1990; Wright & Borland, 1993). Supporters of this approach, argue that it may ameliorate the dearth of African-American students identified as gifted. And, this may lead to an increase in African-American students participating in CYOT programs.

An assessment instrument based on Howard Gardner's multiple intelligences (MI) theory (Gardner, 1983, 1993, 1995), the Teele...
Inventory of Multiple Intelligences (TIMI, 1992; revised, 1993), may assist in meeting PA goals and may be a possible alternative to traditional intelligence tests for identifying gifted African-American students. The TIMI is the first "forced choice" MI instrument of its kind (S. Teele, personal communication, June 5, 1996). As such, it is cutting edge in its impact and continues to undergo validity verification. Because of this ongoing validity concern, cross-validation with other instruments designed to measure specific multiple intelligences was utilized to verify that the TIMI is performing as designed. Specifically, the TIMI is "...designed to examine the dominant intelligences of students in kindergarten through the twelfth grade, and acts as an indicator as to whether or not students in different grade levels possess different intelligences" (Teele, 1995a, p. 1).

Although research supporting the existence of MI was done by others (Guilford, 1950; Thurstone, 1938) before Gardner, he coined the phrase and is recognized as the driving force behind the current emergence of MI theory as a viable alternate to standardized tests that purport to measure general intelligence. Gardner introduced MI in his 1983 book, Frames of Mind: The Theory of Multiple Intelligences and refined the concept in his 1993 book Multiple Intelligences: The Theory in Practice.

In his 1983 book, Gardner stated succinctly his reasoning for using the term intelligence to describe the seven cognitive domains that his theory addresses: "I seek to replace the current, largely discredited notion of intelligence as a single inherited trait (or set of traits) which can be reliably assessed through an hour-long
interview or a paper and pencil test" (p. 284). Gardner defined an intelligence as "...the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community" (1993, p. 15). Thus far, he has identified seven intelligences: musical; bodily-kinesthetic; logical-mathematical; linguistic; spatial; interpersonal; and intrapersonal.

The key concept that Gardner advocates is not that there are seven, and only seven intelligences, but that intelligence is a plural and not a singular concept. Additionally, Gardner stated that intelligences cannot be separated from the cultural milieu in which they operate or comprehended outside of their cultural context. And, "...intelligence exists in significant measure outside of the physical body of the individual" (1993, p. 223). Gardner described this condition as the "distributive" nature of intelligences. MI theory is a direct challenge to general intelligence theory (g) which states that intelligence is singular in nature, resides within the individual, predetermined by biology, and not influenced by the environment. This study utilized the theoretical concepts of Gardner's MI theory, as manifested in the TIMI, to determine if the subscales of a cross-validated MI instrument could identify a statistically significant greater number of potentially gifted and talented African-American urban fourth grade students for participation in CYOT programs than the subscales of a traditional standardized general intelligence instrument--the Otis-Lennon School Ability Test (OLSAT).

Significance of the Study

All three national reports on giftedness have documented the underrepresentiveness of minorities in general, and African-Americans
especially, in CYOT programs (U.S. Commissioner of Education, 1972; Richert, Alvino & McDonnel, 1982; Ross, 1993). E. Susanne Richert (1985), coauthor of The National Report on Identification, commenting on the low percentage of minorities in CYOT programs stated, "In national figures published by the U.S. Department of Education's office of Civil Rights, minority groups such as Blacks, Hispanics and Native Americans are underrepresented by 30 to 70%" (p. 69). Such underrepresentiveness may be of competitive consequence to America in the world economy. If America is to remain a world class economic leader, she must utilize the gifts and talents of all of her citizens. Ross (1993) stated:

To compete on an equal footing with the rest of the world, we must start our children down the path to excellence when they are very young. Learning is cumulative; all students, including the gifted, develop to their full potential only when their strengths are identified and supported throughout their lives. This is particularly true with economically disadvantaged children because they often face so many impediments to success. We must acknowledge that all schools, whether in affluent or low-income communities, have children with outstanding talent. Our job is to find these children and to develop their full potential. (p. 14)


The National Educational Longitudinal Study of eight-grade
programs for gifted students by the U.S. Department of Education (1991) reveals the extent of the problem rather dramatically. Data from the study indicate that students whose families' socioeconomic status places them in the top quartile of the population are about five times more likely to be in programs for gifted students than are students from families in the bottom quartile. (p. 164)

In turn, this lowers the number of gifted and talented students in the CYOT pool—leading to a possible undermining of the future world economic strength of America due to a lack of qualified adults who possess the skills necessary to compete in a global economy. Garrison (1993), commenting on the future expectations of minority professionals in the workplace, stated:

> The future professional roles of men and women from ethnically diverse populations is not optimistic, however. Even though their numbers in the workforce will increase, Johnston and Packer (Workforce 2000, 1987) do not expect a promising employment future for ethnically diverse populations in general, and for African-American and Native American populations in particular. (p. 161)

Baldwin (1987b) stated that, "According to census information and predictions by demographers concerning population growth, by the year 2000, one out of three Americans will be nonwhite and at least 53 U.S. cities will have become predominately nonwhite (Education Week, 1986)" (p. 272). With this kind of demographic change predicted for America, it becomes not a question of whether CYOT programs should have more African-American students in them, but rather how can more African-Americans be identified to participate in CYOT programs since African-Americans comprise approximately 12.6% of America's population currently and will contribute an increasing percentage in the future (Statistical Abstract of the United States, 1994, Table 12, p.13)

This study has provided data that may be of benefit in
increasing the number of African-American students in CYOT programs. And, such an increase is necessary if America is to have an adequate pool of gifted and talented adults that will enable it to remain competitive in future international markets because the America of the 21st century will be increasingly Black, Brown, and Yellow (Statistical Abstract of the United States, 1994, Table 12, p. 13; Western Interstate Commission for Higher Education as cited in Miller, 1990).

Although there has been an intellectual tug-of-war between the proponents of a general faculty of intelligence (g) and those who advocate a multiple intelligences perspective, historically, the proponents of a "g" factor have traditionally carried the debate (Eysenck, 1986; Galton, 1869; Jensen, 1986; Spearman, 1923; Terman, 1916, 1937). However, the writings of MI researchers have increasingly dominated the literature since the early 1980s (Gardner, 1983, 1993; Ceci, 1990; Feldman, 1980; Sternberg, 1985). This study suggests that the MI concept may have practical value in expanding the boundaries of intelligence beyond the exclusiveness and limited intellectual potential espoused by "g" factor proponents to the more inclusive and less limiting intellectual capacity advocated by MI adherents. And, this study has assisted in expanding the current literature on gifted and talented African-American students.

The Research Study

Research Questions

Four research questions were addressed in this study. They are as follows:

(1) Will there be a statistically significant difference when using the subscales of either a multiple
Research Objectives

This study sought to determine if the subscales of a cross-validated multiple intelligences instrument—the Teele Inventory of Multiple Intelligences (TIMI) could identify a statistically significant greater number of potentially gifted and talented African-American urban fourth grade students for participation in CYOT programs than the subscales of a traditional standardized general intelligence instrument—the Otis-Lennon School Ability Test (OLSAT). The combined fourth grade classes at School B (3) and School C (3 regular; fourth graders from 2 mixed [third and fourth graders] classes) formed the sample that was used in this study. All sample participants were administered both the TIMI and CLSAT. Also, all students were administered a series of tests (Intermediate Measures of Music Audiation; Assessment of Interpersonal Relations; Otis-Lennon School Ability Test) to cross-validate specific multiple intelligences (musical intelligence; interpersonal intelligence; logical-mathematical and linguistic intelligences) respectively. This
study was carried out at two elementary schools--School B and School C. Both are located in City Z; a city on the Mid-Atlantic coast of the United States.

Fourth grade students were selected because their ages (8-10) correspond to Piaget's concrete operations stage (Piaget, 1969) and the age (middle childhood) at which information-processing theorists believe that metacognitive abilities "undergo considerable development" (Flavell, 1985, p. 116). As a result of these developments, in which the child is on the threshold of adult cognitive activity, the researcher believed this was the ideal time to measure intelligence because the child is at his/her height of cognitive development and still is considered a child. Thereafter, the child enters into the stage of cognitive development that merges with that of the adult. Thus, middle childhood is the last time that "true" child-like thinking occurs.

Traditional standardized general intelligence instruments have not identified African-Americans in proportion to their representation in the setting in which they are examined for participation in CYOT programs (Masten, 1985; Mitchell, 1988; Woods & Achey, 1990). Research suggests that many of these traditional tests are biased against African-Americans and other minorities (Johnson, 1987-88; Sisk, 1988; Richert, 1987). Still, other researchers have found that standardized general intelligence tests are the primary or sole criterion used to determine eligibility to participate in CYOT programs (Ford & Harris, 1990; McKenzie, 1986; Ross, 1993; Sternberg, 1982). And, historically there has been a scarcity of research documenting giftedness in African-American students (Harris & Ford,
This study offers data that may assist in increasing the number of African-American urban fourth graders participating in CYOT programs and may have implications for non-minorities, as well as, other grade levels. Thus, this study may aid in decreasing the current gap between the number of African-Americans participating in CYOT programs and their representation in the population from which they were selected; help to lessen the bias that current standardized general intelligence instruments exhibit in identifying potential African-American CYOT students; help to expand the criteria used to select African-American students for participation in CYOT programs by offering an additional, and substantially different, selection measure (the TIMI) than standardized general intelligence instruments; and contribute to the literature documenting giftedness in African-American students.

Summary

There are a myriad of issues that currently permeate the giftedness literature. This study has addressed one of them—the need to identify a greater number of gifted African-American students for participation in CYOT programs by means other than standardized general intelligence tests. An MI instrument, the TIMI, was employed for this purpose.

Three national reports (the Marland Report, 1972; the National Report on Identification, 1982; National Excellence, 1993) and numerous researchers have documented that African-American students are underrepresented in CYOT programs (Baldwin, 1987a, 1987b; Maker, 1983; Maker & Schiever, 1989; Scott, Perou, Urbano, Hogan & Gold, 1992; Serwatka, Deering & Stoddard, 1989; Smith, LeRose & Clasen,
Additionally, these sources have stated that African-American CYOT underrepresentation may be the consequence of an over reliance on traditional standardized general intelligence tests which purport to measure linguistic and logical-mathematical constructs. Pluralistic assessment has been advocated as a supplement/alternative to such general intelligence measures as a means to increase African-American student participation in CYOT programs. An MI instrument, the TIMI, is consistent with PA objectives.

The TIMI is undergirded by concepts developed by researchers dating back to the 1930s and revived and refined by scientists in the 1980s--foremost among them is Harvard researcher Howard Gardner. Gardner coined the term multiple intelligences and has identified seven: Interpersonal intelligence; intrapersonal intelligence; spatial intelligence; musical intelligence; bodily-kinesthetic intelligence; linguistic intelligence; and logical-mathematical intelligence. Gardner's findings support the conclusion that intelligences are plural, culturally defined, and exist to a significant degree outside of the individual. These findings contrast with those of general intelligence theorist who state that intelligence is singular, strictly biologically based in the individual, and is not influenced by the environment. This study used Gardner's MI theory as its theoretical base through the use of the TIMI to determine if the subscales of a cross-validated MI instrument could identify a statistically significant greater number of potentially gifted and talented African-American urban fourth grade students for participation in CYOT programs than the subscales of a traditional standardized general intelligence instrument--the Otis-Lennon School Ability Test (OLSAT).
There are four areas in which this study has general significance. One, it may assist in increasing the number of African-American students participating in CYOT programs. Two, it may assist in expanding the future pool of talented entrepreneurs that can aid in keeping America competitive in the world economic market. Third, it may assist in expanding the boundaries of intelligence by not limiting intelligence to the linguistic and logical-mathematical domains. And fourth, it has assisted in expanding the literature addressing giftedness in African-American students.

Specifically, this study sought to determine:

- if a MI instrument can assist in increasing the number of African-American students participating in CYOT programs.
- if the gap between African-American CYOT students and their representation in their selection population can be decreased.
- if the under identifying of potential African-American CYOT students, by general intelligence instruments, can be lessened.
- if the criteria, used to select CYOT students, can be expanded through the use of the TIMI.
CHAPTER II
REVIEW OF THE LITERATURE

This review is divided into eight sections. Section one provides a history of the development of a gifted and talented philosophy at the federal level. Section two provides a chronology of the changing definition of gifted and talented at the federal level and in academia. Section three discusses the giftedness identification process. Section four analyzes the impact of the standardized intelligence test on giftedness. Sections five, six, and seven review the primary three schools of thought pertaining to "a definition of intelligence"—the central concept underlying selection of students for participation in gifted and talented programs. Each of these three sections begins with the researcher(s) that has had an impact of major proportion in its formulation. Section eight provides insight into the gap that exists between the theory that supports standardized intelligence tests and their actual use. The sections are as listed:

1. Gifted and Talented Development at the Federal Level
2. Evolvement of the Gifted and Talented Definition
3. Giftedness Identification Procedures
4. The Impact of Standardized Mental Tests
5. The Impact of General Intelligence (g) Theory and The Single Test Score
6. The Impact of Multiple Intelligences Theory and an Array of Test Scores
7. The Impact of Macro Cultural/Social Theory
8. The Gap Between Theory and Practice
Gifted and Talented Development at the Federal Level

On October 4, 1957, during Eisenhower's second term, the Soviet Union was the first to launch a craft--Sputnik--into space. Sputnik set off hysteria in the minds of the American public. It was feared that the Russians, the arch cold war enemy, had gained superiority in the race in space and also, perhaps, in national defense. The immediate reaction of many political figures and educators was to blame the schools for America's inferior position in space. (Berube, 1991, p. 39)

This researcher can attest to the hysteria that the Soviet space launch created throughout the minds of American society. I was involved. I was placed in one of the first "gifted" programs established by the city of Portsmouth, Virginia in 1958. This gifted program was established as a direct result of Sputnik. Other such programs were established throughout the U.S., as a result, of the passage of the National Defense Education Act (NDEA) of 1958. NDEA, which sought to improve American students' ability in science, was the federal government's response to Sputnik. It easily passed Congress--66 to 15 in the Senate and 212 to 85 in the House. NDEA was testimony to the fact that America's "self-confidence" had been shaken (Berube, 1991).

A primary vehicle used to regain this self-confidence was through giftedness programs with their emphasis on science and math. NDEA served two valuable purposes: (1) it awakened America to the reality of the need to provide the highest level of instruction to those students able to internalize it; and (2) it demonstrated the need to identify "those students able to internalize it"--the gifted. Thus, the National Defense Education Act of 1958 was the first effort by the federal government in the area of gifted education. However, this was not directly acknowledged at the time. A distinct federal role in
gifted education did not occur, although there was an occasional foray of federal giftedness efforts, until the passage of the Jacob K. Javits Gifted and Talented Students Act of 1988 (Ross, 1993).

The reticence of the federal government, to actively seek a role in gifted education, can be traced to the Constitution itself. Berube (1991) stated, "Conventional wisdom holds that education holds a low presidential priority. This argument is based on a historical consensus regarding the U.S. Constitution. Our founding fathers' failure to mention education in the Constitution came to mean that, by default education had become a state responsibility" (p. 3). And, as a result of this Constitutional constraint, any direct federal efforts in developing educational programs have been painstaking arduous tasks. Thus, after the passage of NDEA, no other federal efforts--impacting gifted education--occurred until the publication of the Marland Report of 1972.

Giftedness was addressed under Title V--Guidance, Counseling, and Testing; Identification and Encouragement of Able Students--of NDEA (1958). Section 503 of Title V stipulated that each State plan authorized must include:

(1) a program for testing students in the public secondary schools, and if authorized by law in other secondary schools, of such State to identify students with outstanding aptitudes and ability, and the means of testing which will be utilized in carrying out such program: And
(2) a program of guidance and counseling in the public secondary schools of such State (A) to advise students of courses of study best suited to their ability, aptitudes, and skills, and (B) to encourage students with outstanding aptitudes and ability to complete their secondary school education, take the necessary courses for admission to institutions of higher education, and enter such institutions. (United States Statues at Large, 1958, Volume 72, p. 1592)
With the enactment of the above words into Public Law 85-864 on September 2, 1958, the federal government entered into gifted and talented education. Title V authorized "...$15,000,000 for the fiscal year ending June 30, 1959, and for each of the three succeeding fiscal years..." (p. 1592).

At this juncture, it is necessary to acknowledge that much of the remaining information in this section relies heavily on a 1991 article published by Joseph Harrington, Christopher Harrington, and Edward Karns in the Journal for the Education of the Gifted entitled "The Marland Report: Twenty Years Later".

Although the Marland Report was the first published federal effort addressing giftedness since NDEA, it was not the first federal effort exercised in this area. In 1968, President Lyndon B. Johnson created a task force to investigate education and giftedness. It was chaired by Champion Ward, Vice President of the Ford Foundation, and was named the Task Force on the Education of Gifted Persons. Due to the preoccupation of the Administration with the Vietnam War, this report was never released. Nevertheless, federal level giftedness interest did not evaporate.

The following year, 1969, Senator Jacob K. Javits of New York and Representative John Erlenborn of Illinois introduced "...parallel bills entitled 'the Gifted and Talented Children's Educational Assistance Act' to the 91st Congress" (p. 31). This bill sought to accomplish two things: (1) to amend two educational acts—the Elementary and Secondary Education Act (ESEA) through Titles II, III, and V and the Educational Professional Development Act (EPDA) by including the phrase "gifted and talented". This would allow the use
of funds from these Acts to be used to support gifted and talented activities. And, (2) it "...directed the Commissioner of Education to conduct a study and present its findings to Congress on 'how existing education programs can be best used to meet the needs of the gifted and talented and what new programs might be necessary' (Cong. Rec., 1969, p. 1944)" (p. 32). These bills were passed and became part of the 1969 amendments to the ESEA. The mandated report would be begun by Dr. James Allen, Commissioner of Education,--and completed by his successor--Dr. Sidney P. Marland. This report would be known as the Marland Report.

President Richard M. Nixon was generally perceived as having little interest in education. To rehabilitate the President's educational image, the White House sponsored two conferences. The Conference on Children was held in December, 1970 and the Conference on Youth took place in April, 1971. Both conferences approved recommendations in support of gifted education. Early identification of the gifted and talented, and program design that stimulated and developed, were advocated respectively. These conferences had little influence on President Nixon.

Commissioner of Education, Dr. Sidney P. Marland, presented the report mandated in ESEA Amendments of 1969 to Congress in 1971 and it was published for public consumption in 1972. The official title of this report was Education of the Gifted and Talented: Report to the Congress of the United States by the U.S. Commissioner of Education, the Marland Report. It documented that the federal government's role in providing services and programs for the gifted and talented was "'...all but nonexistent' (Ed. of Gifted and Talented, 1972, p. 4)" (p. 33).
The Marland Report also stated that the Office of Education's role in gifted and talented efforts was also virtually nonexistent even though "discretionary funds" could be utilized in this area (Harrington, Harrington & Karns, 1991). To rectify this state of affairs, Commissioner Marland created the Gifted and Talented Program Group and assigned the Deputy Commissioner for School Systems to head it. Additionally, Commissioner Marland:

ordered the National Institute for Education (NIE) to include data on gifted and talented in its Education Resources and Information Center, generally known as ERIC. Further, in August, 1972, Marland used monies from the EPDA to fund a National/State Leadership Training Institute (N/SLTI) which began operation under the aegis of the Ventura County, California, Superintendent of Schools. This organization focused its attention on implementing the vision of the Marland Report at the state level. The EPDA allocated $290,000 for programs to educate the gifted and talented in FY 1972 (Evans, 1984). (Harrington, Harrington & Karns, p. 34)

The Nixon White House did not embrace the Marland Report. However, Senator Jacob K. Javits (a New York Republican liberal) did. Beginning in 1972 and continuing until 1978 Senator Javits sponsored bills to champion gifted and talented education. Although assisted in these efforts by others, Senator Javits was the primary force advocating these bills through Congress. Listed below are his efforts:

- March 21, 1972 introduced The Gifted and Talented Children's Education Assistance Act. The 92nd Congress adjourned without any action on this bill.
- Reintroduced above bill in the 93rd Congress (Representative Dominick Daniels introduced a similar bill in the House).
- Both bills were incorporated in the 1974 education legislation that extended the 1965 ESEA legislation.
- Under the auspices of "Special Projects", this legislation authorized the creation of the Office of Gifted and Talented operating out of the Office of Education. It also authorized independent funding, for the first time, for gifted and talented education.
- Sponsored the Gifted and Talented Education Act of 1978 which:
  - removed gifted and talented programs from under the
    auspices of "Special Projects" and placed it in a
    separate category under Title IX of the 1965
    reauthorization of ESEA.
  - Continued federal funds for "...model projects, staff
    training, funding for a national information
    clearinghouse, and for research and evaluation" (p. 37).
  - Removed high performance in psychomotor ability as a
gifted area.

None of the above legislation authorized the level of funding that
their sponsors advocated. This lack of funding gifted and talented
programs, at appropriated levels, continued throughout President Jimmy
Carter's administration.

President Carter kept his campaign promise of elevating the
Office of Education to Cabinet status. His Secretary of Education,
Shirley Hufstedler, and he wanted "...to increase funding for gifted
and talented by 5% annually, but the Office of Management and Budget
only authorized a 2% increase (S. Hufstedler, personal communication,
11/16/90)" (p. 37).

Ronald Reagan entered the White House with the goal of
eliminating the new Department of Education. However, he settled for
"...a budget reconciliation bill, PL 97-35, which consolidated the
categorical programs" (p. 38). This 1981 bill eliminated Title IX of
the ESEA and separated gifted and talented funding. In 1982 President
Reagan disbanded the Office of Gifted and Talented in the Department
of Education. As a result of these actions the Administration sought:

To counter charges that the new Administration was unaware of
what it was doing in the field of education, the Secretary of
Education established a National Commission on Excellence in
Education and on April 26, 1983, Terrel Bell submitted the
Commission's report to Congress. Entitled 'A Nation at Risk: The
Imperative for Educational Reform,' the report announced that
'our nation is at risk.' A leading indicator of this risk was
that 'over half the population of gifted students do not match their tested ability with comparable achievement in school.' The report recommended that 'most gifted students...may need a curriculum enriched and accelerated beyond even the needs of other students of high ability' (National Commission, 1983, pp. 8, 24). (p. 38)

Although the Administration had commissioned "A Nation at Risk", it did not actively pursue legislation to correct the charge of gifted students not performing at their ability level. Rather, the cause of gifted and talented education was vicariously championed by President Reagan by way of the "Excellence Reform Movement" Berube (1991) stated:

With the publication of the Department of Education's jeremiad, A Nation at Risk: The Imperative for Education Reform, the excellence reform movement was officially launched. The aim of the excellence reform movement was to raise educational standards to groom the best and the brightest students so as to make America once again economically competitive. Education reform became a national political issue, and Ronald Reagan recognized a good idea when he saw it. Through the use of a bully pulpit, he preached the virtues of excellence reform (p 87)

However, direct efforts for the cause of gifted and talented education was not abandoned. In 1987, Senator William Bradley (Democrat) of New Jersey and Representative Mario Biaggi of New York introduced the Jacob K. Javits Gifted and Talented Children and Youth Education Act. The Javits Bill, as it was called, was incorporated in the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988, Public Law 100-297, under Title IV, Part B. The legislation authorized $20 million for the 1988 fiscal year, only $7.9 million was actually appropriated. "The money would be used to reestablish the Office of Gifted and Talented in the Department of Education, reestablish a national research center, train
teachers and fund programs for gifted and talented children (MA/AIP, 1988)" (p. 40).

Dr. Pat "O'Connell Ross, the former Director of the Javits Gifted and Talented Education Program in the Education Department, stated that the Javits Bill "...calls for the United States Department of Education, through the Javits Program, to carry out three major activities: conduct a program of grants and contracts for demonstration projects; monitor a national research center; and serve as a 'national focal point' in gifted education" (Ross, 1994, p. 64).

With the passage of the Javits Bill, Congress "made good" on the recommendations of the Marland Report which sought the creation of the "...independent Office of Gifted and Talented in the Department of Education, the national research center, and programs for teachers and students..." (p. 40). $9.607 million was appropriated for fiscal year 1994 (Ross, 1994) and $2.714 million (ten old demonstration projects and one new project [$288,654]) for fiscal year 1995 (J. Williams, personal communication, February 22, 1996).

President Reagan did not seek the title of "Education President", but had it thrust upon him through his response "...to the major outside societal force of his era: foreign economic competition" (Berube, 1991, p. 87). However, President George Bush actively sought the title of "Education President" while using the bully pulpit "...to focus on education as a national issue while providing minimal federal funds" (Berube, 1991, p. 138). His major advocacy of gifted and talented education was through his support for expanding "magnet schools".

Evolvement of the Gifted and Talented Definition

Federal Level

No federal definition of giftedness was proposed until the 1972 Marland Report (Harrington, Harrington & Karns, 1991; Passow & Rudnitski, 1994; Ross, 1993). However, some scholars believe that "there are several advantages to using the federal definition. First of all, it has the legitimacy of national law behind it. Secondly, it attempts to be comprehensive in order to be applicable in many settings" (Richert, 1985, p. 68).

The first federal effort into the "gifted and talented" definition area was weak at best. In fact, it does not qualify as a definition proper, but rather as a rudimental precursor of the seminal gifted and talented definition that was yet to come. This occurred as part of the language in the National Defense Education Act of 1958. Under Title V, Section 503 (a) (1), the following language is found: "...to identify students with outstanding aptitudes and ability..." (United States Statutes at Large, 1958, Volume 72, p. 1592). No attempt was made at defining "outstanding aptitudes and ability".

The first federal definition of gifted and talented proper was incorporated in the language of the Marland Report. It appears below:

Gifted and talented children are those identified by professionally qualified persons, who by virtue of outstanding abilities are capable of high performance. These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contribution to self and society.
Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:

1. general intellectual ability,
2. specific academic aptitude,
3. creative or productive thinking,
4. leadership ability,
5. visual and performing arts,
6. psychomotor ability.

It can be assumed that utilization of these criteria for identification of the gifted and talented will encompass a minimum of 3 to 5 percent of the school population. (Public Law 91-230, section 806 as cited in Ross, 1993, p. 16)

The second federal definition of gifted and talented was included in the reauthorization of the Elementary and Secondary Education Act of 1965 which occurred with the passage of Public Law 95-561 in 1978. Title IX, Part A of this Act was called the "Gifted and Talented Children's Education Act of 1978". It included a modified Marland definition that removed "psychomotor ability" as an area of consideration under the gifted and talented rubric and used the term "youth" for the first time. This definition appears below:

The term 'gifted and talented children' means children and, whenever applicable, youth, who are identified at the preschool, elementary, or secondary level as possessing demonstrated or potential abilities that give evidence of high performance capability in areas such as intellectual, creative, specific academic, or leadership ability or in the performing and visual arts, and who by reason thereof, require services or activities not ordinarily provided by the school. (United States Statutes at Large, 1978, Vol. 92, Part 2, p. 2292)

The third federal definition of gifted and talented appeared as part of the language of the Jacob K. Javits Gifted and Talented Students Education Act of 1988. Title IV, Part B of the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988 offers the following definition:
The term 'gifted and talented' means children and youth who give evidence of high performance capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who require services or activities not ordinarily provided by the school in order to fully develop such capabilities. (United States Statutes at Large, 1988, Volume 102, Part 1, pp. 237-238)

The fourth, and current, federal definition of gifted and talented is found in National Excellence and is presented below:

Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment.

These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools.

Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (Ross, 1993, p. 26)

Academia

Early research proponents of an underlying "g" factor of intelligence pursued a definition of giftedness (Galton, 1869; Spearman, 1923, 1927; Terman, 1916, 1925, 1937). They argued that this "g" factor was biologically based, was finite in nature, was manifested at or above a designated level, and was basically the equivalent of "intelligence". No intelligent behavior could exist unless "g" was present. These researchers sought to operationalize giftedness so that the concept could be quantified and measured by way of standardized instruments that purported to measure "intelligence". Such operationalized definitions were as numerous as the researchers who advocated them. In response to "g" factor

**Early "g" Factor Giftedness Definitions**

Although the concept of a "g" factor was not scientific currency at the time that Francis Galton, a first cousin of Charles Darwin, wrote *Hereditary Genius* in 1869, its content is included in this section because Galton's theory of genius was biologically and individually based—two key concepts of g factor proponents. He stated that his purpose in writing was "...to show in this book that a man's natural abilities are derived by inheritance, under exactly the same limitations as are the form and physical features of the whole organic world" (p. 45). The unit of measure implored to obtain this objective was the concept of "genius". The operationalized definition that Galton used for "genius" was one of the first, if not the first, "controlled" attempts to define what is roughly referred to today as giftedness. Referring to what he meant by genius, Galton stated, "There was not the slightest intention on my part to use the word genius in any technical sense, but merely as expressing an ability that was exceptionally high, and at the same time inborn" (p. 26).
What did Galton mean by "exceptionally high"? Before this concept can be fully comprehended, it is necessary to identify the research design Galton employed. He described the research design as follows:

The arguments by which I endeavour to prove that genius is hereditary, consist in showing how large is the number of instances in which men who are more or less illustrious have eminent kinsfolk. It is necessary to have clear ideas on the two following matters before my arguments can be rightly appreciated. The first is the degree of selection implied by the words 'eminent' and 'illustrious.' Does 'eminent' mean the foremost in a hundred, in a thousand, or in what other number of men? The second is the degree to which reputation may be accepted as a test of ability. (p. 47)

Galton believed that "exceptionally high" is tied to the distinction, in meaning, between the concepts of "eminent" and "illustrious". Therefore, it is necessary to define these concepts before genius can be understood. Galton stated, "When I speak of an eminent man, I mean one has achieved a position that is attained by only 250 persons in each million men, or by one person in each 4,000" (p. 53). Referring to what is meant by "illustrious", Galton stated, "...many are as one in a million, and not a few as one of many millions. I use the term 'illustrious' when speaking of these. They are men whom the whole intelligent part of the nation mourns when they die; who have, or deserve to have, a public funeral; and who rank in future ages as historical characters" (p. 53).

Having identified genius as exceptionally high ability as manifested through a person being labeled "eminent" or "illustrious", Galton stated that an individual's "reputation", which is a reflection of a person's eminence or illustriousness is, "a fair test of natural ability" (p. 77). For Galton, this natural ability was equivalent to genius. Thus, Galton sought to prove that genius
(roughly today's concept of giftedness) was hereditary and could be identified through a person's reputation, that is, eminence or illustriousness. In pursuit of this goal, he provided one of the first definitions of "giftedness".

Terman (1925), a researcher at Stanford University, defined "giftedness" in Genetic Studies of Genius: Vol. 1. Mental and Physical Traits of a Thousand Gifted Children. His goal was "...to determine in what respects the typical gifted child differs from the typical child of normal mentality" (Preface, viii). Terman defined giftedness as being manifested in "...subjects of a degree of brightness that would rate them well within the top one per cent of the school population" (p. 19). The instrument used to determine this "one per cent" was an "...abbreviated Stanford-Binet test" (p. 23).

Spearman (1923) stated, "The g proved to be a factor which enters into the measurements of ability of all kinds and which is throughout constant for any individual, although varying greatly for different individuals" (p. 411). Giftedness under such a definition is determined by the amount of g that one has above a level that is designated as being indicative of giftedness as measured on a standardized test.

Early Multi-Dimensional Giftedness Definitions

Thurstone (1924), in The Nature of Intelligence, defined intelligence as, "The intelligence of any particular psychological act is a function of the incomplete stage of the act at which it is the subject of trial-and-error choice. Intelligence, considered as a mental trait, is the capacity to make impulses focal at their early, unfinished stage of formation" (p. 159).
To fully appreciate the above definition, one must first realize that Thurstone believed intelligence to be commensurate to possessing the ability to think in abstraction. The "incomplete stage of the act" referred to in the intelligence definition is this very "abstraction". Thus, since the psychological act or impulse is incomplete and thus not fixed, it possesses an infinite range of possibilities before it is manifested into an outward form of overt behavior. It is at this juncture of the intelligence process that intelligence comes into fruition through the midwife of consciousness. Thus, intelligence is the ability to make a psychological act or impulse conscious while it (the act) is still in its early stages of formation (abstraction) and there remains a wide range of finite manifestations of said act still possible.

The "wide range" of possibilities is operationalized through the individual exercising a conscious trial-and-error process which is finalized in the selection of a particular act that the individual performs. Thus, giftedness for Thurstone was a matter of the degree of abstractness associated with the psychological act or impulse of an individual during consciousness—the more abstract the act or impulse, the more intelligent the individual. Thurstone stated, "The degree of intelligence is measured by the incompleteness of the alternatives which participate in the trial-and-error life of the actor" (1924, p. xv).

Guilford's research attempted to understand the nature of creativity and intelligence. It should be noted that Guilford stated that these concepts are not mutually exclusive. This is important since interrelatedness offers insight into his theoretical
assumptions. Specifically, these assumptions emphasize that creativity
and intelligence are not one-dimensional, but are multi-dimensional.
In fact, Guilford believed that creativity was incorporated within the
intelligence continuum. However, he believed that creativity was not
dependent on being gifted. This is a key issue because it
distinguishes Guilford's theory from g factor theory and firmly places
him in the multiple intelligences camp. The g factor school believes
that giftedness is determined by the amount of g that an individual
possesses. Therefore for this school, those who have an amount of g
that disqualifies them as being gifted would not be
creative--giftedness and creativity are part of one whole
intelligence.

Such thinking is reflected in Guilford's structure-of-intellect
(SI) model. This model postulates that intelligence is comprised of
150 possible combinations of intellectual factors (It is explained in
detail elsewhere in this paper. For now, it is only necessary to know
that this model is multi-dimensional in nature.) Giftedness, defined
within the parameters of the SI model, stresses uniqueness through
combinations of intellectual factors. Thus, giftedness is not
contingent on low or high intellectual capacity, but rather
on one-of-a-kind combinations of "150" intellectual factors.

Current "g" Factor Giftedness Definitions

Three contemporary g factor theorists have dominated the
intelligence debate--Jensen (1969); Herrstein & Murray (1994). All
three have theoretical roots in the Spearman (1923) school of thought
which views intelligence as being biological in origin, finite in
nature and measured by g (now considered to be synonymous with
intelligence).
In a 1969 article in the Harvard Educational Review, Jensen stated succinctly what he believed to be the proper definition of intelligence. He stated, "The term 'intelligence' should be reserved for the rather specific meaning I have assigned to it, namely, the general factor common to standard tests of intelligence. Any one verbal definition of this factor is really inadequate, but if we must define it in so many words, it is probably best thought of as a capacity for abstract reasoning and problem solving" (p. 19).

Thus, in the above definition, Jensen summarized the classic position of g factor theorists—intelligence is equivalent to the g factor; is best measured by standardized tests; and is comprised of the verbal and mathematical domains. Giftedness, under these conditions, is straightforward—it is a score at or above a predetermined level on a standardized instrument that is sensitive to the g factor.

Herrnstein and Murray, referring to giftedness in The Bell Curve, stated that "The SAT population constitutes a sort of broad elite, encompassing but not limited to the upper quartile of the annual national pool of cognitive ability" (p. 427). Later in this paragraph, Herrnstein and Murray delineated more specifically the giftedness definition. Giftedness is evidenced by "...combined scores of 1400 or more..." (p. 428) on the SAT—a classic g factor standardized instrument.

Multiple Intelligences Giftedness Definitions

The dominant MI theorists—Renzulli (1978), Gardner (1983), and Sternberg (1985) have advocated giftedness definitions that have emphasized the interaction and equality of comprising components. Renzulli's definition of giftedness states that:
Giftedness consists of an interaction among three basic clusters of human traits—these clusters being above-average general abilities, high levels of task commitment, and high levels of creativity. Gifted and talented children are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable areas of human performance. Children who manifest or are capable of developing an interaction among the three clusters require a wide variety of educational opportunities and services that are not ordinarily provided through regular instructional programs. (1978, p. 184)

Gardner defined an intelligence as "...the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community" (p. 15). In Gardner's theory, seven intelligences have been identified. Besides these intelligences being plural, they share two additional characteristics—contextness and distributiveness. Contextness refers to the idea that an intelligence cannot be realized or understood without considering the influence that the "context" within which the intelligence exists brings to bear on said intelligence. Distributiveness addresses the notion that an intelligence cannot be fully comprehended or come into fruition without stimulation from objects outside of the biological confines of the individual to the extent that the intelligence and the stimulating objects become "symbiotic" in nature and consequence (A very thorough discussion of Gardner's theory is presented later in this chapter.) Under the auspices of Gardner's theory, giftedness encompasses being able to solve problems or fashion products that a culture values in "excess" of those problems solved or products fashioned by individuals that said culture considers "not gifted".

Sternberg used "insight" as the unit of analysis in defining giftedness. He does not believe that insight is the only aspect of giftedness. However, he chose insight to explore giftedness for two
reasons--its association with "...significant and exceptional intellectual accomplishment..." (p. 282) and its usefulness in studying "...problems in a wide variety of content domains" (p. 283).

From Sternberg's vantage point, giftedness is the ability to utilize insight in understanding novelty. This is accomplished by the interaction of three insight psychological "processes": Selective encoding (identifying relevant information); selective combination (synthesizing isolated information); and selective comparison (seeing the relationship of new with past information). Thus, in this context, giftedness is the utilization of selective encoding, selective combination, and selective comparison interactionally to decipher non-routine tasks and situations.

Giftedness Identification Procedures

"Procedures for identifying gifted children are important for more than the individual children involved. These procedures determine who is served by gifted programs in the United States, and in addition, they influence which specific skills and abilities will be cultivated through curricula" (Richert, 1985, p. 68).

Because of the important consequences and implications of the giftedness identification process for many scholars, it becomes paramount that identification procedures result in an equitable selection of program participants (Harris, III & Ford, 1991; McKenzie, 1986; O'Tuel (1994); Richert, 1987; Ryan, 1983; Woods & Achey, 1990; Yancey, 1983). Although there are numerous approaches utilized in selecting students for participation in CYOT programs, they can be classified into two major categories--unidimensional and multidimensional. Gifted selection based solely or primarily on
standardized test scores falls under the unidimensional matrix, and CYOT selection predicated on a combination of criteria—including standardized tests—is multidimensional. The latter selection process is also referred to as pluralistic assessment (PA), that is, portfolios, inventories, product evaluation, norming for subpopulations, case studies. Despite all three national CYOT reports having recommended that other selection criteria augment standardized tests in selecting students for gifted programs, this has not occurred (Richert, Alvino, & McDonnel, 1982; Ross, 1992; U.S. Commissioner of Education, 1972). However, gifted researchers have championed PA criteria as a means of achieving equity in CYOT selection procedures (Baska 1986; Borland & Wright, 1994; Coleman & Gallagher, 1992; Hadaway & Marek-Schroer, 1992; Mitchell, 1988; Smith, LeRose & Clasen, 1991; Swanson, 1995).

The current thinking, on gifted identification selection procedures, is summarized in the most recent national CYOT report--National Excellence (1993). Pat O'Connell Ross--the then Director of the Javits Gifted and Talented Education Program--listed the criteria that must be included in the gifted identification selection process. They are:

* Seeks variety--looks throughout a range of disciplines for students with diverse talents;
* Uses many assessment measures--uses a variety of appraisals so that schools can find students in different talent areas and at different ages;
* Is free of bias--provides students of all backgrounds with equal access to appropriate opportunities;
* Is fluid--uses assessment procedures that can accommodate students who develop at different rates and whose interests may change as they mature;
* Identifies potential--discovers talents that are not readily apparent in students, as well as those that are obvious; and

* Assesses motivation--takes into account the drive and passion that play a key role in accomplishment. (p. 26)

The Impact of Standardized Mental Tests

Alfred Binet and Theodore Simon's (1916) work in the area of standardized test development and construction is useful because such tests figure prominently in the analysis of the questions and solutions under discussion. In 1904, "...the Minister of Public Instruction (Paris, France) named a commission which was charged with the study of measures to be taken for insuring the benefits of instruction to defective children" (p. 9). The Commission concluded that it was necessary to place the defective (retarded) in separate classrooms. The Commission wanted to ensure that proper criteria were developed and utilized to identify the retarded. The goals of the Commission were honorable; they simply wanted to provide the best possible instruction for the retarded. However, what resulted had far reaching influence. Unfortunately, the original intent, of providing remedial instructional assistance, was distorted and resulted in the IQ test being used as the primary, and sometimes, the only measure to identify those individuals who possess "outstanding talent."

The Commission asked Binet to devise the criteria necessary to identify these retarded students and provide a plan for their administration. With the assistance of Simon, Binet developed what would become recognized as the first standardized intelligence test of importance (There is evidence that a Parisian physician, Dr. Blin, developed test items that Binet drew upon; also, Galton [1869] had devised mental tests before Binet, but never gained the level of
influence and fame of Binet.) Binet and Simon had little notion that their work would revolutionize the study and measurement of intelligence. The IQ test has become the undisputed measure of general intelligence. It is interesting to note that Binet never fully embraced the notion that his test measured a general intelligence (g) (Guilford, 1967). However, others did—including Spearman (1923), Terman (1916, 1937), Jensen (1986), and Eysenck (1986).

The Impact of General Intelligence (g) Theory and The Single Test Score

Inspired by Binet's IQ tests, Spearman (1923) sought to develop a general set of principles that would elevate psychology to the level of a science. In order for this to occur, the nature of cognition would have to be fully understood, for its understanding would reveal its manifestation--general intelligence.

Spearman postulated a theory of general intelligence that stated that g results from the workings of three qualitative principles which comprise the essence of cognition; they are:

I. Any lived experience tends to evoke immediately a knowing of its characters and experience (p. 48).

II. The mentally presenting of any two or more characters (simple or complex) tends to evoke immediately a knowing of relation between them (p. 63).

III. The presenting of any character together with any relation tends to evoke immediately a knowing of the correlative character (p. 91).

These three principles collectively are called noegentic. Spearman stated that by "...noetic is meant any cognitive transition that is valid self-evidently. By generative is meant any bringing of an item into awareness by a process which does not postulate it having been there before" (p. 129). Thus, the three qualitative principles that comprise cognition, and are manifested as intelligence, all must
bring something into awareness of the individual that was not there before and this very act (bringing something into awareness) must be self-evident.

The quantity of this "something" that is brought into awareness of the individual, and is self-evident, is controlled by five principles which Spearman collectively called anoegenesis—because "...they neither have the nature of self-evident propositions nor generate any new items in the cognitive field" (p. 137). These five quantitative principles are:

I. Mental - every mind tends to keep its total simultaneous cognitive output constant in quantity, however varying in quality (p. 131).

II. Retentivity - the occurrence of any cognitive event produces a tendency for it to occur afterwards (p.132).

III. Fatigue - the occurrence of any cognitive event produces a tendency opposed to its occurring afterwards (p. 134).

IV. Conative Control - the intensity of cognition can be controlled by conation (p. 135).

V. Primordial Potencies - every manifestation of the preceding four quantitative principles is superposed upon, as its ultimate basis, certain primordial but variable individual potencies (p. 137).

These three qualitative and five quantitative principles are manifested through six processes:

Qualitative Processes

Principle I - Apprehension of Experience
Principle II - Education of Relations
Principle III - Education of Correlatives

Quantitative Processes

Principle I
Principle II - Reproduction
Principle III - Disparition
Principle IV - Clearness - Variation
Principle V
Thus, the qualitative principles, which comprise cognition, are regulated in quantity by the quantitative principles which have no cognitive function. Both sets of principles are manifested through the above six processes, which in turn, comprises general intelligence (g). Consequently, Spearman's theory of g and the underlying principles that support it are biological in origin--deriving solely from within the individual and biologically predetermined in capacity. Since this theory identifies a general intelligence, it can be measured by an IQ test that summarizes this general intelligence in the form of a single score.

Terman (1916) in *The Measurement of Intelligence* revised the 1911 Binet-Simon Intelligence Scale. The new scale became known as the Stanford Revision and represented an expansion of its predecessor. It contained 90 test items as compared to 54 on the 1911 Binet-Simon scale.

In turn, Terman and Merrill (1937) revised the 1916 Stanford Revision of the 1911 Binet-Simon Intelligence Scale in *Measuring Intelligence*. This new version had two scales instead of the customary one as did its predecessors. These scales were extended so that they would provide a more accurate sampling of those tested who fell within the upper and lower levels of the scales. And, the scales were normed on larger and more representative samples.

The significance of these revisions is that they revealed the zeal with which the psychological and testing communities embraced them. These revisions manifested the hold that the concept of general intelligence (g) held--for this is exactly what these tests purported to measure.
Jensen (1986) argued quantitatively that general intelligence (g) is the most objective and measurable variable when determining what is intelligence. Jensen provided a step-by-step process showing how the various subconcepts operate to comprise the overall concept of g.

