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Implications of Gifted Criteria on Achievement

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IMPLICATIONS OF GIFTED CRITERIA ON ACHIEVEMENT

BY

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Dedication

I dedicate this research project and my specialist degree to my grandmother, Evangelina Gomez, who arrived to this country with limited resources and a first grade education, and yet, was able to raise and bring my mother and her other children to this country in order to enable future generations to lead educated, successful and fulfilling lives. Your leadership, determination and love was extraordinary.

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Abstract

The relations between IQ scores, socioeconomic status and high stakes standardized test achievement have become increasingly relevant for study in recent years due to the movement toward alternate criteria for low SES gifted students. To date, there has been insufficient research conducted on this relationship in elementary age students. There has been substantial research attention dedicated to the study of IQ and socioeconomic status, and to IQ and achievement as separate research fields. However, fewer researchers have established a connection between the achievement of students from a low SES after entry into gifted through alternative qualifying criteria. The goals of this study included: 1) reporting on the extent to which the IQ scores of gifted students predict achievement scores and 2) examining whether the relationship between IQ scores and achievement scores is different for Plan A and Plan B eligibility groups. The results of this study indicated that IQ did not significantly predict reading achievement for gifted students [b = -.01, $t(1)$ = -.30, p = .768]. In addition, students from the Plan A group did not significantly outperform students in the Plan B group who entered the gifted program through alternative qualifying IQ score criteria [$t(1098)$=.53, p = .598]. Improved knowledge in this area may help promote adequate gifted program eligibility criteria and instructional development. However, there is a need for further research with the gifted population that examines the effect of IQ scores on achievement other than high-stakes tests, such as projects or grades.

Implications of Gifted Criteria on Achievement

A Review of the Literature

The relationship between how the intellectual quotient (IQ) of students from varying socio-economic backgrounds in the gifted program affects their performance on standardized academic assessments is understudied. Improved knowledge about possible differences within the academic performance of gifted students whom enter the gifted program under, both, different IQ scores and different socioeconomic status (SES) statuses may help to promote appropriate eligibility criteria for gifted programs for underrepresented groups. While there has been research attention dedicated to the implications of IQ on academic achievement and to the impact of SES on IQ scores as separate research fields, few researchers have established a connection between these phenomena with regards to academic performance of gifted students across socio-economic backgrounds (Kershaw & Schatschneider, 2012; Tyler-Woods & Carri, 1993).

Intelligence has been defined as the "ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought" (Neisser et al., 1996, p. 77), and IQ refers to performance on a variety of cognitive tests specifically designed to measure intelligence. This is an important distinction, because although IQ purports to measure intelligence, research has suggested that IQ tests tend to underestimate the intelligence of certain subgroups of the population (Tyler-Wood & Carri, 1993; McBee, 2006). This testing bias has far reaching implications, as educational decisions are made based on IQ scores, such as identification for gifted and talented education (McBee, 2006). One subgroup that falls victim to testing bias is that of individuals who come from a low

socio-economic status background and this is believed to result in an underrepresentation of low SES students in gifted education (Tyler-Wood & Carri, 1993). According to McBee (2006), in the state of Georgia students receiving free or reduced-price lunches have been shown to be much less likely to be nominated for the gifted program than students paying for their own lunches, in addition to more nominations for Caucasian and Asian students than African-American and Hispanic students.

Some states have implemented safeguards to avoid the underrepresentation of low-SES students in gifted programs. According to the Florida State Board of Education (2011), a student who is gifted is one who has superior intellectual development and is capable of high performance, which is frequently measured by an IQ score. However, the state of Florida uses different eligibility criteria and consideration of other markers of ability, such as a lower IQ score requirement for students belonging to underrepresented groups, including those from a low SES (Florida State Board of Education, 2011). Students being considered for gifted education based on these lower IQ score requirements have additional criteria that must be used to justify inclusion in gifted education.