First, he defined these subconcepts—mental test, item or cognitive task, objective, requirements, and internal consistency reliability or homogeneity. This accomplished, Jensen made a case for g as the most viable representative of intelligence. He stated that when any sample of ten (10) or more cognitive tests, consisting of dissimilar item types, is "...administered to a representative sample of the population, the tests show substantially higher positive intercorrelations than do the items" (p. 10). He concluded that this "empirical fact" confirms that there is a common source of "variance" in all of the tests. Factor analysis is then performed on each of the tests to determine the "...relative degree to which variance on each of the various tests in a particular collection of tests is 'loaded' with the source of variance that is common to all of the tests in the collection" (p. 110). Jensen asserted that this common source of variance is a "general factor" which is general intelligence or g.

Why does Jensen focus on g rather than some other factor? He stated:

First is the fact that g is the single largest source of individual differences in all cognitive activities that involve some degree of mental complexity and that eventuate in behavior which can be measured in terms of some objective standard of performance. Also, g carries far more predictive weight than any other single factor or combination of other factors (independent of g) in its practical validity for predicting the performance of individuals in school and college, armed forces training programs, and in employment in business and industry.

The fact that the g factor is more highly related than any other
factor to variables whose origin and measurement are entirely independent of factor analysis, such as choice reaction time, the average evoked potential, and inbreeding depression, means that $g$ is a construct with theoretical significance which extends beyond the mathematical operations involved in its extraction from the intercorrelations among psychometric variables. There are also many physical correlates of $g$ (e.g., stature, brain size, myopia, blood type, body chemistry), but their meaning is still obscure (p.111).

Thus, Jensen is resolute that intelligence is general and that $g$ is the best measure of it. Moreover, he holds that $g$ is the best predictor of individual performance across a large array of activities; that it can be measured by a single test score; and that it is biologically based.

Eysenck (1986) viewed intelligence as being firmly rooted in human biology. He defined intelligence as "...essentially the outcome of error-free transmission of information through the cortex" (p. 71). However, instead of one intelligence, he identified two—intelligence A and intelligence B. Intelligence A includes adaptation to environment, reasoning, judgement, problem solving, learning, comprehension, and memory. Intelligence B includes strategies, apprehension of experience, eduction of relations, eduction of correlates, and information processing.

The influence of Spearman is evident in Eysenck's use of the concept of "noegentics"—apprehension of experience, eduction of relations, eduction of correlates—which Spearman called cognition and Eysenck referred to as intelligence B. Even though Spearman identified two intelligences, his theory actually functions as a general intelligence $(g)$ theory because of his subordination of intelligence A to intelligence B. Thus intelligence B roughly approximates what the literature calls $g$. Eysenck's stressing of "cortex" information transmission leaves no doubt that his theory is biologically based.
All of these theories share all or some of the following characteristics:

- there exists a general intelligence (g).
- g is the best measure of this general intelligence.
- g can be measured by a single test score on an IQ test.
- g is biologically based.
- g is finite (the amount is fixed--cannot be increased or decreased).
- g is the best predictor of certain types of individual performance.
- g is not found in raw form, but only exists above a designated numerical minimum.
- g is not found in pure form, but in varying degrees.

Let us examine a group of theorists who adopt a viewpoint that is at the opposite end of the continuum. They advocate a position that has become recognized as "multiple intelligences theory" or simply MI. Included in this group of theorists are Gardner (1983, 1993); Thurstone (1938); Guilford (1950, 1967); Feldman (1980); Sternberg (1985); and Ceci (1990).

The Impact of Multiple Intelligences Theory and an Array of Test Scores

Gardner (1982, 1993) is the most prominent theorist to develop the idea of multiple intelligences (MI). The word "idea" is stressed by Gardner because the existence of these intelligences has not been experientially proven. Gardner (1983) offered the following caveat:

These intelligences are fictions--at most, useful fictions--for discussing processes and abilities that (like all of life) are continuous with one another; Nature brooks no sharp discontinuities of the sort proposed here. Our intelligences are being separately defined and described strictly in order to illuminate scientific issues and to tackle pressing practical problems. It is permissible to lapse into the sin of reifying so long as we remain aware that this is what we are doing (p. 70)

Gardner gave this warning in his original and seminal work on MI. Although the existence of MI still has not been proven, Gardner's
newest publication provided a multitude of research studies indicating that the "idea" of MI has made much progress toward being statistically probable. So that today, one can speak with more confidence that MI exists. The following discussion is an up-to-date description of the present status of MI theory as expressed in Gardner's 1993 publication.

Gardner began by examining the development of the concept of intelligence. He credited the origin of the idea of intelligence to Alfred Binet. In 1904 Binet was approached by the city fathers of Paris and posed the following question: "Could he devise some kind of a measure that would predict which youngsters would succeed and which would fail in the primary grades of Paris schools" (p. 5)? Binet's efforts to answer this question, resulted in his developing the first recognized "intelligence test" and the concept of "IQ" as its measure.

Gardner stated that Binet's intelligence was one-dimensional and general in nature. That is, it professed to represent all ability as if it or intelligence resided in one place and was found in one form--the individual. This conception went unchallenged and quickly spread from Europe to America where it was deified and became the sacred text of psychological professionals and the superficial knowledge of laypersons; for the intelligence test was hailed as a virtual Rosetta Stone that could decipher the "true ability" of an individual. Thus, intelligence as one-dimensional and measurable by an intelligence test became the established view--going unchallenged from the early 1900s until the late 1930s. Critics of g theory, although few and between, gained adherents from the 1950s through the 1970s culminating--in their influence--with the publication of Gardner's
Gardner offered a quite different view of intelligence; one that was multi-dimensional, contextual, and distributed. He defined an intelligence as "...the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community" (p. 15).

Before one can fully appreciate Gardner's work, it is worthwhile to first examine his methodology. Gardner began his research by "reversing" the methodology traditionally employed in intelligence research. Instead of first defining intelligence and then determining its use, he first sought to identify the "...problems that humans solve and worked back to the 'intelligences' that must be responsible" (p. 26). Working in tandem with this backward approach, to identify intelligences, was the realization that no one intelligence was responsible for solving all problems. Advocates of a one-dimensional intelligence begin with one general intelligence and work under the assumption that all problems can be solved by applying it.

Gardner's methodology was supported by varied research data. Before Gardner's intelligences could be identified for selection, they had to meet certain criteria. These included being biologically based and being of value culturally. Gardner described the selection process below:

In coming up with our list, we consulted evidence from several different sources: knowledge about normal development and development in gifted individuals; information about the breakdown of cognitive skills under conditions of brain damage; studies of exceptional populations, including prodigies, idiots savants, and autistic children; data about the evolution of cognition over the millennia; cross-cultural accounts of
cognition; psychometric studies, including examinations of correlations among tests; and psychological training studies, particularly measures of transfer and generalization across tasks. Only those candidate intelligences that satisfied all or a majority of the criteria were selected as bona fide intelligences (p. 16)

The key concept that Gardner advocates is not that there are seven, and only seven, intelligences, but that intelligence is plural and not a singular concept. He believes that there are possibly more intelligences than the ones that he has identified. However, for now he is concentrating on the following seven: Musical intelligence, bodily-kinesthetic intelligence, logical-mathematical intelligence, linguistic intelligence, spatial intelligence, interpersonal intelligence, and intrapersonal intelligence.

Another central concept of Gardner's theory of MI is the influence of "context" on MI. What does a contextualized view of intelligences mean? Gardner stated:

Quite simply, it does not make sense to think of intelligence, or intelligences, in the abstract, as biological entities, like the stomach, or even as a psychological entity, such as emotion or temperament. At most, intelligences are potentials or proclivities, which are realized or not realized, depending upon the cultural context in which they are found.... Intelligence, or intelligences, are always an interaction between biological proclivities and the opportunities for learning that exist in a culture. (p.221)

Thus, intelligences cannot be separated from the cultural milieu in which they operate and cannot be fully comprehended outside of the cultural context.

The last key concept is that intelligences are distributive in nature. Gardner explained the distributive characteristic as follows:

...intelligence exists in significant measure outside of the
physical body of the individual. Specifically, in a distributed notion of intelligence, it is recognized that rarely if ever do productive humans work alone, simply using their heads. Rather, it is the rule that individuals work with all kinds of human and inanimate objects and prosthetics; these entities become so integral to their activities that it is reasonable to think of them as part of the individual's intellectual armament. (p. 223)

This notion of out-of-body intelligence implies that individual intelligences may be a myth and cannot exist or are severely limited without the stimulation provided by humans or objects outside of the domain of the individual. Thus, Gardner not only discounted the one-dimensional view of intelligence, but expanded the idea of MI to include consideration of contextual and distributive characteristics.

Gardner's intelligences are found in raw form in everyone. One-dimensional theorists define a numerical minimum that one must possess to be intelligent. Below that minimum, one is without intelligence.

Gardner's intelligences are rarely found in anyone in pure form. When they are, the individual is considered abnormal. One-dimensional theorists do not view intelligence as existing in a pure form, but rather as existing along a continuum ranging from no intelligence to varying degrees of more intelligence.

Gardner's intelligences work in concert with one another to solve problems. One-dimensional theorists have a singular general intelligence solving problems or, when some of their members admit to another form of intelligence, this form is always subordinate to general intelligence. This subordinate intelligence does not work in concert with general intelligence, rather it only flows through it or is organized by it.

Gardner's intelligences can reside in varying degrees in an
individual. One can be quite bright in musical intelligence and not as bright in logical-mathematical intelligence. One-dimensional theorists do not advocate varying degrees of intelligences, but rather, speak of varying degrees of ability in one general intelligence.

Gardner's intelligences can be further developed. They can actually increase in problem solving ability. One-dimensional theorists state that intelligence is fixed and cannot be improved.

Gardner's intelligences are influenced by the context in which they are found. One-dimensional theorists ignore context, which they feel has little or no influence in problem solving.

Gardner's intelligences are distributive in nature, that is, they are influenced by forces, objects, and individuals outside of the individual. Thus, a sort of interactional process occurs between the intelligences within the individual and the intelligences outside of the individual which results in enhanced problem solving. One-dimensional theorists believe that intelligence resides solely within the individual.

Gardner's MI theory is a direct challenge to the old paradigm of intelligence as a single entity residing within the individual, predetermined by biology, and not influenced by the environment in which the individual interacts. It has made gradual progress toward validation since its inception and may hold unlimited potential in answering questions that are the subject of this research.

Thurstone (1938) sought to "...present in a relatively non-technical form the nature of the factorial methods and the assumptions that are involved" (p. 1). His point of departure was to seek an answer to the question--How do you describe and explain...
variations in the abilities of individuals? He argued that the factorial method allowed a researcher to isolate the primary abilities that create the variations in the abilities of individuals. This is accomplished by, "...objective experimental procedures so that it may be a question of fact how many abilities are represented in a set of tasks, and whether a particular objective performance represents an ability that is in some fundamental sense primary" (p. 1).

The problem, presented in his analysis, involved seeking the answer to what primary traits were manifested in the psychological tests of the period. To determine this, it was necessary to "...include a fairly wide variety of tests covering verbal, numerical, and visual tasks" (p. 10). What is important about this work is not the specific problem analyzed, but the fact that the method employed sought to isolate an array of variables at a time when one-dimensional intelligence researchers were using the same technique to prove the opposite.

In an article that laments the lack of formal study of creativity by psychologists, Guilford (1950), stated that the generally accepted belief, within the field of psychology, that high intelligence (high IQ) is a prerequisite for creativity is wrong. Rather, he asserted that a factorial approach which views creativity as not being one-dimensional in causation, but consisting of "patterns of primary abilities" is more accurate. Guilford went one step further by explaining that each person differed in his degree of innate primary abilities and that these primary abilities manifested themselves differently in "different spheres of creative activity." Such thinking
was ahead of its time. Years later, Guilford would expound on this multi-variable approach in his structure-of-intellect theory (SI).

In *The Nature of Human Intelligence* (1967), Guilford stated that his primary reason for writing "...is to give the concept of 'intelligence' a firm comprehensive, and systematic theoretical foundation" (preface). He also acknowledged an ancillary objective of having intelligence included in the general body of inquiry in general psychological theory.

Additionally, Guilford provided a review of the general field of psychology covering such topics as the history of tests, the historical conceptions of intelligence, and the various approaches to studying intelligence before presenting his SI theory.

Guilford's morphological (structural) model is three dimensional. It includes three parameters: operation, product, and content. Its purpose is to provide a picture of intelligence by stressing that intelligence is not an all encompassing general concept (g), but is comprised of many unique combinations of factors or variables. Guilford described the SI model below:

The structure-of-intellect model, with its three parameters--operation, content and product--makes possible the unique definition of each intellectual ability in terms of one of five kinds of operation, combined with one of four kinds of content and with one of six kinds of product. Although each factor shares one or two properties in common with every other factor, something about the unique combinations makes them relatively independent in terms of individual differences in a population. (p. 465)

Guilford rejected the notion that there is one general intelligence which is the total of intellect. He expanded the purview of intelligence research by stressing that creativity is part of the
intelligence equation. His SI theory demonstrates the complexity of intelligence with its 150 possible combinations of intellectual factors.

Feldman's (1980) purpose was to broaden the concept of developmental as it had traditionally been defined in the developmental psychology of intelligence--limited to universals. He reasoned:

The argument for proposing nonuniversal regions of development is straightforward enough: universal achievements are acquired under conditions so varied that they occur in all environments in all cultures, and while these achievements may be described in rich detail, the nonspecific nature of experience presumed to engender them makes them of limited value in examining the processes by which they are achieved. Moreover, much of what people come to know simply cannot be characterized as universal in this sense. 'Nonuniversal' achievements, in contrast, provide us with negative cases (only some individuals acquire them) and demand study of the specialized environmental conditions (such as instruction and available technology) by which they are achieved. (p.1)

Feldman's theory, of nonuniversal development, is not a completely new theory, but a reworking of the theory of universal development. Specifically, Feldman keeps two of the four components of universal development; sequentiality and hierarchical integration and modifies two others; universality and spontaneity.

He proposed that to understand how nonuniversal development progresses, it must be viewed within the context of a continuum of domains with "universal" at one extreme and "unique" at the other extreme. "Discipline based" is in the center, with "cultural" to its left and "idiosyncratic" to its right. Feldman stated that the continuum "...represents the idea that many domains may be identified as developmental without having to be universally acquired" (p. 20).
What makes the continuum approach of Feldman different from the universal development concept is the intervention of different environmental conditions that effect change at different stages on the continuum and that movement from left to right indicates a decrease in frequency. Neither of these occur in the universal model. This theory offers a contrast to the "cookie cutter" cognitive development approach to universal development theory which states that development is independent of environmental intervention.

Sternberg (1985) updated his componential theory that was presented in his 1977 book, Intelligence, Information Processing, and Analogical Reasoning: The Componential Analysis of Human Abilities. He believed that an update was needed because his componential theory may have explained cognition (information-processing), but not intelligence. He defined intelligence as follows:

Intelligence is the mental capability of emitting contextually appropriate behavior at those regions in the experiential continuum that involve response to novelty or automation of information processing as a function of metacomponents, performance components, and knowledge-acquisition components. (p.128)

His original componential theory is one of the three subtheories in his new triarchic theory of human intelligence--with contextual and experiential being the remaining two. Thus, the triarchic theory is, as its name denotes, made up of three distinct theories. These distinct theories each explain an aspect of intelligence. However, when brought together and functioning under one umbrella theory (triarchic) in concert, they are able to explain the whole of intelligence. Sternberg stated:
In sum, the contextual subtheory relates intelligence to the external world of the individual; it addresses the questions of what behaviors are intelligent for whom and of where these behaviors are intelligent. The subtheory specifies the potential set of contents for behaviors that can be characterized as intelligent. The experiential subtheory relates intelligence to both the internal and external worlds of the individual; it answers the question of when behavior is intelligent. This subtheory specifies the relation between intelligence as exhibited on a task or in a situation, on the one hand, and amount of experience with the task situation, on the other. The componential subtheory relates intelligence to the internal world of the individual; it answers the question how intelligent behavior is generated. In particular, the subtheory specifies the potential set of mental mechanisms that underlie intelligent behavior, regardless of the particular behavioral contents. The three subtheories, taken together, can be used to understand individual differences, or who is intelligent (pp. xii-xiii).

The triarchic theory of human intelligence takes into consideration the environment in which the individual finds himself; the interaction of the individual with the environment in which he finds himself; and the mental components that the individual utilizes to determine intelligent behavior during and after this interaction.

Ceci (1990) espoused a theory that is still in the discovery stage and is "...lacking some of the formal specification needed for theoretical confirmation or disconfirmation" (p. 3). This developing theory states that both biology and environment influence intellectual development. However, Ceci ensconces his theory in a developmental perspective arguing that at each stage of cognitive development in an individual there is an "...interaction between biology and ecology (that) results in changes that may themselves produce other changes until a full cascading of effects is set in motion" (p. 10). An individual's cognitive potential, which is biologically based, is altered and re-altered over time during the developmental process in which the individual interacts with the "...social, cognitive (e.g.,
beliefs and the structure of knowledge), and physical environment" (p. 10).

Not only is there alteration of an individual's innate cognitive potential over time as a result of interaction with outside forces, but these environmental forces are "...specific to each type of cognitive potential, both in the timing of onset and the rate of unfolding" (p. 10). This developmental process is usually not linear because there are periods in which an individual's cognitive development may be unduly influenced by his environment; adding to unpredictability while change is continuously occurring.

Ceci stated that the cognitive potential, that is interacting with and influenced by the environment, is not the "...central processor g underlying most or all cognitive performances, but multiple cognitive potentials" (p. 100). This acknowledgement firmly places his theory in the multiple intelligences camp.

All of the theories in this section share all or some of the following characteristics:

- advocate the existence of multiple intelligences.
- there is no one best measure of these intelligences.
- these intelligences must be measured by an array of test scores.
- multiple intelligences are not limited to the biological domain, but also include cultural, contextual, and distributive domains.
- multiple intelligences are not finite, but actually have the potential to expand or grow.
- different intelligences predict different performances individually and in concert with one another.
- multiple intelligences are found in raw form in everyone.
- multiple intelligences are rarely found in anyone in pure form.

There is a third orientation that sheds illumination on the questions pursued in this research. Its researchers have not utilized
a micro level of analysis in defining intelligence as have the one-dimensional and multiple intelligences theorists. Rather, they have focused at the macro level of analysis by examining the cultural and social environment in which the individual exists and how they define the "intelligence" of the individual. Researchers that are pursuing this line of inquiry include Ogbu (1985); Hare (1987); McKenzie (1986); Mugny and Carugati (1989); Scott (1993); and Staunton (1993).

The Impact of Macro Cultural/Social Theory

Ogbu (1985) sought answers "...for the reasons why school learning problems persist or do not persist among minority children" (p.861). His methodology was comparative along a historical contemporary continuum and was macro in nature. It was comparative, for example, when he contrasted African-American and White children or contrasted successful and unsuccessful minority groups. These comparisons occurred within a framework that encompassed the historical to the present day, but from a societal level--thus, the historical contemporary continuum was macro in perspective.

Primary to Ogbu's analysis are the concepts of primary cultural differences and secondary cultural differences. The former refers to differences that made a group unique before they were placed in a context that made them a minority. For example, those distinct group characteristics that the Irish brought with them when they came to America. The latter refer to differences that develop after a group has come into contact with another group; especially when this contact was involuntary and results in subordinate status for the subdued group. Such an example would be African-Americans subjugated to
subordinate status as slaves by White Americans. When this occurs, Ogbu believes, "The subordinate or minority group develops new or 'secondary' cultural ways of behaving, perceiving, and feeling and perceptions to cope with their subordination and exploitation, to protect their dentity, and to maintain the boundary between them and the dominant group" (p. 862).

The consequence of these two types of cultural differences appear to manifest different behavior modalities for the group affected: Groups that exhibit behavior attributed to primary cultural differences are more able to cross cultural boundaries in a learning context than those that exhibit behavior attributed to secondary cultural differences.

Having developed the primary and secondary cultural differences concepts, Ogbu introduced a trilogy classification of minority groups: Autonomous, immigrant, and castelike. He then illustrated how the "cultural differences concepts" interacted with the minority classification concepts to determine the degree of adjustment and ultimate success or failure of each minority within a learning environment controlled by an all encompassing "majority".

Autonomous minorities "...possess a distinct group identity or sense of peoplehood..." (p. 862) when contrasted with the dominant group. They may suffer prejudice but usually are not the victims of economic or political exploitation by the dominant group. Examples of autonomous minorities in America are Jews, Mormons, and the Amish.

Immigrant minorities are "...people who have recently moved more or less voluntarily to their host society" (p. 862). In the beginning,
they are at the bottom of the stratification system. However, this is temporal in nature. They are able to "avoid" internalizing the negative image that the dominant or majority group attributes to their status because their status in the host country is much better than their status in their country of origin. This, avoidance of internalizing a negative self-concept, enables them to adapt to the majority controlled learning environment without being absorbed by it. Thus, they are able to perform adequately in school, and armed with education, have upward mobility. Examples of immigrant minorities in America are the Irish, Germans, and Italians.

Ogbu attributes the economic, political, and social success of autonomous and immigrant minorities to the fact that they possess primary cultural differences. This enables them to ward off the negative personal imagery, political impotence, and economic lethargy that results from majority group domination. These minorities are insular, but not to the point of rejecting the cultural infrastructure of the dominant group that would preclude their economic and social success.

Castelike minorities are "...those who have been incorporated into the society where they are found more or less involuntarily and permanently through slavery, conquest, or colonization" (p. 863). Such castelike minorities are isolated by the majority group and systematically denied economic and social success. Thus, they are relegated to perform the "throwout" jobs of the dominant culture; those discarded or thrown out by the majority because of undesirability. Such a consequence banishes castelike minorities and their progeny to permanent negative social status.
Ogbucket argued that castelike minorities' negative social status is permanent because of their overall poor school performance. However, he emphasized that this underachieving academically is not the sole result of castelike minorities lack of effort, but must be shared by the dominant group. He stated that this is true because the dominant group has complete control of the educational system and uses this control to systematically deny castelike minorities "...access to good education" (p. 864). As a consequence of this denial, castelike minorities "...have come to distrust the schools" (p. 865). Thus, a double edge sword mechanism is operating: The dominant group denies castelike minorities access to good education (one edge) and castelike minorities do not give their best effort in school because of their distrust of the dominant group (second edge). This situation leads castelike minorities to view themselves as being distinctly different from the dominant group and leads them to develop "secondary cultural differences". Ogbucket described this phenomenon below:

Partly because of dominant group treatment and partly to protect their sense of collective identify, castelike minorities evolve new cultural differences between them(selves) and the dominant group. Because the evolved or secondary cultural differences usually serve as a boundary--maintaining system, they form the basis upon which the minorities come to designate certain ways of behaving as more appropriate for whites, while other ways of behaving (usually the opposite) are regarded as more appropriate for minorities. In this way there come to coexist in certain areas of life two opposing ideal ways of behaving: one for whites and the other for the minorities (pp. 866-867).

Examples of castelike minorities in America are

African-Americans, Native Americans, and Mexican Americans. Thus, Ogbucket concluded that school learning problems do not persist among all minority children. He believes that--although learning problems can be
found among all minorities--it is the degree of the problem among each group of minorities, included in his trilogy, that is significant. Using degree as the measure to identify which minority does have school learning problems, he concluded that castelike minorities fit this measurement. The reason castelike minorities do not perform well in school is not due to some innate deficiency, but is in reaction to mistreatment by, and mistrust of the dominant group. The pattern of behavior attributable to this reaction toward the dominant group, Ogbu called secondary cultural differences. Thus, secondary cultural differences is the independent variable that explains the school learning problems of castelike minorities.

Hare (1987) argued, from a macro perspective, that the white controlled American social structure and not any innate biological or group cultural disorder is responsible for "...the disproportionate underattainment of African-American youth" (p. 100). This argument is developed and explained in a concept which Hare calls "structural inequality".

Structural inequality states that the American social structure determines one's economic and social success based on what it (the social structure) needs to keep it functioning. Hare explained that:

...the social system needs people to replenish its ranks at all levels of skill and credentials, and that in producing such differences the schools respond to structural needs rather than innate differences. It is further assumed that such ascribed characteristics as one's race, sex, and social-class background deliver differential treatment, consequently increasing the probability of lower educational attainment and lower occupational placement among people of color, women, and people of lower-class origin. (p. 103)

After defining structural inequality, Hare laid, as the foundation of
his argument, the necessity of stable adequate paying employment as being essential to an individual providing for his family and himself. Upon this foundation, he built an environmental structure in which the role of home, the role of school, and the role of peers resided. These in turn, were developed to illustrate how the social structure benefited from structural inequality.

Hare stated, "African-American youth are four times more likely, than their white counterparts to grow up in a poor household and are as likely to grow up in a one-parent household as not" (p. 104). He then illustrated how such a home environment increased the probability that African-American children would be exposed to a multiplicity of social ills such as family instability, deprivation, child abuse, poor health care, absentee fathers, etc. Hare believes these consequences developed as a direct result of inadequate or no employment opportunities for African-American parents. This situation resulted from the American social structure predetermining that African-Americans must and will be relegated to the lower economic levels.

Next, Hare focused on the role that structural inequality plays in the school. After providing a capsule review of the literature regarding African-American student achievement results in the school setting and performance results on standardized tests, Hare directed attention on the role of the school and teachers in determining these results. He cited specific studies, in the literature, to support a theory of school and teacher culpability in African-American student underattainment in school. These studies highlighted "...teacher expectations and differential treatment of children of different
characteristics..." (p. 106). He believes that such studies might present an opposing explanation to the achievement disparity between African-American students and other ethnic groups often cited in standardized test results.

Specifically, Hare presented study results that indicated that the prevalent societal belief that all children start life at the same "starting line" is a myth or at best a distortion. He showed that the school, through the actions of educators, serves the requirements of structural inequality by not providing African-American students with an appropriate and adequate education that would prepare them for opportunities in the job market. This forces African-Americans to fill job vacancies at the bottom of the American economic system; a result consistent with social inequality serving the needs of the American social structure. Hare stated, "Given racism as well as sexism and classism in a stratified America, it has been posited that the disproportional allocation of African-Americans, women, and people of lower-class origin to the lowest labor slots is functional, and that their relative academic failure is essential to getting the job done" (p. 107).

What makes this, tracking of African-American students to fill the lower level least desirable jobs in the American economic system, even more insidious is the fact that the educational institution influences them to believe that their failure is their fault and thus their economic position justified. Hare explained, "The fact that the schools simultaneously homogenize attitudes while differentiating skills increases the probability that the youngsters themselves will accept their outcomes as the consequence of their own attributes or deficiencies" (p. 108).
Hare believes that school failure leads many African-American students to more strongly identify with their peer group than would ordinarily occur. This strong peer group embracement, Hare theorized, may occur because these African-American students are "...in search of higher possibilities of success and ego enhancement" (p. 108). Because the peer group exhibits behaviors that are in conflict with the generally accepted "model" behaviors of the social structure, internalization of these behaviors, by African-American students, preclude them a legitimate opportunity to succeed economically. Hare stated, "It should be noted that although the larger culture views these patterns as maladaptive and strange, they are, within the cultural milieu, perfectly realistic adaptive, and respected responses to reality" (p. 109).

Again, the tenets of structural inequality are realized because the social structure sees these African-American students as expendable and not necessary for its (the social structure) functioning.

Thus, Hare's argument states that the American social structure, as manifested in the concept of structural inequality, is responsible for the underattainment of African-American youth. The home, school, and peer group serve as the conduits through which the specific failure mechanisms are internalized. Thus, biological and cultural explanations, for the underattainment of African-American youth, are questioned and structural inequality is offered as an alternative.

Although African-Americans have made progress within American economic and educational institutions as a result of the civil rights struggles of the 1960s, statistics in the 1995 edition of Statistical...
Abstract of the United States lend support to Hare's overall thesis.

In 1970, the median income of Whites (in constant dollars) was $31,828; African-Americans' median income was $19,373 [60.9% of that of Whites]. In 1993 the median income of Whites was $32,960; African-Americans' median income was $19,533 [59.3% of that of Whites]. In comparison to Whites, African-Americans' median income had decreased by 1.6% between 1970 and 1993.

Although there was a 5.4% increase in the percentage of higher income [$50,000 or more] African-Americans between 1970-1993, the gap between Whites and African-Americans earning $50,000 or more increased by 2.7% in favor of Whites. During this same period, the number of African-Americans making $14,999 and "below", increased by .5%. And, there was a 1.2% increase (favoring Whites) in the gap between Whites and African-Americans making $14,999 or below between 1970-1993 (This information can be found on page 469 of the aforementioned abstract. The under $10,000 and $10,000-$14,999 categories were combined to obtain percentages for $14,999 and below. Also, the $50,000-74,999 and $75,000 and over categories were combined to obtain percentages for "$50,000 and more".)

In 1960, 43.2% of Whites completed 4 years of high school or more; 20.1% of African-Americans. This is a 23.1% difference (favoring Whites) between the two groups. By 1994, 82.0% of Whites were high school graduates; 72.9% of African-Americans. This equates to a 9.1% difference (favoring Whites), in high school graduation, between the two groups. However, this is an overall closing of the gap by "14%" (favoring African-Americans) for those who have completed 4 years of high school or more or are high school graduates.
In 1960, 8.1% of Whites completed 4 years of college or more; 3.1% of African-Americans. This is a difference of 5% (favoring Whites) between 1960-1994 between the two groups. By 1994, 22.9% of Whites had a B.A. degree or higher; 12.9% of African-Americans. This is an overall widening of the gap by 5% between 1960-1994 (favoring Whites) for those who have completed 4 years of high school or more or have a B.A. degree or higher (This information can be found on page 157 of the aforementioned abstract.)

Thus, most of the economic and educational progress made by African-Americans since the civil rights struggles of the 1960s have been "within" their own group (There have been retrogressions as well.) The gap between Whites and African-Americans has "increased" since the civil rights struggles of the 1960s in the economic and educational institutions except in the area of high school graduations.

McKenzie (1986) reported the results of a survey of 461 (82.5%) New Jersey school districts that, "...sought to determine if G/T programs are more likely to serve the wealthy, the white and those from high status socioeconomic backgrounds than the poor, the disadvantaged, the minorities and those from low status socioeconomic backgrounds" (p. 93). Underlying assumptions employed by McKenzie for this study were that: (1) traditional achievement and intelligence tests may reflect bias of a racial and socioeconomic nature; (2) traditional achievement and intelligence tests may lack validity in identifying giftedness in a large segment of students; and (3) that there is a divergence of thought within the scholarly community in regards to the definition of giftedness--genetic vs nurture.
McKenzie's survey data were summarized in three categories; racial, identification, and socioeconomic. Under the racial rubric, Asians \([10.11\%]\), followed by whites \([6.85\%]\), had the highest incidence of participation in G/T programs followed by Native Americans \([3.85\%]\), African-Americans \([2.42\%]\), and Hispanics \([1.87\%]\) respectively. The type of procedure used to identify a student for selection to a G/T program was included in the identification category. Fourteen procedures were utilized with teacher nomination \([90.0\%]\), achievement tests \([89.6\%]\), and IQ tests \([82.0\%]\) leading the list and culture free tests \([3.5\%]\) bringing up the rear. Ten groups comprised the socioeconomic heading. Arranging these groups in ascending order, McKenzie found that the two lowest had the lowest percentage of students in G/T programs; 4.4\% and 8.1\%. The two highest had the highest and next to the highest percentage of students in G/T programs; 13.8\% and 12.1\%. The fifth ranked socioeconomic group had 13.6\% of its students in G/T programs.

McKenzie's findings support his hypothesis that G/T programs are skewed in favor of the wealthy, the White, and the socioeconomic privileged at the expense of the poor, the disadvantaged, the minorities, and the socioeconomic underprivileged.

Mugny and Carugati (1989) contended that intelligence is a creation of humankind. It had its origins in the history that is particular to a distinct culture. They further asserted that intelligence can no longer be interpreted as singular in nature, but must be viewed as a plural concept. Thus, intelligence is social in origin and multifaceted in nature.

The authors stated that no longer should intelligence be thought...
of as something that is possessed by an individual, but be viewed for what it really is, simply a label that society places on an individual who has characteristics that society has defined as intelligence.

Mugny and Carugati stated, "A semantic change of this sort opens up a new perspective, in which intelligence, instead of being regarded as a quality per se, can be seen as an attribute, admittedly socially necessary, which is culturally and historically determined, and therefore as liable to vary between the sub-groups of a single society as from one latitude to another" (p. ix).

Thus, Mugny and Carugati emphasized the preeminence of the social structure to biology in determining which individuals will be viewed as intelligent within the context of their society.

This researcher (1983), in a paper seeking the answer to the question--"What are the political implications of the underrepresentiveness of African-Americans in gifted and talented programs?" (p.18)--found the following:

This paper has demonstrated how the issue of political implications of the underrepresentiveness of African-Americans in GTPs, though appearing specific and mutually exclusive in nature, is intricately intertwined with the concept of power and its manifestation--control. It has shown that control is exercised for four reasons: to reduce randomness; to avoid necessity; to accomplish specified objectives; and to receive psychological satisfaction. It has illustrated that control can be personal or institutional. It has further demonstrated that a U.S. social system that is structurally inequitable and requires individuals to have unequal qualifications for it to function uses the educational institution for this purpose. The consensus role of African-Americans in helping to originate power within the educational institution through ignorance has been shown. These variables, in concert, have resulted in GTPs masking themselves euphemistically as havens for all gifted and talented students... (p. 18)

This researcher agrees with Hare (1987) and Ogbu (1985) that
Macro societal forces are at operation in the underrepresentiveness of African-American students in educational programs that serve children and youth with outstanding talent. However, I stress how power is exercised by Whites, within the context of the social structure, through the use of control. Hare argues that social structure "needs" determine the ultimate ranking of African-Americans economically and socially. Ogbug believes that "culture" modification, as a reaction to the control exercised by the dominant group, results in the persistence of "learning problems" for African-Americans.

Staunton (1993), in companion news articles discussing the disparity between African-American and White students in programs for children and youth with outstanding talent in the Hampton Roads area of Virginia, revealed a virtual cornucopia of statistics skewed in favor of White students compared to African-American students who participate in such programs. The comments of educators, concerning the economic and imperfect test influences in explaining the disparity of African-American students, support the general thrust of articles in this section that cultural and social structure mechanisms are the cause of the underrepresentiveness of African-American students in programs designed for children and youth with outstanding talent.

All of the theories and research in this section share all or some of the following characteristics:

- Macro forces, at the societal level, define intelligence and aid in explaining why African-American students are underrepresented in CYOT programs. These include:
  - Culture.
  - Social structure.
  - Economic structure.
  - Social definitions of intelligence.
  - Societal level power exercised through control.
Having presented the three major categories of theories that offer insight to explain why African-American students are underrepresented in educational programs designed for children and youth with outstanding talent, an assessment of the "gap" that exists between the current theories and actual CYOT program practices is in order. Some researchers who have addressed this concern are Jenkins-Friedman (1982); Ryan (1983); Richert (1985, 1987); Baldwin (1987); Roberts (1989); and Ford & Harris (1989).

**The Gap Between Theory and Practice**

Jenkins-Friedman's (1982) purpose was to debunk the myth that standard IQ tests measure giftedness or its potential. She began by acknowledging that Louis M. Terman, who helped develop the Stanford Binet Intelligence Scale, "...shaped both the conception and measurement of giftedness" (p. 24). This occurred because Terman believed that giftedness and intellectual ability were virtually synonymous and could best be measured by the standard IQ test. Jenkins-Friedman asserted that this narrow definition and interpretation of giftedness was in vogue in the field of education for over thirty years. She stated that despite numerous studies that support the conclusion that traditional IQ tests identify persons that perform well in a school environment and not giftedness, the practice of having IQ tests weigh more in gifted and talented program selection continues. However, she argued that such selection is guised under the rubric multiple selection criteria.

Ryan (1983) reported the findings of a 1974 study of kindergarten and third grade students, in the Maryland suburbs of Washington, D.C., whose purpose was to see if "...the traditional means used to screen

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and to measure intellectually gifted African-American children are
effective and efficient" (p. 155). The study was conducted in two
phases, screening and final identification.

In the screening phase, four methods were used--two traditional;
teacher nomination and the Goodenough Draw-A-Man, and two
nontraditional; peer nomination and pupil product. The final
identification phase employed one traditional assessment tool--the
Stanford-Binet and one nontraditional assessment tool--the Leiter
International Performance Scale (LIPS).

Using multiple regression analyses incorporating the four
screening methods, the Binet and Leiter scores, and parent
questionnaire results, Ryan discovered "...that information provided
by a parent may be more effective than any one or combination of the
four nomination criteria used in this study" (p. 155). The results of
the head-to-head use of the Binet and Leiter indicated that the Leiter
"...may be effective in the screening and final identification of
intellectually superior African-American children" (p. 155).

In general, nontraditional methods--used to screen and measure
intellectually gifted African-American children--may be more effective
than traditional methods. Since traditional methods of nomination and
selection are used much more than nontraditional methods, in spite of
an available literature that questions the traditional methods, this
results in many intellectually gifted African-American children being
overlooked for such programs.

Richert (1985) summarized the recommendations reported in The
National Report on Identification, Assessment and Recommendations for
Comprehensive Identification of Gifted and Talented Youth (1982) of
which she was a coauthor. Listed below are some of its findings concerning the identification of gifted students:

- several categories of giftedness are simply not being addressed.
- education equity is being violated in the identification of significant subpopulations.
- identification instruments are being used to identify categories of giftedness for which they were not designed.
- instruments and procedures are being used at inappropriate stages of identification.
- multiple criteria are being combined inappropriately. (p. 69)

The National Report clearly established that a gap exists between theory and practice.

Richert (1987) purported two objectives in an article addressing giftedness and disadvantaged gifted students—to isolate the problems and promising practices in identifying disadvantaged gifted students.

Addressing the former, she listed four possible problems:

- conceptually limited definitions of giftedness that reduce giftedness to a single test score.
- confusion between the research and programmatic purposes of identification.
- identification procedures that oversimplify the complexity of giftedness as a developmentally linked phenomenon by placing too much emphasis on tests and other measures of academic achievement biased against the disadvantaged.
- program designs that serve too few students with exceptional potential. (pp. 150-151)

Addressing the latter, she listed four possible promising practices:

- appropriate use of test data.
- non-test approaches—nominations, observation scales, and checklists.
- information from students—self-nomination, interviews, biographical data, and case studies.
- developmental curriculum—(used to identify those students whose only source of nomination is the school). (pp. 152-154)

Richert was writing two years after the preceding article, and five
years after the National Report in which she summarized similar problems that she addressed in this article. Yet, the problems remained and the gap between theory and practice persisted.

Baldwin (1987) was concerned with the low representation of African-American students in programs for the gifted. She attributed this underrepresentation to historical and environmental factors such as "...socioeconomic deprivation, cultural diversity, social and geographic isolation, and a relative perception of powerlessness" (p. 180). Different assessment and identification techniques were offered to ameliorate this condition. These included teacher, peer, and parent nomination; the involvement of the community at large in identifying gifted African-American students; and personal abilities of African-American students—leadership skills, creativity, and mental processing abilities. Baldwin believes that a comprehensive gifted educational plan for African-American students would include "...identification, curriculum, the instructional environment (teacher, setting, strategies), and evaluation" (p. 180).

Roberts (1989) in her dissertation entitled THE IDENTIFICATION OF GIFTED CHILDREN AT THE FIRST GRADE LEVEL IN AN URBAN AND RURAL POPULATION, which "...examined the nomination procedures and assessment instruments employed in the gifted programs in ten urban and four rural southeastern Virginia school divisions (abstract, p. 1), found a disparity in K-1 membership of gifted programs, in both urban and rural school divisions, that favored white students. Roberts stated:

In urban divisions in which K-1 membership was reported as white, African-American, other, white children were four times as likely to be a member of the gifted program at the end of the 1987-88
school year as African-American children. In urban divisions in which K-1 membership was reported as a total and the percentage of white and African-American/other, white children were 2.73 times as likely to be a member of the gifted program as African-American/other children. In rural divisions, white children were six times as likely to be a member of the gifted program in kindergarten and grade one at the end of the 1987-88 school year as African-American/other children. (abstract, p.2)

The concept of "Action/Inaction" was introduced by Roberts to indicate what a particular school division actually did in response to "The Initiating Force" (the way in which the issue of the identification of gifted African-American children has been perceived or not perceived as an issue within a community and/or school division) (p. 91). A third variable, "The Descriptors" referred to "...characteristics of school divisions in this research project which have experienced this Initiating Force" (p. 9). A fourth variable was "Administrator" which encompassed "...the experience of the gifted program administrator and the percentage of time he or she spends administering the gifted program" (p. 92). The final variable was "Resulting Force" which "...is evidence through membership of African-American children in the gifted program and/or new program development efforts that progress is being made, or not being made, in the identification of African-American gifted children" (p. 92).

Roberts analyzed these five variables and developed profiles of "Action" and Inaction school divisions.

Action school divisions exhibited the following characteristics:

- a positive Initiating Force.
- specific identifiable Descriptors.
- an experienced gifted program administrator who spends a majority of his/her time administering the gifted program. (p.92)
Inaction school divisions exhibited the following characteristics:

- a negative Initiating Force.
- non-specific Descriptors.
- a less experienced administrator (five years or less) who spends less than 60% of his/her time administering the gifted program. (p. 93)

Action school divisions were identified as those who were large and urban with a positive Resulting Force. Inaction school divisions were identified as those who were rural or urban, with a small percentage of African-American students, with a negative Resulting Force.

Roberts stated that her research "...confirms much of the literature which cites the underrepresentation of African-American children in gifted programs..." (p. 95). However, she believes that her study went beyond its stated objectives. She stated, "...this study also illuminates elements which directly relate to the issue which go beyond procedures and assessment instruments. It appears that, based on this investigation, the identification of gifted African-American children is contingent upon forces unique to each community and school division" (p. 95).

In her recommendations, Roberts advocated that more research be conducted in "...unexplored dimensions to the issue of the identification of gifted African-American children..." (p. 96). These recommendations are listed below:

- to examine in depth, and with a larger sample, the nomination procedures and assessment instruments which appear to result in the nomination and eligibility of African-American children for the gifted program in urban and rural divisions.
- to study central office staff organization and the impact of staff assignments on the productivity of the gifted program administrator within a division.
- to examine the attitudes and backgrounds of Superintendents...
regarding education in 'Action' and 'Inaction' divisions. (p. 96)

Roberts' findings, conclusions, and recommendations are in harmony with the research explored in this section.

Ford and Harris (1990) argued that there exists a dearth of scholarly articles documenting African-American student experiences in gifted and talented programs. They reasoned that this, in turn, lead to a lower degree of comprehension of the nature of gifted and talented African-American students which resulted in "...inadequate identification procedures, definitions, theories, and programs" (p. 27). Consequently, they believe African-American gifted and talented students may be underrepresented in such programs.

They offered a variety of nontraditional approaches to overcome this underrepresentation which were inspired by Howard Gardner's multiple intelligences theory (1983). These ranged from multicultural education to early identification utilizing pluralistic assessment instruments.

The gap that exists between theory and practice can best be synopsized by listing the characteristics of an ideal program for "children and youth with outstanding talent" as summarized in National Excellence: A Case for Developing America's Talent (1993). The list follows:

- Seeks variety--looks throughout a range of disciplines for students with diverse talents;
- Uses many assessment measures--uses a variety of appraisals so that schools can find students in different talent areas and at different ages;
- Is free of bias--provides students of all backgrounds with equal access to appropriate opportunities;
- Is fluid--uses assessment procedures that can accommodate students who develop at different rates and whose interests may change as they mature;
- Identifies potential--discovers talents that are not readily apparent in students, as well as those that are obvious; and
- Assesses motivation--takes into account the drive and passion that play a key role in accomplishment. (p. 26)

The above "ideal" program characteristics, for children and youth with outstanding talent, have positive implications for the issues that this study addresses.

Summary

This review has shown that the federal role in gifted education had its genesis in the National Defense Education Act of 1958. However, this fact was not officially acknowledged--at the time--due to the long standing reticence of the federal government to exercise a direct role in education at the state level because of Constitutional constraints. However, the responsibility for slow development and implementation of gifted education nationally cannot be solely blamed on timid federal efforts. A portion must be associated with the difficulty in developing a "definition" of giftedness, both at the federal level and within the academic community, due to the ambiguity of its major construct--intelligence.

The first comprehensive federal definition of giftedness was contained in the 1972 Marland Report. Three definitions subsequently were included in two legislations and one national report. These are listed below:

During the development of the above succession of giftedness definitions, "psychomotor ability" was deleted and the term "youth" was used for the first time in the 1978 definition. The National Excellence definition is restated below:

Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment.

These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools.

Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (Ross, 1983, p 26)

The first academic attempt at defining giftedness is credited to Francis Galton in Hereditary Genius published in 1869. Ever since this seminal effort, many others have sought the same objective—resulting in the development of the general and multiple intelligence(s) schools of thought.

The general intelligence and multiple intelligences schools' giftedness definitions are exemplified by their most ardent proponents respectively—Arthur Jensen and Howard Gardner. A Jensen giftedness definition stresses that a predetermined score on a g factor sensitive instrument identifies giftedness. A Gardner giftedness definition stresses problem solving and the fashioning of products that a culture values. The intelligence(s) of one who accomplishes these things may be determined by an array of measures, i.e., portfolios, inventories,
Regardless of which orientation researchers favor, general intelligence or multiple intelligences all agree that the selection process which determines CYOT program participation should be as equitable as possible. Two selection approaches have been identified in the literature—unidimensional and multidimensional. Of the two, multidimensional selection criteria also known as pluralistic assessment (PA), is generally advocated as being preferable. National Excellence, the most recent national CYOT report, advocated the following gifted program identification selection procedures:

* Seeks variety—looks throughout a range of disciplines for students with diverse talents;

* Uses many assessment measures—uses a variety of appraisals so that schools can find students in different talent areas and at different ages;

* Is free of bias—provides students of all backgrounds with equal access to appropriate opportunities;

* Is fluid—uses assessment procedures that can accommodate students who develop at different rates and whose interests may change as they mature;

* Identifies potential—discovers talents that are not readily apparent in students as well as those that are obvious; and

* Assesses motivation—takes into account the drive and passion that play a key role in accomplishment. (p. 26)

Although pluralistic assessment has been officially championed in all three national CYOT reports, most gifted programs in the United States rely on standardized tests for admittance. This state of affairs has developed because of the major historical influence of g factor standardized tests.
A third area of intelligence research has developed as a reaction to both general intelligence and multiple intelligences research--macro cultural/social theory. These researchers state that intelligence is best studied at the "macro" level. This approach differs from the "micro" or individual level of analysis pursued by the g factor and MI camps. Macro cultural/social theorists state that societal level forces define the parameters of intelligence.

All of the above theorists agree that African-American students are not represented in CYOT programs proportionate to their representation in the larger U.S. society. However, there is disagreement as to whether the gifted selection process is to blame. General intelligence researchers support the position that the selection process is not responsible. Multiple intelligences and macro cultural/social researchers take the opposite position. Insight into this issue was provided by E. Susanne Richert, a coauthor of The National Report on Identification: Assessment and Recommendation for Comprehensive Identification of Gifted and Talented Youth (1982). Writing in 1985, Dr. Richert summarized its recommendations below:

- several categories of giftedness are simply not being addressed.
- education equity is being violated in the identification of significant subpopulations.
- identification instruments are being used to identify categories of giftedness for which they were not designed.
- instruments and procedures are being used at inappropriate stages of identification.
- multiple criteria are being combined inappropriately. (p. 69)

These recommendations highlight the gap that currently exists between gifted/intelligence theory and CYOT program practices. This gap can be ameliorated by implementing the characteristics of an ideal gifted
program as listed in ***National Excellence: A Case for Developing America's Talent*** (1993). These appear below:

- Seeks variety—looks throughout a range of disciplines for students with diverse talents;
- Uses many assessment measures—uses a variety of appraisals so that schools can find students in different talent areas and at different ages;
- Is free of bias—provides students of all backgrounds with equal access to appropriate opportunities;
- Is fluid—uses assessment procedures that can accommodate students who develop at different rates and whose interests may change as they mature;
- Identifies potential—discovers talents that are not readily apparent in students, as well as those that are obvious; and
- Assesses motivation—takes into account the drive and passion that play a key role in accomplishment. (p. 26)

If the above National Excellence "ideal CYOT program characteristics" are universally adopted, it is likely that an amelioration will occur in the underrepresentation of African-American students participating in programs for the gifted. Hopefully, the data gathered from this research will assist in realizing this objective.
CHAPTER III
RESEARCH METHODOLOGY

Research Design

Two objectives have been pursued in this research. The primary focus of this research has been to determine if a multiple intelligences instrument—the Teele Inventory of Multiple Intelligences (TIMI) can identify a statistically significant greater number of potentially gifted and talented African-American students for participation in CYOT programs than a traditional standardized general intelligence instrument—the Otis-Lennon School Ability Test (OLSAT). An ancillary objective has been to cross-validate four of the seven intelligences that the TIMI purports to identify and measure. Four instruments were used in this research.

The TIMI was chosen for use in this study because it is the first general, forced choice, instrument that was specifically designed with Howard Gardner's theory of multiple intelligences as its theoretical underpinning (S. Teele, personal communication, June 5, 1996). The OLSAT was chosen because it is the same instrument that is used in the gifted program selection process for School System Z and is one of the premiere (g) factor-theoretically based instruments available for use today (Anastasi, 1992). It was also used to cross-validate two TIMI intelligences; logical-mathematical and linguistic intelligence. The Assessment of Interpersonal Relations (AIR) was chosen because it has
as its primary purpose to identify interpersonal relations and its strength within an individual (Bracken, 1993) it was also used to cross-validate interpersonal intelligence for the TIMI. And, the Intermediate Measures of Music Audiation (IMMA) was chosen because it was designed to measure musical ability and its strength within an individual (Gordon, 1986). It was also used to cross-validate musical intelligence. Cross-validation was deemed necessary because of the newness of the TIMI and the fact that it is currently undergoing validation studies (see Appendix A).

Convergent correlation was utilized in cross-validating the TIMI. Instruments that measure similar underlying constructs should produce high correlation coefficients. Confirming such similarity is the function of convergent correlation.

Originally, the researcher had intended to use complete intact fourth grade classes for this study. However, due to the low return of parental permission forms at the first data collection site, this idea was abandoned. Instead, the researcher found it necessary to combine all fourth grade classes (three) at School C with all fourth grade classes (three) and fourth graders in two mixed (third and fourth graders) classes at School B to form one sample. School B had a total fourth grade population of 60 students (Source: Official class rolls; see Appendix c). Its sample consisted of 35 students. School C had a total fourth grade population of 95 students (Source: Official class rolls; see Appendix c).

Because intact classes were not used, but combined "remnants" of all classes, the researcher compared the students who participated in the study to those who did not participate on a number of variables.
(age, sex, race, socio-economic status) to ascertain whether or not the two groups unlikeness may have influenced the study's findings. A counterbalanced format was employed for instrument administration to avoid the effects of sequence or order of instrument administration on analysis results (Borg & Gall, 1989).

A counterbalanced repeated measures 2 (instruments--TIMI and OLSAT) x 2 (race--African-American and Caucasian) x 2 (sex--male and female) factorial quasi-experimental design was utilized for this study. Counterbalancing avoids "...the problems of interpretation due to order effects" (Borg & Gall, 1989, p. 709). Borg & Gall stated:

"Quasi-experimental designs are used when random assignment of subjects to experimental and control groups is not possible" (p. 688).

It was the ultimate goal of this research to be able to match subjects involved in this study as much as possible. Borg & Gall state, "Random assignment is the best technique available for assuring initial equivalence between different treatment groups" (p. 664). A repeated measures design allows the researcher to bring this desirable goal (equivalence) into fruition, for it allows each subject, in a study to, serve as his/her own control. Kachigan (1986) commented on the "strength" of the repeated measures design:

To appreciate the power and efficiency of this type of design, it needs to be recognized that measurements on the same individual are much less variable than measurements on twins, which are less.
variable than measurements on siblings, which are less variable than measurements on "matched" individuals, which are less variable than measurements on random individuals; the latter condition representing the completely randomized experimental design. (p. 302)

The independent variables in this study are the instruments (TIMI and OLSAT), the race of the subjects (African-American and Caucasian), and sex of the subjects (male or female). A subject's obtained score on each instrument, that falls within a "score band" considered to be representative of "giftedness" for each instrument, is the dependent variable.

Hypotheses

Null: H01 There is not a statistically significant difference between the subscales of a multiple intelligences and a general intelligence instrument in identifying potential urban fourth grade African-American CYOT students.

Null: H02 There is not a statistically significant difference, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race.

Null: H03 There is not a statistically significant difference, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of sex.

Null: H04 There is not a statistically significant interaction, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race and sex.

Alternate Hypotheses
Ho1 There is a statistically significant difference between the subscales of a multiple intelligences and a general intelligence instrument in identifying potential urban fourth grade African-American CYOT students.

Ho2 There is a statistically significant difference when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race.

Ho3 There is a statistically significant difference when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of sex.

Ho4 There is a statistically significant interaction when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race and sex.

Research Setting

Community This research study was conducted in City Z—an urban community of 430,295 (7/1/94) located on the Mid-Atlantic coast of the United States. Like other urban communities, City Z is a cornucopia of racial, ethnic, socio-economic, and educational diversity. In 1990, the total population of City Z was 393,069. This figure was composed of 316,408 [80.5%] White, 54,671 [13.9%] African-American, 17,025 [4.3%] Asian-Pacific Islander, 3,581 [0.09%] Hispanic, and 1,384 [0.035%] Native American. In 2010, City Z is projected to have a total population of 575,000 (City Z Data Sheet, 1995-96).

The median income for City Z is $33,928 (Opinion Surveys, 1994 as
cited in City Z Data Sheet, 1995-96). Four percent of City Z's population earns under $14,999; 27% earns between $25,000-$34,999; 12% earns between $50,000-$74,999; and 7% earns $75,000 or more. Diversity extends across occupational categories in City Z--White Collar [45%], Military [27%], Blue Collar [14%], and Retired [13%] (Opinion Surveys, 1994 as cited in City Z's Data Sheet, 1995-96). City Z's business base is a diversity of manufacturing and non-manufacturing companies. A sampling of which include Raytheon Service Company, Milcom Systems Corporation, Architectural Graphics; Avis Incorporated, Lillian Vernon Corporation and Navy Exchange Service Command.

As in other urban communities, City Z exhibits diversity in educational attainment of its citizens and its educational facilities. City Z has a very high degree of educated and professionally trained citizens: 5% have less than a high school diploma, 36% have both a high school diploma and technical school degree, 26% have some college, and 32% have a college degree or more. (This is considerably higher than the national average--see Statistical Abstract of the United States, 1995, p. 157.) Because City Z is a racially, ethnically, socio-economically, and educationally diverse community (see Appendix B), this study has an urban focus.

School System

City Z City Public Schools (CZCPS) is the second largest school district within its state and the 38th largest in the United States (1995-1996 Guide, City Z City Public Schools). Its physical plant consists of 75 schools; 10 high schools, 13 middle schools, and 52 elementary schools. As of September 30, 1995, the system had 76,508
students enrolled, of which, 52,808 [69.0%] were Caucasian; 17,595 [23.0%] were African-American; 4,079 [05.3%] were Asian-Pacific Islander; 1,941 [2.5%] were Hispanic and 85 [0.1%] were Native American (S. Vaughn, personal communication, January 31, 1996; see Appendix C).

It is noteworthy that the percentage of African-Americans comprising the student population is 9.1% greater [23%] than the 13.9% of African-Americans in City Z's general population. This could be the result of a higher birth rate among African-Americans or due to Whites sending their children to private schools (sectarian and non-sectarian). In any case, this question is fertile ground for future research.

On January 3, 1996, City Z City Public Schools' total enrollment was 75,993 (Office of Technology, 1996, Monthly Attendance Reports [breakdown of figures by race was unavailable]). Approximately 25% [18,589] of CZCPS's students participate in the free or reduced lunch program (School Profiles, 1995-96).

Schools

Two schools participated in this study--School C and School B. School B is located just a couple of miles from the "resort strip" of City Z. It is bordered on the west by an expressway which leads to the resort strip. This expressway is about one hundred yards away and its exit puts one within a block of School B. School C is located on the western border of City Z just a few miles from the bordering city. It is nestled within a residential community approximately five miles to the west of the "same" expressway that is so close to School B. The
Schools are twelve miles apart. Below is a detail description of each school (See Appendixes C & D for a visual summary of Schools B and C respectively.)

School B

In School Profiles 1995-96, a comprehensive visual statistical analysis of all schools within City Z published by City Z Public Schools' Educational Planning Center, the following description of School B was given by its principal:

School B was built in 1952 to serve School B's community and is a facility educating students in kindergarten through grade five. Additionally, it serves students with emotional disturbances, learning disabilities, and speech/language impairments. School B is an at-risk school meaning that over 75% of the students receive free or reduced lunch because of economic disadvantages. As a result, special instructional programs including Chapter 1, Reading Recovery, and extended-day kindergarten are available. (p. 124)

School B has a total enrollment of 464 students, of which, 284 [61.2%] were African-American, 163 [35.1%] were Caucasian, 14 [3.0%] were Hispanic, 2 [0.4%] were Asian/Pacific Islander, and 1 [0.2%] was Native American. Its fourth grade population consisted of 60 students. Of this total, 40 [66.7%] were African-American, 19 [31.7%] were Caucasian, 1 [1.7%] was Hispanic, and there were no Asian-Pacific Islanders or Native Americans. (S. Vaughan, personal communication, February 22, 1996; see Appendix C). School Profiles stated that School

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School B had a staff of 72. There were two administrators (African-American female principal, Caucasian male assistant principal); 36 teachers [33 (92%) females, 3 (8%) males] and 34 classified [28 (82%) females, 6 (18%) males]. Twenty-five [69.4%] of the teachers were Caucasian, 10 [27.8%] were African-American, and 1 [2.8%] was Other. Thirteen [38%] of the classified were Caucasian, 20 [58.8%] were African-American, and 1 [2.9%] was Other. Teachers with graduate degrees comprised 44.4% of School B's instructors, 2.7% of them were "new" to the system, and the average years of teaching experience was 11.6 years. There were 399 [89.5%] (based on a 1994-95 "Average Daily Membership" of 446) students participating in the Free/Reduced Lunch Program.

**School C**

The principal of School C described her school in *School Profiles* below:

Our mission is to create and nurture a cooperative community for children, families, and staff that fosters respect, self-worth, interdependence, and lifelong learning.

School C is an elementary school which serves students from preschool through grade five. Preschoolers and their caretakers are served through Head Start, an integrated preschool program, and a special program, the Pre-Roadrunner Program. Students in grades kindergarten through grade five are organized into single grade and multi-age groups. Caretakers choose the arrangement they prefer for their child(ren). School C serves all school-age students living in the zoned area, no matter the student's ability or disability. (p.82)

School C had a student body of 789. Its racial makeup was as follows: 586 [74.3%] were African-American, 176 [22.3%] were Caucasian, 20 [2.5%] were Hispanic, 7 [0.9%] were Asian/Pacific Islander, and there were no Native Americans (S. Vaughn, personal communication, February 22, 1996; see Appendix C). Its fourth grade population consisted of 95 students. Of this total, 74 [77.9%] were
African-American, 19 [20.0%] were Caucasian, 2 [2.1%] were Hispanic, and there were no Asian-Pacific Islanders or Native Americans. School Profiles stated that School C had a staff of 131. There were three female administrators (Caucasian principal; two African-American assistant principals), 60 teachers [57 (95%) females; 3 (5%) males], and 68 classified [59 (87%) females; 9 (13%) males]. Thirty-nine [65%] of the teachers were Caucasian and 21 [35%] were African-American. Thirty-eight [55.9%] of the classified were Caucasian, 24 [35.3%] were African-American, and 6 [8.8%] were Other. Forty-five percent of School C's teachers had graduate degrees: 13.3% were new to the system and the average years of teaching experience was 10.3. There were 464 [62.2%] (based on a 1994-95 "Average Daily Membership" of 746) students participating in the Free/Reduced Lunch Program.

School Synthesis

School Similarities

Both schools were Title 1 Schools; both had before/after school care; both served majority African-American students; both had female principals; both had over 90% female teachers; both had over 80% female classified; both had over 60% Caucasian teachers; both had over 40% of their teachers possessing graduate degrees; and both schools had over 60% of their students participating in the Free/Reduced Lunch Program.

School Dissimilarities

School B was the smaller school physically [52,687 sq. feet] and in enrollment [464]. School C had 57,568 sq. feet of space and enrolled 789 students. School B's principal was African-American and School C's principal was Caucasian. Fewer [2.7%] of School C's
teachers were "new" to the system than School B's [13.3%]. And, School B's teachers had less [10.3] years of teaching experience than School B's teachers [11.6].

Overall, the two schools were more similar than dissimilar. Thus, the sample drawn from each school should have been more alike than different. This, in turn, should have allowed the study's findings to not be impacted, by extraneous variables, in a manner that was statistically significant.

CZCPS's Gifted Population

Systemwide

As of September 30, 1994 (the latest available figures), City Z had a systemwide gifted enrollment of 5,601 students. This number consisted of 4,687 [83.7%] Caucasians, 423 [7.6%] Asian/Pacific Islander, 406 [7.2%] African-Americans, 66 [1.2%] Hispanic, and 19 [0.3%] Native American/Alaskan Native (S. Vaughan, personal communication, February 2, 1996; see Appendix D).

Elementary Level

On January 29, 1996, there were 1,862 students participating in CZCPS's Elementary Level Gifted and Talented Program located at Old Donation Center for the Gifted and Talented (ODCGT). Of this number, 1,558 [83.7%] were Caucasian, 167 [9%] were African-American, 101 [5.4%] were Asian/Pacific Islander, 32 [1.7%] were Hispanic, and 4 [0.2%] were Native American (D. Kingery, personal communication, January 29, 1996; see Appendix D). [See Appendices E - K for Gifted and Talented Program descriptions/selection criteria.]

Fourth Grade

On January 29, 1996, there were 505 fourth grade students
enrolled at ODCGT. Of this number, 424 [84%] were Caucasian, 36 [7.1%] were African-American, 34 [6.7%] were Asian/Pacific Islander, 9 [1.8%] were Hispanic, and 2 [0.4%] were Native American (D. Kingery, personal communication, January 29, 1996; see Appendix D).

School B

School B had 5 students participating in City Z Gifted and Talented Program (CZGTP). Of this number, 3 were African-American and 2 were Caucasian. There was 1 fourth grade student (African-American) participating in the CZGTP (S. Vaughn, personal communication, February 2, 1996; see Appendix D).

School C

School C had 9 students participating in the CZGTP. This number was comprised of 4 African-Americans, 3 Caucasians, and 2 Hispanics. No fourth grade students were participating in the CZGTP (S. Vaughn, personal communication, February 2, 1996; see Appendix D).

Research Population

Total Elementary Population Demographics

As of September 30, 1995, there were 36,448 elementary students enrolled in City Z City Public Schools (CZCPS). This total consisted of 25,347 [69.5%] Caucasians; 8,529 [23.4%] African-Americans; 1,564 [4.3%] Asian/Pacific Islanders; 970 [2.7%] Hispanics and 38 [0.1%] Native Americans (S. Vaughn, personal communication, February 19, 1996; see Appendix C).

Total Fourth Grade Population Demographics

On September 30, 1995, there were 5,917 fourth grade students in the CZCPS. This total consisted of 4,163 [70.4%] Caucasians, 1,367 [23.1%] African-Americans, 251 [4.2%] Asian-Pacific Islanders, 133
[2.2%] Hispanics, and 3 [0.1%] Native Americans (S. Vaughn, personal communication, February 19, 1996; see Appendix C).

School B's Fourth Grade Demographics

There was a total of 60 fourth grade students enrolled at School B. Of this total, 40 [66.7%] were African-American, 19 [31.7%] were Caucasian, 1 [1.7%] was Hispanic, and none were Asian-Pacific Islander or Native American (Source: Official class rolls; see Appendix C).

School C's Fourth Grade Demographics

There were a total of 95 fourth grade students enrolled at School C. Of this total, 74 [77.9%] were African-American, 19 [20.0%] were Caucasian, 2 [2.1%] were Hispanic, and none were Asian-Pacific Islander, or Native American (Source: Official class rolls; see Appendix C).

Research Sample

The research sample was drawn from the fourth grade population of two elementary schools in City Z--School B and School C. These schools were chosen because of their high percentage of African-American students (School B [61.2%]; School C [74.3%]) and their high percentage of students participating in the Free/Reduced Lunch Program (School B [89.5%]; School C [62.2%]). Traditionally, African-American students from low economic backgrounds have not performed well on standardized achievement/intelligence tests (Ford & Harris, 1990; Griffin, 1992; Hadaway & Mark-Schroer, 1992; Harris & Ford, 1991; Hiebert & Calfe, 1989; Madaus, 1994; Mitchell, 1988; Ryan, 1983; Woods & Achey, 1990; Yancey, 1983).

School B had a total of 60 fourth grade students. Of this number,
37 students originally participated in this study. And, 23 did not participate. However, 2 of the original student participants (both African-American) were not included in the data analysis due to their not taking the TIMI or OLSAT (see following paragraphs for details).

School B had 37 [61.7%] students participate in this study. Of this number, 26 [70.3%] were African-American and 11 [29.7%] were Caucasian (see Appendix L). No Asian/Pacific Islanders, Hispanics or Native Americans participated. After removing 2 student participants from the data analysis for not completing the TIMI or OLSAT, 35 [58.3%] School B students' instrument battery scores were analyzed for this study. Of this number, 24 [68.6%] were African-American and 11 [31.4%] were Caucasian (see Appendix L).

There were 23 [38.3%] School B students who did not participate in this study. Of this number, 14 [60.9%] were African-American, 8 [34.8%] were Caucasian, and 1 [4.3%] was Hispanic (see Appendix L).

School C had 69 [72.6%] students participate in this study. Of this number, 52 [75.4%] were African-American, 15 [21.7%] were Caucasian, and 2 [2.9%] were Hispanic (see Appendix M). One African-American student was not included in the data analysis due to her not taking the TIMI or OLSAT.

Therefore, 68 [71.6%] School C students' instrument battery scores were analyzed for this study. This number included 51 [75%] African-Americans, 15 [22.1%] Caucasians, and 2 [2.9%] Hispanics (see Appendix M).

There were 26 [27.4%] School C students who did not participate in this study. This number included 21 [80.8%] African-Americans and 5 [19.2%] Caucasians (see Appendix M).
A total of 103 students comprised the study's sample. This number consisted of 35 [34%] students from School B and 68 [66%] students from School C. Of the 103 sample students, 75 [72.8%] were African-American, 26 [25.2%] were Caucasian, and 2 [1.9%] were Hispanic. The sample of 103 was 66.5% of the two schools' combined fourth grade enrollment (see Appendix N).

The combined fourth grade enrollment for School B and School C was 155 students. This number was comprised of 113 [72.9%] African-Americans, 39 [25.2%] Caucasians, and 3 [1.9%] Hispanics (see Appendix N). No Asian/Pacific Islanders or Native Americans attended either school.

Thus, the sample racial composition mirrored the two schools' combined fourth grade racial composition. African-Americans were 72.8% of the sample and were 72.9% of the combined population. Caucasians were 25.2% of the sample and were 25.2% (identical) of the combined population. And, Hispanics were 1.9% of the sample and were 1.9% (identical) of the combined population (see Appendix N).

Sample Selection.

All students, at both elementary schools, were given the opportunity to participate in the study. The first school sample was drawn from School B. To prepare parents for the four page permission form that would be forthcoming, a half page note was sent home with each student (see Appendix O). A few days later a four page permission form (see Appendix P) was sent to each parent/guardian by way of each student. However, the return rate was much lower than expected. A contributing factor may have been the concern of some Caucasian parents that the focus of the study was on African-American
students. It was surmised, but never verified, that the length and "legalese" contained in the original four page permission form was intimidating to parents. To correct these concerns, a half page explanatory note was sent to parents by way of students. This note assured parents that no student would benefit over any other student because of his/her race in the study (see Appendix Q). Still, the return rate was very low. Finally, a signature line was included at the bottom of the last note sent to parents (see Appendix R). This last procedure resulted in a little over a 60% return rate and resulted in 37 students participating in the study out of a total of 60.

Because of the unexpected concern expressed by Caucasian parents at Seatack Elementary and the initial low return percentage of the four page permission form, all references to race were deleted from the truncated one page replacement form that was used at School C (see Appendix S). This modification may have eliminated the Caucasian parents' concerns and increased the permission form return percentage to over 70%. As a result, 69 students participated in the study out of a total of 95.

**Operational Procedures**

Before research can be conducted in City Z City Public Schools, approval must be granted by the principal of the school in which the researcher wishes to collect data. This can be done through a visit or phone call to the principal. The researcher gained approval through a phone call to one principal and a visit to another. After gaining the principals' approval, the researcher had to seek permission from the teachers whose students would participate. Both of these procedures
did not require a written application, but had to precede submission of a formal application.

The researcher submitted a formal "Application to Conduct Research" (ACR) (see Appendix T) to an Assessment Specialist in Educational Planning. Once approved, at this level, the ACR was forwarded to the superintendent and the school board for approval. After final approval, an approval letter was sent to this researcher-by an Assessment Specialist-with a copy to School B's principal. The principal of School C sent a follow-up approval letter to an Assessment Specialist confirming prior telephone approval. (see Appendixes U & V respectively).

Experimental Treatment and Procedures

Subjects as Own Control

As stated elsewhere in this paper, a repeated measures design enables each subject to serve as his/her own control. All students, in this study, performed this function.

Counterbalancing

The order of test administration was varied to ameliorate the possible confounding effects that may result from a particular administration sequence (See Appendix W for a graphic display of the order and days of instruments administrations.)

Data Collection

Four instruments were utilized in this study: The Teele Inventory for Multiple Intelligences (TIMI), the Otis-Lennon School Ability Test (OLSAT), the Intermediate Measures of Music Audiation (IMMA), and the Assessment of Interpersonal Relations (AIR). The TIMI and the OLSAT were the instruments of primary focus in this study. Ancillary imput
was provided by the IMMA and the AIR for the purpose of cross-validating the TIMI through the use of discriminate and convergent correlation. The OLSAT served a double purpose by also being used to cross-validate logical-mathematical and linguistic intelligences measured by the TIMI. The IMMA and AIR cross-validated music and interpersonal intelligences respectively.

The objectives of this study were twofold: (1) To determine if the TIMI could identify a statistically significant greater number of African-American CYOT students than the OLSAT; and, (2) To cross-validate four of the seven intelligences purported to be measured by the TIMI. These four intelligences were musical, interpersonal, logical-mathematical, and linguistic.

**Instruments**

The TIMI was selected for use in this study because it is the first "forced choice" instrument available—that is based on Howard Gardner's theory of multiple intelligences—that claims to measure all seven intelligences (S. Teele, personal communication, June 5, 1996). City Z City Schools uses the OLSAT as part of its gifted identification process. And, since it is considered to be one of the most accurate group (g) factor measures, it is appropriate for use in this study (Anastasi, 1992). The IMMA and AIR were selected after extensive research using The Eleventh Mental Measurements Yearbook (1992) and a series of testing catalogues (The Psychological Corporation, Western Psychological Services, etc.). Each instrument can be group administered in less than an hour--making them ideal for this study due to limited student testing time.

**Teele Inventory for Multiple Intelligences (TIMI).**
The Teele Inventory for Multiple Intelligences (TIMI) was developed by Dr. Sue Teele at the University of California, Riverside in 1992. In a copyrighted paper entitled *Statistical Analysis of The Teele Inventory of Multiple Intelligences* (1995), Dr. Teele stated that the TIMI "...is specifically designed to examine the dominant intelligences of students in kindergarten through the twelfth grade, and acts as an indicator as to whether or not students in different grade levels possess different intelligences" (p. 1). The TIMI is "untimed". However, its administration is usually completed within 30-45 minutes (Teele, 1992).

The theory of multiple intelligences, as espoused by Howard Gardner of Harvard University, is the theoretical underpinning upon which the TIMI is based. Gardner defines an intelligence as "...the ability to solve problems or fashion products that are of consequence in a particular cultural setting or community" (1983, p. 15). He has presented empirical data that supports the position that at least seven intelligences exist and argues that others probably will be discovered in the future. These intelligences are found in everyone in varying degrees and function independently and in concert with each other. They are not static, but have growth potential through interaction with the environment. Intelligences do not have meaning outside of the context or cultural milieu in which they are manifested because there is "...always an interaction between biological proclivities and the opportunities for learning that exit in a culture" (Gardner, 1993, p. 221). And, a part of Gardner's intelligences exist outside of the human body--fellow humans and inanimate objects become "...part of the individual's intellectual
armament" (Gardner, 1993, p. 223). Thus, multiple intelligences theory emphasizes that intelligence is plural in nature; results from an interaction of biology and environment within a cultural contextual milieu; and exists, to a considerable degree, outside of an individual's body because of an individual's dependence upon them for intellectual development and expression.

Teele (1995) described the TIMI as follows:

The TIMI is a forced choice pictorial inventory that contains 56 numbered pictures of panda bears representing characteristics of each of the seven intelligences and provides students twenty-eight opportunities to make their selections of two choices. The different intelligences are matched with one another and students have eight different times they can select each of the seven intelligences. Students are asked to select one of the two choices that they feel is the most like them. There are no right or wrong answers. When completed, the resulting data is compiled, and then the inventory identifies the dominant intelligences each participant possesses. The intelligences have been coded by number and by letter, and can be tallied on the answer sheet by either the instructor or student. The answer sheet is easily scored and presents a profile of the responses enabling the student and teacher to determine the students most dominant intelligences as indicated by the highest scores. (p. 2)

Validity studies for the TIMI are ongoing and preliminary results indicate that the TIMI is valid. Teele field tested the TIMI at an elementary school to analyze its content validity. She stated, "An examination of each picture was done to see if the pictures adequately represented descriptors for each of the seven intelligences (p.4). As a result of this effort, Teele stated,"Based on an item by item analysis many corrections were made to the pictures in the inventory in order to make them as valid as possible to the specific intelligence they represented. (p. 4)

Exploratory item validity was done through convergent validity
using the Metropolitan Achievement Test (MAT 6). Teele stated, "The MAT 6 is designed to measure the achievement of students in reading, mathematics, language, science and social studies. The battery of tests provides information about the relative performance of students in each of the content areas and in research skills" (p. 4). Steele performed convergent validity analysis on two students comparing their scores on the MAT 6 to their scores on logical-mathematical and linguistic intelligences on the TIMI. Below, Teele summarized these results:

Student number one, a third grade male, scored five points on linguistic intelligence and eight points on logical-mathematical intelligence on the TIMI. On the MAT 6 taken in March, 1993 he scored at the 81% in total reading, 84% in total language, 96% in math and 92% in math and 92% overall in the total battery. Comments from his teacher in his report card indicate strengths in language, reading and mathematics. There is a high correlation between the two assessments as in mathematics he scored the highest number of points in mathematics, 8, and received his highest scores on the MAT 6 in math. His score of five points on the TIMI correlates with his scores in reading and language as his scores were as follows: Vocabulary-92%, Word Recognition-97%-Reading Comprehension-65%-Spelling-61%, Language-93%, Total Reading-81%, Total Language-84%. Student number one indicated in an interview that math is his most favorite subject and that he wants to be a math teacher when he becomes an adult. He also indicated that reading and spelling were hard for him which is supported by his scores in spelling, 61% and reading comprehension, 65%.

Student number two, a third grade male, scored eight in logical-mathematical and five in linguistic intelligence on the TIMI. His total math scores in March, 1993 was 99%. It was the same score in March, 1992 indicating he has maintained a strong dominance in mathematical ability. There is a high correlation between his TIMI score of 8 in logical-mathematical intelligence and his MAT 6 score of 99% in mathematics. His total language score in March, 1993 was 78% but his reading score was 98%. In March, 1992 his total reading and language scores were both 99%. His TIMI score in linguistic intelligence was a 5 and was his third highest score indicating strength in this area but not as strong as the logical mathematical intelligence. There is a positive correlation between these two test results as well.

Discussing test-retest reliability analysis, Teele stated:
Over 10,000 TIMI inventories are currently being used in over 450 schools. Approximately 4000 answer sheets have been returned from kindergarten through twelfth grade students. This data has been used to conduct test-retest reliability on the instrument and to determine the dominant intelligences of students by grade level and also of teachers as well. (p. 5)

First grade students from "...an all Anglo school district in Kentucky and first grade classrooms from schools with high minority student populations in California" (p. 6) were included in the reliability analysis. These are the norming populations that have been described thus far. This study is part of the norming process as well. Also participating, were teachers from "...California with some representation from Kentucky, South Carolina, Arizona, Nevada, Michigan and Minnesota" (p. 6). Teachers from California were predominant in the teacher sample.

Three student samples were administered the TIMI twice during intervals of two, three, and four weeks. The two week sample had 63 students sit for the first administration and 52 for the second. The three week sample had 929 students sit for the first administration and 812 for the second. And, the four week sample had 668 students sit for the first administration and 619 for the second. All correlation coefficients were "...within a .01 significance level" (p. 6).

Four teacher samples were administered the TIMI twice within intervals of one, three, and four day(s) and two months. The one day sample had 34 teachers sit for the first administration and 30 for the second. The three day sample had 46 teachers sit for the first administration and 44 for the second. The four day sample had 160 teachers sit for the first administration and 154 for the second. And, the two month sample had 69 teachers sitting for both administrations.

Teele offered the following summary of the above analysis:
The results for students indicate a higher reliability of the inventory with five of the intelligences with the two week interval. Compared to the four week interval logical-mathematical, linguistic, spatial, musical and interpersonal intelligences were higher while intrapersonal and bodily-kinesthetic were not.

The results for teachers indicate a higher reliability of the inventory with the shorter interval of time. All of the intelligences were much higher with the one-day interval than the two-month interval. The comparison from four day interval to one day interval showed all but linguistic intelligence were higher. The test-retest reliability results and the analysis of the mean scores of students from elementary to secondary levels have revealed an indication that the intelligences may vary given time and circumstances and that there is a developmental aspect to the intelligences that needs to be further explored. (p. 10)

Currently, the TIMI is undergoing cross-validation with the Myers-Briggs Type Indicator (MBTI) in Brownsville, TX. The MBTI is an instrument designed to group individuals by "personality type". A total of 18 schools (grades 4th-12th) and 2,000 students in the Brownsville Independent School District are participating in this study. Data should be available within the next three to four months.

The TIMI was selected as the multiple intelligences measure because it is the only such measure available and it has demonstrated promise, through preliminary validity and reliability analysis, to be valid and reliable.

Otis-Lennon School Ability Test (OLSAT), Sixth Edition.

The Otis-Lennon School Ability Test (OLSAT) is "...designed to measure those verbal, qualitative, and figural reasoning skills that are most closely related to scholastic achievement. This complex of abilities is assessed through performance on such tasks as detecting similarities and differences, solving analogies and matrixes, classifying, and determining sequence" (The Psychological Corporation, 1993, p. 9). There are seventy-two (72) items in the OLSAT.
Approximately sixty (60) minutes are required for its administration. Students are allowed forty (40) minutes to complete the instrument.

This particular OLSAT has evolved from a series of predecessors beginning in 1918 with the publication of the Otis Group Intelligence Scale. Three subsequent tests followed—the Otis Self-Administering Tests of Mental Ability; The Otis Quick-Scoring Mental Ability Tests; the Otis-Lennon Mental Ability Test—before the current instrument was developed.

The OLSAT's theoretical underpinning is based on "...the Hierarchical Theory of Human Abilities of Vernon and Burt" (p. 9). This theory places Spearman's g factor at the top of its "hierarchy". Three levels—Major Group Factors (MAGF), Minor Group Factors (MIGF), and Specific Factors—complete the hierarchy respectively. As discussed elsewhere in this text, Spearman's "g" is equivalent to what is believed to be "general intelligence". The MAGF consists of verbal-educational and practical-mechanical abilities. The MAGF can be subdivided into the MIGF (verbal and numerical), these factors "...can be further divided into the specific factors or tasks involved in reasoning" (p. 10).

The OLSAT is comprised of "...seven levels and two forms that collectively assess the range of ability of students from Kindergarten through Grade 12" (p. 10). Level E (Grades 4-5), Form 1 was used in this study.

OLSAT validity and reliability was established through a national standardization program. Two standardization samples were administered the OLSAT. Specifics are provided below, "Testing for the Spring
Standardization took place from April 1 to April 30, 1988, with approximately 175,000 students from 1000 school districts participating in the program. The Fall Standardization took place from September 15 to October 8, 1988, with approximately 135,000 students participating in the program. (p. 17)

Both standardization samples sought to identify students who possessed characteristics that were representative of the national school population. These included socioeconomic status (SES), urbanicity, region of the country, ethnicity, and handicapping conditions.

SES was subdivided into five categories: Low, Low-Middle, Middle, High-Middle, and High. Each of these SES levels contained 20% of the total U.S school enrollment. The Fall Standardization Sample (FSS) contained nearly the same national distribution, with two SES levels (Low-Middle [21%] and High-Middle [19%]) off by only one percentage point. The Spring Standardization Sample (SSS) was identical to the national distribution--20% at each SES level.

Urbanicity was subdivided into three categories: Urban [23%], Suburban [46%], and Rural [31%]. This time the standardization samples were reversed. The FSS distribution was identical to the national distribution and the SSS had two categories off by one percentage point (Urban [22%] and Rural [32%]).

Region of the country was subdivided into four categories: Northwest [22%), Midwest [26%], South [22%], and West [29%]. Again, there was never a discrepancy more than a percentage point between
categories of the U.S national school population and categories of both standardization samples.

Ethnicity was subdivided into four categories: African-American [16%]; Hispanic [78%]; White [73%] and Other [3%]. All categories, within both standardization samples, never deviated more than one percentage point from the U.S. national school population.

Handicapping conditions were subdivided into seven categories: Emotionally Disturbed, Learning Disabled, Mentally Handicapped, Hearing Impaired, Visually Impaired, Orthopedically Impaired, and Other. No U.S national school enrollment percentages were provided. Only, one category had a percentage of more than one--Learning Disabled (FSS [2.3%] and SSS [3%]). All others never exceeded .5%. Nonpublic school students comprised 11% of both standardization samples.

The above statistics support the conclusion that the OLSAT is an instrument that was normed on a stratified representative sample. Borg and Gall (1989) stated that such "...sampling procedures assures...that the sample will be representative of the population in terms of certain critical factors that have been used as a basis for stratification, and also assures the researcher of adequate cases for subgroup analysis" (p. 225).

The OLSAT, Sixth Edition, was cross-validated with the Stanford, Achievement Test, Eighth Edition, and the Metropolitan Achievement Tests, Seventh Edition, for students that were tested in the spring for grades four and five. Why was the OLSAT cross-validated with the SAT and MAT 7? The technical information section of the OLSAT National Norms Booklet, Level E, Forms 1 and 2 states, "Since the relationship
between school ability and achievement has been demonstrated repeatedly in educational research over the years, tests that are intended to assess these constructs should also bear a solid relationship to each other" (p. 33). With this goal as the objective, correlation analysis was performed on the three instruments.

Total fourth grade correlation figures for the OLSAT and the SAT were compiled in four SAT subtest areas: Reading [.75], Mathematics [.79], Language [.69], and Thinking Skills [.81]. Their complete battery correlation was .82. The Sat fourth grade sample was N = 4186.

Total fourth grade correlation figures for the OLSAT and the MAT 7 were compiled in four MAT 7 test areas: Reading [.72], Mathematics [.75], Language [.73], and Thinking Skills [.77]. Their complete battery correlation was .80. The MAT 7 fourth grade sample was N = 5181.

Kuder-Richardson Formula #20 reliability coefficients were calculated for Forms 1 and 2 of the OLSAT for 9-year-olds, 10-year-olds, and 11-year olds. Only Form 1 statistics are discussed below because only Form 1 was used in this study.

Coefficients were provided in three categories for each age group: Verbal, Nonverbal, and Total. Coefficients for 9-year-olds were: Verbal [.84], Nonverbal [.86], and Total [.92]. Coefficients for 10-year-olds were Verbal [.86], Nonverbal [.88], and Total [.93]. Coefficients for 11-year-olds were Verbal [.88], Nonverbal [.89], and Total [.94].

Borg and Gall (1989) state:

The reliability of a standardized test is usually expressed as a coefficient. Reliability coefficients vary between values of .00 and 1.00, with 1.00 indicating perfect reliability, which is
never attained in practice, and .00 indicating no reliability. The reliability coefficient reflects the extent to which a test is free of error variance. Error variance may be defined as the summed effect of the chance differences between persons that arise from factors associated with a particular measure. (p. 259)

The OLSAT can be said to be highly reliable because of coefficients, within domains (Verbal/Nonverbal) across age groups, ranging from a low of .84 to a high of .89. Coefficient Totals ranged from a low of .92 to a high of .94.

The OLSAT was used in this study because it is viewed as one of the premier (g) factor standardized tests in wide use today (Anastasi, 1992). Also, it is one of the instruments used by the City Z City Schools in its giftedness selection process.

Assessment of Interpersonal Relations (AIR).

Bruce A. Bracken (1993), writing in the Assessment of Interpersonal Relations' Examiner's Manual, summarizes the philosophy and purpose underlying the development of the AIR:

The premise behind the Assessment of Interpersonal Relations (AIR) is that the early identification and remediation of relationship difficulties can contribute to children's overall healthy psychological adjustment. Therefore, this scale was developed to assess the quality of relationships children have with the individuals who are most important in their lives--their mothers, fathers, male peers, female peers, and teachers. (p. 1)

The AIR has five subscales: Mother, Father, Male Peer, Female Peer, and Teacher. Theses subscales are grouped into three sections. The Mother and Father subscales are in the first section. They are the only subscales that can be omitted due to death, separation, divorce or "other" reason. Male and Female peers are grouped in the second section. And, the third section contains the
Teacher subscale. Each subscale has the "same" thirty-five items. Each item has four possible responses: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). However, only one response can be given. There are a total of 700 possible responses, of which, 175 are selected. The AIR is an "untimed" instrument. "Although the AIR does not have administration time limits, the scale can be administered in about 20 minutes with most individuals" (Bracken, 1993, p. 18).

The AIR is theoretically based:

on a multidimensional, context-dependent model of psychosocial adjustment. The...AIR model proposes that individuals behave and are differentially adjusted in the various contexts in which they function. The educational and psychological literature frequently mentions six dimensions and contexts as being primary: Social, Competence, Affect, Academic, Family, and Physical. The...AIR assesses interpersonal relations in the three extra-individual contexts, Social (i.e., Male Peers and Female Peers subscales), Academic (i.e., Teachers subscale), and Family (i.e., Mother and Father subscales) (p. 1).

The construct of interpersonal relations is closely aligned with "...the seven theoretical and definitional characteristics of self concept proposed by Shavelson, Hubner, and Stanton (1976)" (p. 3). These seven characteristics are "...organizational structure, multifaceted nature, hierarchical dimensionality, stability, developmental characteristics, evaluative underpinnings, and construct differentiality" (p. 3). A brief description of each is provided below:

Organizational Structure - Interaction between individuals does not occur within a vacuum. Rather, there are parameters that limit and provide direction for the interpersonal behaviors of individuals. These parameters are found within the confines of an unseen social structure that assures that the interaction progresses along lines that are socially acceptable through feedback from interactional partners.
Multifaceted Nature - Interpersonal relations are not limited to one context. They occur across a wide range of environmental contexts. The AIR addresses three of these contexts; family, social, and academic. They are manifested in its Mother, Father, Male Peers, Female Peers, and Teachers subscales.

Hierarchical Dimensionality - It is theorized that the AIR subscales are "moderately intercorrelated". However, this does not mean that all the subscale relationships have an equal impact upon an individual. It simply means that together they form "...a generalized pattern of interpersonal relations" (p. 4).

Stability - A person's interpersonal relations change gradually over time as a result of forming and dropping relationships with individuals, contextual alterations, and positive/negative behavior reinforcement.

Developmental Characteristics - Interpersonal relations are correlated with the aging process. As an individual matures, his/her relationships with family members are altered due to increasing interaction with persons "outside" of the immediate family.

Evaluative Underpinnings - Individuals "...tend to generalize across relationships within domains and classify their relations according to these generalizations" (p. 6).

Construct Differentiality - Interpersonal relations, though not mutually exclusive from "general affectivity", is different from other psychological constructs.

Thus, the theoretical underpinnings of the AIR consist of seven characteristics that comprise the interpersonal construct and presupposes that interpersonal relations manifest themselves in individuals and in contexts.

The AIR was standardized on a sample of 2,501 children enrolled in Grades 5 through 12 [This study's student mean age was 9.50 years; well within the AIR's norming population's age range]. The sample ranged in age from 9 years to 19 years. The AIR was group administered at 17 sites across the four major regions of the United States. The sample included children of both genders and all major ethnic groups...the sample is quite representative of the U.S. population and matches the U.S. population parameters very well on most variables; however, the Northeast was somewhat undersampled and the South was oversampled. (p. 12)

The AIR sample was subdivided into gender, race, ethnicity, and U.S. region. Its composition consisted of male (1179 [47.39%]) and female (1309 [52.61%]); White (201C [62.28%]), Black (239 [9.78%]),

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and Other (194 [7.94%]); **ethnicity**—Hispanic (110 [4.50%], Native American (24 [0.98%]), Oriental (27 [1.11%]), African-American (239 [9.78%]), and Other (2043 [83.63%]); Northeast (173 [6.93%]), South (1310 [52.50%]), North Central (563 [22.57%]), and West (449 [17.99%]).