For example, a point-based system considered the “Plan B Matrix Scoring System” is used to determine if students from a low socioeconomic background or who are in the English for Speakers of Other Languages (ESOL) program meet eligibility for the gifted program. Students who do not demonstrate socio-economic need, as indicated by ineligibility to receive free or reduced lunch, are required to obtain a minimum IQ score of 130 in order to meet the standard, or Plan A, eligibility criteria for the gifted program. In order to meet eligibility under the District Plan to Increase the Participation

of Underrepresented Students in the Gifted Program (Plan B), a student who is eligible for free or reduced lunch must obtain a minimum score of 112 in the Intelligence Quotient (IQ) category of the Plan B Matrix Scoring System (Miami Dade County Public Schools, 2012).

In Miami-Dade County Public Schools (M-DCPS), students from a low SES who do not meet the standard IQ cutoff of 130 for gifted education must demonstrate high academic achievement, as measured by performance on high stakes testing, and teacher ratings that show students possess certain characteristics that are typical of gifted students (Miami-Dade County Public Schools, 2012). Points are awarded for each eligibility criterion that a student meets (e.g., a score between 0 and 4 is awarded for gifted characteristics, percentile rank scores on achievement tests, IQ score, and a creativity measure). Scores for each criterion are then summed, and students who attain a set cutoff score are then considered to meet criteria for gifted education, even if they fall below the standard IQ score of 130.

Despite sufficient evidence of bias in IQ testing, there has been little research done to test the appropriateness of using achievement test scores as an alternative means to identification of low SES students for gifted education (Tyler-Wood & Carri, 1993, McBee, 2006; Hanscombe, 2012). In order to determine this, it is necessary to first establish that achievement scores are in fact indicative of high ability students; that is, whether more intelligent individuals have higher academic achievement. It must then be determined whether the IQ scores of average to high SES students are more highly predictive of achievement scores than those of low SES students. This would reflect bias

in IQ testing and indicate that achievement tests may be the better measure of academic potential for low SES students.

IQ and Achievement

Findings from previous studies have demonstrated support for a hypothesized positive correlation between IQ scores and achievement (Freberg, Vandiver, Watkins, & Canivez, 2008; Alloway & Alloway, 2010; Kershaw & Schatschneider, 2012; Duckworth, Quinn, & Tsukayama, 2012; Kaufman, Reynolds, Liu, Kaufman, & McGrew, 2012;). For example, Kershaw and Schatschneider (2012) found that performance IQ was a predictor of decoding and linguistic comprehension for third grade students. Furthermore, other research has demonstrated that IQ may predict improved changes in high stakes academic testing (Duckworth et al., 2012). For example, Duckworth and colleagues (2012) examined this phenomenon in a predominantly Caucasian sample of students and found that the IQ scores of elementary-age students predicted changes in standardized academic test scores over time.

Cognitive ability appears to be related to achievement in reading, writing, and math (Kaufman et al., 2012). Using a nationally representative sample of 2520 students between the ages of 4 and 19, Kaufman and colleagues (2012) found that intellectual ability and academic ability were significantly correlated and that the correlation increased as participants grew older. In addition, Freberg and colleagues (2008) investigated the validity of IQ scores predicting academic achievement in a sample of students between the ages of 6 and 13 years, of whom 78.7% were Caucasian, 10.4% were Hispanic/Latino, 8.4% were African American, 1.5% were Native Americans, 0.5% were Asian/Pacific Islander, and 0.5% were of Other ethnicity. Results showed that the

Full Scale IQ (FSIQ) was a valid predictor of academic achievement scores across students of various disabilities, age, sex, and ethnicities.

Other studies have further investigated the predictability of academic achievement with IQ by examining the relationship between single components of IQ, such as the aspect of working memory, and the implications for future academic achievement (Alloway & Alloway, 2010; Edwards, 2009). For example, Alloway and Alloway (2010) investigated whether working memory provides a unique contribution to learning outcomes, and found that children's working memory skills at 5 years of age were the best predictor of literacy and numeracy 6 years later. This demonstrated that working memory is not only a proxy for IQ but a cognitive skill with unique links to academic attainment.

The component of verbal ability in IQ has also been examined independently from the other components of students' overall Full Scale IQ score in relationship to academic achievement (Edwards, 2009). The research has shown that in addition to the predictive utility of IQ scores for academic achievement, the academic achievement scores on research-based, diagnostic assessments of achievement can also predict IQ scores. Research with a sample of 127 students between grades Pre-K and 5 demonstrated that the Academic Knowledge subtest of the Woodcock Johnson (WJ-III) Tests of Achievement can be a significant predictor of both Verbal IQ and Full Scale IQ (Edwards, 2009). Therefore, it can be concluded based on prior research that intellectual ability is in fact highly associated with academic achievement (Freberg et al., 2008; Edwards, 2009; Alloway & Alloway, 2010; Kershaw & Schatschneider, 2012; Duckworth, Quinn, & Tsukayama, 2012; and Kaufman, Reynolds, Liu, Kaufman, &

McGrew, 2012). However, more research is needed that looks specifically at Florida's system and examines whether or not a low SES status affects high stakes achievement test (.e.g., the FCAT), particularly within the gifted student population.

IQ and Socio-economic Status

Test bias is defined by Roberts and DeBlassie (1983) as "a phenomenon in which the effects of a given test result in negative outcomes for a given person because that person is identified with a certain group" (p. 837). Other research has demonstrated that students of low SES may score lower on IQ tests than students of average to above average SES due to test biases in which IQ tests involve an inherent lack of consideration for the lack of opportunities for acquisition or mastery of vocabulary skills of low SES examinees. It has been found that children's shared experiences appear to explain the greater variation in intelligence scores in lower SES children (Hanscombe, 2012). Research shows that test bias affects the identification of low SES children for placement in gifted programs (Tyler-Wood and Carri, 1993); this research showed that on five different types of intellectual ability assessments, students from low SES backgrounds scored lower than students from average to above average SES backgrounds. Furthermore, the primary reason low SES students did not meet criteria for gifted placement is they were not able to obtain a required rank score in the 96th percentile on a measure of cognitive ability. The students who did not meet the 96th percentile mark reportedly scored particularly low on the verbal subtests of the IQ tests administered (Tyler-Wood and Carri, 1993). Research on IQ tests has shown that most IQ tests are heavily verbally laden (Ingram & Hakari, 1985; Koehn, 1999). Research has found that less exposure to a language rich environment is one of the reasons why low SES students

would be at a disadvantage for verbal tasks (Raizada, Richards, Meltzoff & Kuhl, 2008). Language development has been reported to be strongly affected by the richness of the linguistic environment in which a child is raised (Raizada et al., 2008). A study on the effects of socioeconomic status on IQ scores found that low SES has a negative effect on IQ scores, and suggested that this is due to lack of environmental experiences, such as being read to less at home, having less books and access to computers, as well as watching more television (Hanscombe, 2012). Furthermore, research shows that parents in low SES families "tend to be less responsive to children, participate less in their children's school activities, and are more authoritarian" (Hanscombe, 2012, p.10).

Research has shown that in order to best examine genetic and environmental influences on the IQ scores of underrepresented groups, such as students from a low SES and English Language Learners (ELLs), the children in that group must first be placed in optimal educational environments before attempting to use achievement or intelligence scores as evaluative tools (Wilig, 1988). For example, earlier research on the effects of ELL status on IQ scores examined IQ testing on US-born Hispanics (Wilig, 1988). It was found that the genetic components of scores on IQ tests cannot be determined from intelligence tests heavily loaded with a language component, since such tests measure language facility rather than intelligence (Wilig, 1988). Other research has also demonstrated that the use of Verbal IQ and Full Scale IQ scores in assessing ELLs provides an underestimate of actual cognitive ability when compared to that of monolingual, English speaking peers (Dynda, 2009). Furthermore, research has emphasized the growing importance of truly inclusive identification systems for gifted

ELLs, that are attuned to how a gifted ELL student acquires, processes, and applies information (Brulles, Castellano, & Laing, 2011)

These aforementioned findings by Wilig (1988), Tyler-Wood and Carri (1993), Dynda (2009), Brules, Castellano, and Lang (2011), and Hanscombe (2012) all support the underlying theory for the design of Plan B gifted eligibility criteria in the public schools, which allows underrepresented groups, such as low SES and ELL students the opportunity to enter the gifted program if they have an IQ score of 112-129, high academic grades and gifted characteristics. However, less is known about future performance on high-stakes testing by students after they have entered the program with an IQ score of 112-129 through Plan B eligibility, as it compares to that of students who entered the program with an IQ of 130 or higher, as required by Plan A.