Comparing the AIR sample percentages to the U.S. population percentages, the following is revealed: Male (AIR 47.39% [U.S. 48.80%]), female (AIR 52.61% [U.S. 51.20%]), White (AIR 82.28% [U.S. 84.10%]), Black (AIR 9.78% [U.S. 12.40%]), and Other (AIR 7.94% [U.S. 3.50%]).

Viewing **ethnicity**, the following is revealed: Hispanic (AIR 4.50% [U.S. 7.90%]), Native American (AIR 0.98% [U.S. 0.70%]), Oriental (AIR 1.11% [U.S. 1.60%]), African-American (AIR 9.78% [U.S. 9.2%]), and Other (AIR 83.63% [U.S. 80.60%]).

Viewing U.S. region, the following is revealed: Northeast (AIR 6.93% [U.S. 20.20%]), South (AIR 52.50% [U.S. 35%]), North Central (AIR 22.57% [U.S. 23.90%]), and West (AIR 17.99% [U.S. 20.90%]).

AIR sample family characteristics are very similar to U.S. population family characteristics. The following comparison illustrates this conclusion: Intact Family (AIR 67% [U.S. 57%]), Foster Home Placement (AIR 1% [U.S. 1%]), Reconstituted Family (AIR 10% [U.S. 14%]), and Single-Parent Family (AIR 22% [U.S. 17%]).

As stated earlier, the above statistics confirm that the AIR sample "...matches the U.S population parameters very well on most variables; however, the Northwest was somewhat undersampled and the South was oversampled" (p. 12).

The AIR was validated in five areas: Content, Age and Gender
Differentiation, Contrasted Groups, Discriminant Analysis, and Factor Analysis.

Borg and Gall (1989) state, "Content validity is the degree to which the sample of test items represents the content that the test is designed to measure" (p. 250). An "appendix" is provided in the AIR Examiner's Manual (AEM) that lists over "...60 personality scales [that] assess adjustment in one or more of the AIR domains (i.e., Family, Social, Academic)" (p. 37).

Age and gender differentiation that was revealed in the literature, were supported in the charts and graphs--presented in the AEM. These charts and graphs were derived from the "standardization data" obtained from "...a national sample of over 2,500 children and adolescents" (p. 38).

A researcher in the field of interpersonal relations found the following, in regards to "contrasted groups":

Kelly (1990) assessed 92 nonclinic 'normal' adolescents and 88 adolescents who were admitted to an inpatient psychiatric treatment center. Because the literature implicates interpersonal relation deficits in a wide variety of psychiatric disorders, Kelly hypothesized that the AIR would discriminate between the clinic and the nonclinic groups. She found that the clinic sample reported significantly poorer interpersonal relations on all five of the AIR subscales than did the nonclinic group (p. 38).

Discriminant analysis was performed on the AIR and its co-normed instrument--the Multidimensional Self Concept Scale (MSCS). The following information and conclusions were realized from this analysis:

In general...the correlations between the two instruments, respective scales are quite low, suggesting that different constructs are being assessed by the two scales. Although this trend of low correlations is true across the unrelated subscales,
the correlations between related subscales show higher levels of relationship. For example, the MSCS Social subscale correlated at a very low level with the AIR Mother, Father, and Teachers subscales (.15, .13, and .08, respectively), but correlated at a moderate to high degree with Male Peers and Female Peers subscales (.36 and .78, respectively). Likewise, those interpersonal relations that are family oriented (i.e., Mother and Father) correlated moderately with Family self concept (i.e., the Mother subscale correlated .67 with Family self concept, and the Father subscale correlated .57 with Family self concept). The AIR Teachers subscale, predictably correlated highest with Academic self concept (r = .32).

The AIR TRI [Total Relationship Index] correlated at a moderate level (.55) with the MSCS Total Scale Score. This level of correlation suggests that the two instruments share only 30% of their reliable variance and assess different constructs. Interpersonal relations might affect self concept and might be affected by self concept, but it appears to be a different construct from self concept. (p. 39).

Last, factor analysis was performed on the AIR to determine its principal components. A varimax rotation revealed the following:

14 factors were identified with eigenvalues greater than 1; however, the subsequent scree plot suggested the presence of seven 'meaningful' factors. In combination, the seven factors accounted for 43.9% of the variance and had eigenvalues that ranged from 25.83 to 3.55. As anticipated, the first five factors corresponded with the five AIR subscales. The remaining two factors were identified as individual items that were present across all five subscales...

In an independent study, Peterson (1991) conducted a factor analysis of the AIR items and extracted five independent factors that corresponded with each of the AIR subscales. She concluded, 'The analyses indicate that each of the subscales measures a unique relationship, each with its own characteristics and factor structure' [p. 60] (pp. 38-39).

AIR reliability data was gathered in two areas—internal consistency and stability. Internal consistency addresses the degree of positive correlation for items within a subscale and their overall contribution to the instrument's total score. Stability focuses on the ability of an instrument to produce similar scores over time.

The AIR is internally consistent at the subscale level and in
instrument total score. This conclusion is supported by very high coefficient alphas as evidenced below:

Each of the five subscales evidences internal consistency estimates that exceed .90, regardless of the child's age or gender. At the lowest level of internal consistency (i.e., Male Peers, Grades 5 and 6; Teachers at all age levels), 93% of the AIR obtained score is the result of reliable variance, with only 7% associated with error variation.

At each grade level, the TRI coefficient alphas are .96, and the TRI coefficient for the entire standardization sample of 2,501 subjects is .96. This level of internal consistency suggests that examiners can expect examinee item responses to be quite consistent within scales. Also, these findings suggest that approximately 96% of TRI variance is reliable or true, and only 4% is due to error (p. 36 note: The current paragraph preceded the former in the original document.)

Results of a Pretest-posttest design, that employed a sample of 22 (ages 13 through 16 years; 14 females and 8 males), found the "...TRI stability coefficient was .98 and the stability coefficients for the five subscales were as follows; Mother, [sic] 97; Father, .95; Male Peers, .96; Female Peers, .94; and Teachers, .97 (p. 36).

Intermediate Measures of Music Audiation (IMMA).

Gordon (1986) states, "The Primary Measures of Music Audiation (PMMA) and the Intermediate Measures of Music Audiation (IMMA) are designed to act as objective aids to teachers and parents in helping each child make the best use of his music aptitudes by providing the child with appropriate opportunities and instruction" (p. 1). The IMMA was used in this study.

Musical phrases, of short duration, comprise both the Tonal and Rhythm tests that makeup the IMMA. It was designed to be a group test, but can be administered to individuals. A summary of the IMMA follows:
Each test is recorded on a separate cassette. There are forty questions with practice examples for each test. A child does not need to know how to read a language or music, or to know numbers, in order to use the answer sheet for either test. The child answers the questions presented on the cassette by making circles around pictures on the answer sheet. No formal music achievement is required to answer the questions. The child simply draws a circle around the pair of faces that are the same on the answer sheet if the two musical phrases sound the same; if the two phrases sound different, the child draws a circle around the pair of faces that are different on the answer sheet. (p. 2)

The IMMA, which requires 40-45 minutes to administer, seeks to identify audialional abilities in children from grades one through four. "Audiation takes place when one hears and feels music through recall or creativity, the sound not being physically present except when one is audiating while also aurally perceiving music that is being performed by others or that one is performing himself" (p. 9).

The IMMA measures what eventually becomes "music aptitude". Why not just call it music aptitude since it measures what will be deemed as music aptitude? An answer to this question is provided by the test developer. Gordon stated, "Because stabilized music aptitude becomes the actual measure of one's potential for achievement in music in later years, and because music aptitude does not stabilize until age nine, these tests are called measures of music audiation rather than measures of music aptitude" (p. 9).

Since a measure of audiation is a precursor of what will ultimately become music aptitude, music aptitude theory provides the theoretical support for the IMMA. There are two dominant schools of thought pertaining to music aptitude; one is the Gestalt school and the other is the atomistic school. "The Gestalt group holds that music aptitude is a unitary trait of which overall intelligence is a substantial part. The atomistic group contends that music aptitude is

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multidimensional; that is, that it has various parts, none of which are significantly related to overall intelligence" (p. 5).

Gestaltist believe that a music aptitude test score must be "composite" in nature (no subtest scores). However, atomistic researchers advocate the opposite position. They insist upon music aptitude tests that emphasize subtest scores. The IMMA synthesizes the two research traditions because it "...yields an objective tonal subtest score, an objective rhythm subtest score, and a composite score" (p. 11).

Four forms of validity testing were conducted for the IMMA; content, concurrent; congruent; and longitudinal.

Content validity for IMMA test items was analyzed through "...intercorrelation among the test items" (p. 101). Although the coefficients are reported for the PMMA, they are applicable to the IMMA because "...the rationale and design of the Primary Measures of music Audiation and the Intermediate Measures of Music Audition are the same" (p. 22). A sample of 873 (127 kindergarten, 202 grade one; 280 grade two; and 264 grade three) students participated in the study. It took place in West Irondequcit, New York in October and November of 1978. Although statistical significance at the one percent level was obtained with a coefficient of .23 or higher, the standard was set to equal .30 or more to account for practical significance. The results are reported below, "It was found that 26 percent (422) of the possible tonal pattern intercorrelations that equal or exceed .30 are positive and that 8 percent (122) are negative, making 34 percent, (544) in all. Similarly, 17 percent (277) of the possible rhythm pattern intercorrelations that exceed .30 are
positive and 9 percent (147) are negative, making 26 percent (424) in all" (p. 101)

Borg and Gall (1989) stated, "The concurrent validity of a test is determined by relating the test scores of a group of subjects to a criterion measure administered at the same time or within a short time interval" (p. 254). Details of two IMMA concurrent validity studies appear below:

Without knowledge of test scores, the general music specialist in the Chestnut Hill Academy, a private school for boys outside Philadelphia, Pennsylvania, was asked to rate each of the children in her class in terms of overall music aptitude. All of the children in the first four grades were rated; 24 in grade 1, 23 in grade 2, 29 in grade 3, and 31 in grade 4. The children attended music classes two or three times a week, depending upon the grade. As a result, the teacher was well acquainted with all of the children and their musicianship. Each child was given one rating on a five-point scale by the teacher. Those ratings were correlated with all of the children's Intermediate Measures of Music Audiation scores. (p.105)

Validity coefficients were provided for subtest (Tonal and Rhythm) and Composite scores for all four grade levels. Grade 1 had coefficients of .45 (Tonal), .23 (Rhythm), and .35 (Composite). Grade 2 had coefficients of .47 (Tonal), .22 (Rhythm), and .44 (Composite). Grade 3 had coefficients of .46 (Tonal), .25 (Rhythm), and .45 (Composite). And, grade 4 had coefficients of .40 (Tonal), .25 (Rhythm), and .36 (Composite). Gordon interpreted the findings thusly:

The validity coefficients for the Tonal test and the Composite test are what should be expected. The validity coefficients for the Rhythm test, however, are comparatively low. Most teachers give primary consideration to tonal attributes in the evaluation process. The coefficients emphasize the need for objective tests not only to identify children with high overall music aptitude but, moreover, to diagnose the musical strengths and weaknesses of individual children. (p. 105)
General music ability is not the only area that yields information on music aptitude. Another fruitful avenue of inquiry focuses on a more specific application of music aptitude—the playing of musical instruments. A description of a concurrent validity study, involving the playing of musical instruments, appears below:

In the second concurrent validity study, the band director in the one elementary school in Jenkintown, Pennsylvania, was asked to rate all of the children in his fourth grade beginning instrumental music ensemble on the basis of overall music aptitude after he had taught them for slightly less than one year. Each child was given a rating on a five-point rating scale. There were only two fourth-grade classes in the school with a combined enrollment of 32. Of the 32 children, 21 had elected to study a music instrument. After the children had been rated, the Intermediate Measures of Music Audition was administered to them. The ratings and the test scores were correlated. (p. 105)

There was a strong to very strong correlation between students' IMMA scores and the instrumental music teacher's ratings of the fourth grade beginning instrumental students' music aptitude. Validity coefficients were .42 (Tonal), .69 (Rhythm), and .81 (Composite). In regards to these impressive correlations, Gordon cautions, "Concurrent validity coefficients that are derived in association with instrumental music instruction, however, are usually higher than those that are derived in association with general music instruction" (p. 105).

Congruent validity (correlation of tests that measure the same factor) studies were conducted between the IMMA, the PMMA, and the Musical Aptitude Profile (MAP). These studies and their results are discussed below:

The data [from the study] are based upon the test results of all 26 children in grade one, 26 children in grade two, 34 children
in grade three, and 40 children in grade four in an elementary school in Great Valley, Pennsylvania. Two tests were administered, the Primary Measures of Music Audiation first and the Intermediate Measures of Music Audiation second, approximately one month apart.

Correlation coefficients revealed a very strong correlation between the IMMA and the PMMA for all grade levels. Grade one had coefficients of .58 (Tonal), .53 (Rhythm), and .62 (Composite). Grade two had coefficients of .68 (Tonal), .56 (Rhythm), and .72 (Composite). Grade three had coefficients of .62 (Tonal), .64 (Rhythm), and .66 (Composite). And, grade four had coefficients of .61 (Tonal), .60 (Rhythm), and .74 (Composite). "In a second study, scores on the Intermediate Measures of Music Audiation were correlated with scores on the Musical Aptitude Profile. The test results for 92 children in grade four in Troy, New York, were used for that purpose. Only the Tonal imagery and Rhythm Imagery parts of the Musical Aptitude Profile were administered to the children" (p. 111)

Again, the correlation between the two tests was very strong. There was a coefficient of .54 between Tonal Imagery-Melody (MAP) and Tonal (IMMA). There was a coefficient of .50 between Tonal Imagery-Harmony (MAP) and Tonal (IMMA). And, there was a coefficient of .58 between Tonal Imagery-Total (MAP) and Tonal (IMMA).

There was a coefficient of .52 between Rhythm Imagery-Tempo (MAP) and Rhythm (IMMA). There was a coefficient of .60 between Rhythm Imagery-Meter (MAP) and Rhythm (IMMA). And, there was a coefficient of .63 between Rhythm Imagery-Total (MAP) and Rhythm (IMMA).

The coefficients...indicate that the Intermediate Measures of Music Audiation has as much in common with the Musical Aptitude Profile as it has with the Primary Measures of Music Audiation. Thus, the evidence shows that the Intermediate
Measures of Music Audiation can function as a valid test of stabilized music aptitude as well as a valid test of developmental music aptitude. (p. 111)

Borg and Gall (1989) stated, "Predictive validity is the degree to which the predictions made by a test are confirmed by the later behavior of the subjects" (p. 252). A longitudinal predictive validity study was conducted with students who attended a private boys academy in Chestnut Hill, Pennsylvania. The details of this study are described below:

All fourth grade children in the academy must study the violin for one semester and the recorder for one semester. All 33 boys who were nine years that year participated in the one-year study. During the first semester, approximately half of the class received violin instruction and the remainder of the class received recorder instruction. At the beginning of the second semester, the boys changed teachers; those who had been studying violin began instruction on the recorder and those who had been studying the recorder began instruction on the violin. Before instrumental instruction was begun, the Intermediate Measures of Music Audiation was administered to the boys. At the end of the first and second semesters, each boy performed privately two songs on the violin or on the recorder. Before he performed the two songs instrumentally, each boy sang them. The instrumental and vocal performances were recorded. Two judges evaluated the melodic accuracy, the rhythmic accuracy, and the musical expression of the performances. (pp. 116-117)

The first semester predictive coefficients for the Recorder Group were very strong. There was a coefficient of .74 between Tonal and Instrument and .63 between Tonal and Singing. There was a coefficient of .76 between Rhythm and Instrument and .69 between Rhythm and Singing. And, there was a coefficient of .75 between Composite and Instrument and .67 between Composite and Singing.

First semester predictive validity coefficients were similar, in strength, for the Violin Group. There was a coefficient of .54 between Tonal and Instrument and .57 between Tonal and Singing. There was a
coefficient of .71 between Rhythm and Instrument and .74 between Rhythm and Singing. And, there was a coefficient of .63 between Composite and Instrument and between Composite and Singing.

Second semester predictive validity coefficients mirrored first semester coefficients in all categories except Instrument and in one instance for Tonal, in the Singing category, for the Violin Group. The coefficients between Tonal, Rhythm, Composite, and between Instrument were .90, .91, and .92 respectively. There was a difference of + .06 (.63) in coefficient value between Tonal and Singing for the second semester over the coefficient value between Tonal and Singing for the first semester (.57).

IMMA reliability was assessed utilizing two methods—reliability coefficients (group) and the standard error of measurement (individual). Two types of reliability coefficients were used. One was the split-halves (administration of one test) and the other was the test-retest (administration of one test twice). These calculations were performed on the previously mentioned West Irondequoit, New York sample.

Although, reliability results were reported for grades 1-4, only grade 4 results are reported here. Split-halves reliability coefficients were .72 (Tonal), .70 (Rhythm), and .80 (Composite). Test-retest reliability with raw scores were .85 (Tonal), .83 (Rhythm), and .90 (Composite). Test-retest reliability with criterion scores were .86 (Tonal), .84 (Rhythm), and .76 (Composite). The standard error of measurement was 1.1 (Tonal), 1.3 (Rhythm), and 1.5 (Composite).

The above IMMA validation and reliability data supports the
conclusion that the IMMA is valid and reliable. Therefore, it was an excellent instrument to use to cross-validate "musical intelligence" for the TIMI.

Limitations

Internal Validity Concerns

Differential selection may have been an influence in this study because of "differences" between the students whose parents/guardians signed Consent Forms for their participation.

Since a "Practice Test" was administered with only one of the instruments (OLSAT) used in this study, "testing" may have been an influence on the OLSAT scores. However, this influence would be minimal—at best—due to the fact that the Practice Test was of short duration (approximately fifteen [15] minutes) and included only one example of each test item type.

History may have been an influence. Its possible influence was not the result of extended time required for each testing (3-4 days). Nor was it due to the time span between test administration at the two schools. It may have resulted from a three day "vacation" experienced by School C's students five days before the start of testing. This "unexpected" vacation was the result of a heavy snow fall. Therefore, School C's students may have been more rested than School B's students when they sat for testing. Also, they may have been more excited and less able to concentrate because large amounts of snow are "unusual" for the area in which City Z is located.

External Validity Concerns

Multiple-treatment interference may be a concern because all subjects were administered all test instruments in this
study. However, counterbalancing of test administration was employed to ameliorate this influence.

The Hawthorne Effect may be a concern because the subjects in this study may have felt "special" because they were participating in the study. As a consequence, they may have tried to perform a little harder on all instruments than they would have otherwise.

Novelty and disruption may be a concern simply because these students had their daily routines interrupted and this interruption may have impacted due to the "new" routine of being study participants.

The uniqueness (low SES) of the population may limit the generalizability of this study's results to similar SES populations.

Data Analysis

A combination of techniques and procedures were employed to analyze the data gathered from this study. These included generating frequency distributions of test scores based on type of testing instrument, the race of the subjects, and the sex of the subjects. Also, descriptive statistics were developed for these variables. These included standard deviations, means, ranges, etc. Additionally, convergent correlation, Chi-square and the General Linear Model were employed.
CHAPTER IV
DATA ANALYSIS AND FINDINGS

Contained within this section is a step-by-step description of the requirements/procedures followed, the analyses performed, and the findings generated for testing the four hypotheses that this study addressed. However, before we begin, it is appropriate to describe the two primary statistical analyses (General Linear Model [GLM] and Chi-Square) utilized in this study and explain their purpose.

The GLM is the "basic model" from which all linear analysis designs (i.e., factorial, Latin square, repeated measures, covariance, regression analysis, etc.) are derived (Horton, 1978). The SAS/Statistical Users Guide (1990) stated, "The analysis of variance procedure should be used whenever possible for analysis of variance because it processes data more efficiently than the General Linear Model. However, the GLM should be used in most unbalanced situations, that is, models where there are unequal numbers of observations for the different combinations of independent variables specified in the dependent variable statement" (p. 898). This research fits the latter situation.

In a table of inferential statistics, Borg and Gall (1989) stated that Chi-Square ($X^2$)is a nonparametric statistic "Used to determine whether two frequency distributions differ significantly from each other" (p. 356). Kachigan (1986) stated that Chi-Square is used "To determine whether observed frequencies [of categorical variables]
differ significantly from the expected frequencies of occurrence..." (p. 343). Chi-Square was used for each of these purposes in this study.

All data analyses for this study were performed utilizing the Statistical Analysis Software (SAS). Statistical significance was established at the .05 level.

**Hypotheses**

Null: Ho1 There is not a statistically significant difference between the subscales of a multiple intelligences and a general intelligence instrument in identifying potential urban fourth grade African-American CYOT students.

Null: Ho2 There is not a statistically significant difference, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race.

Null: Ho3 There is not a statistically significant difference, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of sex.

Null: Ho4 There is not a statistically significant interaction, when using the subscales of either a multiple intelligence or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race and sex.

**Procedures Followed**

Care was taken to assure that objective, simple to replicate, procedures were adhered to at all times. To accomplish this guideline, all instruments used in this study had to meet six criteria: They had
to be applicable for use with fourth grade students (as determined by instrument manufacturer), be able to be completed in one hour or less (minimum amount of class disruption), have easily understood directions, be amenable to group administration, simple to score, and be valid and reliable. The TIMI, OLSAT, IAM, and AIR met these criteria.

The schools selected had to be able to yield a sample of African-American and Caucasian students that was large enough (100 or more) to yield valid statistical analyses. Additionally, the administrators, faculty, and staff of both schools had to be receptive to participating in this study. And, the instrument administration setting had to have adequate space, lighting, and be quiet. Each school met these criteria.

Besides the above requirements/procedures, all instrument administrators had to be familiar with the purposes of the study and the instruments that they administered. To assure that this was implemented, this researcher met with each instrument administrator at least two days before instrument administration and oriented each to the purposes of the study and the proper administration of each instrument. All instrument administrators were instructed to read each instrument's instructions verbatim. This was done to insure continuity of administration.

It is necessary to note that instrument administrators, other than this researcher, were used only at School C. This use of additional instrument administrators was required because School C did not have a test conducive setting available that was large enough to accommodate its 69 study participants (The library was used at School
B.) In addition to the study's instrument administrators, each school provided one adult to monitor the administration of instruments. School B provided either one of the teachers of the study's participants or a teacher's aide. School C provided each teacher of the study's participants since administration of all instruments occurred in the classroom of the study's participants.

All guidelines and directions, for each of the four instruments administered, were followed precisely. These guidelines and directions are detailed in Appendix Y.

**Analyses Performed**

Six sequential statistical analyses were performed to test the four hypotheses of this study. Also, convergent validity was assessed by performing correlations between the TIMI and each of the three additional instruments (i.e., OLSAT, IMMA, and AIR) used in this study to cross-validate four TIMI intelligences. These TIMI intelligences were logical-mathematical, linguistic, musical, and interpersonal. The OLSAT was used to compare logical-mathematical and linguistic intelligences. The IMMA was used to compare musical intelligence. And, the AIR was used to compare interpersonal intelligence.

First, descriptive statistics were generated (i.e., mean, minimum and maximum score, range, and standard deviation) for the sample characteristics of all areas of each test (see Table 1). This was done so that a "mental" picture of the characteristics and boundaries of the data could be formed.

Second, Chi-Squares ($X^2$) were generated--examining all fourth graders at both schools--to determine equivalency between School B and
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</table>
School C (i.e., age, race, sex, and SES) at the school population level \([n = 152]\). Additionally, participants/non-participants were further analyzed by age, race, sex, and SES \([n = 152]\). This was done to insure that there was no statistically significant difference in the students who participated in this study and those who did not. (Table 2 contains an example of the Chi-Square printout.)

Third, Chi-Squares were generated—comparing those students who participated in the study—to determine equivalency between School B and School C (i.e., age, race, sex, and SES) at the sample level \([N = 103]\) (Table 3 contains an example of the Chi-Square printout.) This was done to establish that the participants were equal across schools. It is necessary to note that two (2) Hispanic students, from School C, were dropped from this sample after the initial analysis because their small number was not sufficient to render meaningful results regarding race. All subsequent analyses were performed with a sample of \(N = 101\).

Fourth, the General Linear Model (GLM) was performed on all four instruments (i.e., TIMI, OLSAT, IMAA, and AIR) with race, sex, and school as independent variables. This was done to further confirm students' independence on scores by race, sex, and school. All analyses indicated student equivalence by school.

Additionally, this analysis served as a means to verify previous research that stated that standardized achievement instruments, like the OLSAT, produces significant test score differences with minorities in general and African-Americans specifically (Ford & Harris, 1990; Hare, 1987, McKenzie, 1936; Richert, 1985, 1987; Richert, Alvino, & McDonnel; Roberts, 1955; Ross, 1992; Ryan, 1999; U.S. Commissioner of Education, 1972). It also allowed a determination as to whether any
<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>SEX</th>
<th>Frequency</th>
<th>Expected</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>31</td>
<td>27</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>51</td>
<td>43</td>
<td>94</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>70</td>
<td>152</td>
<td></td>
</tr>
</tbody>
</table>

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### TABLE 3

**TABLE OF SCHOOL BY SEX**

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>SEX</th>
<th>Frequency</th>
<th>Expected</th>
<th>Percent Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Row Pct</td>
<td>Col Pct</td>
<td>Col Pct</td>
</tr>
</tbody>
</table>
|        | 1   | 19 | 16 | 35
|        | 2   | 38 | 28 | 66

Total: 57 | 44 | 101

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of the other instruments discriminated as a function of race and as a function of sex. (Table 4 contains an example of the GLM printout.)

Fifth, GLM analyses were again performed on all four instruments, but omitting "school" as an independent variable (The previous analysis had shown school not to be statistically significant.) This left race, sex, and interaction of race and sex as potential effects (Table 5 contains an example of the GLM printout.)

Sixth, Chi-Squares were generated to determine the proportions of "gifted" and "non-gifted" students identified by the TIMI, IMMA, and AIR with race and sex as independent variables while controlling for the OLSAT (Tables 6 & 7 contain an example of the Chi-Square printouts for race and sex respectively.)

Finally, convergent correlations were performed to cross-validate four TIMI intelligences. A significant correlation (i.e., $p \leq 0.05$) indicated the instruments demonstrated convergent validity. A non-significant correlation (i.e., $p \geq 0.05$) indicated the instruments were not convergent.

### Findings

#### Descriptive Statistics

There were a total of 103 subjects whose instrument scores were analyzed. Their mean age was 9.50 with a minimum age of 8 and a maximum age of 12. The range was 4 and the standard deviation was 0.66. There were 58 [56.3%] males and 45 [43.7%] females in the sample of 103 students. These statistics were modified in later analyses due to the removal of two Hispanic students (one male; one female) at School C from the sample because their small number was not sufficient
TABLE 4
SCHOOL as IV
General Linear Models Procedure

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>RACE</td>
<td>1</td>
<td>7625.94</td>
<td>7625.94</td>
<td>9.95</td>
<td>0.0022</td>
</tr>
<tr>
<td>SEX</td>
<td>1</td>
<td>106.81</td>
<td>106.81</td>
<td>0.14</td>
<td>0.7098</td>
</tr>
<tr>
<td>RACE*SEX</td>
<td>1</td>
<td>488.46</td>
<td>488.46</td>
<td>0.64</td>
<td>0.4268</td>
</tr>
<tr>
<td>SCHOOL</td>
<td>1</td>
<td>440.80</td>
<td>440.80</td>
<td>0.57</td>
<td>0.4502</td>
</tr>
<tr>
<td>RACE*SCHOOL</td>
<td>1</td>
<td>1975.04</td>
<td>1975.04</td>
<td>2.58</td>
<td>0.1119</td>
</tr>
<tr>
<td>SEX*SCHOOL</td>
<td>1</td>
<td>47.53</td>
<td>47.53</td>
<td>0.06</td>
<td>0.8039</td>
</tr>
<tr>
<td>RACE<em>SEX</em>SCHOOL</td>
<td>1</td>
<td>724.56</td>
<td>724.56</td>
<td>0.95</td>
<td>0.3335</td>
</tr>
<tr>
<td>ERROR</td>
<td>93</td>
<td>71300.41</td>
<td>766.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>83448.75</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent Variable: OLLCGRDP

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TABLE 5  
School Removed as IV  
General Linear Models Procedure  

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>RACE</td>
<td>1</td>
<td>1.095</td>
<td>1.095</td>
<td>0.50</td>
<td>0.4823</td>
</tr>
<tr>
<td>SEX</td>
<td>1</td>
<td>2.786</td>
<td>2.786</td>
<td>1.27</td>
<td>0.2633</td>
</tr>
<tr>
<td>RACE*SEX</td>
<td>1</td>
<td>1.591</td>
<td>1.591</td>
<td>0.72</td>
<td>0.3973</td>
</tr>
<tr>
<td>ERROR</td>
<td>97</td>
<td>213.537</td>
<td>2.201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>218.911</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>TIMI7</th>
<th>RACE</th>
<th>Frequency</th>
<th>Percent</th>
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<th>Col Pct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>55</td>
<td>12</td>
<td>67</td>
<td>67.90</td>
<td>82.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>67.90</td>
<td>14.81</td>
<td>82.09</td>
<td>85.94</td>
<td>70.59</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>11.11</td>
<td>17.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>64.29</td>
<td>35.71</td>
<td>14.06</td>
<td>29.41</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>79.01</td>
<td>20.99</td>
<td>100.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>99.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TIMI7 SEX</th>
<th>Frequency</th>
<th>Percent</th>
<th>Row Pct</th>
<th>Col Pct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37</td>
<td>45.68</td>
<td>45.68</td>
<td>45.68</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>4.94</td>
<td>12.35</td>
<td>28.57</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>50.62</td>
<td>49.38</td>
<td>100.00</td>
<td>81</td>
</tr>
</tbody>
</table>
to render meaningful results regarding race. The adjusted statistics were 57 [56.4%] males and 44 [43.6%] females (see Table 8).

There were 75 [72.8%] African-Americans, 26 [25.2%] Caucasians, and 2 [1.9%] Hispanics in the original sample. This was modified to 75 [74.26%] African-Americans and 26 [25.74%] Caucasians (see Appendix N).

Of the 103 students in the original sample, 54 [52.4%] were free lunch, 12 [11.7%] were reduced lunch, and 37 [35.9%] were no lunch. This was modified to 53 [52.5%] free lunch, 12 [11.9%] reduced lunch, and 36 [35.6%] no lunch (received no financial assistance toward lunch purchase). Of these numbers, 45 [44.6] of the 53 free lunch were African-American and 8 [7.9%] were Caucasian; 9 [8.9%] of the 12 reduced lunch were African-American and 3 [2.8%] were Caucasian; and 21 [20.8%] of the 36 no lunch were African-American and 15 [14.9%] were Caucasian (see Appendix X).

The Teele Inventory of Multiple Intelligences (TIMI) is composed of 7 areas--one for each intelligence. The lowest possible score for any intelligence is 0 and the highest is 8. There are a total of 28 possible points available to be distributed between 7 intelligences. For this study a score of 6-8 on any one intelligence is deemed as gifted and below 6 as not gifted. A summary of TIMI statistics can be found in Table 1.

The TIMI 1 (linguistic) had a mean of 4.03 with a minimum of 1 and a maximum of 7. Its range was 6 and its standard deviation was 1.48.

The TIMI 2 (logical-mathematical) had a mean of 4.78 with a minimum of 0 and a maximum of 8. Its range was 8 and its standard deviation was 1.93.

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Table 8
Sample Membership by Race and Sex

<table>
<thead>
<tr>
<th></th>
<th>African-American</th>
<th>Asian/Pacific Islander</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Native American</th>
<th>T</th>
<th>Total by Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M    F</td>
<td>M    F</td>
<td>M    F</td>
<td>M    F</td>
<td>M    F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School B’s Sample</td>
<td>12   12</td>
<td>0    0</td>
<td>7    4</td>
<td>0    0</td>
<td>0    0</td>
<td>35 100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[34.3%]</td>
<td>[0.0%]</td>
<td>[11.4%]</td>
<td>[0.0%]</td>
<td>[0.0%]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School C’s Sample</td>
<td>28   23</td>
<td>0    0</td>
<td>10   5</td>
<td>1    1</td>
<td>0    0</td>
<td>68 100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[41.2%]</td>
<td>[0.0%]</td>
<td>[7.4%]</td>
<td>[1.5%]</td>
<td>[1.5%]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original School B &amp; C’s Combined Sample</td>
<td>40   35</td>
<td>0    0</td>
<td>17   9</td>
<td>1    1</td>
<td>0    0</td>
<td>103 100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[38.8%]</td>
<td>[34.0%]</td>
<td>[16.5%]</td>
<td>[1.0%]</td>
<td>[1.0%]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modified School B &amp; C’s Combined Sample</td>
<td>40   35</td>
<td>0    0</td>
<td>17   9</td>
<td>0    0</td>
<td>0    0</td>
<td>101 100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[39.6%]</td>
<td>[34.7%]</td>
<td>[16.8%]</td>
<td>[0.0%]</td>
<td>[0.0%]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The TIMI 3 (intrapersonal) had a mean of 2.8 with a minimum of 0 and a maximum of 7. Its range was 7 and its standard deviation was 1.38.

The TIMI 4 (spatial) had a mean of 4.57 with a minimum of 0 and a maximum of 8. Its range was 8 and its standard deviation was 1.72.

The TIMI 5 (musical) had a mean of 3.37 with a minimum of 0 and a maximum of 7. Its range was 7 and its standard deviation was 1.61.

The TIMI 6 (bodily-kinesthetic) had a mean of 4.44 with a minimum of 0 and a maximum of 7. Its range was 7 and its standard deviation was 1.34.

And, the TIMI 7 (interpersonal) had a mean of 3.90 with a minimum of 1 and a maximum of 7. Its range was 6 and its standard deviation was 1.58.

The "Total" TIMI had a mean of 27.89 with a minimum of 25 and a maximum of 28. Its range was 3 and its standard deviation was 0.47.

The Otis-Lennon School Ability Test (OLSAT) is composed of two areas--Verbal and Nonverbal. "The classification of items as verbal or nonverbal hinges upon whether knowledge of the English language is requisite to answering the items" (Psychological Corporation, 1993, p. 11). If knowledge of English is necessary, items are classified as Verbal. Each has a lowest possible score of 0 and a highest of 36. These combined scores are converted to a School Ability Index (SAI) [see definition below]. For this study, a SAI of 120 or above is deemed as gifted, 112-119 as promising, and below 112 as not gifted. A summary of OLSAT statistics can be found in Table 1.

The Verbal mean was 14.40 with a minimum of 3 and a maximum of 29. Its range was 26 and its standard deviation was 5.69.
The Nonverbal mean was 16.29 with a minimum of 5 and a maximum of 31. Its range was 26 and its standard deviation was 6.56.

The Total Raw Score (TRS), which is simply the number of questions answered correctly, had a mean of 30.68 with a minimum of 8 and a maximum of 58. Its range was 50 and its standard deviation was 11.46.

The School Ability Index (SAI), which is composed of the TRS, is "...a normalized standard score with a mean of 100 and a standard deviation of 16" (Psychological Corporation, 1993, pp. 21-22). However, the general descriptives listed here are the result of compilations based on the obtained SAI scores of sample subjects. The SAI mean was 97.76 with a minimum of 60 and a maximum of 133. Its range was 73 and its standard deviation was 14.59.

Age percentiles "...show the relative standing of a student in comparison with other students of the same age.... Because they are not an equal-interval scale, percentile ranks may never be averaged or used in computations" (Psychological Corporation, 1993, p. 22). The age percentile mean was 45.10 with a minimum of 1 and a maximum of 98. Its range was 97 and its standard deviation was 27.45.

Age stanines are "...normalized standard scores with a range of 1 to 9 and a mean of 5. The nine units of the stanine scale represent equal distances along the baseline of the normal curve. This means that the difference in ability between stanines 7 and 9 is the same as the difference in ability between stanines 1 and 3" (Psychological Corporation, 1993, p. 23).

However, the general descriptives listed here are the result of
compilations based on the obtained stanine scores of sample subjects. The age stanine mean was 4.85 with a minimum of 1 and a maximum of 9. Its range was 8 and its standard deviation was 1.83.

Normal Curve Equivalents (NCEs) "...are obtained by converting percentiles [age or grade] to normalized z-scores and making the transformation NCE = 50 + 21.06z. In contrast to percentile ranks, NCEs are an equal-interval scale...." (p. 25). However, the general descriptives listed here are the result of compilations based on the obtained scores of sample subjects. The NCE mean was 47.14 with a minimum of 1 and a maximum of 93. Its range was 92 and its standard deviation was 18.95.

The scaled score system for the Otis-Lennon School Ability Test links together all of the levels and both forms of the test, yielding a continuous scale that makes it possible to compare the performance of students taking different levels or forms of the test. Once a raw score has been converted to its corresponding scaled score, you need no longer be concerned with the level or form that was taken when you obtain the SAI or the grade-based percentile rank, stanine, or NCE for that score. This makes scaled scores especially suitable for comparing scores from different levels and forms of the test, for studying change in performance over time, and for testing out of level. (Psychological Corporation, 1993, p. 21)

The scale score mean was 586.93 with a minimum of 516 and a maximum of 658. Its range was 142 and its standard deviation was 28.89.

The adjective "national" preceding the norm scores listed below simply means that the particular norm score being addressed is relating the student's score to the scores of students included in the OLSAT's national sample.

The national grade percentile mean was 44.72 with a minimum of 1 and a maximum of 98. Its range was 97 and its standard deviation was 28.21.
The national grade stanine mean was 4.69 with minimum of 1 and a maximum of 9. Its range was 8 and its standard deviation was 1.86.

The national grade NCE mean was 47.21 with a minimum of 1 and a maximum of 97. Its range was 96 and its standard deviation was 19.59.

The adjective "local" preceding the norm scores listed below simply means that the particular norm score being addressed is relating the student's score to the scores of students who sat for the OLSAT at the "same time" that the student (whose scores are being compared) sat for the OLSAT.

The local grade percentile mean was 49.05 with a minimum of 1 and a maximum of 99. Its range was 98 and its standard deviation was 28.89.

The local grade stanine mean was 4.99 with a minimum of 1 and a maximum of 9. Its range was 8 and its standard deviation was 1.99.

The local grade NCE mean was 49.44 with a minimum of 1 and a maximum of 99. Its range was 98 and its standard deviation was 20.81.

The Intermediate Measures of Music Audiation (IMMA) consists of two areas--Tonal and Rhythm. Each area has 40 items. Each item is scored as 1 point. The lowest possible area score is "0" and the high is 40. The combined scores of the two areas comprises the Total Score. The lowest possible score is "0" and the highest is 80. For this study a Total Score of 76 or above is deemed as gifted and 73-75 as promising. A summary of IMMA statistics can be found in Table 1.

The Tonal mean was 34.27 with a minimum of 27 and a maximum of 40. Its range was 13 and its standard deviation was 2.72.

The Rhythm mean was 32.57 with a minimum of 14 and a maximum of 39. Its range was 25 and its standard deviation was 4.27.
The Assessment of Interpersonal Relations (AIR) consists of three areas. These are a Parent Scale (Mother & Father); a Peer Scale (Male & Female); and a Teacher Scale. Each subscale (Mother, Father, Male, Female, and Teacher) has 35 items for a total of 175 items. Each item has 4 possible responses with a possible score ranging from 1-4. A score of 1 is the lowest possible score for an item. And, a score of 4 is the highest possible score for an item. However, every fifth score is reversed scored. Items 5; 10; 15; 20, 25; 30; and 35 are reversed scored. The higher the score, the more positive the relation for a particular scale. The reverse is also true. The highest obtainable score for any subscale is 140 and the lowest is 36. For this study, a Standard Score (a sum of each subscale's raw score converted to the standard score scale) of 126 or above is deemed as gifted and a score of 111 to 125 is promising. A summary of AIR statistics can be found in Table 1.

A note is necessary at this juncture. The AIR's Examiner's Manual stated, "If the examinee omits more than five items in any of the five subscales, the examiner should consider the subscale an invalid representation of the child's relationship in that domain" (Bracken, 1993, p. 20). The sample sizes for the subscales listed below are Mother [96], Father [61], Males [88], Females [88], and Teacher [97].

The Mother mean was 119.41 with a minimum of 49 and a maximum of 140. Its range was 91 and its standard deviation was 16.71.

The Father mean was 115.63 with a minimum of 55 and a maximum of 140. Its range was 85 and its standard deviation was 18.37.

The Male mean was 105.83 with a minimum of 63 and a maximum of 135. Its range was 72 and its standard deviation was 17.75.
The Female mean was 103.43 with a minimum of 38 and a maximum of 133. Its range was 95 and its standard deviation was 26.14.

The Teacher mean was 99.65 with a minimum of 41 and a maximum of 137. Its range was 96 and its standard deviation was 27.04.

The "Total" AIR mean was 539.18 with a minimum of 352 and a maximum of 673. Its range was 281 and its standard deviation was 75.

School Population Equivalency

Chi-Squares were generated for School B and School C's fourth grade populations on five variables: age, race, sex, SES, and participation/nonparticipation. The latter variable was divided into subcategories of age, race, sex, and SES. A summary of the Chi-Square results for school B and School C's fourth grade populations can be found in Table 9. The results of the Chi-Square analyses are listed below.

Population Age (all 4th graders)

There was no statistically significant difference in age between the fourth grade populations of School B and School C. \( X^2 (4, N = 152) = 2.316, p > .05 \).

Population Race (all 4th graders).

There was no statistically significant difference in race between the fourth grade populations of School B and School C. \( X^2 (2, N = 155) = 3.227, p > .05 \).

Population Sex (all 4th graders).

There was no statistically significant difference in sex between the fourth grade populations of School B and School C. \( X^2 (1, N = 153) = 0.009, p > .05 \).

Population SES (all 4th graders).
Table 9
Chi-Square Results for School B
and School C’s Populations (n=152)

<table>
<thead>
<tr>
<th>Variables</th>
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<th>Probability</th>
</tr>
</thead>
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<td>2.316</td>
<td>0.804</td>
</tr>
<tr>
<td>Race</td>
<td>2</td>
<td>3.227</td>
<td>0.199</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.009</td>
<td>0.923</td>
</tr>
<tr>
<td>SES</td>
<td>2</td>
<td>17.969</td>
<td>0.000*</td>
</tr>
<tr>
<td>Participants</td>
<td>1</td>
<td>2.363</td>
<td>0.124</td>
</tr>
<tr>
<td>Participant’s Age</td>
<td>4</td>
<td>3.421</td>
<td>0.635</td>
</tr>
<tr>
<td>Participant’s Race</td>
<td>2</td>
<td>0.196</td>
<td>0.907</td>
</tr>
<tr>
<td>Participant’s Sex</td>
<td>1</td>
<td>0.718</td>
<td>0.397</td>
</tr>
<tr>
<td>Participant’s SES</td>
<td>2</td>
<td>1.243</td>
<td>0.537</td>
</tr>
</tbody>
</table>

*Statistically Significant
There was a statistically significant difference in SES between the fourth grade populations of School B and School C. $X^2 (2, N = 152) = 17.969, \ p < .05$.

It was noted that out of School B's 56 students, 41.38% received free lunch; 1.72% received reduced lunch; and 56.90% received no lunch. A total of 59.57% of School C's 98 students received free lunch; 14.89% received reduced lunch; and 25.53% received no lunch.

Population Participants/Non-participants (all 4th graders).

There was no statistically significant difference in the number of fourth grade students who participated vs those who did not participate in this study between School B and School C. $X^2 (1, N = 152) = 2.363, \ p > .05$.

Age

There was no statistically significant difference in the number of fourth grade students who participated vs those who did not participate in this study, as a function of age, between School B and School C. $X^2 (4, N = 152) = 3.421, \ p > .05$.

Race

There was no statistically significant difference in the number of fourth grade students who participated vs those who did not participate in this study, as a function of race, between School B and School C. $X^2 (2, N = 152) = 0.196, \ p > .05$.

Sex

There was no statistically significant difference in the number of fourth grade students who participated vs those who did not participate in this study, as a function of sex, between School B and School C. $X^2 (1, N = 152) = 0.718, \ p > .05$.

SES

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There was no statistically significant difference in the number of fourth grade students who participated vs those who did not participate in this study, as a function of SES, between School B and School C. $X^2 (2, N = 152) = 1.243, p > .05$.

**School Sample Equivalency**

Chi-Squares were generated for School B and School C's fourth grade samples on 4 variables; age, race, sex, and SES (see Table 10). The results of the Chi-Square analyses are listed below.

**Sample Age.**

There was no statistically significant difference in age between the fourth grade samples of School B and School C. $X^2 (4, N = 101) = 1.632, p > .05$.

**Sample Race.**

There was no statistically significant difference in race between the fourth grade samples of School B and School C. $X^2 (1, N = 101) = 0.906, p > .05$.

**Sample Sex.**

There was no statistically significant difference in sex between the fourth grade samples of School B and School C. $X^2 (1, N = 101) = 0.101, p > .05$.

**Sample SES.**

There was a statistically significant difference in SES between the fourth grade samples of School B and School C. $X^2 (2, N = 101) = 9.837, p < .05$.

There was a significant difference in SES representation. School C's 38 free lunch students comprised 71.7% of the 53 total free lunch students. School B's 15 free lunch students comprised 28.3% of all students who received free lunch.
Table 10
Chi-Square Results for School B and School C's Samples (N=101)

<table>
<thead>
<tr>
<th>Variables</th>
<th>DF</th>
<th>( x^2 )</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>4</td>
<td>1.632</td>
<td>0.803</td>
</tr>
<tr>
<td>Race</td>
<td>1</td>
<td>0.906</td>
<td>0.341</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td>0.101</td>
<td>0.751</td>
</tr>
<tr>
<td>SES</td>
<td>2</td>
<td>9.837</td>
<td>0.007*</td>
</tr>
</tbody>
</table>

*Statistically Significant
School C's 11 reduced lunch students comprised 91.7% of the 12 total reduced lunch students. School B's 1 reduced lunch student comprised 8.3% of all students who received reduced lunch.

School C's 17 no lunch students comprised 47.2% of the 36 total no lunch students. School B's 19 no lunch students comprised 52.8% of all students who did not receive lunch (see Appendix X).

Sample SES, by Race

There was a statistically significant difference in SES, as a function of race, for the combined fourth grade samples of School B and School C. $X^2 (2, N = 101) = 7.923, p < .05$.

There was a significant difference in SES representation of African-American students. African-American students comprised 45 \[84.9\%\] of the 53 free lunch students. Caucasian students comprised 8 \[15.1\%\] of all free lunch students.

African-American students comprised 9 \[75\%\] of the 12 reduced lunch students. Caucasian students comprised 3 \[25\%\] of all reduced lunch students.

African-American students comprised 21 \[59.3\%\] of the 36 no lunch students. Caucasian students comprised 15 \[41.7\%\] of all no lunch students (see Appendix Z).

Sample SES, by Sex

There was no statistically significant difference in SES, as a function of sex, for the combined fourth grade samples of School B and School C. $X^2 (2, N = 101) = 1.481, p > .05$.

Race/Sex (controlling for free lunch)

There was no statistically significant difference in free lunch students, as a function of race/sex, for the combined fourth grade samples of School B and School C. $X^2 (1, N = 53) = 0.504, p > .05$. 

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Race/Sex (controlling for reduced lunch)

There was no statistically significant difference in reduced lunch students, as a function of race/sex, for the combined fourth grade samples of School B and School C. $X^2 (1, N = 12) = 0.114, p > .05.$

Race/Sex (controlling for no lunch)

There was no statistically significant difference in no lunch students, as a function of race/sex, for the combined fourth grade samples of School B and School C. $X^2 (1, N = 36) = 0.086, p > .05.$

General Linear Model (GLM) Analyses with School as an IV

In order to confirm that the sample students from School B and School C were not different due to the independent variable of school, a GLM analysis was performed on all four instruments (i.e., TIMI, OLSAT, IMMA, and Air). All analyses indicated no differences between the two schools.

The GLM analysis of the OLSAT revealed statistically significant differences in every area with Caucasians demonstrating higher mean test scores. These results support the findings of previous research that achievement instruments like the OLSAT exhibit test score differences for minorities in general and African-Americans specifically (Bailey & Harbin, 1980; Hadaway & Marek-Schroer, 1992; Hoffman, 1962; Johnson, 1987-88; Kamin, 1974; Madaus, 1994; Masten, 1985; O'Connor, 1989; Samuda, 1975).

The IMMA and AIR showed no statistically significant differences based on race. Only one area of the TIMI (TIMI 3) showed a statistically significant difference as a function of race. All other TIMI areas did not reveal statistically significant differences due to
race. All instruments except the OLSAT showed statistically significant sex differences, however, not in all areas.

**General Linear Model (GLM) Analyses with School Removed as an IV**

All data analyzed in this section were generated from a 2 (Race = African-American & Caucasian) x 2 (Sex = Male & Female) factorial design. This design examines main effects for race and sex, as well as, race and sex interaction. Originally, the independent variable of race had three levels, but the data generated from School C's two (2) Hispanic students were not included in this analysis because their small number was not sufficient to render meaningful results.

**TIMI 1 (linguistic intelligence) (see Table 11).**

The main effect of race was not significant, \( F(1, 101) = 0.50, p > .05 \). Also, the main effect of sex was not significant, \( F(1, 101) = 1.27, p > .05 \). The interaction between race and sex was not significant, \( F(1, 101) = 0.72, p > .05 \).

**TIMI 2 (logical-mathematical intelligence) (see Table 11).**

The main effect of race was not significant, \( F(1, 101) = 0.00, p > .05 \). However, the main effect of sex was significant, \( F(1, 101) = 8.77, p < .05 \). The interaction between race and sex was not significant, \( F(1, 101) = 0.57, p > .05 \).

Male students \( (n = 57) \) scored significantly higher than female students \( (n = 44) \). Male students had a mean of 5.28 and a standard deviation of 1.78 compared to a mean of 4.14 and a standard deviation of 1.95 for female students.

**TIMI 3 (intrapersonal intelligence) (see Table 11).**

The main effect of race was significant, \( F(1, 101) = 5.04, p < .05 \). There was no significant main effect for sex, \( F(1, 101) = 0.36, p > .05 \).
<table>
<thead>
<tr>
<th>TIMI Variable</th>
<th>Variable</th>
<th>DF</th>
<th>F-Value</th>
<th>P-Value</th>
</tr>
</thead>
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<td>TIMI 1 (Linguistic)</td>
<td>Race</td>
<td>1</td>
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<td>0.4823</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
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<td>1.27</td>
<td>0.2633</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.72</td>
<td>0.3973</td>
</tr>
<tr>
<td>TIMI 2 (Logical-Mathematical)</td>
<td>Race</td>
<td>1</td>
<td>0.00</td>
<td>0.9610</td>
</tr>
<tr>
<td></td>
<td>Sex (Males)</td>
<td>1</td>
<td>8.77</td>
<td>0.0038*</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.57</td>
<td>0.4529</td>
</tr>
<tr>
<td>TIMI 3 (Intrapersonal)</td>
<td>Race (Caucasians)</td>
<td>1</td>
<td>5.04</td>
<td>0.0270*</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>0.36</td>
<td>0.5487</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.44</td>
<td>0.5087</td>
</tr>
<tr>
<td>TIMI 4 (Spatial)</td>
<td>Race</td>
<td>1</td>
<td>0.16</td>
<td>0.6920</td>
</tr>
<tr>
<td></td>
<td>Sex (Males)</td>
<td>1</td>
<td>4.13</td>
<td>0.0448*</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.28</td>
<td>0.5950</td>
</tr>
<tr>
<td>TIMI 5 (Musical)</td>
<td>Race</td>
<td>1</td>
<td>0.40</td>
<td>0.5283</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>0.03</td>
<td>0.8613</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>2.27</td>
<td>0.1353</td>
</tr>
<tr>
<td>TIMI 6 (Bodily-Kinesthetic)</td>
<td>Race</td>
<td>1</td>
<td>1.48</td>
<td>0.2262</td>
</tr>
<tr>
<td></td>
<td>Sex (Females)</td>
<td>1</td>
<td>4.23</td>
<td>0.0425*</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>3.61</td>
<td>0.0603</td>
</tr>
<tr>
<td>TIMI 7 (Interpersonal)</td>
<td>Race</td>
<td>1</td>
<td>0.27</td>
<td>0.6056</td>
</tr>
<tr>
<td></td>
<td>Sex (Females)</td>
<td>1</td>
<td>7.20</td>
<td>0.0086*</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.03</td>
<td>0.8683</td>
</tr>
</tbody>
</table>

*Statistically Significant
And, there was no significant interaction effect between race and sex, $F(1, 101) = 0.44, p > .05$.

Caucasian ($n = 26$) students scored significantly higher than African-American students ($n = 75$). Caucasian students had a mean of 3.35 and a standard deviation of 1.47 compared to a mean of 2.61 and a standard deviation of 1.20 for African-American students.

**TIMI 4 (spatial intelligence) (see Table 11).**

The main effect of race was not significant, $F(1, 101) = 0.16$, $p > .05$. However, the main effect of sex was significant, $F(1, 101) = 4.13$, $p < .05$. The interaction between race and sex was not significant, $F(1, 101) = 0.28$, $p > .05$.

Male students ($n = 57$) scored significantly higher than female students ($n = 44$). Male students had a mean of 4.97 and a standard deviation of 1.57 compared to a mean of 4.07 and a standard deviation of 1.78 for female students.

**TIMI 5 (musical intelligence) (see Table 11).**

The main effect of race was not significant, $F(1, 101) = 0.40$, $p > .05$. Also, the main effect of sex was not significant, $F(1, 101) = 0.03$, $p > .05$. The interaction between race and sex was not significant, $F(1, 101) = 2.27$, $p > .05$.

**TIMI 6 (bodily-kinesthetic intelligence) (see Table 11).**

The main effect of race was not significant, $F(1, 101) = 1.48$, $p > .05$. However, the main effect of sex was significant, $F(1, 101) = 4.23$, $p < .05$. The interaction between race and sex was not significant, $F(1, 101) = 3.61$, $p > .05$.

Female students ($n = 44$) scored significantly higher than male students ($n = 57$). Female students had a mean of 5.00 and a standard
deviation of 1.36 compared to a mean of 4.04 and a standard deviation of 1.18 for male students.

**TIMI 7 (interpersonal intelligence) (see Table 11).**

The main effect of race was not significant, $F(1, 101) = 0.27, p > .05$. However, the main effect of sex was significant, $F(1, 101) = 7.20, p < .05$. The interaction of race and sex was not significant, $F(1, 101) = 0.03, p > .05$.

Female students ($n = 44$) scored significantly higher than male students ($n = 57$). Female students had a mean of 4.46 and a standard deviation of 1.52 compared to a mean of 3.47 and a standard deviation of 1.51 for male students.

**Selected TIMI Subject Mean/Standard Deviation Data.**

**African-Americans (male & female) (see Table 12)**

The four dominant intelligences for African-American students ($n = 75$), in descending order were: Logical-mathematical ($M = 4.72, SD = 1.94$); spatial ($M = 4.60, SD = 1.77$); bodily-kinesthetic ($M = 4.52, SD = 1.37$); and interpersonal ($M = 3.88, SD = 1.59$).

**Caucasians (male & female) (see Table 12)**

The four dominant intelligences for Caucasian students ($n = 26$), in descending order, were: Logical-mathematical ($M = 4.96, SD = 1.95$); spatial ($M = 4.50, SD = 1.58$); bodily-kinesthetic ($M = 4.19, SD = 1.23$); and interpersonal ($M = 3.96, SD = 1.61$).

**Males (African-American & Caucasian) (see Table 13)**

The four dominant intelligences for male students ($n = 57$), in descending order, were: Logical-mathematical ($M = 5.28, SD = 1.78$); spatial ($M = 4.97, SD = 1.57$); bodily-kinesthetic ($M = 4.04, SD = 1.18$); and linguistic ($M = 3.91, SD = 1.55$).

**Female (African-American & Caucasian) (see Table 13)**
### Table 12
Four Dominant TIMI Intelligences by Race

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>African-American (n=75)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logical/Mathematical</td>
<td>1st</td>
<td>4.72</td>
<td>1.94</td>
</tr>
<tr>
<td>Spatial</td>
<td>2nd</td>
<td>4.60</td>
<td>1.77</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>3rd</td>
<td>4.52</td>
<td>1.37</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>4th</td>
<td>3.88</td>
<td>1.59</td>
</tr>
<tr>
<td><strong>Caucasian (n=26)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>1st</td>
<td>4.96</td>
<td>1.95</td>
</tr>
<tr>
<td>Spatial</td>
<td>2nd</td>
<td>4.50</td>
<td>1.58</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>3rd</td>
<td>4.19</td>
<td>1.23</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>4th</td>
<td>3.96</td>
<td>1.61</td>
</tr>
</tbody>
</table>
Table 13  
Four Dominant TIMI Intelligences by Sex

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male (n=57)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logical/Mathematic</td>
<td>1st</td>
<td>5.28*</td>
<td>1.78</td>
</tr>
<tr>
<td>Spatial</td>
<td>2nd</td>
<td>4.97*</td>
<td>1.57</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>3rd</td>
<td>4.04</td>
<td>1.18</td>
</tr>
<tr>
<td>Linguistic</td>
<td>4th</td>
<td>3.91</td>
<td>1.55</td>
</tr>
<tr>
<td><strong>Female (n=44)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>1st</td>
<td>4.96*</td>
<td>1.36</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>2nd</td>
<td>4.46*</td>
<td>1.52</td>
</tr>
<tr>
<td>Linguistic</td>
<td>3rd</td>
<td>4.18</td>
<td>1.39</td>
</tr>
<tr>
<td>Logical-Mathematic</td>
<td>4th</td>
<td>4.14</td>
<td>1.95</td>
</tr>
</tbody>
</table>

*Statistically Significant
The four dominant intelligences for female students (n = 44), in descending order, were: Bodily-kinesthetic [M = 4.96, SD = 1.36]; interpersonal [M = 4.46, SD = 1.52]; linguistic [M = 4.18, SD = 1.39]; and logical-mathematical [M = 4.14, SD = 1.95].

African-American Males (see Table 14)

The four dominant intelligences for African-American male students (n = 40), in descending order, were: Logical-mathematical [M = 5.18, SD = 1.75]; spatial [M = 5.08, SD = 1.51]; linguistic [M = 4.08, SD = 1.46]; and bodily-kinesthetic [M = 3.98, SD = 1.19].

Caucasian Males (see Table 14)

The four dominant intelligences for Caucasian male students (n = 17), in descending order, were: Logical-mathematical [M = 5.53, SD = 1.87]; spatial [M = 4.71, SD = 1.72]; bodily-kinesthetic [M = 4.18, SD = 1.19]; and interpersonal [M = 3.65, SD = 1.46].

African-American Females (see Table 14)

The four dominant intelligences for African-American female students (n = 35), in descending order, were: Bodily-kinesthetic [M = 5.14, SD = 1.31]; interpersonal [M = 4.43, SD = 1.46]; logical-mathematical [M = 4.20, SD = 2.03]; and linguistic [M = 4.17, SD = 1.36].

Caucasian Females (see Table 14)

The four dominant intelligences for Caucasian female students (n = 9), in descending order, were: Interpersonal [M = 4.56, SD = 1.81]; bodily-kinesthetic [M = 4.22, SD = 1.39]; linguistic [M = 4.22, SD = 1.56]; and spatial [M = 4.11, SD = 1.27].

Summary

Two TIMI intelligences (linguistic & musical) did not exhibit
## Four Dominant TIMI Intelligences by Race and Sex

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>African-American Male (n=40)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logical/Mathematical</td>
<td>1st</td>
<td>5.18</td>
<td>1.75</td>
</tr>
<tr>
<td>Spatial</td>
<td>2nd</td>
<td>5.08</td>
<td>1.51</td>
</tr>
<tr>
<td>Linguistic</td>
<td>3rd</td>
<td>4.08</td>
<td>1.46</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>4th</td>
<td>3.98</td>
<td>1.19</td>
</tr>
<tr>
<td><strong>Caucasian Male (n=17)</strong></td>
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<td></td>
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<td>1.87</td>
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<td>4.18</td>
<td>1.19</td>
</tr>
<tr>
<td>Interpersonal</td>
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<td>3.65</td>
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<tr>
<td><strong>African-American Female (n=35)</strong></td>
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<td></td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>1st</td>
<td>5.14</td>
<td>1.31</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>2nd</td>
<td>4.43</td>
<td>1.46</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>3rd</td>
<td>4.20</td>
<td>2.03</td>
</tr>
<tr>
<td>Linguistic</td>
<td>4th</td>
<td>4.17</td>
<td>1.36</td>
</tr>
<tr>
<td><strong>Caucasian Females (n=9)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td>1st</td>
<td>4.56</td>
<td>1.81</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>2nd</td>
<td>4.22</td>
<td>1.39</td>
</tr>
<tr>
<td>Linguistic</td>
<td>3rd</td>
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<tr>
<td>Spatial</td>
<td>4th</td>
<td>4.11</td>
<td>1.27</td>
</tr>
</tbody>
</table>
statistically significant differences. One TIMI intelligence (logical-mathematical) was statistically significant, by race, with Caucasians demonstrating higher mean test scores. And, four TIMI intelligences were statistically significant, by sex. Males had higher mean test scores on two intelligences (spatial & logical-mathematical). And, females had higher mean test scores on two intelligences (interpersonal & bodily-kinesthetic).

African-Americans and Caucasians had the same four dominant intelligences in the same order. They were, in descending order, logical-mathematical, spatial, bodily-kinesthetic, and interpersonal.

Logical-mathematical intelligence was the most dominant intelligence for males. Linguistic intelligence was the fourth most dominant intelligence.

Bodily-kinesthetic intelligence was the most dominant intelligence for females. Logical-mathematical was the fourth most dominant intelligence.

African-American and Caucasian males shared the same top two intelligences; logical-mathematical and spatial. Additionally, both had bodily-kinesthetic intelligence ranked in their four dominant intelligences. This intelligence was ranked third for Caucasian males and fourth for African-American males.

African-American and Caucasian females shared three intelligences in their four dominant intelligences. However, their order was different. They reversed the order of their first two intelligences. Bodily-kinesthetic was ranked first for African-American females and second for Caucasian females. Interpersonal was ranked first for Caucasian females and second for
African-American females. Linguistic was ranked third for Caucasian females and fourth for African-American females.

**OLSAT Verbal Raw Score (see Table 15)**

The main effect of race was significant, $F(1, 101) = 8.33$, $p < .05$. However, the main effect of sex was not significant, $F(1, 101) = 0.15$, $p > .05$. The interaction between race and sex was not significant, $F(1, 101) = 2.64$, $p > .05$.

Caucasian students scored significantly higher than African-American students. Caucasian students had a mean of 16.85 ($n = 26$) and a standard deviation of 5.89 compared to a mean of 13.55 ($n = 75$) and a standard deviation of 5.40 for African-American students.

**OLSAT Nonverbal Raw Score (see Table 15)**

The main effect of race was significant, $F(1, 101) = 9.04$, $p < .05$. However, the main effect of sex was not significant, $F(1, 101) = 1.24$, $p > .05$. The interaction between race and sex was not significant, $F(1, 101) = 0.55$, $p > .05$.

Caucasian students scored significantly higher than African-American students. Caucasian students had a mean of 19.58 ($n = 26$) and a standard deviation of 6.85 compared to a mean of 15.15 ($n = 75$) and a standard deviation of 6.10 for African-American students.

**OLSAT Total Raw Score (see Table 15)**

The main effect of race was significant, $F(1, 101) = 5.53$, $p < .05$. However, the main effect of sex was not significant, $F(1, 101) = 0.64$, $p > .05$. The interaction between race and sex was not significant, $F(1, 101) = 0.53$, $p > .05$.

Caucasian students scored significantly higher than African-American students. Caucasian students had a mean of 36.42 ($n = 26$) and a standard deviation of 7.22 compared to a mean of 30.71 ($n = 75$) and a standard deviation of 9.10 for African-American students.
Table 15
OLSAT GLM Results by Race, Sex, and Race/Sex (N=101)

<table>
<thead>
<tr>
<th>OLSAT Variable</th>
<th>Student Variable</th>
<th>DF</th>
<th>F-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal</td>
<td>Race (Caucasian)</td>
<td>1</td>
<td>8.33</td>
<td>0.0048*</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>0.15</td>
<td>0.7016</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>2.64</td>
<td>0.1074</td>
</tr>
<tr>
<td>Nonverbal</td>
<td>Race (Caucasian)</td>
<td>1</td>
<td>9.04</td>
<td>0.0034*</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>1.24</td>
<td>0.2691</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.55</td>
<td>0.4587</td>
</tr>
<tr>
<td>Total Score</td>
<td>Race (Caucasian)</td>
<td>1</td>
<td>5.53</td>
<td>0.0207*</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>0.64</td>
<td>0.4253</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.53</td>
<td>0.4675</td>
</tr>
<tr>
<td>School</td>
<td>Race (Caucasian)</td>
<td>1</td>
<td>6.35</td>
<td>0.0134*</td>
</tr>
<tr>
<td>Ability</td>
<td>Sex</td>
<td>1</td>
<td>0.86</td>
<td>0.3571</td>
</tr>
<tr>
<td>Index</td>
<td>Race/Sex</td>
<td>1</td>
<td>0.23</td>
<td>0.6294</td>
</tr>
</tbody>
</table>

*Statistically Significant
and a standard deviation of 11.69 compared to a mean of 28.69 (n = 75) and a standard deviation of 10.76 for African-American students.

**OLSAT School Ability Index (SAI) (see Table 15)**

The main effect of race was significant, $F(1, 101) = 6.35, p < .05$. However, sex was not significant, $F(1, 101) = 0.86, p > .05$. The interaction of race and sex was not significant, $F(1, 101) = 0.23, p > .05$.

Caucasian students scored significantly higher than African-American students. Caucasian students had a mean of 104.08 (n = 26) and a standard deviation of 16.11 compared to a mean of 95.57 (n = 75) and a standard deviation of 13.45 for African-American students.

**Selected OLSAT Subject Mean/Standard Deviation.**

**African-Americans (see Table 16)**

African-American students (n = 75) ranked second across all OLSAT measures: Verbal [M = 13.55, SD = 5.40]; Nonverbal [M = 15.15, SD = 6.10]; Total [M = 28.69, SD = 10.76]; and SAI [M = 104.08, SD = 16.11]. Nonverbal raw scores were higher than Verbal raw scores.

**Caucasians (see Table 16)**

Caucasian students (n = 26) ranked first across all OLSAT measures: Verbal [M = 16.85, SD = 5.89]; Nonverbal [M = 19.58, SD = 6.85]; Total [M = 36.42, SD = 11.67]; and SAI [M = 104.08, SD = 16.11]. Nonverbal scores were higher than Verbal scores.

**Males (see Table 17)**

Male students (n = 57) ranked first across all OLSAT measures: Verbal [M = 14.79, SD = 6.34]; Nonverbal [M = 17.42, SD = 6.93]; Total [M = 32.21, SD = 12.50]; and SAI [M = 99.81, SD = 1605]. Nonverbal scores were higher than Verbal scores.

**Females (see Table 17)**
## Table 16
**Dominant OLSAT Scores by Race**

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verbal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>1st</td>
<td>16.85*</td>
<td>5.89</td>
</tr>
<tr>
<td>(n=26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>2nd</td>
<td>13.55</td>
<td>5.40</td>
</tr>
<tr>
<td>(n=75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonverbal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>1st</td>
<td>19.58*</td>
<td>6.85</td>
</tr>
<tr>
<td>(n=26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>2nd</td>
<td>15.15</td>
<td>6.10</td>
</tr>
<tr>
<td>(n=75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>1st</td>
<td>36.42*</td>
<td>11.67</td>
</tr>
<tr>
<td>(n=26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>2nd</td>
<td>28.69</td>
<td>10.76</td>
</tr>
<tr>
<td>(n=75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School Ability Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>1st</td>
<td>104.8*</td>
<td>16.11</td>
</tr>
<tr>
<td>(n=26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>2nd</td>
<td>95.57</td>
<td>13.45</td>
</tr>
<tr>
<td>(n=75)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Statistically Significant
Table 17
Dominant OLSAT Scores
by Sex

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Verbal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=57)</td>
<td>1st</td>
<td>14.79</td>
<td>6.34</td>
</tr>
<tr>
<td>Female (n=44)</td>
<td>2nd</td>
<td>13.89</td>
<td>4.75</td>
</tr>
<tr>
<td><strong>Nonverbal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=57)</td>
<td>1st</td>
<td>17.42</td>
<td>6.93</td>
</tr>
<tr>
<td>Female (n=44)</td>
<td>2nd</td>
<td>14.82</td>
<td>5.81</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=57)</td>
<td>1st</td>
<td>32.21</td>
<td>12.50</td>
</tr>
<tr>
<td>Female (n=44)</td>
<td>2nd</td>
<td>28.71</td>
<td>9.74</td>
</tr>
<tr>
<td><strong>School Ability Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=57)</td>
<td>1st</td>
<td>99.81</td>
<td>16.05</td>
</tr>
<tr>
<td>Female (n=44)</td>
<td>2nd</td>
<td>95.11</td>
<td>12.11</td>
</tr>
</tbody>
</table>
Female students (n = 44) ranked second across all OLSAT measures: Verbal \(M = 13.89, \text{SD} = 4.75\); Nonverbal \(M = 14.82, \text{SD} = 5.81\); total \(M = 28.71, \text{SD} = 9.74\); and SAI \(M = 99.11, \text{SD} = 12.11\). Nonverbal scores were higher than Verbal scores.

African-American Males (see Table 18)

African-American male students (n = 40) ranked third across all OLSAT measures: Verbal \(M = 14.30, \text{SD} = 6.18\); Nonverbal \(M = 16.43, \text{SD} = 6.60\); Total \(M = 30.73, \text{SD} = 12.02\); and SAI \(M = 97.98, \text{SD} = 14.81\). Nonverbal scores were higher than Verbal scores.

Caucasian Males (see Table 18)

Caucasian male students (n = 17) ranked in first place on Nonverbal \(M = 19.77, \text{SD} = 7.31\) and SAI \(M = 104.59, \text{SD} = 18.22\) scores. They ranked in second place on Verbal \(M = 15.94, \text{SD} = 6.74\) and total \(M = 35.71, \text{SD} = 13.28\) scores. Nonverbal scores were higher than Verbal scores.

African-American Females (see Table 18)

African-American female (n = 35) students ranked fourth across all OLSAT measures: Verbal \(M = 12.69, \text{SD} = 4.28\); Nonverbal \(M = 13.69, \text{SD} = 5.18\); Total \(M = 26.37, \text{SD} = 8.71\); and SAI \(M = 93.06, \text{SD} = 11.40\). Nonverbal scores were higher than Verbal scores.

Caucasian Females (see Table 18)

Caucasian female students (n = 9) ranked in first place on Verbal \(M = 18.56, \text{SD} = 3.54\) and Total \(M = 37.78, \text{SD} = 8.42\) scores. They ranked in second place on Nonverbal \(M = 19.22, \text{SD} = 6.30\) and SAI \(M = 103.11, \text{SD} = 12.08\). Nonverbal scores were higher than Verbal scores.

Summary

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<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verbal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian Female (n=9)</td>
<td>1st</td>
<td>18.56</td>
<td>3.54</td>
</tr>
<tr>
<td>Caucasian Male (n=17)</td>
<td>2nd</td>
<td>15.94</td>
<td>6.74</td>
</tr>
<tr>
<td>African-American Male (n=40)</td>
<td>3rd</td>
<td>14.30</td>
<td>6.18</td>
</tr>
<tr>
<td>African-American Female (n=35)</td>
<td>4th</td>
<td>12.69</td>
<td>4.28</td>
</tr>
<tr>
<td><strong>Nonverbal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian Male (n=17)</td>
<td>1st</td>
<td>19.77</td>
<td>7.31</td>
</tr>
<tr>
<td>Caucasian Female (n=9)</td>
<td>2nd</td>
<td>19.22</td>
<td>6.30</td>
</tr>
<tr>
<td>African-American Male (n=40)</td>
<td>3rd</td>
<td>16.43</td>
<td>6.60</td>
</tr>
<tr>
<td>African-American Female (n=35)</td>
<td>4th</td>
<td>13.59</td>
<td>5.18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian Female (n=9)</td>
<td>1st</td>
<td>37.78</td>
<td>8.42</td>
</tr>
<tr>
<td>Caucasian Male (n=17)</td>
<td>2nd</td>
<td>35.71</td>
<td>13.28</td>
</tr>
<tr>
<td>African-American Male (n=40)</td>
<td>3rd</td>
<td>30.73</td>
<td>12.02</td>
</tr>
<tr>
<td>African-American Female (n=35)</td>
<td>4th</td>
<td>26.37</td>
<td>8.71</td>
</tr>
<tr>
<td><strong>School Ability Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian Male (n=17)</td>
<td>1st</td>
<td>104.59</td>
<td>18.22</td>
</tr>
<tr>
<td>Caucasian Female (n=9)</td>
<td>2nd</td>
<td>103.11</td>
<td>12.08</td>
</tr>
<tr>
<td>African-American Male (n=40)</td>
<td>3rd</td>
<td>97.78</td>
<td>14.81</td>
</tr>
<tr>
<td>African-American Female (n=35)</td>
<td>4th</td>
<td>93.06</td>
<td>11.40</td>
</tr>
</tbody>
</table>

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There was a statistically significant difference, by race, with Caucasian students demonstrating higher mean test scores on every measure of the OLSAT. There was no statistically significant difference found for sex or the interaction of race and sex.

Caucasian students ranked first on Verbal, Nonverbal, Total, and SAI scores. African-American students ranked second on these scores.

Male students ranked first on Verbal, Nonverbal, Total, and SAI scores. Female students ranked second on these scores.

There was a difference of 3.34 in Nonverbal score means and 1.64 in Verbal score means favoring Caucasian male students. The Total score mean of Caucasian male students exceeded that of African-American male students by 4.98. Additionally, Caucasian male students' SAI score was 6.81 points higher than that of African-American male students.

The Total Raw Score of Caucasian female students exceeded that of African-American female students by 11.41. Additionally, Caucasian female students' SAI score was 10.05 points higher than that of African-American female students.

All students had higher Nonverbal than Verbal scores.

Additional OLSAT Scores

Besides the four primary scores (Verbal, Nonverbal, Total, and SAI) generated above, nine additional scores were compiled; Age Percentiles, Age Stanines, Normal Curve Equivalents (NCEs), National Percentiles, National Stanines, National NCEs, Local Percentiles, Local Stanines, and Local NCEs. In all instances, there was a significant racial difference, in that, Caucasian students had higher mean test scores than African-American students.

IMMA Tonal (see Table 19).
The main effect of race was not significant, $F(1, 98) = 3.45$, $p > .05$. However, the main effect of sex \textit{was} significant, $F(1, 98) = 8.68$, $p < .05$. The interaction between race and sex was not significant, $F(1, 98)$, $p > .05$.

Male students ($n = 55$) scored significantly higher than female students ($n = 43$). Male students had a mean of 34.87 and a standard deviation of 2.59 compared to a mean of 33.49 for female students.

\textbf{IMMA Rhythm (see Table 19).}

The main effect of race was not significant, $F(1, 95) = 0.20$, $p > .05$. Also, the main effect of sex was not significant, $F(1, 95) = 0.95$, $p > .05$. The interaction between race and sex was not significant, $F(1, 95) = 0.46$, $p > .05$.

\textbf{IMMA Total (see Table 19).}

The main effect of race was not significant, $F(1, 92) = 0.67$, $p > .05$. The main effect of sex was not significant, $F(1, 92) = 3.37$, $p > .05$. The interaction of race and sex was not significant, $F(1, 92) = 0.00$, $p > .05$.

\textbf{Selected IMMA Subject Mean/Standard Deviation Data.}

\textbf{African-Americans (see Table 20)}

African-American students ranked in first place across all IMMA measures: Tonal ($n = 73$) $[M = 34.48, SD = 2.65]$; rhythm ($n = 71$) $[M = 32.69, SD = 4.29]$; and total ($n = 69$) $[M = 67.00, SD = 6.00]$ scores. Tonal scores were higher than rhythm.

\textbf{Caucasians (see Table 20)}

Caucasian students ranked in second place across all IMMA measures: Tonal ($n = 25$) $[M = 33.64, SD = 2.87]$; rhythm ($n = 24$) $[M = 32.21, SD = 4.27]$; and total ($n = 23$) $[M = 66.09, SD = 6.56]$. Tonal scores were higher than rhythm scores.
Table 19
IMMA GLM Results by Race, Sex, and Race/Sex

<table>
<thead>
<tr>
<th>IMMA Variable</th>
<th>Student Variable</th>
<th>DF</th>
<th>F-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonal (N=98)</td>
<td>Race</td>
<td>1</td>
<td>3.45</td>
<td>0.0664</td>
</tr>
<tr>
<td></td>
<td>Sex (Male)</td>
<td>1</td>
<td>8.68</td>
<td>0.0041*</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>1.34</td>
<td>0.2530</td>
</tr>
<tr>
<td>Rhythm (N=95)</td>
<td>Race</td>
<td>1</td>
<td>0.20</td>
<td>0.6546</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>0.95</td>
<td>0.3317</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.46</td>
<td>0.4988</td>
</tr>
<tr>
<td>Total IMMA (N=92)</td>
<td>Race</td>
<td>1</td>
<td>0.67</td>
<td>0.4138</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>1</td>
<td>3.37</td>
<td>0.0697</td>
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<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.00</td>
<td>0.9796</td>
</tr>
</tbody>
</table>

*Statistically Significant
Table 20
Dominant Musical Ability by Race

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IMMA Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American (n=73)</td>
<td>1st</td>
<td>34.48</td>
<td>2.65</td>
</tr>
<tr>
<td>Caucasian (n=25)</td>
<td>2nd</td>
<td>33.64</td>
<td>2.87</td>
</tr>
<tr>
<td><strong>IMMA Rhythm</strong></td>
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<td></td>
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</tr>
<tr>
<td>African-American (n=71)</td>
<td>1st</td>
<td>32.69</td>
<td>4.29</td>
</tr>
<tr>
<td>Caucasian (n=24)</td>
<td>2nd</td>
<td>32.21</td>
<td>4.27</td>
</tr>
<tr>
<td><strong>IMMA Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American (n=69)</td>
<td>1st</td>
<td>67.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Caucasian (n=23)</td>
<td>2nd</td>
<td>66.09</td>
<td>6.56</td>
</tr>
</tbody>
</table>
Males (see Table 21)

Male students were ranked in first place across all IMMA measures: Tonal \( (n = 55) \ [M = 34.87, SD = 2.59] \); rhythm \( (n = 54) \ [M = 33.15, SD = 3.72] \); and total \( (n = 52) \ [M = 67.92, SD = 5.60] \). Tonal scores were higher than rhythm scores.

Females (see Table 21)

Female students were ranked in second place across all IMMA measures: Tonal \( (n = 43) \ [M = 33.49, SD = 2.70] \); rhythm \( (n = 41) \ [M = 31.81, SD = 4.84] \); and total \( (n = 40) \ [M = 65.28, SD = 6.50] \) scores. Tonal scores were higher than rhythm scores.

African-American Males (see Table 22)

African-American male students ranked in first place across all IMMA measures: Tonal \( (n = 39) \ [M = 35.00, SD = 2.53] \); rhythm \( (n = 38) \ [M = 33.50, SD = 3.43] \); and total \( (n = 37) \ [M = 68.27, SD = 5.17] \) scores. Tonal scores were higher than rhythm scores.

Caucasian Males (see Table 22)

Caucasian male students ranked second across all IMMA measures: Tonal \( (n = 16) \ [M = 34.56, SD = 2.78] \); rhythm \( (n = 16) \ [M = 32.31, SD = 4.33] \); and total \( (n = 15) \ [M = 67.07, SD = 6.68] \) scores. Tonal scores were higher than rhythm scores.

African-American Females (see Table 22)

African-American female students ranked in third place on tonal \( (n = 34) \ [M = 33.88, SD = 2.68] \) and total \( (n = 32) \ [M = 65.53, SD = 6.62] \) score. They ranked fourth on rhythm \( (n = 33) \ [M = 31.76, SD = 4.99] \) score. Tonal scores were higher than rhythm scores.

Caucasian Females (see Table 22)

Caucasian female students ranked third on rhythm \( (n = 8) \ [M =
Table 21
Dominant Musical Ability by Sex

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IMMA Tonal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=55)</td>
<td>1st</td>
<td>34.87*</td>
<td>2.59</td>
</tr>
<tr>
<td>Female (n=43)</td>
<td>2nd</td>
<td>33.49</td>
<td>2.70</td>
</tr>
<tr>
<td><strong>IMMA Rhythm</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=54)</td>
<td>1st</td>
<td>33.15</td>
<td>3.72</td>
</tr>
<tr>
<td>Female (n=41)</td>
<td>2nd</td>
<td>31.81</td>
<td>4.84</td>
</tr>
<tr>
<td><strong>IMMA Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=52)</td>
<td>1st</td>
<td>67.92</td>
<td>5.60</td>
</tr>
<tr>
<td>Female (n=40)</td>
<td>2nd</td>
<td>65.28</td>
<td>6.50</td>
</tr>
</tbody>
</table>

*Statistically Significant
Table 22
Dominant Musical Ability by Race and Sex

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Menu</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IMMA Tonal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American Male (n=39)</td>
<td>1st</td>
<td>35.00</td>
<td>2.53</td>
</tr>
<tr>
<td>Caucasian Male (n=16)</td>
<td>2nd</td>
<td>34.56</td>
<td>2.78</td>
</tr>
<tr>
<td>African-American Female (n=34)</td>
<td>3rd</td>
<td>33.89</td>
<td>2.68</td>
</tr>
<tr>
<td>Caucasian Female (n=9)</td>
<td>4th</td>
<td>32.00</td>
<td>2.35</td>
</tr>
<tr>
<td><strong>IMMA Rhthym</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American Male (n=38)</td>
<td>1st</td>
<td>33.50</td>
<td>3.43</td>
</tr>
<tr>
<td>Caucasian Male (n=16)</td>
<td>2nd</td>
<td>32.31</td>
<td>4.33</td>
</tr>
<tr>
<td>Caucasian Female (n=8)</td>
<td>3rd</td>
<td>32.00</td>
<td>4.44</td>
</tr>
<tr>
<td>African-American Female (n=33)</td>
<td>4th</td>
<td>31.76</td>
<td>4.99</td>
</tr>
<tr>
<td><strong>IMMA Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African-American Male (n=37)</td>
<td>1st</td>
<td>68.27</td>
<td>5.17</td>
</tr>
<tr>
<td>Caucasian Male (n=15)</td>
<td>2nd</td>
<td>67.07</td>
<td>6.68</td>
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<tr>
<td>African-American Male (n=32)</td>
<td>3rd</td>
<td>65.53</td>
<td>6.62</td>
</tr>
<tr>
<td>Caucasian Female (n=8)</td>
<td>4th</td>
<td>64.25</td>
<td>6.32</td>
</tr>
</tbody>
</table>
32.00, $SD = 4.44$] score. They ranked fourth on tonal ($n = 9$) [$M = 32.00, SD = 2.35$] and total ($n = 8$) [$M = 64.25, SD = 6.32$] score. Tonal and rhythm mean scores were identical. However, their standard deviations were different; tonal [$SD = 2.35$] and rhythm [$SD = 4.44$].

**Summary**

There was no statistically significant difference by race. However, there was a statistically significant difference by sex on the tonal area of the IMMA favoring male students. And, there was no statistically significant difference for the interaction of race and sex.

African-American students ranked in first place on tonal, rhythm, and total scores. Caucasian students ranked in second place on these scores. As a function of race, all students had tonal scores that were higher than rhythm scores.

Male students ranked in first place on tonal, rhythm, and total scores. Female students ranked in second place on these scores. As a function of sex, all students had tonal scores that were higher than rhythm scores.

African-American male students ranked in first place on tonal, rhythm, and total scores. Caucasian male students ranked in second place on tonal, rhythm, and total scores. African-American female students ranked in third place on tonal and total scores. They ranked in fourth place on rhythm scores. And, Caucasian female students ranked in fourth place on tonal and total scores. They ranked in third place on rhythm scores.

As a function of race and sex, all students except Caucasian
females, had tonal scores that were higher than rhythm scores. Caucasian female students, tonal and rhythm scores were identical. However, there was a disparity in deviation scores. Rhythm deviation scores were twice the size of tonal deviation scores.

**AIR Mother Score (see Table 23).**

The main effect of race was not significant, $F(1, 79) = 2.17, p > .05$. However, the main effect of sex was significant, $F(1, 79) = 4.46, p < .05$. The interaction of race and sex was not significant, $F(1, 79) = 0.44, p > .05$.

Female students ($n = 38$) scored significantly higher than male students ($n = 41$). Female students had a mean of 122.97 and a standard deviation of 14.37 compared to a mean of 116.10 and a standard deviation of 18.17 for male students.

**AIR Father Score (see Table 23).**

The main effect of race was not significant, $F(1, 43) = 2.36, p > .05$. Also, the main effect of sex was not significant, $F(1, 43) = 0.11, p > .05$. The interaction of race and sex was not significant, $F(1, 43) = 0.30, p > .05$.

**AIR Male Score (see Table 23).**

The main effect of race was not significant, $F(1, 71) = 0.30, p > .05$. Also, the main effect of sex was not significant, $F(1, 71) = 0.51, p > .05$. The interaction of race and sex was not significant, $F(1, 71) = 2.52, p > .05$.

**AIR Female Score (see Table 23).**

The main effect of race was not significant, $F(1, 63) = 0.00, p > .05$. However, the main effect of sex was significant, $F(1, 63) = 15.30, p < .05$. The interaction of race and sex was not significant, $F(1, 63) = 0.14, p > .05$.

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Table 23  
AIR GLM Results by Race, Sex, and Race/Sex

<table>
<thead>
<tr>
<th>AIR Variable</th>
<th>Student Variable</th>
<th>DF</th>
<th>F-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Mother</td>
<td>Race</td>
<td>1</td>
<td>2.17</td>
<td>0.1450</td>
</tr>
<tr>
<td>(N=79)</td>
<td>Sex (Female)</td>
<td>1</td>
<td>4.46</td>
<td>0.0381*</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.44</td>
<td>0.5090</td>
</tr>
<tr>
<td>Total Father</td>
<td>Race</td>
<td>1</td>
<td>2.36</td>
<td>0.1324</td>
</tr>
<tr>
<td>(N=43)</td>
<td>Sex</td>
<td>1</td>
<td>0.11</td>
<td>0.7378</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.30</td>
<td>0.5896</td>
</tr>
<tr>
<td>Total Male</td>
<td>Race</td>
<td>1</td>
<td>0.30</td>
<td>0.5830</td>
</tr>
<tr>
<td>(N=71)</td>
<td>Sex</td>
<td>1</td>
<td>0.51</td>
<td>0.4785</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>2.52</td>
<td>0.1175</td>
</tr>
<tr>
<td>Total Female</td>
<td>Race</td>
<td>1</td>
<td>0.00</td>
<td>0.9650</td>
</tr>
<tr>
<td>(N=63)</td>
<td>Sex (Female)</td>
<td>1</td>
<td>15.30</td>
<td>0.0002*</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
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<td>0.14</td>
<td>0.7092</td>
</tr>
<tr>
<td>Total Teacher</td>
<td>Race</td>
<td>1</td>
<td>1.32</td>
<td>0.2547</td>
</tr>
<tr>
<td>(N=85)</td>
<td>Sex</td>
<td>1</td>
<td>1.99</td>
<td>0.1624</td>
</tr>
<tr>
<td></td>
<td>Race/Sex</td>
<td>1</td>
<td>0.60</td>
<td>0.4422</td>
</tr>
</tbody>
</table>

*Statistically Significant

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Female students (n = 27) scored significantly higher than male students (n = 36). Female students had a mean of 118.07 and a standard deviation of 12.26 compared to a mean of 92.44 and a standard deviation of 28.44 for male students.

**AIR Teacher Score (see Table 23).**

The main effect of race was not significant, $F(1, 85) = 1.32, p > .05$. Also, the main effect of sex was not significant, $F(1, 85) = 1.99, p > .05$. The interaction of race and sex was not significant, $F(1, 85) = 0.60, p > .05$.

**Selected AIR Subject Mean/Standard Deviation Data.**

**African-Americans (males & females) (see Table 24)**

African-American students ranked in first place on Female (n = 46) [$M = 104.39, SD = 27.08$] and Teacher (n = 63) [$M = 102.43, SD = 24.34$] scores. They ranked in second place on Mother (n = 57) [$M = 118.16, SD = 17.79$]; Father (n = 28) [$M = 112.64, SD = 20.64$] and Male (n = 52) [$M = 105.33, SD = 18.36$] scores. African-American students' AIR scores in descending order were Mother, Father, Male, Female, and Teacher.

**Caucasians (males & females) (see Table 24)**

Caucasian students ranked in first place on Mother (n = 22) [$M = 122.64, SD = 13.35$]; Father (n = 15) [$M = 121.30, SD = 11.84$]; and Male (n = 19) [$M = 107.21, SD = 16.36$] scores. They ranked second on Female (n = 17) [$M = 100.82, SD = 23.97$] and Teacher (n = 22) [$M = 91.73, SD = 32.97$] scores. Caucasian students' AIR scores in descending order were Mother, Father, Male, Teacher, and Female.