Achievement and Socio-economic Status

A common marker used by researchers to define low socioeconomic status of students in the public schools is eligibility for free or reduced lunch (Ross, 2005; Hughes, 2012). Researchers have also found that students from families of low socio-economic status are at risk for failure on high stakes testing (Canto, 2006; Aikens & Barbarin, 2008; Takanishi, 2006). Socio-economic status was a statistically significant predictor of Reading scores in a study where the inter-relationships of students' socio-economic status (SES), other student background data, reading performance indicators, and the predictive utility of those variables was examined as a means to identify students at risk for failure on high stakes, standardized testing in Florida (i.e., on the Florida Comprehensive Assessment Test) (Canto, 2006). Currently, most states' high stakes, standardized academic test scores are not adjusted for the SES of students (Baker & Johnston, 2010).

However, despite such research, the Florida Department of Education states that schools are responsible for teaching all students, regardless of their SES, that all schools are held to equally challenging performance standards, and that all students are capable of making adequate yearly progress (AYP) (Baker and Johnston, 2010). This adequate yearly progress is determined by student scores on the Florida Comprehensive Assessment Test (FCAT), a standardized measure of student performance on reading, mathematics, science, and writing, and (Florida Department of Education, 2012). However, findings from Baker and Johnston's (2010) analysis of FCAT Reading scores were consistent with the existing literature indicating that SES predicts academic achievement (Aikens & Barbarin, 2008). According to Baker and Johnston (2010), about two-thirds of high SES 3rd grade students passed the FCAT, while two-thirds of low SES students did not pass. Therefore, SES was found to be a significant factor in determining a child's performance in school. These findings raise the question that perhaps achievement scores should not be used as predicators of giftedness.

The No Child Left Behind (NCLB) method of assessing academic achievement in the public schools implies a set of adequate yearly progress (AYP) targets which all public schools are mandated to set and achieve. The emphasis on the high stakes testing requirements that have resulted from NCLB accountability efforts has affected the practices of public schools, and it has affected all students, regardless of socioeconomic status (McKay, 2012). On a national level, student proficiency on AYP targets is typically measured with high stakes, standardized academic achievement tests. According to Takanishi (2006), the socioeconomic status of a school is one of the key factors that

has been identified as being strongly related to students' grade 3 proficiency statuses on adequate yearly progress (AYP) targets.

The aforementioned findings regarding test bias in IQ and in high-stakes academic tests support the hypothesis of this study that students who entered the gifted program under IQ scores of 130 or higher will academically outperform students who entered the gifted program under the Plan B lower IQ score criteria of 112-129. Overall, the association of SES with IQ scores has been well studied (Wilig, 1988; Tyler-Wood & Carri, 1993; Hanscombe, 2012). Therefore, findings regarding IQ test bias may have led to the underlying theory behind Florida's development of Plan B eligibility criteria for underrepresented groups for the gifted program, including qualifications of students of a low SES, as well as school district plans to comply with this state initiative (Florida State Board of Education , 2011; Miami-Dade County Public Schools, 2012). This underlying theory, in part, assumes that students of low socio-economic status who obtain IQ scores in the ranges of High Average to Superior (112 to 129) should be allowed into the gifted program based on good academic performance and the presence of gifted characteristics. It also assumes that students of low SES can be expected to perform at the same level of achievement on high stakes tests as students from an equal or higher SES whom have obtained an IQ score in the Very Superior range of 130 or higher (i.e., students who entered under Plan A criteria). However, less research has been conducted to explore the differences in high stakes academic achievement of students who entered the gifted program under the two different sets of criteria (i.e., those who qualified under IQ scores of 130 or higher versus entry with an IQ of 112-129 eligibility criteria). Furthermore,

findings from previous studies have demonstrated support for a positive effect of higher IQ scores on reading achievement (Kershaw & Schatschneider, 2012).