**Males (African-Americans & Caucasians) (see Table 25)**

Male students ranked in first place on Father (n = 25) [$M = 107.21, SD = 16.36$] scores.
Table 24
Dominant Interpersonal Relations by Race

<table>
<thead>
<tr>
<th>Total Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Type</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td>(n=22)</td>
</tr>
<tr>
<td>African-American</td>
</tr>
<tr>
<td>(n=57)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Father</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Type</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td>(n=15)</td>
</tr>
<tr>
<td>African-American</td>
</tr>
<tr>
<td>(n=28)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Type</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td>(n=19)</td>
</tr>
<tr>
<td>African-American</td>
</tr>
<tr>
<td>(n=52)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Type</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>African-American</td>
</tr>
<tr>
<td>(n=46)</td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td>(n=17)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Type</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>African-American</td>
</tr>
<tr>
<td>(n=63)</td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td>(n=22)</td>
</tr>
</tbody>
</table>
They ranked in second place on Mother (n = 41) [M = 116.10, SD = 18.17], Female (n = 36) [M = 92.44, SD = 28.44], and Teacher (n = 48) [M = 96.10, SD = 30.01] scores. Male students' AIR scores-in descending-order were Father, Mother, Male, Teacher, and Female.

**Females (African-Americans & Caucasians) (see Table 25)**

Female students ranked in first place on Mother (n = 38) [M = 122.97, SD = 14.37]; Female (n = 27) [M = 118.07, SD = 12.26], and Teacher (n = 37) [M = 104.27, SD = 22.17] scores. They ranked in second place on Father (n = 18) [M = 114.28, SD = 19.53] and Male (n = 32) [M = 101.84, SD = 17.80] scores. Female students' AIR scores-in descending order-were Mother, Female, Teacher, Father, and Male.

**African-American Males (see Table 26)**

African-American males ranked in first place on Male (n = 27) [M = 110.63, SD = 16.90] score. They ranked in third place on Father (n = 17) [M = 114.71, SD = 20.92]; Female (n = 25) [M = 93.32, SD = 30.77], and Teacher (n = 32) [M = 100.30, SD = 26.86] scores. And, ranked fourth on Mother (n = 27) [M = 114.93, SD = 19.94]. score. African-American male students' AIR scores-in descending order-were Mother, Father, Male, Teacher, and Female.

**Caucasian Males (see Table 26)**

Caucasian Males ranked in second place on Father (n = 8) [M = 120.63, SD = 7.93] score. They ranked in third place on Mother (n = 14) [M = 118.36, SD = 14.57] and Male (n = 12) [M = 105.67, SD = 18.28] scores. And, they ranked in fourth place on Female (n = 11) [M = 90.46, SD = 23.51] and Teacher (n = 15) [M = 86.87, SD = 35.22] scores. Caucasian males' AIR scores-in descending order-were Father, Mother, Male, Female, and Teacher.
Table 25
Dominant Interpersonal Relations by Sex

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Mother</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female (n=38)</td>
<td>1st</td>
<td>122.97*</td>
<td>14.37</td>
</tr>
<tr>
<td>Male (n=41)</td>
<td>2nd</td>
<td>116.10</td>
<td>18.17</td>
</tr>
<tr>
<td><strong>Total Father</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=25)</td>
<td>1st</td>
<td>116.60</td>
<td>17.84</td>
</tr>
<tr>
<td>Female (n=18)</td>
<td>2nd</td>
<td>114.28</td>
<td>19.53</td>
</tr>
<tr>
<td><strong>Total Male</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=39)</td>
<td>1st</td>
<td>109.10</td>
<td>17.25</td>
</tr>
<tr>
<td>Female (n=32)</td>
<td>2nd</td>
<td>101.84</td>
<td>17.80</td>
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<td><strong>Total Female</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Female (n=27)</td>
<td>1st</td>
<td>118.07*</td>
<td>12.26</td>
</tr>
<tr>
<td>Male (n=36)</td>
<td>2nd</td>
<td>92.44</td>
<td>28.44</td>
</tr>
<tr>
<td><strong>Total Teachers</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Female (n=37)</td>
<td>1st</td>
<td>104.27</td>
<td>22.17</td>
</tr>
<tr>
<td>Male (n=48)</td>
<td>2nd</td>
<td>96.10</td>
<td>30.01</td>
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</table>

*Statistically Significant
Table 26
Dominant Interpersonal Relations
by Race and Sex

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Rank</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Mother</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian Female (n=8)</td>
<td>1st</td>
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<td>6.29</td>
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<tr>
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<td>15.36</td>
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<tr>
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<td>118.36</td>
<td>14.57</td>
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<td>African-American Male (n=27)</td>
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<td>114.93</td>
<td>19.94</td>
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<td><strong>Total Father</strong></td>
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<tr>
<td>Caucasian Female (n=7)</td>
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<td>121.86</td>
<td>15.90</td>
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<tr>
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<td>120.63</td>
<td>7.93</td>
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<td>114.71</td>
<td>20.92</td>
</tr>
<tr>
<td>African-American Female (n=11)</td>
<td>4th</td>
<td>109.46</td>
<td>20.76</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>African-American Male (n=27)</td>
<td>1st</td>
<td>110.63</td>
<td>16.90</td>
</tr>
<tr>
<td>Caucasian Female (n=7)</td>
<td>2nd</td>
<td>109.86</td>
<td>13.32</td>
</tr>
<tr>
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<td>3rd</td>
<td>105.67</td>
<td>18.28</td>
</tr>
<tr>
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<td>4th</td>
<td>99.60</td>
<td>18.47</td>
</tr>
<tr>
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<tr>
<td>Caucasian Female (n=6)</td>
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<td>119.83</td>
<td>7.94</td>
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<td>African-American Male (n=25)</td>
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<td>93.32</td>
<td>30.77</td>
</tr>
<tr>
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<td>90.46</td>
<td>23.51</td>
</tr>
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<td></td>
<td></td>
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<td>104.76</td>
<td>21.43</td>
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<td>102.14</td>
<td>26.92</td>
</tr>
<tr>
<td>African-American Male (n=33)</td>
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<td>106.30</td>
<td>26.86</td>
</tr>
<tr>
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<td>86.87</td>
<td>35.22</td>
</tr>
</tbody>
</table>
African-American Females (see Table 26)

African-American female students ranked in first place on Teacher (n = 30) [M = 104.76, SD = 21.43] score. They ranked in second place on Mother (n = 30) [M = 121.07, SD = 15.36] and Female (n = 21) [M = 117.57, SD = 13.36] scores. And, they ranked in fourth place on Father (n = 11) [M = 109.46, SD = 20.76] and Male (n = 25) [M = 99.60, SD = 18.47] scores. African-American female students' AIR scores-in descending order-were Mother, Female, Father, Teacher, and Male.

Caucasian Females (see Table 26)

Caucasian females ranked first on Mother (n = 8) [M = 130.13, SD = 6.29]; Father (n = 7) [M = 121.86, SD = 15.90], and Female (n = 6) [M = 119.83, M = 7.94] scores. They ranked second on Male (n = 7) [M = 109.86, SD = 13.82] and Teacher (n = 7) [M = 102.14, SD = 26.92] scores. Caucasian female students' AIR scores-in descending order-were Mother, Father, Female, Male, and Teacher.

Summary

Sex was statistically significant in two AIR areas; Mother and Female. Female students scored significantly higher than male students in both areas. All other AIR areas were not statistically significant.

African-American students ranked in first place on Female and Teacher scores. Their AIR scores-in descending order-were Mother, Father, Male, Female, and Teacher.

Caucasian students ranked in first place on Mother, Father, and Male scores. Their AIR scores-in descending order-were Mother, Father, Male, Female, and Teacher.

African-American and Caucasian students shared the same top three scores in identical order; Mother, Father, and Male.
Male students ranked first on Father and Mother scores. Their AIR scores—in descending order—were Father, Mother, Male, Teacher, and Female.

Female students ranked first on Mother, Female, and Teacher scores. Their AIR scores—in descending order—were Mother, Female, Teacher, Father, and Male.

Female peers ranked fifth (last) for males. Male peers ranked fifth (last) for females.

African-American male students ranked in first place on Male score. Their AIR scores in descending order were Mother, Father, Male, Teacher, and Female.

Caucasian male students did not rank in first place on any scores. Their AIR scores in descending order were Father, Mother, Male, Female, and Teacher.

African-American and Caucasian male students shared the same ranking for Male. They reversed the order for Mother and Father. Mother was first for African-American male students and Father was first for Caucasian male students.

African-American female students ranked in first place on Teacher score. Their AIR scores—in descending order—were Mother, Female, Father, Teacher, and Male.

Caucasian female students ranked in first place on Mother, Father, and Female scores. Their AIR scores—in descending order—were Mother, Father, Female, Male, and Teacher.

African-American and Caucasian female students shared Mother as their highest score.

CYOT Score Equivalency for Instruments
Chi-Squares were generated comparing the TIMI, IMMA, and AIR to the OLSAT for equivalency in identifying CYOT students. The OLSAT was divided into three bands; not gifted, promising, and gifted. The TIMI was divided into two bands; not gifted and gifted. The IMMA was divided into three bands; not gifted, promising, and gifted. And, the AIR was divided into five bands; very negative, moderately negative, average, promising, and gifted. Chi-Square printouts displayed the data in a 3 X 2 format for the OLSAT and TIMI (see Table 27), a 3 X 3 format for the OLSAT and IMMA (see Table 28), and a 3 X 5 format for the OLSAT and AIR (see Table 29).

The operational definitions for giftedness and bands for each of the instruments used in this study are listed below:

**OLSAT:** NotGifted = a SAI score below 112  
Promising = a SAI score of 112-119  
Gifted = a SAI score of 120 or above  

**TIMI:** Not Gifted = a score below 6  
Gifted = a score of 6-8  

**IMMA:** Not Gifted = a Total below 73  
Promising = a Total Score of 73-75  
Gifted = a Total Score of 76 and above  

**AIR:** Very  
Negative = a Standard Score of 75 or below  
Moderately  
Negative = a Standard Score of 76-89  
Average = a Standard Score of 90-110  
Promising = a Standard Score of 111-125  
Gifted = a Standard Score of 126 or above
Table 27
OLSAT/TIMI Chi-Square Table

<table>
<thead>
<tr>
<th>Not Gifted on Both Tests</th>
<th>Not Gifted on OLSAT Gifted on TIMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promising on OLSAT</td>
<td>Promising on OLSAT Gifted on TIMI</td>
</tr>
<tr>
<td>Not Gifted on TIMI</td>
<td></td>
</tr>
<tr>
<td>Gifted on OLSAT</td>
<td>Gifted on Both Tests</td>
</tr>
<tr>
<td>Not Gifted on TIMI</td>
<td></td>
</tr>
</tbody>
</table>
### Table 28
OLSAT/IMMA Chi-Square Table

<table>
<thead>
<tr>
<th>Not Gifted on Both Tests</th>
<th>Not Gifted on OLSAT Promising on IMMA</th>
<th>Gifted on OLSAT Promising on IMMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promising on OLSAT Not Gifted on IMMA</td>
<td>Promising on Both Tests</td>
<td>Promising on OLSAT Gifted on IMMA</td>
</tr>
<tr>
<td>Gifted on OLSAT Not Gifted on IMMA</td>
<td>Gifted on OLSAT Promising on IMMA</td>
<td>Gifted on Both Tests</td>
</tr>
</tbody>
</table>
The OLSAT's three bands (Not Gifted, Promising, and Gifted) were derived from page 23 of the National Norms Booket (1993). The "Not Gifted" band corresponds to stanine 6 or below (76 or below percentile rank); the "Promising" band corresponds to stanine 7 (77-88 percentile rank); and the "Gifted" band corresponds to stanines 8 and 9 (89 or above percentile rank).

The TIMI's two bands (Not Gifted and Gifted) were derived after this researcher had a telephone conversation with the TIMI's developer Dr. Sue Teele (S. Teele, personal communication, March 4, 1996). Dr. Teele was reticent about specifying a "cut off" point for defining giftedness because such a notion runs counter to the inclusiveness orientation of the multiple intelligences approach. However, she did offer this assessment. "Anything that is 4 or above (on the TIMI) would be considered a stronger intelligence." Using the above statement as a guide, this researcher operationalized "Gifted" to be a TIMI score of 6 or above and "Not Gifted" to be a TIMI score below 6.

The IMMA's three bands (Not Gifted, Promising, and Gifted) were derived from definitions given for each on pages 68-69 of the IMMA's manual, Intermediate Measures of Music Audiation (1979/1986). A Composite raw score of 73 corresponds to a Composite percentile rank of 80 (Promising for this study). A Composite raw score of 76 (Gifted for this study) corresponds to a Composite percentile rank of 95. And, a Composite raw score of 72 corresponds to a Composite percentile rank of 75 (Not Gifted for this study).

The AIR's five bands (Very Negative, Moderately Negative, Average, Promising, and Gifted) were derived from definitions given on
page 23 of the *Assessment of Interpersonal Relations Examiner's Manual* (1993). An AIR Standard Score of 75 or below was defined as a "Very Negative Relationship". An AIR Standard Score of 76-89 was defined as a "Moderately Negative Relationship". An AIR Standard Score of 90-110 was defined as an "Average Relationship". An AIR Standard Score of 111-125 was defined as a "Moderately Positive Relationship". This definition was operationalized as "Promising" for this study. An AIR Standard Score of 126 or above was defined as a "Very Positive Relationship". This definition was operationalized as "Gifted" for this study.

The following section used Chi-Square data from three distinct areas of analysis that involved the OLSAT, TIMI, IMMA, and AIR. Area 1 supplied data that was generated from the OLSAT contrasted with the TIMI or IMMA or AIR. There was no "controlling" for the OLSAT in these analyses. Areas 2 and 3 did involve controlling for the OLSAT. Area 2 analyzed race and area 3 analyzed sex.

Before an explicit discussion is begun, it is necessary to familiarize the reader with the Chi-Square tables that were generated for the analyses in this section.

The OLSAT and TIMI Chi-Square Table had 6 cells consisting of 2 columns (TIMI) and 3 rows (OLSAT) with 2 cells each (see Table 27).

The OLSAT and IMMA Chi-Square Table had 9 cells consisting of 3 columns (IMMA) and 3 rows (OLSAT) with 3 cells each (see Table 28).

The OLSAT and AIR Chi-Square Table had 15 cells consisting of 5 columns (AIR) and 3 rows (OLSAT) with 3 cells for each column and 5 cells for each row (see Table 29).

Each area 2 (race) and 3 (sex) analysis isolated the bands of the
### Table 29
**OLSAT/AIR Chi-Square Table**

<table>
<thead>
<tr>
<th>Not Gifted on OLSAT</th>
<th>Not Gifted on OLSAT</th>
<th>Not Gifted on OLSAT</th>
<th>Not Gifted on OLSAT</th>
<th>Not Gifted on OLSAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Negative on AIR</td>
<td>Moderately Negative on AIR</td>
<td>Average on AIR</td>
<td>Promising on AIR</td>
<td>Gifted on AIR</td>
</tr>
<tr>
<td>Promising on OLSAT</td>
<td>Promising on OLSAT</td>
<td>Promising on OLSAT</td>
<td>Promising on Both Tests</td>
<td>Promising on Both Tests</td>
</tr>
<tr>
<td>Very Negative on AIR</td>
<td>Moderately Negative on AIR</td>
<td>Average on AIR</td>
<td>Gifted on OLSAT</td>
<td>Gifted on Both Tests</td>
</tr>
<tr>
<td>Gifted on OLSAT</td>
<td>Gifted on OLSAT</td>
<td>Gifted on OLSAT</td>
<td>Gifted on OLSAT</td>
<td>Gifted on Both Tests</td>
</tr>
<tr>
<td>Very Negative on AIR</td>
<td>Moderately Negative on AIR</td>
<td>Average on AIR</td>
<td>Promising on AIR</td>
<td>Gifted on Both Tests</td>
</tr>
</tbody>
</table>
TIMI (Not gifted and Gifted), IMMA (Not Gifted, Promising, and Gifted), and AIR (Very Negative, Moderately Negative, Average, Promising, and Gifted), from the originally generated Chi-Square table, for analysis while controlling for the corresponding two bands of the OLSAT. Data generated from area 2 and area 3 analyses enabled the identification of students by race or sex.

**NOTE:** RESULTS OF CHI-SQUARES ARE REPORTED WHETHER SIGNIFICANT OR NOT SIGNIFICANT BECAUSE "NOT SIGNIFICANT" RESULTS ARE INTERPRETED IN CHAPTER 5 OF THIS STUDY. HOWEVER, THESE INTERPRETATIONS ARE PURELY DESCRIPTIVE IN NATURE BECAUSE THEY ARE NOT SUPPORTED BY INDEPENDENT STATISTICAL PROBABILITY AND THEREFORE COULD HAVE OCCURRED BY CHANCE ALONE. THEY ARE INCLUDED BECAUSE OF THEIR VALUE FOR PROVIDING INSIGHT FOR THIS STUDY'S ANALYSES AND FUTURE STUDY.

Bar graphs (Figures 1-9), which visually present the CYOT identification results for the OLSAT/TIMI, OLSAT/IMMA, and OLSAT/AIR for the following section, are contained in Appendix AA.

**TIMI 1 (linguistic intelligence)**

There was no statistically significant difference in the number of students identified as gifted by TIMI 1 compared to the OLSAT. \(X^2(2, N = 101) = 0.199, p > .05.\)

TIMI 1 identified 16 students as gifted. The OLSAT identified 11 as gifted. However, 13 of TIMI 1's gifted students would not have been identified by the OLSAT. Of this number, 3 were African-American and 10 were Caucasian. Also, 6 of these 13 gifted were male and 7 were female.

**TIMI 2 (logical-mathematical)**

There was no statistically significant difference in the number
of students identified as gifted by TIMI 2 compared to the OLSAT. $X^2(2, N = 101) = 0.306, p > .05$.

TIMI 2 identified 40 students as gifted. The OLSAT identified 11 as gifted. However, 32 of TIMI 2's gifted students would not have been identified by the OLSAT. Of this number, 9 were African-American and 23 were Caucasian. Also, 20 of these 32 gifted were male and 12 were female.

**TIMI 3 (intrapersonal intelligence)**

There was no statistically significant difference in the number of students identified as gifted by TIMI 3 compared to the OLSAT. $X^2(2, N = 101) = 0.504, p > .05$.

TIMI 3 identified 2 students as gifted. The OLSAT identified 11 as gifted. However, both of TIMI 3's gifted students would not have been identified by the OLSAT. Of this number, both were Caucasian. Also, both were male. It should be noted that race was shown to be significant. However, due to the small number of students involved, no interpretation can be ventured.

**TIMI 4 (spatial intelligence).**

There was no statistically significant difference in the number of students identified as gifted by TIMI 4 compared to the OLSAT. $X^2(2, N = 101) = 1.237, p > .05$.

TIMI 4 identified 27 students as gifted. The OLSAT identified 11 as gifted. However, 23 of TIMI 4's gifted students would not have been identified by the OLSAT. Of this number, 4 were African-American and 19 were Caucasian. Also, 15 of these 23 gifted were male and 8 were female.

**TIMI 5 (musical intelligence).**
There was no statistically significant difference in the number of students identified as gifted by TIMI 5 compared to the OLSAT. \( \chi^2 (2, N = 101) = 0.104, p > .05 \).

TIMI 5 identified 12 students as gifted. The OLSAT identified 11 as gifted. However, 10 of TIMI 5's gifted students would not have been identified by the OLSAT. Of this number, 2 were African-American and 8 were Caucasian. Also, 6 of these 10 gifted were male and 4 were female.

**TIMI 6 (bodily-kinesthetic intelligence).**

There was no statistically significant difference in the number of students identified as gifted by TIMI 6 compared to the OLSAT. \( \chi^2 (2, N = 101) = 2.744, p > .05 \).

TIMI 6 identified 21 students as gifted. The OLSAT identified 11 as gifted. However, 18 of TIMI 6's gifted students would not have been identified by the OLSAT. Of this number, 1 was African-American and 17 were Caucasian. Also, 2 of these 18 gifted were male and 16 were female. This sex difference was significant. \( \chi^2 (1, n = 18) = 0.000, p < .05 \).

**TIMI 7 (interpersonal intelligence).**

There was no statistically significant difference in the number of students identified as gifted by TIMI 7 compared to the OLSAT. \( \chi^2 (2, N = 101) = 0.237, p > .05 \).

TIMI 7 identified 17 students as gifted. The OLSAT identified 11 as gifted. However, 14 of TIMI 7's gifted students would not have been identified by the OLSAT. Of this number, 5 were African-American and 9 were Caucasian. Also, 4 of these 14 gifted were male and 10 were female.

IMMA.
There was a statistically significant difference in the number of students identified as gifted by the IMMA (Total Score) compared to the OLSAT. \( X^2 (4, N = 92) = 20.206, p < .05 \).

The IMMA identified 2 students as gifted. The OLSAT identified 10. One of the 11 gifted identified as gifted by the OLSAT did not complete the IMMA. Therefore, this student's OLSAT score was dropped from the analysis when the Chi-Square was computed.

Both of these students would have been identified as **promising** by the OLSAT. Of this number, 1 was African-American and 1 was Caucasian. Both were males.

**AIR.**

There was a statistically significant difference in the number of students identified as gifted by the AIR compared to the OLSAT. \( X^2 (4, N = 86) = 0.007, p < .05 \).

The AIR identified "0" students as gifted. The OLSAT identified 10 as gifted (See IMMA above for explanation of why there are not 11 OLSAT gifted.) The AIR identified 14 students as promising. The OLSAT identified 8 students as promising. However, the 14 identified as promising by the AIR were identified as not gifted by the OLSAT.

Because the "standard" score used in the above Chi-Square analysis was derived from a total of all five AIR subscales, a student would have to do well on all or most of the subscales or score "extremely high" on several subscales to be identified as "gifted". And since no students were identified as gifted, Chi-Square analyses were conducted on each of the AIR subscales. The results of these analyses are described below.

**Mother**
There was no statistically significant difference in the number of students identified as gifted by the Mother subscale compared to the OLSAT. $X^2 (8, N = 96) = 3.429, p > .05$.

The AIR identified 5 students as gifted. The OLSAT identified 11 as gifted. **ALL** 5 of the AIR's gifted students would not have been identified by the OLSAT. Of this number, **all** were African-American. Also, 3 of these 5 gifted were male and 2 were female.

**Father**

There was no statistically significant difference in the number of students identified as gifted by the Father subscale compared to the OLSAT. $X^2 (8, N = 96) = 9.895, p > .05$.

The AIR identified 4 students as gifted. The OLSAT identified 11 as gifted. However, all of the AIR's gifted students would not have been identified by the OLSAT. Of this number, all were African-American. Also, 1 of these 4 gifted was male and 3 were female.

**Males**

There was no statistically significant difference in the number of students identified as gifted by the Male subscale compared to the OLSAT. $X^2 (8, N = 88) = 2.372, p > .05$.

The AIR identified 2 gifted students. The OLSAT identified 10 (See IMMA above for explanation of why there are not 11 OLSAT gifted.) Both of the AIR's gifted students would not have been identified by the OLSAT. Of this number, both were African-American. Also, both were female.

**Female**
There was a statistically significant difference noted between the Female subscale and the OLSAT. \(X^2 (8, N = 88) = 19.612, p < .05\).

A statistically significant greater number of students who are OLSAT 1 (not gifted) are identified as 3 (average), 4 (promising), and 5 (gifted), in female interpersonal relations, on the Female subscale than are identified on the OLSAT 2 and 3.

The AIR identified 2 gifted. The OLSAT identified 10 gifted (See IMMA above for explanation of why there are not 11 OLSAT gifted.) Both of the AIR's gifted students would not have been identified by the OLSAT. Of this number, both were African-American. Also, both were male.

Teacher

There was a statistically significant difference noted between the Teacher subscale and the OLSAT. \(X^2 (8, N = 97) = 20.620, p < .05\).

A statistically significant greater number of students who are OLSAT 1 (not gifted) are identified as 3 (average), 4 (promising), and 5 (gifted), in teacher interpersonal relations, on the Female subscale than are identified on the OLSAT 2 and 3.

The AIR identified 7 gifted. The OLSAT identified 11 gifted. However, 6 of the AIR's gifted would not have been identified by the OLSAT. Of this number, 3 were African-American and 3 were Caucasian. Also, 4 of these gifted were male and 2 were female.

There was a statistically significant difference noted between African-American and Caucasian students on the Teacher subscale. \(X^2 (4, N = 77) = 12.610, p < .05\).

A statistically significant greater number of African-American students who are OLSAT 1 (not gifted) were identified as 3 (average),
4 (promising) and 5 (gifted) on the Teacher subscale than Caucasian students identified as OLSAT 1.

Correlation Analysis Results

Pearson product-moment correlation coefficients were computed for the OLSAT verbal scores and the TIMI 1 (linguistic intelligence) scores, the OLSAT nonverbal scores and the TIMI 2 (logical-mathematical intelligence) scores, the IMMA Tonal/Rhythm scores and TIMI 5 (musical intelligence) scores, and the Total AIR/subscale AIR standard scores and the TIMI 7 (interpersonal intelligence) scores. Borg & Gall (1989) stated, "Product-moment correlation is the most used bivariate correlational technique because \( r \) has a small standard error and because most educational measures yield continuous scores. In fact, \( r \) can be calculated for any two sets of scores, even if one or both measures do not yield scores in continuous form" (p. 590).

A significant correlation (i.e., \( p \leq .05 \)) indicated the instruments demonstrated convergent validity. And, a non-significant correlation (i.e., \( p \geq .05 \)) indicated the instruments did not demonstrate convergent validity.

Tests for Convergent Validity

**OLSAT Verbal/TIMI 1. (see Table 30)**

The correlation between the OLSAT verbal scores and the TIMI 1 scores was not significant; \( r = 0.12449, p \geq .05 \).

**OLSAT Nonverbal/TIMI 2. (see Table 30)**

The correlation between the OLSAT nonverbal scores and the TIMI 2 scores was not significant; \( r = 0.12806, p \geq .05 \).

**IMMA Tonal/TIMI 5 (see Table 30)**
<table>
<thead>
<tr>
<th>Variable</th>
<th>DF</th>
<th>$X^2$</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIMI 3 (Both Races)</td>
<td>1</td>
<td>7.720</td>
<td>0.005</td>
</tr>
<tr>
<td>TIMI 4 (Males)</td>
<td>1</td>
<td>3.938</td>
<td>0.047</td>
</tr>
<tr>
<td>TIMI 6 (Females)</td>
<td>1</td>
<td>14.450</td>
<td>0.000</td>
</tr>
</tbody>
</table>
The correlation between the IMMA Tonal scores and the TIMI 5 scores was not significant; \( r = 0.27327, p > .05 \).

**IMMA Rhythm/TIMI 5 (see Table 30)**

The correlation between the IMMA Rhythm scores and the TIMI 5 scores was not significant; \( r = 0.00308, p > .05 \).

**Total AIR/TIMI 7 (see Table 30)**

The correlation between the Total AIR standard scores and the TIMI 7 scores was not significant; \( r = -0.08342, p > .05 \).

**AIR Mother/TIMI 7 (see Table 30)**

The correlation between the Mother subscale and the TIMI 7 was not significant; \( r = -0.07170, p > .05 \).

**AIR Father/TIMI 7 (see Table 30)**

The correlation between the Father subscale and the TIMI 7 was not significant; \( r = -0.21104, p > .05 \).

**AIR Male/TIMI 7 (see Table 30)**

The correlation between the Male subscale and the TIMI 7 was not significant; \( r = -0.08177, p > .05 \).

**AIR Female/TIMI 7 (see Table 30)**

The correlation between the Female subscale and the TIMI 7 was significant; \( r = 0.18820, p < .05 \), demonstrating statistically significant convergent validity.

**AIR Teacher/TIMI 7 (see Table 30)**

The correlation between the Teacher subscale and the TIMI 7 was not significant; \( r = -0.08342, p > .05 \).

**Summary**

There was one statistically significant result (convergent correlation) in the above section. The correlation between the AIR
Female subscale scores and the TIMI 7 were statistically significant: All others were not.
CHAPTER V
SUMMARY, CONCLUSIONS, AND FUTURE IMPLICATIONS

Summary

The models and paradigms that have dominated the search for talent potential, primarily psychometric and test-driven, have been justly criticized because of the drastic and unconscionable underrepresentation of culturally different, economically disadvantaged, and limited English proficient gifted students. Although the traditional paradigms seemed to have worked somewhat better with the non-minority middle class groups, even within that population they have neither adequately nor satisfactorily identified the range and variety of talent potential. (Passow & Frasier, 1996, p. 200)

During the last twenty plus years, there have been three national reports which have documented the underrepresentation of African-American students in academic programs for the "gifted"; currently, known as programs for Children and Youth with Outstanding Talent (CYOT). These national reports were Education of the Gifted and Talented: Report to the Congress of the United States by the U.S. Commissioner of Education (1972) AKA the Marland Report; The National Report on Identification: Assessment and Recommendation for Comprehensive Identification of Gifted and Talented Youth (1982) AKA the National Report on Identification; and National Excellence: A Case for Developing America's Talent (1993) AKA National Excellence. Others have conducted research that has replicated the above finding (Baldwin, 1985, 1987a, 1987b; Richert, 1985, 1987; Rhodes, 1992; Roberts, 1989; Ross, 1993; Smith, LeRose, & Clasen, 1991).
One of the reasons for this underrepresentation of African-American students in CYOT programs has been their poor performance on standardized achievement and intelligence tests (Bailey & Harbin, 1980; Hadaway & Marek-Schroer, 1992; Hoffman, 1962; Johnson, 1987-88; Kamin, 1974; Madaus, 1994; Masten, 1985; O'Connor, 1989; Samuda, 1975). Selection, for participation in CYOT programs has been and continues to be based primarily on high performance on achievement and intelligence tests (Jenkins-Friedman, 1982; Richert, Alvino & McDonnel, 1982; Ross, 1993; U.S Commissioner of Education, 1972). These tests have been demonstrated to select proportionately less African-American students into gifted and talented programs (Griffin, 1992; Madaus, 1994; Mitchell, 1988; Yancey, 1983). Thus, there is a need for a more equitable CYOT selection process—than primary reliance on standardized achievement and intelligence tests—if African-American student underrepresentiveness is to be ameliorated (Harris, III & Ford, 1991; Mills & Tissot, 1995; Mckensie, 1986; Ryan, 1983; Woods & Achey, 1990). This study has sought to examine whether the use of the Teele Inventory of Multiple Intelligences (TIMI), as a supplement to or as a replacement for standardized achievement and intelligence tests, would identify more African-Americans as CYOT students.

Specifically, this study examined the selection rate of the subscales of the TIMI and Otis-Lennon School Ability Test (OLSAT) in identifying fourth grade CYOT students from an African-American and Caucasian fourth grade population. In doing so, it also examined the underlying theoretical supports of each instrument, that is, multiple intelligences theory (MI) for the TIMI (Gardner, 1983, 1993; Guilford,
This study's primary goal was to determine if the subscales of a multiple intelligence instrument could identify a statistically significant greater number of potentially gifted African-American urban fourth grade students than the subscales of a general intelligence instrument. And, whether there was a statistically significant difference in the ability of a multiple intelligences and a general intelligence instrument to identify potential urban fourth grade CYOT students as a function of race, sex or the interaction of race and sex. A secondary objective was to cross-validate four of the TIMI's seven intelligences through convergent correlation due to the fact that the TIMI is still undergoing reliability and validation studies.

A combined sample of 101 fourth grade students from two majority (above 60%) African-American and majority (above 60%) Reduced/Free Lunch Program participating urban elementary schools was examined to supply answers to these questions.

This study examined four hypotheses. They were:

Null: H0: There is not a statistically significant difference between the subscales of a multiple intelligences and a general intelligence instrument in identifying potential urban fourth grade African-American CYOT students
Null: Ho2 There is not a statistically significant difference, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race.

Null: Ho3 There is not a statistically significant difference, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of sex.

Null: Ho4 There is not a statistically significant interaction, when using the subscales of either a multiple intelligences or a general intelligence instrument to identify potential urban fourth grade CYOT students, as a function of race and sex.

Although the IMMA and AIR were not included, as instruments to be considered under the above four hypotheses, each was so examined. Each was substituted for the primary intelligence instrument (i.e., the TIMI) in the above hypotheses. Both were contrasted with the OLSAT in identifying potential urban fourth grade African-American students. And, each was examined under the guidelines (race, sex, and race/sex interaction) of the remaining three hypotheses. Note: The results for the OLSAT was always the same as reported for the OLSAT contrasted with the TIMI except in one instance when one of the OLSAT's gifted students did not complete the IMMA or the AIR's Female and Male subscales. This is noted appropriately. Therefore, these results will not be restated when discussing IMMA and AIR results.
Conclusions

This section will examine the results of the Chi-Square analyses for the OLSAT contrasted with each of the three remaining instruments. To accomplish this goal; first, the results of each hypothesis will be stated; second, the support or lack of support for each hypothesis will be stated; and third, the interpretation of each hypothesis' results will be presented.

It should be noted that there will be instances when the sample number (N = 101) will be less. This will occur for two reasons: one, because some students did not complete the IMMA or AIR; two, because sometimes the OLSAT subject data is being "controlled". This means that the Chi-Square analysis is "isolating" one of the three OLSAT student identification bands (not gifted, promising, and gifted) and identifying gifted students for the TIMI, IMMA, or AIR contained within this particular band.

OLSAT/TIMI

Identifying African-American CYOT Students

Alternative H0 was accepted.

The Chi-Square analysis (see Table 30) indicated there was a statistically significant difference in the ability of TIMI 3 to identify potential urban fourth grade African-American CYOT students. However, due to the small subject size of the 2 Caucasian students identified as gifted by TIMI 3, caution should be used in interpreting this data. There was no statistically significant difference in the ability of the OLSAT or TIMIs 1, 2, 4, 5, 6, and 7 to identify potential urban fourth grade African-American CYOT students. However, there was a difference in the number of potential urban fourth grade
African-American CYOT students identified by each instrument (see Table 31).

The OLSAT identified 6 potential urban fourth grade African-American CYOT students and 5 potential urban fourth grade Caucasian CYOT students. Six of the TIMI's subscales identified more potential urban fourth grade African-American CYOT students than the OLSAT (see Table 31). This ranged from a low of 9 for TIMI 5 (musical) to a high of 27 for TIMI 2 (logical-mathematical). However, only TIMI 2 (logical-mathematical) identified more potential urban fourth grade Caucasian CYOT students than the OLSAT (see Table 31). TIMI 3 did not identify any potential urban fourth grade African-American CYOT students.

Identifying CYOT Students by Race

Alternative Ho2 was accepted.

The Chi-Square analysis (see Table 30) indicated there was a statistically significant difference in the ability of TIMI 3 to identify potential urban fourth grade CYOT students, as a function of race. However, due to the small subject size of 2 Caucasian students identified as gifted by TIMI 3, caution should be used in interpreting this data. There was no statistically significant difference in the ability of the OLSAT or TIMIs 1, 2, 4, 5, 6, and 7 to identify potential urban fourth grade CYOT students, as a function of race. However, there was a difference in the number of potential urban fourth CYOT students identified by each instrument, as a function of race. (see Table 31).

Identifying CYOT Students by Sex

Alternative Ho3 was accepted.
Table 31
Number of Gifted Students Identified by OLSAT and TIMI by Race

<table>
<thead>
<tr>
<th></th>
<th>OLSAT</th>
<th>TIMI 1</th>
<th>TIMI 2</th>
<th>TIMI 3</th>
<th>TIMI 4</th>
<th>TIMI 5</th>
<th>TIMI 6</th>
<th>TIMI 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American</td>
<td>6</td>
<td>11</td>
<td>27</td>
<td>0*</td>
<td>22</td>
<td>9</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Caucasian</td>
<td>5</td>
<td>5</td>
<td>13</td>
<td>2*</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Total Both Races</td>
<td>11</td>
<td>16</td>
<td>40</td>
<td>2</td>
<td>27</td>
<td>12</td>
<td>21</td>
<td>17</td>
</tr>
</tbody>
</table>

*Statistically Significant
The Chi-Square analysis (see Table 30) indicated that there was a statistically significant difference in the ability of TIMI 4 (spatial) and TIMI 6 (bodily-kinesthetic) to identify potential urban fourth grade CYOT students, as a function of sex. There was no statistically significant difference in the ability of the OLSAT or TIMIs 1, 2, 3, 5, and 7 to identify potential urban fourth grade CYOT students, as a function of sex (see Table 32).

The OLSAT identified 9 potential urban fourth grade male CYOT students and 2 potential urban fourth grade female CYOT students.

TIMI 4 (Table 1 controlling for OLSAT 1) identified 15 potential urban fourth grade male CYOT students and 8 potential urban fourth grade female CYOT students. These numbers are included in the 27 total gifted identified by TIMI 4 (see Table 32).

TIMI 6 (Table 1 controlling for OLSAT 1) identified 2 potential urban fourth grade male CYOT students and 16 urban fourth grade female CYOT students. These numbers are included in the 21 total gifted identified by TIMI 6 (see Table 32).

### Identifying CYOT Students by Race and Sex

**Null:** Ho4 was not evaluated due to the small subject sizes that would have been generated. For example, the OLSAT identified 11 students as gifted. Of this number, only 2 were female. Even if both were African-American or Caucasian, no realistic evaluation could have been rendered with such a small subject size. Therefore, no effort was made to analyze student data based on an interaction of race and sex.

It should be noted that many of the CYOT students identified by the TIMI were not identified by the OLSAT.
Table 32
Number of Gifted Students Identified by OLSAT and TIMI by Sex

<table>
<thead>
<tr>
<th></th>
<th>OLSAT</th>
<th>TIMI 1</th>
<th>TIMI 2</th>
<th>TIMI 3</th>
<th>TIMI 4</th>
<th>TIMI 5</th>
<th>TIMI 6</th>
<th>TIMI 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>9</td>
<td>9</td>
<td>28</td>
<td>2</td>
<td>18*</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>7</td>
<td>12</td>
<td>0</td>
<td>9</td>
<td>6</td>
<td>17*</td>
<td>11</td>
</tr>
<tr>
<td>Total Both Sexes</td>
<td>11</td>
<td>16</td>
<td>40</td>
<td>2</td>
<td>27</td>
<td>12</td>
<td>21</td>
<td>17</td>
</tr>
</tbody>
</table>

*Statistically Significant
OLSAT/IMMA

Identifying African-American CYOT Students

Alternative Ho1 was not accepted.

The Chi-Square analysis indicated there was not a statistically significant difference in the ability of the OLSAT or IMMA to identify potential urban fourth grade African-American CYOT students. However, there was a difference in the number of potential urban fourth grade African-American CYOT students identified by each instrument (see Table 33).

Identifying CYOT Students by Race

Alternative Ho2 was not accepted.

The Chi-Square analysis indicated there was not a statistically significant difference in the ability of the OLSAT or IMMA to identify potential urban fourth grade CYOT students, as a function of race. However, there was a difference in the number of potential urban fourth grade CYOT students, as a function of race, identified by each instrument (see Table 33).

Identifying CYOT Students by Sex

Alternative Ho3 was not accepted.

The Chi-Square analysis indicated that there was not a statistically significant difference in the ability of the OLSAT and IMMA to identify potential urban fourth grade CYOT students, as a function of sex. However, there was a difference in the number of potential urban fourth grade CYOT students identified, as a function of sex, by each instrument (see Table 34).
Table 33
Number of Gifted Students Identified by OLSAT and IMMA by Race

<table>
<thead>
<tr>
<th>Race of Student</th>
<th>OLSAT</th>
<th>TOTAL IMMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American</td>
<td>5*</td>
<td>1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Total Both Races</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

*The OLSAT identified five (5) African-American students as gifted instead of six (6) because one student, who previously had been identified by the OLSAT, did not complete the IMMA.
Table 34
Number of Gifted Students Identified by OLSAT and IMMA by Sex

<table>
<thead>
<tr>
<th>Sex of Student</th>
<th>OLSAT</th>
<th>Total IMMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Female</td>
<td>1*</td>
<td>0</td>
</tr>
<tr>
<td>Total Both Sexes</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

*The OLSAT identified one (1) female as gifted instead of two (2) because one student who previously had been identified by the OLSAT as gifted, did not complete the IMMA.
Identifying CYOT Students by Race and Sex

Null: Ho4 was not evaluated due to the small subject sizes that would have been generated (see Null: Ho4 under OLSAT/TIMI for detailed explanation).

OLSAT/AIR

Identifying African-American CYOT Students

Alternative Ho1 was accepted.

The Chi-Square analysis (see Table 35) indicated there was a statistically significant difference in the ability of the AIR's Teacher subscale to identify potential urban fourth grade African-American CYOT students. There was no statistically significant difference in the ability of the OLSAT or the AIR's Mother, Father, Female, and Male subscales to identify potential urban fourth grade African-American CYOT students. However, due to the small subject size [4] identified, no evaluation was rendered (see Table 36).

Identifying CYOT Students by Race

Alternative Ho2 was accepted.

The Chi-Square analysis (see Table 35) indicated there was a statistically significant difference in the ability of the AIR's Teacher subscale to identify potential urban fourth grade CYOT students, as a function of race. However, due to the small [4 African-American; 3 Caucasian] subject sizes, no evaluation was rendered (see Table 36).

Identifying CYOT Students by Sex

Alternative Ho3 was not accepted.

The Chi-Square analysis indicated there was not a statistically significant difference in the ability of the OLSAT and AIR's subscales...
<table>
<thead>
<tr>
<th>Variables</th>
<th>DF</th>
<th>$X^2$</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher (Race)</td>
<td>4</td>
<td>12.610</td>
<td>0.013</td>
</tr>
</tbody>
</table>
### Table 36
Number of Gifted Students Identified by OLSAT and AIR by Race

<table>
<thead>
<tr>
<th>Race of Student</th>
<th>OLSAT</th>
<th>AIR Mother</th>
<th>AIR Father</th>
<th>AIR Female</th>
<th>AIR Male</th>
<th>AIR Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Caucasian</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0*</td>
<td>0*</td>
<td>3</td>
</tr>
<tr>
<td>Total Both Races</td>
<td>10</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

*The OLSAT identified four (4) Caucasian students, when compared to the above AIR subscales, as gifted instead of five (5) because one student, who previously had been identified by the OLSAT as gifted, did not complete the AIR.*
to identify potential urban fourth grade CYOT students, as a function of sex. However, there was a difference in the number of potential urban fourth grade CYOT students identified, as a function of sex, by each instrument (see Table 37).

**Identifying CYOT Students by Race and Sex**

Null: $H_04$ was not evaluated due to the small subject sizes that would have been generated (see Null: $H_04$ under OLSAT/TIMI for detailed explanation).

**Implications**

This section will highlight the above findings for the TIMI, IMMA, and AIR contrasted with the OLSAT and their implications.

**OLSAT/TIMI**

The literature is replete with research that states that standardized (g) factor based instruments like the OLSAT consistently under identify African-American gifted students (Bailey & Harbin, 1980; Hadaway & Marek-Schroer, 1992; Hoffman, 1962; Johnson, 1987-88; Kamin, 1974; Madaus, 1994; Masten, 1985; O'Connor, 1989; Samuda, 1975). This study's results are not consistent with these findings at a level that is statistically significant. However, there was a difference in the raw number of African-American potential urban fourth grade CYOT students identified. The OLSAT identified less African-American students as gifted when compared to TIMIs 1, 2, 4, 5, 6, and 7 (see Table 31).

Unless the impact of (g) factor instruments like the OLSAT, which under identify potential African-American CYOT students, are ameliorated with alternative assessment measures like the TIMI, it is probable that African-American students will continue to be under
Table 37
Number of Gifted Students Identified by OLSAT and AIR by Sex

<table>
<thead>
<tr>
<th>Sex of Student</th>
<th>OLSAT</th>
<th>Air Mother</th>
<th>Air Father</th>
<th>Air Female</th>
<th>Air Male</th>
<th>Air Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>2*</td>
<td>0*</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total Both Sexes</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

*The OLSAT identified eight (8) males as gifted, when compared to the above AIR subscales, instead of nine (9) because one student who previously had been identified by the OLSAT as gifted, did not complete the AIR.
identified as gifted and thus remain underrepresented in CYOT programs.

The use of the TIMI, or another multiple intelligences theory based assessment measure, in tandem with the OLSAT is consistent with the position of pluralistic assessment advocates (Callahan, Lundberg & Hunsaker, 1993; Clasen, 1994; Coleman, 1994; Hadaway & Marek-Schroer, 1992; Hansen & Linden, 1990; Harris & Ford, 1991; MacRae & Lupart, 1991; Swanson, 1995; Tyler-wood & Carri, 1991; Woods & Achey, 1990; Wright & Borland, 1993). If the TIMI was used in conjunction with the OLSAT, this study's results indicate that an increase in the number of African-American students in CYOT programs is not only possible, but probable.