Therefore, the goal of this cross sectional study was to examine the extent to which IQ scores predict state academic achievement scores obtained by students in the gifted program. Furthermore, it was evaluated whether or not varying levels of SES have moderating effects on the relationship between IQ and achievement. That is, does IQ predict achievement equally for students from high and low SES?

The present study was designed to explore the following relationships:

H_{a1}: Performance on high-stakes testing by students who have entered the gifted program with an IQ of 130 or higher, as required by Plan A is higher than the achievement of students who entered the program with an IQ score of 112-129 through Plan B eligibility.

H_{a2}: The IQ scores obtained by individuals in the gifted program who were eligible for gifted during 2007-2012 significantly predict their achievement scores during the 2011-2012 school year.

H_{a3}: SES moderates the effect of IQ scores on achievement, such as that students who are not on free or reduced lunch and who entered under the Plan A IQ score eligibility criteria academically outperform students from a low SES and who also entered under the Plan B IQ score criteria on the Florida Comprehensive Assessment Test (FCAT) (e.g., Tyler-Woods & Carri, 1993).

H_{O1}: There was no difference in the relationship between IQ scores and FCAT achievement regardless of SES status.

Methods

Participants

There were 1,100 participants who were selected from archival records for the 2011-2012 academic year from a diverse South Florida public school district using stratified random sampling. Participants were described as having entered the gifted educational program during the 2007-2012 school years. As shown in Table 1, demographic information regarding the race, gender, age, grade, years in the gifted program, and SES was collected for all participants. Table 2 shows the demographic information collected for participants in the Plan A and Plan B groups, respectively.

As seen on Table 1, the 11.6% of African-American/Black students in the overall sample was smaller than and not representative of the 25.3% of African-American/Black students in the school district where the data was collected. In addition, Table 2 shows that there were more African-Americans (n=82) in the Plan B group than in the Plan A group (n=46). Furthermore, there were also more White, non-Hispanic students (n= 173) in the gifted Plan A group than in the Gifted Plan B group (n=77).

Also shown on Table 2, 30.9% of all Plan B students were denied or did not apply for free or reduced lunch (n=170) (i.e., 30.9% of Plan B students were likely ESOL program students); whereas, 20% of Plan A students were eligible for free or reduced lunch (i.e., 20% of Plan A students are from a low-SES and obtained an IQ score of 130 or higher). The number of years in the gifted program was greater for participants in the Plan A (M=2.47) group than for participants in the Plan B (M=1.83) group. However, the average age of participants in the Plan A (M=9.69) and Plan B (M=9.59) groups was comparable. Participants with missing data were eliminated from the data set.

Table 1

Demographic Characteristics of the Sample

Characteristic	*n*	*%*
Race		
White, Hispanic	667	60.6
White, non-Hispanic	250	22.7
African-American/Black	128	11.6
Asian	46	4.2
Native American	5	0.5
Black Hispanic	3	0.3
Pacific Islander	1	0.1
Gender		
Male	537	48.8
Female	564	51.2
Age		
8	139	12.6
9	361	32.8
10	365	33.2
11	229	20.8
12	6	.5

(continued)

Characteristic	*n*	%
Grade		
3	366	33.3
4	366	33.3
5	368	33.4
Years in Gifted		
0	97	8.8
1	314	28.5
2	234	21.3
3	289	26.3
4	122	11.1
5	42	3.8
6	1	.1
7	1	.1
SES		
Eligible for free/reduced lunch	490	44.5
Not eligible for free/reduced lunch	610	55.5

Table 2

Demographic Characteristics of Participants in Plan A and Plan B Eligibility Groups

Characteristics	Plan A		Plan B	
	n	*%*	*n*	*%*
Race				
White, Hispanic	298	54.2	369	67.1
White, non-Hispanic	173	31.5	77	14.0
African-American/Black	46	8.4	82	14.9
Asian	28	5.1	18	3.3
Native American	3	.5	2	.4
Black Hispanic	2	.4	1	.2
Pacific Islander	0	0	1	.2
Gender				
Male	275	50	262	47.6
Female	275	50	288	52.4
Age				
8	88	16	51	9.3
9	165	30	196	35.6
10	185	33.6	180	32.7

(continued)

Characteristics	Plan A		Plan B	
	n	*%*	*n*	*%*
Age				
11	109	19.8	120	21.8
12	3	.5	3	.5
Grade				
3	183	33.3	183	33.3
4	183	33.3	183	33.3
5	184	33.5	183	33.5
Years in Gifted				
0	34	6.2	63	11.5
1	112	20.4	202	36.7
2	121	22	113	20.5
3	166	30.2	123	22.4
4	84	15.3	38	6.9
5	31	5.6	11	2.0
6	1	.2	0	0
7	1	.2	0	0
SES				
Eligible for free/reduced lunch	440	80	380	69.1
Not eligible for free/reduced lunch	110	20	170	30.9

Measures

Archival data regarding IQ scores, SES status, FCAT scale scores, gender, ethnicity, and length of time in gifted were provided by Miami-Dade County Public Schools.

Intellectual Quotient. An Intelligence Quotient (IQ) is a score for overall intelligence that is obtained on a standardized intellectual assessment. A standardized intellectual assessment is a test that is individually administered by a certified school psychologist, intern, or licensed school psychologist. The content is based on advice from experts in neuropsychology, clinical psychology and school psychology, as well as on extensive research regarding intelligence theory, intellectual assessment, cognitive development and cognitive neuroscience (Wechsler, 2003). Intelligence Quotient (IQ) for the purpose of eligibility into the gifted educational program at Miami-Dade County Public Schools is considered to be the IQ score obtained by students on any of the following standardized intellectual assessments or otherwise standardized intellectual assessments not listed, such as the:

- Woodcock-Johnson Tests of Cognitive Abilities-III (WJ-COG)
- Wechsler Nonverbal Scale of Ability (WNV):
- Wechsler Intelligence Scale for Children, 4th Edition (WISC-IV)
- Stanford-Binet, 5th Edition (SB-5)
- Differential Abilities Scale, 2nd Edition (DAS-II)
- Kaufman Assessment Battery for Children, 2nd Edition (KABC-II)
- Reynolds Intellectual Assessment Scales (RIAS)
- Universal Nonverbal Intellectual Test (UNIT)

Psychologists may use the highest part or composite score (partial scores are acceptable from Wechsler or DAS Scales only) for all students entering into gifted (under either Plan A or Plan B criteria). A minimum IQ score of 112 (a score of one point in the category of "intellectual ability") is required for eligibility under the Matrix Scoring System of the District's Plan B. Students who qualify for admission into the gifted program under Plan B criteria may qualify with an IQ score of 112 or higher on any empirically-based intellectual assessment, such as a score of 112 on any of the following: Full Scale IQ, Verbal IQ, Perceptual Reasoning/Nonverbal IQ or Special Non Verbal Composite. The reliability and validity of the intellectual assessments administered are high, with a typical reliability coefficient of .9 for most published intellectual assessments (Berkovits & Armor, 2006).

Socio-Economic Status. In Miami-Dade County Public Schools, students are identified as being from low socio-economic status (SES) families by the measure of "students' eligibility for the government-subsidized free and reduced lunch program" (Miami Dade County Public Schools, 2012, p. 140). The school district has initiated a plan to help ensure students in socio-economic need with equal and equitable access to gifted programs and educational services that is based on the "yes" or "no" status of eligibility of each student for free or reduced lunch. Therefore, for the purposes of this study, high and low SES was determined by using archived demographic information from M-DCPS for each participant, which indicates all students' "yes" or "no" status of eligibility for the government-subsidized free and reduced lunch program. "Yes" was considered low SES and "no" was considered average or high SES.