If there is to be an increase in the number of African-American CYOT students, an equitable selection process must be assured (Harris, III & Ford, 1991; Marquardt & Karnes, 1994; McKensie, 1986; Richert, 1987; Ryan, 1983; Woods & Achey, 1990; Yancey, 1983). Standardized achievement and intelligence tests have been shown to select proportionately less African-American students into gifted and talented programs. (Harris & Ford, 1991; Johnson, 1987-88; Kearney & LeBlanc, 1993; Richert, 1987; Sisk, 1988; Yancey, 1983). Yet, despite this finding and the recommendation in three national gifted reports that standardized achievement and intelligence tests not be used as the sole or more heavily weighted criterion for CYOT selection, this practice continues (Richert, Alvino & McDonnel, 1982; Ross, 1993; U.S. Commissioner of Education, 1972). This study's results are consistent with the finding that standardized achievement and intelligence tests identify less African-American students as gifted.
The OLSAT always selected proportionately more Caucasian fourth grade students as gifted than would have been their expected mathematical gifted proportion (as determined by their sample representation). Of the 11 gifted students that the OLSAT identified, 5 [45.5%] were Caucasian and 6 [54.5%] were African-American. Since Caucasian students comprised 26 [25.7%] of the sample, their mathematical gifted proportion would have been 3 of the total number of gifted students (assuming all things being equal). And, since African-American students comprised 75 [74.3%] of the sample, their mathematical gifted proportion would have been 8 (assuming all things being equal). Thus, the OLSAT over identified the number of gifted Caucasian students and under identified the number of African-American gifted students.

The TIMI was more consistent in identifying a proportionate number of CYOT students, as a function of race, when contrasted with the OLSAT on 6 of 7 of its intelligences (see Table 31). However, its TIMI 3 (intrapersonal intelligence) may select proportionately more Caucasian fourth grade students in its CYOT identification as compared to the OLSAT. TIMI 3 identified 2 Caucasian CYOT students and no African-American CYOT students. It is important to note that because of the small subject size, no evaluation was rendered. The TIMI fared better than the OLSAT in Caucasian CYOT student identification on logical-mathematical intelligence and matched the OLSAT on three others: linguistic, spatial, and interpersonal (see Table 31). Thus, the TIMI identified more gifted students overall than the OLSAT.

Why does the OLSAT consistently identify less African-American CYOT students? It may relate to the fact that the OLSAT's test items
require the student to possess a higher reading ability than the TIMI. And, the directions for the OLSAT "change" from section to section, whereas they do not for the TIMI. There is only one set of instructions for the TIMI. Also, the TIMI's format is mostly visual (consisting of sets of panda bears) and the OLSAT's is not. The panda bears speak in only 3 pictures out of 56. And, even then the language is very basic and simplistic. Thus, the ability to read probably exerts minimal impact on the comprehension level of the student.

One difference between the TIMI and OLSAT may be of major importance. The TIMI is a self-report instrument and the OLSAT is not. Thus, the TIMI may be getting at more of the essence of the student's intellectual abilities because the student may be more uninhibited in this "free" expression format than in the more "restricted" format of the OLSAT.

The administration of the two instruments is similar; requiring the presence of a test administrator. However, the time required to complete each test is different: The OLSAT requires more time (60 minutes of administration and 40 minutes of test time); and the TIMI is untimed (Students in this study completed the TIMI in 20 to 30 minutes.) However, the lack of stress that may accompany an untimed test may not have impacted the students in this study because all students were aware that only an hour was allotted for testing at each sitting.

This study's results indicate that, if the goal is to increase African-American student CYOT identification, the TIMI is preferred over the OLSAT. Overall, the TIMI identified more potential urban fourth grade African-American CYOT students than the OLSAT (see Table 31).
Also, this study's results indicate that if an overall increase in the identification of CYOT students is desired, the TIMI is preferred over the OLSAT. The TIMI identified more CYOT students overall than the OLSAT (see Tables 31 & 32).

The TIMI's African-American CYOT student identification was; TIMI 1 [11 gifted], TIMI 2 [27 gifted], TIMI 3 [0 gifted], TIMI 4 [22 gifted], TIMI 5 [9 gifted], TIMI 6 [18 gifted], and TIMI 7 [12 gifted] (see Table 31). Allowing for overlapping in TIMI CYOT identification, it is evident that the TIMI still consistently identifies more African-American CYOT students than the OLSAT [6 gifted].

The OLSAT's fourth grade student CYOT identification, as a function of sex, was not statistically significant. However, its raw fourth grade student CYOT identification deserves description because of possible insight gleaned for use now and for future research.

The OLSAT identified 9 males as gifted compared to a low of 4 males identified as gifted by TIMI 6 (bodily-kinesthetic) to a high of 28 males identified as gifted by TIMI 2 (logical-mathematical). However, the OLSAT identified more males than four TIMI subscales (see Table 32).

The OLSAT identified 2 females as gifted compared to a low of 2 females identified as gifted by TIMI 3 (intrapersonal) and a high of 17 females identified as gifted by TIMI 6 (bodily-kinesthetic). It should be noted that TIMI 6's results were statistically significant. \( X^2 (1, n = 81) = 14.450, p < .05 \). Note: The sample size was 81 instead of 101 because these results were generated from table 2 of the TIMI while "controlling" band 1 of the OLSAT.
The OLSAT identified less potential urban fourth grade female CYOT students than six TIMI subscales (see Table 32).

This study's results indicate that when the goal is to insure equitable selection of CYOT students, as a function of sex, the OLSAT and TIMI should be used in tandem.

**OLSAT/IMMA**

Although no statistically significant results were found for the IMMA pertaining to the four hypotheses that this study addressed, descriptive interpretation of data will be summarized.

The IMMA identified 2 students as gifted. Both students were male. One was African-American and one was Caucasian.

Additionally, 11 students were identified as promising. All 11 were African-American. Of this number, 7 were male and 4 were female.

The OLSAT identified 10 gifted students (one previously identified gifted student was not identified as gifted in this analysis because she did not complete the IMMA) compared to the IMMA's 2. However, the 2 identified by the IMMA would not have been identified by the OLSAT. These results suggest that using the two instruments in combination would produce a net gain of 2 students identified as gifted.

**OLSAT/AIR**

The OLSAT always identified more students as gifted regardless of race or sex (not statistically significant). However, it should be noted that in every instance, those students that were identified by the AIR as gifted were not included in those students identified by the OLSAT as gifted. Therefore, all of the students identified as gifted by the AIR would add to the CYOT pool.
Correlation Analyses

Correlation analyses were necessary because the TIMI is currently undergoing validity and reliability studies. Although, preliminary results indicate that the TIMI is valid (Teele, 1995a), this study performed correlation analyses to clarify and better interpret this study's results and to add to the TIMI's validity data base.

Convergent correlation analyses were performed to determine if TIMI 1 (linguistic intelligence) and the OLSAT's Verbal subscale were "related" and thus possibly be measuring similar underlying intelligence constructs. Identical correlation analyses were performed on TIMI 2 (logical-mathematical intelligence) and the OLSAT's Nonverbal subscale for the same reason. These correlations were repeated for TIMI 5 (musical intelligence) and the IMMA's Tonal and Rhythm subscales, as well as TIMI 7 (interpersonal intelligence) and the AIR's subscales. It was hoped that all of the above correlations would be convergent because such a finding would support the conclusion that the TIMI is valid.

A statistically significant convergent correlation would suggest that the two subscales being compared were measuring (at best) the same or a similar construct(s) of intelligence or (at worst) that the two subscales' construct(s) were within the same "nemological net". This would mean that each subscale's intelligence construct would be in a general area that contained intelligence constructs that were "getting at" similar (if not exactly the same) aspects of intelligence.

The AIR Female/TIMI 7 (interpersonal) was the only subscale pair that converged. All others did not converge.
TIMI 1 (linguistic intelligence) was expected to converge; it did not. TIMI 2 (logical-mathematical intelligence) was expected to converge; it did not. TIMI 5 (musical intelligence) was expected to converge; it did not. (see Table 38).

**Convergent Correlation**

Not only did the AIR Female/TIMI 7 subscales correlate, the correlation was positive. Such a positive convergent correlation indicates that the AIR Female (measures interpersonal relation between student and female peers) and TIMI 7 (interpersonal intelligence) subscales are measuring a similar construct, but the relationship is weak [r = 0.18820]. However, each subscale may be measuring a different "aspect" of the same construct(s).

What do the above correlations indicate about TIMI validity? They suggest that the TIMI may be measuring a different "aspect" of the construct(s) that the contrasted instruments are measuring. It also may be measuring error bias. If the TIMI is measuring a different aspect of the intelligence construct(s), it may assist in bringing a different perspective or angle (from which to view intelligence) to the CYOT selection process.

**Future Implications**

**Educational Policy Makers**

State boards of education and local school boards need to affirm in a policy statement "...the belief that every student is gifted, has unique talents and abilities, can succeed, and should be taught and assessed in ways that reach all seven intelligences" (Teele, 1995b, p. 8). Such a policy statement would establish that the full weight, authority (both legal and moral), and prestige of the State and
### Table 38
**TIMI Convergent Validity Results**

<table>
<thead>
<tr>
<th>Type of Scale/Subscale</th>
<th>OLSAT Verbal</th>
<th>OLSAT Nonverbal</th>
<th>IMMA Tonal</th>
<th>IMMA Rhythm</th>
<th>AIR Total</th>
<th>AIR Mother</th>
<th>AIR Father</th>
<th>AIR Male</th>
<th>AIR Female</th>
<th>AIR Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Coefficient</td>
<td>0.12449</td>
<td>0.12806</td>
<td>0.27327</td>
<td>0.00308</td>
<td>-0.08342</td>
<td>-0.07170</td>
<td>-0.21104</td>
<td>-0.06177</td>
<td>0.18820</td>
<td>-0.08342</td>
</tr>
<tr>
<td>Significance</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>S</td>
<td>NS</td>
</tr>
<tr>
<td>Direction of Correlation</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>P</td>
<td>N</td>
</tr>
</tbody>
</table>

**Key:**

- **NS** = Not Significant
- **S** = Significant
- **P** = Positive
- **N** = Negative
municipality are behind "salvaging" every student regardless of individual circumstances.

Next, these policy makers should adopt the definition of "Children and Youth with Outstanding Talent (CYOT) as stated in National Excellence: A Case for Developing America's Talent (1993) and below:

Children and youth with outstanding talent perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment.

These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields. They require services or activities not ordinarily provided by the schools.

Outstanding talents are present in children and youth from all cultural groups, across all economic strata, and in all areas of human endeavor. (p. 26)

The adoption of this CYOT definition would establish a uniform way of conceptualizing CYOT students statewide. Such a gifted conceptualization, coupled with the implementation of the above policies, would aid in creating an environment that would be conducive for the findings and conclusions of this study to be put into practice.

Equitable selection of CYOT students has been advocated by researchers through the years (Harris, III & Ford, 1991; Marquardt & Karnes, 1994; McKensie, 1986; Richert, 1987; Ryan, 1983; Woods & Achey, 1990; Yancey, 1983). It is the moral and legal duty of educational policy makers to insure that the attainment of this goal is sought and hopefully achieved. Implementing the above recommendations and findings of this study would be a first step in bringing the goal of equitable CYOT selection into fruition.
Educational Administrators

Educational policy makers can establish a moral and legal environment for CYOT reform to occur, but these policies can only be implemented at the school site. School principals must actively participate in getting their staffs, teachers, parents, and students to "buy into" these policies. If they embrace this effort, a more equitable CYOT selection process is likely to occur.

Teachers

Teachers are the foot soldiers who, through their implementation of policy, determine success or failure for any policy. This study has demonstrated that an increase in African-American student CYOT identification specifically and CYOT student identification in general is likely if the TIMI is used to augment the OLSAT. It has also presented student data, for School System Z, that showed African-American students to be underrepresented in gifted programs by 15.8% (see Appendix D).

Teachers are the ones who have daily face-to-face contact and interaction with students. Thus, they are the ones in a position to notice students who exhibit signs of giftedness in the classroom and implement procedures for gifted identification. A 1 to 2 hour workshop on multiple intelligences (MI) should equip teachers with the basics of MI theory and identification "cues" for the (7) intelligences (see Appendix AA)

Teachers can use the TIMI, as a first line measure, in identifying gifted African-American students. This should not unduly burden teachers because the TIMI is such a simple instrument to administer and requires approximately thirty minutes to complete.
Students

If the above policies are implemented and individual efforts undertaken, students should benefit from increased teacher identification efforts by participating in CYOT programs. And, hopefully a synergistic effect of greater overall academic performance and cooperation will be manifested between principal, teacher, and student.

Businesses

Local merchants, manufacturers, and service providers can use competent, knowledgeable employers. The increased gifted identification of an under represented gifted pool of African-American students can benefit entrepreneurs by providing them with highly skilled and knowledgeable employees. The need for highly skilled and knowledgeable African-Americans is highlighted in National Excellence (1993), "...blacks make up 12 percent of the population, yet earn only 5 percent of the baccalaureate degrees awarded each year in science and mathematics, receive only 1 percent of the Ph.D.s, and make up only 2 percent of all employed scientists and engineers in the country" (p. 11). If America is to compete at the highest levels internationally, it can not afford to overlook or dismiss a potential pool of gifted students. African-Americans represent such a gifted pool.

Community

The local community will benefit by having a more representative sample of its residents developing talents and abilities that would otherwise be overlooked. Thus, the community can tap these talents and abilities to assist in its development. And, the community will have
at its disposal "role models" that have been lacking or under represented in the past. All of these things can aid in strengthening the community academically, morally, and spiritually.

Limitations of Study

Although the convergent correlation analyses were inconclusive in determining the validity of the TIMI, this study has contributed to the literature addressing validation of the TIMI by cross-validating the TIMI with the OLSAT, IMMA, and AIR. Also, this study only used a specific African-American/Caucasian population (fourth graders) and not a wider spectrum of students (i.e., middle and senior high). In some instances, the sample was too small to render evaluations on sex, race, or the interaction of race and sex. And, since the TIMI is a self-report instrument and the other instruments are not, this may have hindered the comparison between the instruments.

Suggestions for future Research

Harris and Ford (1991), commenting on the paucity of scholarly writing addressing giftedness in African-Americans, found "...the relevant literature since 1924 reveals that, of approximately 4,000 articles on the gifted, a paltry 63 (less than 2 percent) address minority group members. The percentage would be lower still if one counted only those articles about gifted Blacks" (p. 3). As evidenced, by the preceding quotation, the need is great for quality research examining giftedness in African-American students. This study has contributed to ameliorating this need by demonstrating that the TIMI is a multiple intelligences instrument that consistently identified a greater number of African-American fourth grade CYOT than the (g) factor based OLSAT. However, much more research must be done.
Discovering more/other ways of identifying African-American
gifted students may not, in and of itself, eliminate the dearth of
such students. That is because the lack of proper identifying
instruments is only one causal aspect for under identification of
African-American CYOT students; cultural/social causes represent the
remainder (i.e., culture, social structure, economic structure, social
definitions of intelligence, societal level power exercised through
control). See Ogbu (1985); Hare (1987); McKensie (1986); Mugny and
Carugati (1989); Scott (1993); Staunton (1993). Until these
cultural/social factors are integrated with the "more/other" ways to
identify gifted African-American students, it is not likely that
significant progress will be made toward correcting the dearth of
African-American CYOT students. In spite of this shortcoming, there
are some efforts that can be pursued to increase the identification of
African-American CYOT students specifically and students in general.

School System Z should allow all students, identified as gifted
by this study, to participate in their gifted program. Data should be
gathered on their performance for one academic year. This data should
be analyzed to determine how these students performed relative to
those students who had been identified by School System Z's giftedness
program proper (see Appendixes E thru K). This data would provide
insight into whether the TIMI is an alternative instrument that can be
utilized to increase the number of African-American CYOT students
specifically and students in general.

An academic year pilot project should be conducted at Schools B
and C of this study in which an intact fourth grade at each school is
evaluated by the TIMI and students' instruction matched with students'
dominant intelligences. After identifying students' dominant intelligences, instruction (for these students) could then be synchronized with these dominant intelligences. These results would provide insight as to whether multiple intelligences is a viable alternative to current instructional methods for increasing the performance of African-American students specifically and students in general.

Many researchers have identified differences between males and females (Arnold, 1991; Feingold, 1992; Hoover & Feldhusen, 1990; Katzman & Alliger, 1992; Lim, 1994). This study has contributed to this literature. It found a statistically significant sex difference between the OLSAT and TIMI 4 (spatial) favoring males and TIMI 6 (bodily-kinesthetic) favoring females. Therefore, School System Z should have all fourth grade students sit for the TIMI to determine if these results can be replicated. If they can, this would have profound implications for male and female instruction.

Armstrong (1994), in Multiple Intelligences in the Classroom, provided teaching strategies for each of the seven intelligences. Five specific strategies were presented for spatial and bodily-kinesthetic intelligences. Spatial intelligence teaching strategies were visualization, color cues, picture metaphors, idea sketching, and graphic symbols. Bodily-kinesthetic teaching strategies were body answers, the classroom theater, kinesthetic concepts, hands-on thinking, and body maps. Armstrong stated that such teaching strategies will enhance the performance of the particular intelligence dominant students. And, if males' spatial and females' bodily-kinesthetic intelligence is dominant at the fourth grade level,
instituting spatial and bodily-kinesthetic instruction is likely to enhance the respective sex's academic performance.

Hopefully, if the above efforts are pursued, their results will begin the journey toward "parity" in the CYOT selection process for African-American students specifically and students in general.

This study has provided a data base that should have implications for future research addressing urban phenomena because it was guided by an "urban" perspective; a recognition that its subjects' observed interactional patterns and personality constructs resulted from the unique characteristics associated with cities--large size, high density, heterogeneity, and diversity. (Phillips & LeGates, 1981).
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Statistical Analysis of The Teele Inventory Of Multiple Intelligences

By Dr. Sue Teele

The Teele Inventory for Multiple Intelligences developed in 1992 is specifically designed to examine the dominant intelligences of students in kindergarten through the twelfth grade, and acts as an indicator as to whether or not students in different grade levels possess different intelligences.

The Teele Inventory of Multiple Intelligences (TIMI) has been utilized in a broad spectrum of applications since its inception. It has been administered to students at the pre-school level through elementary, secondary, community college and institutions of higher education. The TIMI has been and is employed as one of the means for identifying students' dominant intelligences. This instrument which has proven to be reliable through test-retest studies is currently being used in over four hundred and fifty different public and private school settings in the United States, as well as six other countries throughout the world. The results of the inventory have indicated that students possess different combinations of the seven intelligences and process information in many different ways.

The TIMI is a forced choice pictorial inventory that contains 56 numbered pictures of panda bears representing characteristics of each of the seven intelligences and provides students twenty-eight opportunities to make their selections of two choices. The different intelligences are matched with one another and students have eight different times they can select each of the seven intelligences. Students are asked to select one of the two choices that they feel is the most like them. There are no right or wrong answers. When completed, the resulting data is compiled, and then the inventory identifies the dominant intelligences each participant
possesses. The intelligences have been coded by number and by letter, and can be tallied on the answer sheet by either the instructor or student. The answer sheet is easily scored and presents a profile of the responses enabling the student and teacher to determine the students most dominant intelligences as indicated by the highest scores.

An analysis of over 4,000 answer sheets has revealed some interesting data that could affect the way instruction is provided at different grade levels. As the table on the next page indicates, students at the primary level demonstrated a much stronger preference for linguistic and logical-mathematical intelligences than students at the middle and high school levels. Primary students most dominant intelligences were spatial, bodily-kinesthetic, linguistic and logical-mathematical while upper elementary students were spatial, bodily-kinesthetic, interpersonal and musical. Middle and high school students were strongest in interpersonal, bodily-kinesthetic, spatial and musical intelligences.

A separation by grade levels indicates the following dominant intelligences by grade level and is listed by order of strongest intelligences:

Kindergarten students were spatial, bodily-kinesthetic, linguistic and intrapersonal
First grade students were spatial, logical-mathematical, bodily-kinesthetic and linguistic
Second grade students were spatial, bodily-kinesthetic, logical-mathematical and linguistic
Third grade students were spatial, bodily-kinesthetic, interpersonal and linguistic and logical-mathematical intelligences were tied for fourth
## A Student Profile of Multiple Intelligences

Based on the Teele Inventory of Multiple Intelligences

<table>
<thead>
<tr>
<th>Type</th>
<th>Primary</th>
<th>Upper</th>
<th>MS</th>
<th>HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>4.09</td>
<td>3.48</td>
<td>2.73</td>
<td>2.74</td>
</tr>
<tr>
<td>Logical Mathematical</td>
<td>4.05</td>
<td>3.66</td>
<td>3.04</td>
<td>2.86</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>3.39</td>
<td>2.95</td>
<td>3.26</td>
<td>3.54</td>
</tr>
<tr>
<td>Spatial</td>
<td>4.76</td>
<td>4.89</td>
<td>4.83</td>
<td>4.52</td>
</tr>
<tr>
<td>Musical</td>
<td>3.32</td>
<td>3.84</td>
<td>3.82</td>
<td>3.66</td>
</tr>
<tr>
<td>Bodily Kinesthetic</td>
<td>4.39</td>
<td>4.75</td>
<td>4.76</td>
<td>4.98</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>3.93</td>
<td>4.39</td>
<td>5.48</td>
<td>5.58</td>
</tr>
</tbody>
</table>

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Fourth grade students were spatial, bodily-kinesthetic, interpersonal and musical.

Fifth grade students were spatial, bodily-kinesthetic, interpersonal and musical.

Sixth grade students were bodily-kinesthetic, spatial, interpersonal and musical.

Middle school students were strongest in interpersonal, spatial, bodily-kinesthetic and musical intelligence.

High school students demonstrated that the four most dominant intelligences were interpersonal, bodily-kinesthetic, spatial and musical.

Students at the primary grades were more intrapersonal than students at the upper elementary grades. Students at the upper elementary grades indicated a desire to work together while primary students preferred to work alone.

It is interesting to note that linguistic intelligence was the strongest at grades kindergarten through fourth grade and then dramatically declined. Logical-mathematical intelligence was strongest from first through fourth and began to decline. Spatial and bodily-intelligences remained as the two most dominant intelligences throughout elementary school. In fact spatial intelligence was very strong in all grades. Ironically students enter school at the primary level strong in both linguistic and logical-mathematical intelligences and exit at the high school level with those two areas sharply in decline even though those are the two intelligences that are predominate in our educational system.

Establishing reliability and validity for the TIMI has been an on-going process. When the instrument was created field testing was conducted at an elementary
school to analyze each of the pictures to determine content validity. Based on an item by item analysis many corrections were made to the pictures in the inventory in order to make them as valid as possible to the specific intelligence they represented. An examination of each picture was done to see if the pictures adequately represented descriptors for each of the seven intelligences.

Studies to establish validity for the TIMI are continuing. A perusal of standardized test scores as compared with TIMI profiles indicates that more formal validity studies will be supportive. As an example, I examined the results of two students scores at a school I studied which compared TIMI to the Metropolitan Achievement Test (MAT 6). The MAT 6 is designed to measure the achievement of students in reading, mathematics, language, science and social studies. The battery of tests provides information about the relative performance of students in each of the content areas and in research skills. Convergent validity could be established by correlating the logical-mathematical and linguistic intelligences to the MAT 6 as the correlation should be high with linguistic intelligence and logical-mathematical intelligence. The MAT 6 is given to all the students at the school studied and a correlation could be examined between linguistic and logical-mathematical results on both assessments.

Student number one, a third grade male, scored five points on linguistic intelligence and eight points on logical-mathematical intelligence on the TIMI. On the MAT 6 taken in March, 1993 he scored at the 81% in total reading, 84% in total language, 96% in math and 92% overall in the total battery. Comments from his teacher in his report card indicate strengths in language, reading and mathematics. There is a high correlation between the two assessments as in mathematics he scored the highest number of points in mathematics, 8, and received his highest
scores on the MAT 6 in math. His score of five points on the TIMI correlates with his scores in reading and language as his scores were as follows: Vocabulary-92%, Word Recognition-97% - Reading Comprehension-65% - Spelling-61%, Language-93%, Total Reading-81%, Total Language-84%. Student number one indicated in an interview that math is his most favorite subject and that he wants to be a math teacher when he becomes an adult. He also indicated that reading and spelling were hard for him which is supported by his scores in spelling, 61% and reading comprehension, 65%.

Student number two, a third grade male, scored eight in logical-mathematical and five in linguistic intelligence on the TIMI. His total math scores in March, 1993 was 99%. It was the same score in March, 1992 indicating he has maintained a strong dominance in mathematical ability. There is a high correlation between his TIMI score of 8 in logical mathematical intelligence and his MAT 6 score of 99% in mathematics. His total language score in March, 1993 was 78% but his reading score was 98%. In March, 1992 his total reading and language scores were both 99%. His TIMI score in linguistic intelligence was a 5 and was his third highest score indicating strength in this area but not as strong as the logical mathematical intelligence. There is a positive correlation between these two test results as well.

Over 10,000 TIMI inventories are currently being used in over 450 schools. Approximately 4000 answer sheets have been returned from kindergarten through twelfth grade students. This data has been used to conduct test-retest reliability on the instrument and to determine the dominant intelligences of students by grade level and also of teachers as well. Schools were asked to return a copy of the answer keys to enable comparisons to be made of grade levels from different schools. The
first grade was analyzed and comparisons have been made between first grade classrooms from an all Anglo school district in Kentucky and first grade classrooms from schools with high minority student populations in California. The top three intelligences from several first grade classrooms in Kentucky were: logical-mathematical, bodily-kinesthetic and spatial intelligence. The top three intelligences from several first grade classrooms in California were the same three intelligences.

The findings are presented by intervals first by students and secondly by teachers. All subjects were administered the TIMI during intervals between April, 1992 and August, 1993. The groups represent students from two states, California and Kentucky and teachers are predominately from California with some representation from Kentucky, South Carolina, Arizona, Nevada, Michigan and Minnesota.

Students

For students who took the inventory twice within a four week interval with 668 students completing the first inventory and 619 students completing the second inventory, the correlation coefficients of each intelligence within a .01 significance level are the following:

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>.6308</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>.6602</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>.5471</td>
</tr>
<tr>
<td>Spatial</td>
<td>.4870</td>
</tr>
<tr>
<td>Musical</td>
<td>.6002</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>.5153</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>.5452</td>
</tr>
</tbody>
</table>
For students who took the inventory twice within a three week interval with 929 students completing the first inventory and 812 students completing the second inventory, the correlation coefficients of each intelligence with a .01 significance level are as follows:

- Linguistic - .6213
- Logical-Mathematical - .6840
- Intrapersonal - .4961
- Spatial - .5812
- Musical - .6586
- Bodily-Kinesthetic - .5977
- Interpersonal - .6153

During a two week interval 63 students completed the first inventory and 52 students completed the second inventory. The correlation coefficients of the seven intelligences indicated higher correlations in four of the seven intelligences at the .01 significance level.

- Linguistic - .6458
- Logical-Mathematical - .8117
- Intrapersonal - .4582
- Spatial - .7717
- Musical - .8819
- Bodily-Kinesthetic - .5881
- Interpersonal - .6546

A composite of the three intervals for students indicated the following correlations at the .01 significance level
Test-Retest for Students

<table>
<thead>
<tr>
<th></th>
<th>4 weeks</th>
<th>3 weeks</th>
<th>2 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic-</td>
<td>.6308</td>
<td>.6213</td>
<td>.6458</td>
</tr>
<tr>
<td>Logical-Mathematical-</td>
<td>.6602</td>
<td>.6840</td>
<td>.8117</td>
</tr>
<tr>
<td>Intrapersonal-</td>
<td>.5471</td>
<td>.4961</td>
<td>.4582</td>
</tr>
<tr>
<td>Spatial-</td>
<td>.4870</td>
<td>.5812</td>
<td>.7717</td>
</tr>
<tr>
<td>Musical-</td>
<td>.6002</td>
<td>.6586</td>
<td>.8819</td>
</tr>
<tr>
<td>Bodily-Kinesthetic-</td>
<td>.5153</td>
<td>.5977</td>
<td>.5881</td>
</tr>
<tr>
<td>Interpersonal-</td>
<td>.5452</td>
<td>.6153</td>
<td>.6546</td>
</tr>
</tbody>
</table>

Teachers

When test-retest reliability was conducted with teachers, one day, three day, four day and two month intervals were included. A two month interval included 69 teachers participating in both inventories. The findings indicated the following correlations at the .01 significance level.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic-</td>
<td>.5407</td>
</tr>
<tr>
<td>Logical-Mathematical-</td>
<td>.5982</td>
</tr>
<tr>
<td>Intrapersonal-</td>
<td>.6369</td>
</tr>
<tr>
<td>Spatial-</td>
<td>.6454</td>
</tr>
<tr>
<td>Musical-</td>
<td>.7479</td>
</tr>
<tr>
<td>Bodily-Kinesthetic-</td>
<td>.7265</td>
</tr>
<tr>
<td>Interpersonal-</td>
<td>.6560</td>
</tr>
</tbody>
</table>

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A four day interval included 160 cases for the first testing and 154 for the second testing. The correlation coefficients, significant at the .01 level included:

- Linguistic: .6816
- Logical-Mathematical: .6743
- Intrapersonal: .7060
- Spatial: .6706
- Musical: .7535
- Bodily-Kinesthetic: .7852
- Interpersonal: .7426

A three day interval included 46 cases for the first inventory and 44 cases for the second one. The correlation coefficients were at the .01 significance level and demonstrated higher correlations than the four day:

- Linguistic: .7746
- Logical-Mathematical: .7539
- Intrapersonal: .7366
- Spatial: .6626
- Musical: .7592
- Bodily-Kinesthetic: .8310
- Interpersonal: .7757

Thirty four teachers participated in a one day interval with 30 teachers completing both inventories. The findings at the .01 significance level indicated the following:

- Linguistic: .6697
- Logical-Mathematical: .8021
- Intrapersonal: .8488
- Spatial: .8538
Musical- .8137  
Bodily-Kinesthetic - .8279  
Interpersonal- .8890

Test-Retest for Teachers

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>2 months</th>
<th>4 days</th>
<th>3 days</th>
<th>1 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic-</td>
<td>.5407</td>
<td>.6816</td>
<td>.7746</td>
<td>.6697</td>
</tr>
<tr>
<td>Logical-Mathematical-</td>
<td>.5982</td>
<td>.6743</td>
<td>.7539</td>
<td>.8021</td>
</tr>
<tr>
<td>Intrapersonal-</td>
<td>.6369</td>
<td>.7060</td>
<td>.7366</td>
<td>.8488</td>
</tr>
<tr>
<td>Spatial-</td>
<td>.6454</td>
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<td>.8538</td>
</tr>
<tr>
<td>Musical-</td>
<td>.7479</td>
<td>.7535</td>
<td>.7592</td>
<td>.8137</td>
</tr>
<tr>
<td>Bodily-Kinesthetic-</td>
<td>.7265</td>
<td>.7852</td>
<td>.8310</td>
<td>.8279</td>
</tr>
<tr>
<td>Interpersonal-</td>
<td>.6560</td>
<td>.7426</td>
<td>.7757</td>
<td>.8890</td>
</tr>
</tbody>
</table>

The results for students indicate a higher reliability of the inventory with five of the intelligences with the two week interval. Compared to the four week interval logical-mathematical, linguistic, spatial, musical and interpersonal intelligences were higher while intrapersonal and bodily-kinesthetic were not.

The results for teachers indicate a higher reliability of the inventory with the shorter interval of time. All of the intelligences were much higher with the one-day interval than the two-month interval. The comparison from four day interval to one day interval showed all but linguistic intelligence were higher. The test-retest reliability results and the analysis of the mean scores of students from elementary to secondary levels have revealed an indication that the intelligences may vary given time and circumstances and that there is a developmental aspect to the intelligences that needs to be further explored.
Appendix B

CITY Z

DATA SHEET

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**LOCATION**

Part of the VA-NC Metropolitan Statistical Area.

The MSA includes 15 cities and counties: the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; Virginia counties of Gloucester, James City, Mathews, Isle of Wight, and York; North Carolina county of Currituck.

The VA-NC Metropolitan Statistical Area is the 27th largest metropolitan market in the United States.

Area: Land: 258.7 square miles (670 km²)
Water: 51.3 square miles (133 km²)
Average elevation: 12 feet (4 meters) above sea level

---

**POPULATION**

... is the most populous city in the Commonwealth. We are the 35th largest city in the United States; a Wall Street Journal article named a "Boom Town of the 90s." On July 1, 1994, 430,295 people lived in ... By the year 2010, population is projected to surpass 575,000. Statistics for selected years:

<table>
<thead>
<tr>
<th>Year</th>
<th>White</th>
<th>Black</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>64%</td>
<td>15%</td>
<td>1%</td>
<td>100%</td>
</tr>
<tr>
<td>1970</td>
<td>71,051</td>
<td>12,908</td>
<td>256</td>
<td>84,215</td>
</tr>
<tr>
<td>1980</td>
<td>154,823</td>
<td>15,693</td>
<td>1,590</td>
<td>172,106</td>
</tr>
<tr>
<td>1990</td>
<td>226,788</td>
<td>26,291</td>
<td>9,120</td>
<td>262,199</td>
</tr>
</tbody>
</table>

The median age is 29 years.

Male: 51%
Female: 49%
Number of households: 154,216
Average persons per household: 2.8

---

**Income**

<table>
<thead>
<tr>
<th>Virginia Beach</th>
<th>South Hampton Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Household Income</td>
<td>$33,928</td>
</tr>
<tr>
<td>Under $14,999</td>
<td>4%</td>
</tr>
<tr>
<td>$15,000-$24,999</td>
<td>10%</td>
</tr>
<tr>
<td>$25,000-$34,999</td>
<td>27%</td>
</tr>
<tr>
<td>$35,000-$49,999</td>
<td>16%</td>
</tr>
<tr>
<td>$50,000-$74,999</td>
<td>12%</td>
</tr>
<tr>
<td>$75,000 or more</td>
<td>7%</td>
</tr>
<tr>
<td>Unknown</td>
<td>24%</td>
</tr>
</tbody>
</table>

**Sales Prices**

- Single Family Homes: $35,000 - $3.5 million
- Townhouse Units: $25,000 - $225,000
- Condominiums: $29,900 - $575,000

**Rental Prices - Monthly**

- Private Homes: $425 - $1,800
- Apartments: $335 - $1,650

**Housing**

In the area, the American Chamber of Commerce Research Association estimates the purchase price of a newly built house with 1,800 square feet of living space to be $108,350. The average price for the 300 communities surveyed is $119,565.

---

**Average 10 A.M. to 4 P.M. Temperatures**

<table>
<thead>
<tr>
<th>Air</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>39</td>
</tr>
<tr>
<td>February</td>
<td>41</td>
</tr>
<tr>
<td>March</td>
<td>49</td>
</tr>
<tr>
<td>April</td>
<td>57</td>
</tr>
<tr>
<td>May</td>
<td>66</td>
</tr>
<tr>
<td>June</td>
<td>74</td>
</tr>
</tbody>
</table>

Average annual temperature is 59.2°F with total rainfall of 52 inches and snowfall of 8.9 inches during 1994.
### Appendix C
Selected School System Z Student Population Statistics by Race

<table>
<thead>
<tr>
<th></th>
<th>African-American</th>
<th>Asian/Pacific Islander</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Native American</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systemwide</td>
<td>17,595 [23.0%]</td>
<td>4,079 [5.3%]</td>
<td>52,808 [69.0%]</td>
<td>1,941 [2.5%]</td>
<td>85 [0.1%]</td>
<td>76,508 [100%]*</td>
</tr>
<tr>
<td>All Elementary Schools</td>
<td>1,367 [23.1%]</td>
<td>251 [4.2%]</td>
<td>4,163 [70.4%]</td>
<td>133 [2.2%]</td>
<td>3 [0.1%]</td>
<td>5,917 [100%]</td>
</tr>
<tr>
<td>All 4th Grade Systemwide</td>
<td>8,529 [23.4%]</td>
<td>1,564 [4.3%]</td>
<td>25,347 [69.5%]</td>
<td>970 [2.7%]</td>
<td>38 [0.1%]</td>
<td>36,448 [100%]</td>
</tr>
<tr>
<td>All Grades at School B</td>
<td>284 [61.2%]</td>
<td>2 [0.4%]</td>
<td>163 [35.1%]</td>
<td>14 [3.0%]</td>
<td>1 [0.2%]</td>
<td>464 [100%]*</td>
</tr>
<tr>
<td>All Grades at School C</td>
<td>586 [74.3%]</td>
<td>7 [0.9%]</td>
<td>176 [22.3%]</td>
<td>20 [2.5%]</td>
<td>0 [0.1%]</td>
<td>789 [100%]</td>
</tr>
<tr>
<td>All 4th Grades at School B</td>
<td>40 [66.7%]</td>
<td>0 [0.1%]</td>
<td>19 [31.7%]</td>
<td>1 [1.6%]</td>
<td>0 [0.1%]</td>
<td>60 [100%]</td>
</tr>
<tr>
<td>All 4th Grades at School C</td>
<td>73 [76.8%]</td>
<td>0 [0.1%]</td>
<td>20 [21.1%]</td>
<td>2 [2.1%]</td>
<td>0 [0.1%]</td>
<td>95 [100%]</td>
</tr>
</tbody>
</table>

* rounded upward
## Appendix D
School System Z's Gifted Students' Population Statistics by Race

<table>
<thead>
<tr>
<th></th>
<th>African-American</th>
<th>Asian/Pacific Islander</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Native American</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systemwide</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>406 [7.2%]</td>
<td>423 [7.6%]</td>
<td>4,687 [83.7%]</td>
<td>66 [1.2%]</td>
<td>19 [0.3%]</td>
<td>5,601 [100%]</td>
</tr>
<tr>
<td><strong>All Elementary Schools</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>167 [9.0%]</td>
<td>101 [5.4%]</td>
<td>1,558 [83.7%]</td>
<td>32 [1.7%]</td>
<td>4 [0.2%]</td>
<td>1,862 [100%]</td>
</tr>
<tr>
<td><strong>All 4th Grade Systemwide</strong></td>
<td>36 [7.1%]</td>
<td>34 [6.7%]</td>
<td>424 [84.0%]</td>
<td>9 [1.8%]</td>
<td>2 [0.4%]</td>
<td>505 [100%]</td>
</tr>
<tr>
<td><strong>All Grades at School B</strong></td>
<td>3 [60.0%]</td>
<td>0</td>
<td>2 [40.0%]</td>
<td>0</td>
<td>0</td>
<td>5 [100%]</td>
</tr>
<tr>
<td><strong>All Grades at School C</strong></td>
<td>4 [44.4%]</td>
<td>0</td>
<td>3 [33.3%]</td>
<td>2 [22.2%]</td>
<td>0</td>
<td>9 [100%]*</td>
</tr>
<tr>
<td><strong>All 4th Grades at School B</strong></td>
<td>1 [100%]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1 [100%]</td>
</tr>
<tr>
<td><strong>All 4th Grades at School C</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* rounded upward
Appendix E

OLD DONATION CENTER
FOR THE GIFTED AND TALENTED

1995-1996

REFERRAL INFORMATION FOR GIFTED EDUCATION PROGRAMS

QUICK REFERENCE

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>DEADLINE/PLACEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary Intellectually Gifted</td>
<td>Referral Deadline: Applications accepted throughout the year*</td>
</tr>
<tr>
<td></td>
<td>School/Parent Notification: 60 days from receipt of referral at ODC</td>
</tr>
<tr>
<td></td>
<td>Placement: Monthly placement (space available)</td>
</tr>
<tr>
<td>Dance Fall</td>
<td>Referral Deadline: October 13, 1995</td>
</tr>
<tr>
<td></td>
<td>Audition Date: November 4, 1995</td>
</tr>
<tr>
<td></td>
<td>Placement: November/December, 1995 (Space Available)</td>
</tr>
<tr>
<td>Spring</td>
<td>Referral Deadline: March 15, 1996</td>
</tr>
<tr>
<td></td>
<td>Audition Date: April 8, 1996</td>
</tr>
<tr>
<td></td>
<td>Placement: September, 1996</td>
</tr>
<tr>
<td>Art</td>
<td>Referral Deadline: February 16, 1996</td>
</tr>
<tr>
<td></td>
<td>Portfolio Review: Spring, 1996</td>
</tr>
<tr>
<td></td>
<td>Placement: September, 1996</td>
</tr>
</tbody>
</table>

* Any academic referrals received after March 31 may not be processed until the next school year. Please advise parents of this when referrals are made late in the school year.

Elementary Assessment Specialists

Mary Cade
Marilyn Draughon
Jane Garriott
Linda Hall

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Appendix F

The Principles of Identification of Gifted Students

THE IDENTIFICATION OF GIFTED STUDENTS IN VIRGINIA BEACH CITY PUBLIC SCHOOLS IS BASED ON TWO PRINCIPLES:

1. Identification should be based upon multiple and specific criteria.
2. Decisions regarding placements should be made by a committee rather than the decision of any one individual.

THE BASIC INFORMATION CONSIDERED IN IDENTIFYING CHILDREN FOR THE PROGRAM IN VIRGINIA BEACH IS AS FOLLOWS:

--Information from a behavioral scale based on characteristics of the gifted completed by the classroom teacher
--Teacher recommendations
--Information from parents
--Achievement in reading and other subjects indicative of giftedness
--A current score (within one year) representing the top 3% on national norms on one of several recognized academic ability tests, such as the Otis-Lennon
--Scores representing the top 3% in national norms on tests of academic achievement
--Writing samples

THE ASSESSMENT SPECIALIST FOR GIFTED EDUCATION WILL ASSUME RESPONSIBILITY FOR THE FOLLOWING TASKS:

--Work with screening committees in assigned schools to screen and to receive referrals of candidates for elementary gifted programs
--Assemble cumulative record information on candidates
--Schedule testing in the home schools in cooperation with the building principals
--Administer and score tests
--Maintain appropriate records on screening/referrals
--Attend meetings of the eligibility committee as requested
--Notify parents and home schools of decisions by the eligibility committee
--Meet with parents from assigned schools to interpret test data and eligibility committee decisions as requested
--Interpret the program to school personnel and to other groups as requested
--Interview/observe referred students as needed
--Maintain confidentiality of student records
--Serve as liaison between home school and ODC
Understands and Uses Advanced Vocabulary—A child uses advanced vocabulary or asks about a new word and then practices that word.

Is a Keen Observer—A child is unusually attentive to details. For instance, a child might frequently be the first to notice a small change in the arrangement of the room or sees details in illustrations in a book.

Has an Active Curiosity—A child asks complex "why" questions that may have no easy answers.

Is a Risk Taker—A child who has confidence in his/her answers and is not afraid to substantiate an opinion that is different from others. This child may be targeted by peers and others for ideas, decisions, and direction.

Possesses a Storehouse of Information—A child demonstrates an exceptional amount of factual knowledge for age level and applies it accurately.

Learns New Skills Quickly—A child acquires new skills and concepts with unusual speed.

Sees Relationships—A child uses metaphors or analogies. For example, a child might say that moss on a tree is like an old man's beard. A child makes mental connections. For example, a child spontaneously applies a principle about mammals to another situation concerned with something other than animal life.

Displays Sense of Humor—A child says or does something that indicates a sense of humor, such as making up a joke or a play on words. The child may see humor in situations others find humorless.

Is Imaginative—A child displays a good deal of intellectual playfulness, such as fantasizing "What if?" situations.

Reveals Originality—A child offers unique responses to problems or questions through written or oral expression, produces elaborate artwork, and creates original structures.

Expresses an Understanding of Abstract or Complex Concepts—A child expresses interest and understanding in concepts, such as time, money, and world hunger.

Explores Topics of Personal Interest—A child has varied interests beyond his/her age level, such as photography, oceanography, and astronomy. A child becomes totally absorbed in an area of particular interest.

Adapts to and/or Seeks Challenging Situations—A child who is able to approach problems from a number of perspectives and enjoys the challenge of difficult issues.
Appendix H

Characteristics of Gifted Students

Leadership Traits

1. Carries Responsibility
2. Adapts Readily to New Situations
3. Directs Activities

Learning Traits

1. Verbal Fluency
2. Advanced Vocabulary
3. Varied Interests
4. Good Memories
5. Rapid Insight
6. Provocative Questions
7. Keen Observer
8. Voracious Reader
9. Analytical Thinker

Motivational Traits

1. Absorbed in Topics of Interest
2. Bored With Routine Tasks
3. Strives for Perfection
4. Self Critical
5. Prefers to Work Independently
6. Interested in Adult Problems
7. Likes to Organize
8. Concern With Moral Issues

Creativity Traits

1. Displays Great Curiosity
2. Offers Unusual Responses
3. Uninhibited in Expressing Opinions
4. Displays Keen Sense of Humor
5. Shows Emotional Sensitivity
6. Nonconforming

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QUICK REFERENCE FOR ACADEMICALLY GIFTED SCREENING PROCESS

1. Referral made by parent, teacher, self, peer, or other.

2. Complete Screening form and teacher information form.

3. Send screening form and teacher information form to ODC. Attention: assessment specialist

4. Assessment specialist will check records for previous testing results and achievement scores.

5. Home school screening committee action. (test or do not test)

6. Send parent form for student to be tested.

7. Return completed parent form to ODC. Attention: assessment specialist

8. ODC assessment specialist will test student
When considering students for the gifted program in Visual Arts, the first consideration should be the student's talent, ability and interest in art.