Florida Comprehensive Assessment Test. According to Canto (2006), the Florida Comprehensive Assessment Test 2.0 (FCAT) is Florida's annual measure of student yearly academic progress with major implications for individual students and schools. Research showed that the FCAT has a Cronbach's Alpha coefficient of .9, which demonstrates the FCAT as a highly reliable test for assessing the educational achievement of Florida students (Florida Department of Education, 2004). Furthermore, the Florida Department of Education (2004) also found that the FCAT demonstrates concurrent validity with the Stanford 9 standardized academic test. The Florida Department of Education (2012) describes the FCAT-2 as a measure of "student performance on selected benchmarks in reading, mathematics, writing, and science that are defined by the Sunshine State Standards (SSS)" (p.1). Particularly, the Sunshine State Standards are the expectations of what students should be able to do by the end of each school year in seven different content areas. Students' test scores fall under one of the five different achievement levels, from a score of 1 through 5, and scaled scores may be obtained on the FCAT-2 Reading and Mathematics tests for grades three through ten.

The five different achievement levels on the FCAT benchmarks are organized so that 1 is the lowest and 5 as the highest achievement score possible, and performance within Level 3 represents satisfactory performance in the assessed grade and subject (Florida Department of Education, 2012). In addition, students receive a standardized developmental scale score in the areas of reading and math, which are classified under each of the 5 achievement levels (Florida Department of Education, 2013). *See Table 3*. For the purpose of this study, reading scaled scores were used to measure varying achievement levels obtained by gifted students on the 2012 FCAT Reading exam.

Experimental Design

In order to examine the prevalence of the relationship between IQ scores and achievement in students from Plan A and Plan B eligibility groups, a representative nature of the demographic sample was selected for a cross-sectional design study.

Procedures

Approval to conduct the present research was obtained from the Barry University Institutional Review Board. Then, anonymous archival data was requested from Miami-Dade County Public Schools regarding 1,100 students in the gifted program during the 2011-2012 school year, who entered the program within the 2007-2012 school years. This archival data was requested by submitting an application to the MDCPS Research Review Committee. Data regarding the following variables was collected: FCAT 2.0 Reading Scaled Scores for the 2011-2012 school year; IQ score and SES status of students upon their initial entry into the gifted program during the 2008-2011 school years; year of entry into the gifted program; ethnicity of all participants; and gender of all participants, such that half of participants are male and half female. Due to the archival nature of data collection about the study variables (IQ scores, SES and FCAT scores), it was assumed that self-reports about SES by the families of students were truthful, and that IQ and FCAT scores were valid estimates of students abilities.

In order to ensure anonymity, once the data was collected by a staff member at MDCPS, a data set (and no personal identifiers) indicating specific information for each participant was given to the researcher. Participants were selected from the larger data set of 6285 students received. Prior to the data selection, the larger data set received was first randomly shuffled by data rows on Microsoft Excel in order to ensure a randomized

sample. After random shuffling, the final 1,100 participants were individually selected from top to bottom in order to obtain an equal number of students in Plan A and Plan B, by selecting 550 students with IQ scores between 112 and 129, and 550 students with IQ scores of 130 and higher. The data collected was analyzed using SPSS software at Barry University.

Results

A *t*-test was conducted in which the mean of FCAT Reading scaled scores by students who entered the gifted program with an IQ of 130 or higher was be compared to the mean FCAT Reading scaled scores of students who entered the gifted program with an IQ score of 112-129. Furthermore, a linear regression analysis was conducted. The predictor variable was IQ score at the time of entry into gifted education. The 2011-2012 FCAT Reading Scaled Score was the outcome variable. In order to test the validity of the underlying theory for designation of Plan B IQ criteria for students of low SES, it was planned that the moderating effects of SES were also going to be examined in order to determine whether or not SES status strengthens or weakens the effect of IQ on FCAT Reading scaled scores. Therefore, SES status at the time of entry into the gifted program was going to be included into a multiple regression analysis as an added predictor of gifted students' achievement on the FCAT Reading test. Socioeconomic status was obtained as a categorical variable, indicated by students' *yes* or *no* status of eligibility for free or reduced lunch. However, due to the non significant effect found for IQ scores on achievement, there was no utility in measuring the effect of SES as a moderator in the relationship; therefore, SES was ultimately not examined.