There are five parts for the Visual Arts Referral.
1. Screening/Referral Page (top section)
2. Classroom Teacher Information Page
3. Art Information Page
4. Parent Letter and Information Page
5. Student Letter and Portfolio Instructions

The referring party should complete the top section of the Screening/Referral page. The classroom teacher, art teacher and parent should complete, sign and date their respective information sheets. The student should complete the portfolio, and all referral information should be forwarded to ODC within the time limit indicated.

The portfolio will be evaluated on the student's demonstrated potential in:
- originality
- complexity of detail
- composition/design quality
- perception
- expressiveness

---

Referral Deadline: February 16, 1996
Portfolio Review: Spring, 1996
Placement: September, 1996
When considering students for the gifted program in Dance, the first consideration should be the student's talent, ability and interest in movement and dance.

There are four parts for the Dance Referral:
1. Screening/Referral Page (top section)
2. Classroom Teacher Information Page
3. Physical Education Teacher Information Page
4. Parent letter and Information Page

The referring party should complete the top section of the Screening/Referral page. The classroom teacher, p.e. teacher and parent should complete, sign, and date their respective information sheets. The completed referral should be forwarded to ODC within the time limit indicated.

An audition is required of all candidates for the dance program and is designed to demonstrate a student's potential in:
- rhythmic ability
- motor adeptness
- expressiveness
- coordination
- flexibility
- comprehension and interpretation of directions

--------------------------
Fall
Referral Deadline: October 13, 1995
Audition Date: November 4, 1995
Placement: November/December, 1995
(Space Available)

Spring
Referral Deadline: March 15, 1996
Audition Date: April 8, 1996
Placement: September, 1996

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### Appendix L
School B's Study Participants/Non-Participants by Race

<table>
<thead>
<tr>
<th></th>
<th>African-American</th>
<th>Asian/Pacific Islander</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Native American</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All 4th Graders</strong></td>
<td>40 [66.7%]</td>
<td>0</td>
<td>19 [31.7%]</td>
<td>1 [1.6%]</td>
<td>0</td>
<td>60 [100%]</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>26 [43.3%]</td>
<td>0</td>
<td>11 [18.3%]</td>
<td>0</td>
<td>0</td>
<td>37 [61.7%]*</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>24 [40.0%]</td>
<td>0</td>
<td>11 [18.3%]</td>
<td>0</td>
<td>0</td>
<td>35 [58.3%]</td>
</tr>
<tr>
<td><strong>Non-Participants</strong></td>
<td>14 [23.3%]</td>
<td>0</td>
<td>8 [13.3%]</td>
<td>1 [1.6%]</td>
<td>0</td>
<td>23 [38.3%]</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>26 [70.3%]</td>
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<td>11 [29.7%]</td>
<td>0</td>
<td>0</td>
<td>37 [100%]</td>
</tr>
<tr>
<td><strong>Non-Participants</strong></td>
<td>14 [60.9%]</td>
<td>0</td>
<td>8 [34.8%]</td>
<td>1 [4.3%]</td>
<td>0</td>
<td>23 [100%]</td>
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<tr>
<td><strong>Participants</strong></td>
<td>24 [68.6%]</td>
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<td>11 [31.4%]</td>
<td>0</td>
<td>0</td>
<td>35 [100%]</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>26 [65.0%]</td>
<td>0</td>
<td>11 [31.4%]</td>
<td>0</td>
<td>0</td>
<td>35 [100%]</td>
</tr>
<tr>
<td><strong>Non-Participants</strong></td>
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<td>8 [42.1%]</td>
<td>1 [100%]</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

* rounded upward

** Two [2] participants were not included in the data analysis due to their not completing the TIMI or OLSAT.
### Appendix M

**School C's Study Participants/Non-Participants by Race**

<table>
<thead>
<tr>
<th></th>
<th>African-American</th>
<th>Asian/Pacific Islander</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Native American</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All 4th Graders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>73</td>
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<td>20</td>
<td>2</td>
<td>0</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>[76.8%]</td>
<td></td>
<td>[21.1%]</td>
<td>[2.1%]</td>
<td></td>
<td>[100%]</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>as % of all 4th Graders</td>
<td>52</td>
<td>0</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>[54.7%]</td>
<td></td>
<td>[15.8%]</td>
<td>[2.1%]</td>
<td></td>
<td>[72.6%]</td>
</tr>
<tr>
<td><strong>Participants whose scores were analyzed as % of all 4th Graders</strong></td>
<td>51</td>
<td>0</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>[53.7%]</td>
<td></td>
<td>[15.8%]</td>
<td>[2.1%]</td>
<td></td>
<td>[71.6%]</td>
</tr>
<tr>
<td><strong>Non-Participants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>as % of all 4th Graders</td>
<td>21</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>26</td>
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<td>[22.1%]</td>
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<td>[5.3%]</td>
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<td></td>
<td>[27.4%]</td>
</tr>
<tr>
<td><strong>Participants as % of all Participants</strong></td>
<td>52</td>
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<td>15</td>
<td>2</td>
<td>0</td>
<td>69</td>
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<tr>
<td></td>
<td>[75.4%]</td>
<td></td>
<td>[21.7%]</td>
<td>[2.9%]</td>
<td></td>
<td>[100%]</td>
</tr>
<tr>
<td><strong>Non-Participants as % of all Non-Participants</strong></td>
<td>21</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>[80.8%]</td>
<td></td>
<td>[19.2%]</td>
<td></td>
<td></td>
<td>[100%]</td>
</tr>
<tr>
<td><strong>Participants whose scores were analyzed as % of all race %</strong></td>
<td>51</td>
<td>0</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>[75.0%]</td>
<td></td>
<td>[22.1%]</td>
<td>[2.9%]</td>
<td></td>
<td>[100%]</td>
</tr>
<tr>
<td><strong>Participants within race %</strong></td>
<td>52</td>
<td>0</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[71.2%]</td>
<td></td>
<td>[75.0%]</td>
<td>[100%]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Non-Participants within race %</strong></td>
<td>21</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[28.8%]</td>
<td></td>
<td>[25.0%]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*One [1] participant was not included in the data analysis due to her not completing the TIMI or OLSAT.*
## Appendix N
Population/Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>African-American</th>
<th>Asian/Pacific Islander</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Native American</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School B's Sample</strong></td>
<td>24 [23.3%]</td>
<td>0</td>
<td>11 [10.7%]</td>
<td>0</td>
<td>0</td>
<td>35 [34%]</td>
</tr>
<tr>
<td><strong>School C's Sample</strong></td>
<td>51 [49.5%]</td>
<td>0</td>
<td>15 [14.6%]</td>
<td>2 [1.9%]</td>
<td>0</td>
<td>68 [66%]</td>
</tr>
<tr>
<td><strong>Original School B &amp; Cs Combined Sample</strong></td>
<td>75 [72.8%]</td>
<td>0</td>
<td>26 [25.2%]</td>
<td>2 [1.9%]</td>
<td>0</td>
<td>103 [100%]*</td>
</tr>
<tr>
<td><strong>Modified School B &amp; C’s Combined Sample</strong></td>
<td>75 [74.3%]</td>
<td>0</td>
<td>26 [25.7%]</td>
<td>0</td>
<td>0</td>
<td>101 [100%]</td>
</tr>
<tr>
<td><strong>School B's 4th Grade Population</strong></td>
<td>40 [66.7%]</td>
<td>0</td>
<td>19 [31.7%]</td>
<td>1 [1.6%]</td>
<td>0</td>
<td>60 [100%]</td>
</tr>
<tr>
<td><strong>School C's 4th Grade Population</strong></td>
<td>73 [76.8%]</td>
<td>0</td>
<td>20 [21.1%]</td>
<td>2 [2.1%]</td>
<td>0</td>
<td>95 [100%]</td>
</tr>
<tr>
<td><strong>School B &amp; C's Combined 4th Grade Population</strong></td>
<td>113 [72.9%]</td>
<td>0</td>
<td>39 [25.2%]</td>
<td>3 [1.9%]</td>
<td>0</td>
<td>155 [100%]</td>
</tr>
</tbody>
</table>

* rounded upward
Dear Parent/Guardian:

My name is Oscar Scott, Jr. and I am a Ph.D. student at Old Dominion University. As part of my studies, I will be giving fourth grade students at Seatack Elementary four tests in January, 1996. No test is longer than sixty minutes. The purpose of my research is to see which of these four tests is better able to identify giftedness in African-American students specifically, and in all students generally.

In a few days, you will receive a "consent form" asking your permission to allow ____________________ to participate in this research study. I hope that you will grant it. Test results will be forwarded to the appropriate school system department. All information, gathered from this research, will be kept confidential. If you have any questions, please call me at 631-0255.

Sincerely yours,

Oscar Scott, Jr.

NOTE: School B's name has been deleted to protect its confidentiality.
SUBJECT CONSENT FORM

TITLE OF RESEARCH: MULTIPLE INTELLIGENCES AND THE GIFTED IDENTIFICATION OF AFRICAN-AMERICAN STUDENTS

Investigator: Oscar Scott, Jr., Ph.D. Candidate
Department of Educational Leadership
Darden College of Education
Old Dominion University

Description: The purpose of this investigation is to determine which of two instruments, the Teele Inventory of Multiple intelligences (TIMI) or the Otis-Lennon School Ability Test (OLSAT), can identify a greater number of African-American fourth grade students as being gifted.

I__________________________________________, have agreed to allow my child ___________________________ to participate as a subject in this study. I understand that my child will be participating in a study involving his/her completing four instruments that identify or measure specific areas of intelligence. My child will complete these four instruments at Seatack Elementary School during the month of January, 1996 on three separate days over a two week period.

Exclusionary Criteria

I am familiar with the purpose of this study and am not aware of any reason that would prohibit my child's participation in it.

Risks and Benefits

The testing procedures that my child will undergo may result in him/her being identified as gifted and may result in him/her being recommended to participate in Virginia Beach Schools' Gifted Program. I understand that all research may involve some unknown risks -- including risks that have not yet been defined. This research is no exception. However, I understand that all precautions will be taken to ensure my child's safety. I
understand that the main benefit that may result from this study is an improved method of identifying gifted African-American students. A second benefit that may result from this study is an improved method of identifying all gifted students. I also understand that the Investigator, Oscar Scott, Jr., or his Dissertation Committee Member at Old Dominion University, Dr. Eleanor C. Handerhan will be available to answer questions about this research. Mr. Scott can be reached at (804) 631-0255. And, Dr. Handerhan can be reached at (804) 683-5103.

Costs and Payments
I understand that my child's participation in this study is voluntary, and he/she will not be paid any money for participating. My child will not receive any money, from anyone involved in this research, to pay for personal expenses that may arise from this research.

New Information
Any new information, that may develop during this research that may affect my child's willingness to continue to participate in this research will be provided to me.

Confidentiality
I understand that any information obtained about my child from this research, including questionnaires, medical history, and laboratory findings will be kept strictly confidential. I also understand that the information obtained from this study could be used in reports, presentations, and publications, but that my child will not be individually identified unless my consent is granted. I do understand however, that my child's records may be subpoenaed by court order or may be inspected by federal regulatory authorities.

Withdrawal Privilege
I understand that my child is free to refuse to participate in this
research or to withdraw at any time. If my child does withdraw, this will not create trouble for him/her at Seatack Elementary or cause a loss of benefits to which he/she might otherwise be entitled. If my child withdraws, he/she agrees to undergo all trial evaluations necessary for his/her safety and well-being as determined by the Investigator. I also realize that the Investigator may withdraw my child's participation at any time during this investigation if he believes that no further benefits will come from continuing the research. The Investigator will tell my child all of the information contained in this section.

Compensation for Illness or Injury

I understand that in the unlikely event of (injury or illness) resulting from the research procedures, no money will be paid to my child, but any immediate emergency medical treatment which may be necessary will be available to my child without charge by the Investigator. I am advised that if any injury should result from my child's participation in this research project Old Dominion University does not provide any insurance coverage, compensation plan, or free medical care planned to compensate my child for such injuries. In the event that my child has suffered injury as a result of his/her participation in this research program I may contact Oscar Scott, Jr. at (804) 631-0255 or Dr. Eleanor C. Handerhan at (804) 683-5103, Old Dominion University, who will be glad to review that matter with me.

Voluntary Consent

I certify that I have read the information in this "Subject Consent Form" or that it has been read to me. I understand its contents and any questions I have about this research have been, or will be answered by Oscar Scott, Jr. at (804) 631-0255 or Dr. Eleanor C. Handerhan at 683-5103. If I have any concerns about this research, I may contact the Old Dominion University Protection of Human Subjects Committee. The Chair of the Darden
College of Education Research and Scholarship Committee is (Dr. David Branch: (804) 683-6029). A copy of this consent form will be given to me. My signature below means that I have freely agreed to allow my child to participate in this investigation.

Date _______ Subject's Signature

_____________________________________
Date _______ Parent or Guardian's Signature (if under 18 years)

_____________________________________
Date _______ Witness's Signature

I certify that I have explained to the above individual the nature and purpose of the potential benefits, and possible risks associated with participation in this study. I have answered any questions that have been raised and have witnessed the above signature. I have explained the above to the volunteer on the date stated on this consent form.
Date _______ Investigator's Signature
Dear Parent/Guardian:

It has been brought to my attention that there may be some concerns regarding the purpose of my proposed research. I am writing in an effort to eliminate any confusion, and to clarify the purpose for my research.

The tests, to be given to fourth grade students, are designed to identify gifted students—regardless of race. All students will take all tests, and all tests will be analyzed to determine which test is able to identify a greater number of students as gifted. All information gathered will be kept confidential. Test results of students, identified as being gifted, will be forwarded to the appropriate school system department.

Although the focus of my research will be on African-American students, I would appreciate the participation of all students. Traditionally, African-American students have made low scores on tests designed to identify gifted students. As a result, they have not been identified as being gifted in proportion to their numbers in the school population.

My research seeks to offer a possible way to increase the number of African-American students identified as gifted. In no instance will this process decrease the number of Caucasian students identified as gifted.

If you have any unanswered concerns, please give me a call at 631-0255.

Thank you,

Oscar Scott, Jr.
Appendix R

School B's Modified Permission Form

December 19, 1995

Dear Parent/Guardian:

It has been brought to my attention that there may be some concerns regarding the purpose of my proposed research. I am writing in an effort to eliminate any confusion, and to clarify the purpose for my research.

The tests, to be given to fourth grade students, are designed to identify gifted students -- regardless of race. All students will take all tests, and all tests will be analyzed to determine which test is able to identify a greater number of students as gifted. All information gathered will be kept confidential. Test results of students, identified as being gifted, will be forwarded to the appropriate school system department.

Although the focus of my research will be on African-American students, I would appreciate the participation of all students. Traditionally, African-American students have made low scores on tests designed to identify gifted students. As a result, they have not been identified as being gifted in proportion to their numbers in the school population.

My research seeks to offer a possible way to increase the number of African-American students identified as gifted. In no instance will this process decrease the number of Caucasian students identified as gifted.

If you have any unanswered concerns, please give me a call at 631-0255.

Thank you,

Oscar Scott, Jr.

---

Child's Name ____________________________

Parent/Guardian Consent ____________________________________________________________________________

SIGN YOUR NAME ON THE ABOVE LINE

Witness ____________________________
Appendix S

School C's Permission Form

January 31, 1996

Dear Parent/Guardian:

My name is Oscar Scott, Jr. and I am a Ph.D. student at Old Dominion University. As part of my studies, I will be giving fourth grade students at Elementary four tests in February, 1996. No test is longer than sixty minutes. The purpose of my research is to see which of these four tests is better able to identify giftedness in students. All students will take all tests, and all tests will be analyzed to determine which test is better able to identify a greater number of students as gifted. Information on all students identified as "gifted", will be forwarded to the appropriate school system department for follow-up.

To grant permission for your child to participate in this study, please sign your name on the line next to "Parent/Guardian Consent" below. I hope that you will allow your child this opportunity to be tested for giftedness.

If you have any questions, please call me at 631-0255; Mrs. xxxxxxxx xxxxxxxx, Assistant Principal--Elementary at 473-5017; or Dr. Eleanor C. Handerhan, Assistant Professor of Curriculum and Instruction--Old Dominion University at 683-5103.

Sincerely yours,

Oscar Scott, Jr.

NOTE: School C's name and its principal's name has been deleted to protect confidentiality.

Mrs. xxxxxxxxxxxxxxxxxxx
Assistant Principal
Elementary School

Child's Name______________________________________________________________

Parent/Guardian Consent____________________________________________________

SIGN YOUR NAME ON THE ABOVE LINE

Witness_______________________________________________________________

NOTE: ALL PERMISSION SLIPS SHOULD BE RETURNED TO YOUR CHILD'S CLASSROOM TEACHER NO LATER THAN WEDNESDAY, FEBRUARY 7, 1996.
APPLICATION TO CONDUCT RESEARCH

I. Identifying Information

Name ________________________________

Work Location _______________________ Position ____________

Work Address _______________________ Telephone ____________

Home Address _______________________ Telephone ____________

II. Introduction to the Project

A. Title of Project __________________

B. Why are you conducting the study?
   Independent Research____  Graduate Course Requirement____
   College/University ____________ Professor ____________

III. Sampling Information

A. Type of Population
   _____ Elementary  _____ Intermediate  _____ Middle
   _____ High       _____ Other

B. Grade Level(s) _____________

C. Subject(s) _________________

D. Name of School(s) ________________________________

_____________________________________________________

E. Special Characteristics (if any) of Population ____________

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<tr>
<th>Group</th>
<th>Number Needed</th>
<th>Time (in minutes) Required for Each Person to Complete Tasks</th>
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</thead>
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<tr>
<td>Students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Application to Conduct Research

Page 2

F. Dates of Data Collection

1. Preferred ______________
2. Alternate ______________

IV. Attachments

A. Provide a detailed description of your purpose, the review of literature, research design, sampling, data collection, data analysis, time line, and value to the school system.

B. Attach a copy of the data collection instrument(s) you plan to use (surveys, tests, questionnaires).

I understand that acceptance of this request for approval of a research proposal in no way obligates the City Public Schools to participate in this research. I also understand that approval does not constitute commitment of resources or endorsement of the study or its findings by the school system or by the School Board.

I acknowledge that participation in research studies by students, parents, and school staff is voluntary. I will preserve the anonymity of all participants in all reporting of this study. I will not reveal the identity or include identifiable characteristics of schools or the school system unless authorized by the director of the Educational Planning Center.

If approval is granted, I will abide by all the City Public School's policies and regulations and will conduct this research within the stipulations accompanying any letter of approval. At the completion of the study, I will provide the City Public Schools with a copy of the results.

Applicant's Signature Date

Professor or Faculty Date

Advisor's Signature

Address Phone

FORWARD ALL REQUESTED MATERIAL TO:

, Ed.D., Assessment Specialist
Educational Planning Center
City Public Schools
P.O. Box

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November 9, 1995

Oscar Scott, Jr.
713 Roosevelt Avenue
Virginia Beach, VA 23452

Dear Mr. Scott:

On November 7 the School Board approved your research request. Department of Education regulations stipulate that parents of students participating in research projects must sign, and have a witness sign, a consent agreement. Please coordinate your project with the principal to insure that disruption of the school schedule is minimized and forward a copy of your parent consent agreement to this office for review. I can be reached at 427-4381 if you have any questions.

Sincerely,

[Signature]

Assessment Specialist
Educational Planning Center

cc: Dr. .
Interim Superintendent

Principal . Elementary
February 2, 1996

Dr. Nancy T. Jones  
Director  
Educational Planning Center  
Virginia Beach City Public Schools

Dear Dr. Jones,

Mr. Oscar Scott has made a presentation regarding his study. He has our approval to conduct this study at Newtown Road Elementary.

Thank you.

Sincerely,

Principal  
Ed.D. O

Assistant Principal
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<tr>
<th></th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
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<td>School B</td>
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<td></td>
<td>OLSAT Practice Test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11 a.m. - 12 noon</td>
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<td>1/10/96</td>
<td></td>
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<td></td>
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<td>AIR</td>
<td>OLSAT</td>
<td>TIMI/OLSAT (tonal)</td>
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<td></td>
<td>1 - 2 p.m.</td>
<td>11 a.m. - 12 noon</td>
<td>11 a.m. - 12 noon</td>
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<td></td>
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<td>1/18/96</td>
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<tr>
<td></td>
<td></td>
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<td>OLSAT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 a.m. - 12 noon</td>
<td>11 a.m. - 12 noon</td>
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<tr>
<td></td>
<td></td>
<td>1/30/96</td>
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<td>School C</td>
<td>OLSAT Practice Test</td>
<td>Class A: AIR</td>
<td>Class A: TIMI</td>
<td>Class A: OLSAT</td>
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<tr>
<td></td>
<td>(all classes)</td>
<td>Class B: OLSAT</td>
<td>IMMA (tonal)</td>
<td>Class B: AIR</td>
</tr>
<tr>
<td></td>
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<td>Class C: TIMI</td>
<td>(tonal)</td>
<td>Class C: AIR</td>
</tr>
<tr>
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<td>2/12/96</td>
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<td>Class B: TIMI</td>
<td>CAREER DAY</td>
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<td>2/13/96</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(tonal)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>10:10 - 11:10 a.m.</td>
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<tr>
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<td>2/19/96</td>
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### Appendix X
#### Socio-Economic Indicators

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<th>Category</th>
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<th>Reduced Lunch</th>
<th>Free Lunch</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td><strong>All Participants</strong></td>
<td>37 [34.9%]</td>
<td>12 [11.3%]</td>
<td>57 [53.8%]</td>
<td>106 [100%]</td>
</tr>
<tr>
<td><strong>Original Participants</strong></td>
<td>37 [35.9%]</td>
<td>12 [11.7%]</td>
<td>54 [52.4%]</td>
<td>103 [100%]</td>
</tr>
<tr>
<td><strong>Non-Participants</strong></td>
<td>20 [40.8%]</td>
<td>3 [6.1%]</td>
<td>26 [53.1%]</td>
<td>49 [100%]</td>
</tr>
<tr>
<td><strong>Modified Participants</strong></td>
<td>36 [35.6%]</td>
<td>12 [11.9%]</td>
<td>53 [52.5%]</td>
<td>101 [100%]</td>
</tr>
<tr>
<td><strong>School B's Participants</strong></td>
<td>19 [18.8%]</td>
<td>1 [1.0%]</td>
<td>15 [14.9%]</td>
<td>35 [34.7%]</td>
</tr>
<tr>
<td><strong>School C's Participants</strong></td>
<td>17 [16.8%]</td>
<td>11 [10.9%]</td>
<td>38 [37.6%]</td>
<td>66 [65.3%]</td>
</tr>
<tr>
<td><strong>School B's % of Category</strong></td>
<td>19 [47.2%]</td>
<td>1 [8.3%]</td>
<td>15 [28.3%]</td>
<td>35 [N/A]</td>
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<tr>
<td><strong>School C's % of Category</strong></td>
<td>17 [52.8%]</td>
<td>11 [91.7%]</td>
<td>38 [71.7%]</td>
<td>66 [N/A]</td>
</tr>
</tbody>
</table>
Appendix Y

Administration of Instruments

Seatack Elementary

All instruments were administered by the researcher, a 49-year-old African-American male. One teacher or assistant teacher, of participating students, was present at every administration to observe and provide a "familiar" face. Testing occurred in the library. All 37 students were tested simultaneously. The assistant teacher and teachers were female: Three were Caucasian. One was African-American.

Newtown Road Elementary

The researcher was assisted directly in test administration by four African-Americans: Three were female (20, 31, and 53 years of age). And, one was a 19-year-old male. All testing occurred simultaneously in three separate classrooms. Each class was administered instruments by an assistant or the researcher with the classroom teacher present. All classroom teachers were African-American females.

Most information provided in this section will be quoted directly from the manuals that accompanied the four instruments administered to students participating in this study. The directions are quoted verbatim so that the reader can gain specific insight into the atmosphere that permeated the testing environment.

Teele Inventory of Multiple Intelligences (TIMI)

The Teele Inventory of Multiple Intelligences (TIMI) Teacher's Manual (1992) provided the following information for instrument administration:

Suggestions For Administering The Inventory
1. This inventory should be given in a relaxed environment that allows individuals to carefully make a forced choice selection.

2. The examiner should be pleasant, positive and encouraging.

3. To motivate the participant to do his or her best, please let participants know there are no right or wrong answers. This inventory simply identifies the strengths or dominant intelligences each participant possesses.

4. Directions to the participants should be read verbatim, rather than given from memory in order to produce continuity.

5. Do not assist participants in making their selections unless they do not understand the picture. Then carefully and objectively describe the picture.

6. The subjects may take any reasonable amount of time per item to make their selection. However, participants should be encouraged to choose one of the two choices. Be sure all participants respond and make a choice on all numbers.

7. Some of the subjects, especially younger students may not realize they have to select one of the two pictures lettered 'A' or 'B'. It is necessary to repeat often: 'Be sure to look carefully at both pictures and select either A or B.'

8. If an individual changes his or her choice, be sure the other choice is erased on the answer sheet.

9. If working with a handicapped individual, the examiner may point to each of the choices asking for a finger response of '1' for A and '2' for B or shake the head once for A or twice for B.

Introducing The Inventory
Introduce the inventory by saying: 'Please put our first and last name on the first line of the answer sheet' (show the answer sheet). Then, 'put today's date on the next line' (write on the board today's date). Then 'put the grade you are in' (write on the board the grade and tell the students the grade) and 'the teacher's name' (write on the board the teacher's name). 'Circle M if you're a boy and F if you're a girl. Write down your age beside the word age. We are going to look at some pictures of panda fears and see which pictures are the most like you.' Turn to the first page and say: 'See the four pictures on the first page.' (Indicate this by holding up page 1, 1A and 1B and 2A and 2. Say 'Look at the pictures on 1A and 1B. Think about which picture is most like you. Is 1A more like you or is 1B more like you? Select the picture that is most like you. Then look at your answer sheet. Find the number 1 and put a check in either the A or B column. Do not put in both A and B, only A or B. There are no right or wrong answers. Whichever picture you feel is most like you is the one you should check. Do the same for 2A and 2B. Is 2A more like you or is 2B? Put a check mark in 2A or 2B on your answer sheet.' Depending on the grade level, the examiner may want to take the whole group through the inventory together. For Kindergarten and first grade students the inventory may need to be done on an individual basis with an examiner entering the score on the answer sheet. If not done individually these two grades may want to complete their answers on the picture booklet by circling the letter of their choice. Grades two through six are usually able to put their responses on the
answer sheet which enables the inventory to be reusable. If the participants are working independently ask them to double check their answer sheet to make sure they're put a response down for each number. (pp. 1-2)

The TIMI can be administered in 30-45 minutes.

**Otis-Lennon School Ability Test (OLSAT)**

The OLSATs *Directions for Administering* (1989) provided the following information for general instrument administration:

The person responsible for administering the *Otis-Lennon School Ability Test* does no need special training but must be able to carry out standard examination procedures. To ensure accurate and reliable results, the examiner must become thoroughly familiar with these procedures before attempting to administer the test. Familiarity with the test materials is essential. It is recommended that the examiner carefully read through these directions and the test booklet prior to beginning the test administration.

Some students are very experienced in taking standardized tests. For them, the mechanics of using a separate answer document, particularly the coding in of identifying information and the filling in of answer spaces, present no problems. On the other hand, there may be some students who are not accustomed to taking tests. They may require pretest orientation in order to earn scores that reflect their true ability. For Levels E and F, a separate Practice Test is available for this purpose (A
Practice Test was used for this study.) This pretest orientation should take place in an ordinary classroom situation that simulates the administration of a standardized test for which separate answer documents are used. It should be conducted approximately one week in advance of actual test administration. This will allow you time to give any additional pretest help to students who may still be having difficulties. (p. 11).

After the examiner has familiarized him/herself with the general directions, specific directions have to be internalized. These specific directions appear below, minus the portion that covers student identification and date of test:

Say

Now turn to page 2 of our booklet, where you see some sample problems. Look at the first one, Sample A. Read it to yourself as I read it aloud. Do not call out the answer. 'Choose the word that best completes this sentence.' Read the sentence to yourself and choose the correct answer.

Pause for responses (Note: All examiner directions are printed in a different colored ink in the Directions for Administering booklet.)

Say Yes, the correct answer is because: 'The little boy cried because he cut his knee.' Now look at your answer sheet. The answer space for choice 'B,' because, has been filled in to
show that it is the correct answer. Does everybody understand?

NOTE: Four other examples/instructions followed. These have been omitted.

Say You are to do all the rest of the problems in this booklet the same way that you did the sample problems. Read each problem carefully and choose the one answer that you think is best. Then find the row that has the same number as the problem you are working on, and fill in the answer space that has the same letter as the answer you chose.

Use a pencil to mark all of your answers. Make your mark heavy and dark and completely fill the answer space. You may mark an answer even if you are not absolutely sure it is correct, but do not guess blindly. To change an answer, you must erase your mark completely and then fill in the space for the answer you think is right.

You will have 40 minutes to work on this test. You are not expected to be able to do all of the problems, but try to get as many right as you can. If you get stuck on a problem, skip it and go on to the next one. When you come to the end of a page, go on to the next page and continue working until you come to the end of the test. Raise our hand if you need another pencil, and I will give you one. If you finish before I say 'stop,' you may go back to work on any problem
you skipped, or you may go over the ones you have done. Are there any questions?

Answer students' questions. Remind students that they are not to mark on their booklets.

Say Now move to page 3 and begin working.

During the test, move quietly about the room to make sure that students are marking their answers correctly. Also make sure that students are continuing with the test after they come to the end of a page.

At the end of 40 minutes,

Say Stop work now. Put your pencil down. Close your test booklet and leave it on your desk with the front cover up.

Collect the answer sheets and then the test booklets. This concludes the administration of the Otis-Lennon School Ability Test. (pp. 19-22)

Assessment of Interpersonal Relations (AIR)

The Assessment of Interpersonal Relations Examiner's Manual provided the following general directions for administering the AIR:

The AIR should be administered in a comfortable, non-distracting...
setting. The examiner should present the scale as a measure of how the examinee feels about his or her relationships with other people, and should stress that the examinee carefully consider and make honest selections among the response options. The examinee should have an abundant time allotment and should not feel hurried in any way. (p. 18)

The following specific directions were provided, in the Record Booklet, for administering the AIR:

Please rate the following statements according to how well they apply to each of your parents, your male and female peers, and your teachers. Please rate each statement according to how you honestly feel. There are no right or wrong answers, so be sure you are honest with yourself as you rate each statement. You should rate only the parent(s) with whom you are currently living. If you rate only one of your parents (e.g., your mother, but not your father), please check the boxes to indicate the parent with whom you are not living and the reason.

I am not rating my [] mother [] father due to [] death, [] separation, [] divorce, or [] other.

Each statement should be rated as:

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<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tr>
<td>(SA)</td>
<td>(A)</td>
<td>(D)</td>
<td>(SD)</td>
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</tbody>
</table>

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Further administration procedures are explained in the *Examiner's Manual*:

In group administrations or individual scale administrations where the child's reading ability is limited (i.e., less than a third-grade reading level), the examiner should read the directions aloud while the examinee reads along [This procedure was followed in this study]. In individual administrations with older examinees who have well-developed reading abilities, the examinee can read the directions alone and proceed with the scale.

In all cases, the examinee should be told: *If you do not understand any of the words on the scale, ask me and I will explain them to you.* The rationale for this practice is that the AIR is a measure of social-emotional adjustment, not of reading achievement or intelligence. Quite simply, to obtain a valid assessment, the examinee must understand what each item is asking. The examiner should explain any unfamiliar words to the examinee in lay English, without suggesting negative or positive connotations for the words explained.

The examiner should make certain that he or she does not lead examinees in their response selections. Connotations of good and bad responses should be avoided. When examinees ask questions about how they should respond to specific items, the examiner should provide a neutral response, such as: *Do what you think is best; Mark the one that best describes how you feel; You decide which response is best for you;* and so on.
Once the examinee has completed the scale, the examiner should scan the examinee's Record Booklet to ensure that all items have been completed before dismissing the examinee. If the examinee has omitted items, the examiner should casually bring the omissions to the examinee's attention and direct the examinee to respond to the incomplete items. If the examinee refuses to complete the omitted items, the examiner should explore the reason for the refusal, but should not insist that the items be competed. Subscales with incomplete items can be prorated, using the procedures outlined in the section of this chapter entitled "Scoring Scales Not Fully Completed." (pp.17-18)

Intermediate Measures of Music Audiation (IMMA)

The Manual for the Primary Measures of Music Audiation and the Intermediate Measures of Music Audition provides the following information for administering the IMMA:

'LISTEN TO THE TWO PARTS OF THIS SONG AND THEN I WILL ASK YOU IF THE TWO PARTS SOUND THE SAME OR DIFFERENT.'

(Start the tape, Listen for the word first and the first part of the song, and for word second and the second part of the song. Stop the tape after the second part of the song.)

'RAISE YOUR HAND IF YOU THINK THAT THE TWO PARTS OF THE SONG SOUND THE SAME.' (Stop to looks [sic] for hands.) 'RAISE YOU [SIC] IF YOU THINK THAT THE TWO PARTS OF THE SONG SOUND
DIFFERENT.' (Stop to look for hands.) 'THE TWO PARTS SOUND THE SAME'.

(Offer help as needed but do not replay any part of the practice example.)

'NOW LISTEN TO THE TWO PARTS OF THIS SONG AND THEN I WILL ASK YOU IF THE TWO PARTS SOUND THE SAME OR IF THE TWO PARTS SOUND DIFFERENT.'

(Start the tape, listen for the words and parts, and stop the tape.)

'RAISE YOUR HAND IF YOU THINK THAT THE TWO PARTS OF THE SONG SOUND THE SAME.' (Stop to look for hands.) 'RAISE YOUR HAND IF YOU THINK THAT THE TWO PARTS OF THE SONG SOUND DIFFERENT.' (Stop to look for hands.) 'THIS TIME THE TWO PARTS SOUND DIFFERENT.'

(Offer help again as needed. If some children are singing out loud as they are listening to the tape, persuade them to sing silently instead.)

'NOW LOOK AT YOUR PAPER AND FIND THE APPLE AT THE TOP.'

(Offer help as needed.)
'THERE ARE TWO BOXES UNDER THE APPLE. THE BOX ON THE TOP HAS TWO FACES THAT LOOK THE SAME. THE BOX ON THE BOTTOM HAS TWO FACES THAT LOOK DIFFERENT. WHEN THE TWO SONGS SOUND THE SAME, YOU WILL DRAW A CIRCLE AROUND THE BOX ON THE TOP BECAUSE THE TWO FACES LOOK THE SAME. WHEN THE TWO SONGS SOUND DIFFERENT, YOU WILL DRAW A CIRCLE AROUND THE BOX ON THE BOTTOM BECAUSE THE TWO FACES LOOK DIFFERENT. NOW LISTEN TO THE APPLE SONG AND SEE HOW THE CIRCLE IS DRAWN.'

(Start the tape, listen for the words and parts, and stop the tape.)

'THERE IS A CIRCLE DRAWN AROUND THE BOX ON THE TOP WITH THE TWO FACES THAT LOOK THE SAME BECAUSE THE TWO PARTS OF THE SONG SOUND THE SAME.' (Offer help if needed.) 'NOW FIND THE SHOE AT THE TOP OF YOUR PAPER. LISTEN TO THE SHOE SONG, AND SEE HOW THE CIRCLE IS DRAWN.'

(Start the tape, listen for the words and parts, and stop the tape.)

'THERE IS A CIRCLE DRAWN AROUND THE BOX ON THE BOTTOM WITH THE TWO FACES THAT LOOK DIFFERENT BECAUSE THE TWO PARTS OF THE SONG SOUND DIFFERENT.'

(Offer help as needed.)
'NOW YOU MAY BEGIN TO DRAW THE CIRCLE. PICK UP YOUR PENCIL. FIND THE CUP AND THE BOXES THAT GO WITH THE CUP SONG. LISTEN TO THE CUP SONG AND DRAW YOUR CIRCLE.'

(Start the tape, listen for the words and parts, and stop the tape. Allow five seconds for the children to draw the circle.)

'YOU SHOULD HAVE DRAWN A CIRCLE AROUND THE BOX ON THE BOTTOM WITH THE TWO FACES THAT LOOK DIFFERENT BECAUSE THE TWO SONGS SOUND DIFFERENT.'

(Offer help as needed.)

'LET'S PRACTICE ONCE MORE. FIND THE BOXES THAT GO WITH THE TREE SONG. NOW LISTEN TO THE TREE SONG AND DRAW YOUR CIRCLE.'

(Start the tape, listen for the words and parts, and stop the tape. Allow five seconds for the children to draw the circle.)

'YOU SHOULD HAVE DRAWN A CIRCLE AROUND THE BOX ON TOP WITH THE TWO FACES THAT LOOK THE SAME BECAUSE THE TWO SONGS SOUND THE SAME.'

(Offer help as needed.)
'SEE THE BIG LINE ON YOUR PAPER. UNDER THE LINE IS A CAR. FIND THE CAR AND THE BOXES THAT GO WITH THE CAR SONG. WE ARE ALL DONE PRACTICING AND READY TO BEGIN. LISTEN TO THE CAR SONG AND DRAW YOUR CIRCLE.'

(Start the tape and the test has begun. Let the tape run continuously until the end. There are forty questions on the Tonal test. The tape is timed to allow the children five seconds to draw each circle. Supervise as much as possible to be sure that the children are circling the box under the correct picture. Tell the children when they should turn over their papers. No extra time is allotted to turn papers over at the end of question fifteen. When the test is completed, check to see that the name is legible on each paper as the papers are collected.) (pp. 45-47)

There are two answer sheets used with the IMMA; one is used for the Tonal portion and the other is used for the Rhythm portion. Each use the same format. The Tonal test must be given first. And, there must be at least one day between administration of the two portions.
Appendix Z
Socio-Economic Indicators by Race

<table>
<thead>
<tr>
<th>All Participants</th>
<th>No Lunch</th>
<th>Reduced Lunch</th>
<th>Free Lunch</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American Students</td>
<td>21 [58.3%]</td>
<td>9 [75.0%]</td>
<td>45 [84.9%]</td>
<td>75 [74.3%]</td>
</tr>
<tr>
<td>Caucasian Students</td>
<td>15 [41.7%]</td>
<td>3 [25.0%]</td>
<td>8 [15.1%]</td>
<td>26 [25.7%]</td>
</tr>
<tr>
<td>Total</td>
<td>36 [100%]</td>
<td>12 [100%]</td>
<td>53 [100%]</td>
<td>101 [100%]</td>
</tr>
</tbody>
</table>
Proportion of Gifted to Nongifted Students as a Function of the Otis-Lennon School Ability Test versus the Teele Multiple Intelligences Inventory.
Proportion of Students Identified as Gifted on Both the Otis-Lennon School Ability Test and the Teele Multiple Intelligences Inventory versus those Students Identified as Gifted on the Teele Multiple Intelligences Inventory and NonGifted on the Otis-Lennon School Ability Test.

- Gifted on Both Tests
- NonGifted on OLSAT and Gifted on the TIMI
Number of African-American and Caucasian Students Identified as Gifted on the Teele Multiple Intelligences Inventory and NonGifted on the Otis-Lennon School Ability Test
Number of Male and Female Students Identified as Gifted on the Teele Multiple Intelligences Inventory and NonGifted on the Otis-Lennon School Ability Test
Number of Students Identified as Gifted, Promising, and NonGifted as a Function of the Otis-Lennon School Ability Test and the Intermediate Measures of Musical Audition

- Gifted
- Promising
- NonGifted
Number of Students Identified as Gifted, Promising, and NonGifted as a Function of the Otis-Lennon School Ability Test and the Assessment of Interpersonal Relations (Standardized Total Score).
Number of Students Identified as Gifted on Both the Otis-Lennon School Ability Test and Subscales of the Assessment of Interpersonal Relations versus those Students Identified as NonGifted on the Otis-Lennon School Ability Test and Gifted on Subscales of the Assessment of Interpersonal Relations

- Gifted on Both Tests
- NonGifted on OLSAT and Gifted on Subscales of the AIR

Mother AIR | Father AIR | Male AIR | Female AIR | Teacher AIR
Number of African-American and Caucasian Students Identified as Gifted on Subscales of the Assessment of Interpersonal Relations.

- Mother AIR: 5 African-American, 1 Caucasian
- Father AIR: 4 African-American, 2 Caucasian
- Male AIR: 3 African-American, 1 Caucasian
- Female AIR: 2 African-American, 2 Caucasian
- Teacher AIR: 2 African-American, 3 Caucasian
Number of Male and Female Students Identified as Gifted on Subscales of the Assessment of Interpersonal Relations.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Male</th>
<th>Female</th>
</tr>
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<tr>
<td>Mother AIR</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Father AIR</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Male AIR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female AIR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher AIR</td>
<td>31</td>
<td>7</td>
</tr>
</tbody>
</table>
Appendix BB

The Seven Intelligences

**Linguistic**
- Has highly developed auditory skills
- Enjoys reading
- Likes to write
- Can learn by listening
- Possesses a good memory for names, dates, places

**Logical-Mathematical**
- Explores patterns, categories and relationships
- Reasons in a logical pattern
- Likes to problem solve and experiment
- Can think sequentially

**Spatial**
- Thinks in images and pictures
- Enjoys visually oriented activities
- Designs, invents, and creates
- Reads maps, charts, and diagrams

**Musical**
- Sensitive to sounds in the environment
- Enjoys music
- Responds to rhythm and melody in musical structure
- May play an instrument, sing, or move rhythmically
- Appreciates pitch, tone, rhythm, and melody

**Bodily-Kinesthetic**
- Processes knowledge through bodily sensations
- Needs to move around physically
- Likes to touch and feel things
- Responds best to experiential, constructivist learning
- Is able to use body in differentiated and skilled ways

**Intrapersonal**
- Understands inner self
- Aware of strengths, weaknesses, and inner feelings
- Often is reflective and introspective
- Marches to own drummer
- Can be strong-willed and independent

**Interpersonal**
- Understands and works with others
- Expresses empathy for feelings of others
- Responds to moods and temperaments of others
- Enjoys relating and participating with people
- May be able to effect transformation in patterns between individuals and groups

* From p. 3 of Sue Teele's *The Multiple Intelligences School: A Place for All Students to Succeed*
Appendix C: Copyright Authorization for Teele Statistical Analysis

Oscar Scott, Jr.
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May 25, 1996

Dr. Sue Teele
Director, Education Extension
Director, The Renaissance Project
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University of California at Riverside
Riverside, California 92507-4596

Dear Dr. Teele:

I am writing to get your permission to incorporate the "Statistical Analysis of The Teele Inventory Of Multiple Intelligences" (copyright, 1995) as an "Appendix" in my dissertation Multiple Intelligences and the Gifted Identification of African-American Students. If you grant such permission, please sign the authorization section (of this original) below:

I, Dr. Sue Teele, grant permission for Oscar Scott, Jr. to use the "Statistical Analysis of The Teele Inventory Of Multiple Intelligences" (copyright, 1995) as an "Appendix" in his dissertation Multiple Intelligences and the Gifted Identification of African-American Students.

[Signature]
Dr. Sue Teele

Keep the attached copy of this correspondence for your records and return the signed original in the enclosed self-addressed stamped envelope.

Sincerely yours,

[Signature]
Oscar Scott, Jr.
Oscar Scott, Jr.
B.A. June 1969, Norfolk State College
M.B.A. June 1971, Syracuse University

713 Roosevelt Ave.
Virginia Beach, VA 23452

Oscar Scott, Jr. was born in Norfolk County, VA in 1946 to
Oscar Scott, Sr. and the late Johnie Mae Scott.

He has taught full time at Syracuse University, General Motors
Institute, and Tidewater Community College and part time at Norfolk
State University. Additionally, he has held positions in the auto and
insurance industries.

In 1977, he received the Phi Theta Kappa Annual Faculty/Staff
Recognition Award from Tidewater Community College (Virginia Beach
Campus). Also, he is a member of Phi Kappa Phi Honor Society. And, he
is a co-founder of the Concerned African-American Students (CAAS); a
Ph.D. group that addresses the needs of Darden College of Education's
African-American Urban Services students.