H_{a1}: Performance on high-stakes testing by students who have entered the gifted program with an IQ of 130 or higher, as required by Plan A is higher than the achievement of students who entered the program with an IQ score of 112-129 through Plan B eligibility.

An independent-samples *t*-test was conducted to compare FCAT Reading Scale Scores of students who entered the gifted program through Plan B (IQ scores between 112 and 129) and those who entered the gifted program through Plan A (IQ scores of 130 and higher). The 550 participants from Plan B (M= 234.62, SD= 18.43) and the 550 participants from Plan A (M= 234.05, SD= 17.34), demonstrated a non-significant difference in their FCAT Reading performance $t(1098)=.53$, $p = .598$; therefore, an IQ score of 112-129 did not inhibit performance on the FCAT Reading test as predicted.

H_{a2}: The IQ scores obtained by individuals in the gifted program who were eligible for gifted during 2007-2012 significantly predict their achievement scores during the 2011-2012 school year.

A linear regression analysis was conducted to evaluate how well IQ scores measure FCAT Reading scores. The predictor was IQ score, while the criterion variable was the FCAT Reading scaled score. IQ scores did not significantly predict FCAT Reading scaled scores, $b = -.01$, $t(1) = -.30$, $p = .768$. IQ scores also did not explain any significant proportion of variance in FCAT Reading scaled scores, $R^2 = .000$, $F(1, 1098)$ $p = .09$.

Discussion

The results of the *t*-test showed that the first null hypothesis was accepted. This indicated that the FCAT Reading achievement of students in the Plan A program did not differ significantly from the FCAT Reading achievement of students who enter the gifted program under Plan B eligibility criteria. Therefore, the Plan B eligibility theory was supported, as this suggests that students who are allowed to enter the gifted program with IQ scores under 130, either because of low SES status or ESOL participation, do achieve comparably to Plan A students who qualify for the gifted program with an IQ score of 130 or higher. In addition, the results of the linear regression show that the second experimental hypothesis was also rejected, demonstrating that IQ did not significantly affect FCAT Reading achievement for gifted students.

Furthermore, the overrepresentation of White, Non Hispanic students and the underrepresentation of African-American/Black students in Plan A when compared to students in Plan B suggests that most White, Non Hispanic participants in the overall sample obtained an IQ score of 130 or higher and that most African-American/Black students in the sample obtained an IQ score of 112-129. These differences between both groups, as well as the underrepresentation of Black students found in the overall sample could be explained by previous research findings which indicate that IQ tests are biased against minorities and are designed in favor of White, Non-Hispanic individuals (Partenio, & Taylor, 1985; Schiele, 1991; Fagan & Holland, 2007).

Limitations. The IQ scores of participants that were provided from their gifted eligibility evaluations were not all derived from the same intellectual ability assessment. Therefore, the inherent differences in the reliability and validity of different intellectual

assessments administered to students by different evaluators can be considered a limitation of this study. This is one reason that could also explain why results were contrary to the experimental hypotheses. In addition, the restricted range of IQ scores and FCAT Reading scale scores in the obtained sample of gifted students can be considered another limitation of the present study. Furthermore, the underlying theory behind the Plan B eligibility criteria for the gifted program assumes that students of low socio-economic status will score lower on IQ tests due to test biases, because IQ tests do not typically account for the lack of opportunities students from a low SES have to achieve the same level of acquisition or mastery over vocabulary and other cognitive processes as students of mid-to-high SES. However, the possibility may exist that some students who entered the gifted program under Plan B criteria may, in fact, have lower intellectual abilities that are not accounted for by their low SES, which may in itself contribute to a difference in predictability of FCAT scores between students who entered the program under Plan A and those who entered under Plan B.

Implications

The present study demonstrates the resiliency of low-SES gifted students in cases in which some gifted students have had higher poverty levels than other students and, yet, were able to achieve comparably on the FCAT Reading test. However, there is a need for further research with the gifted student population that examines the effect of IQ scores on a different type of academic assessment besides standardized tests, such as academic portfolio assessments or grades.

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Table 3

FCAT 2.0 Reading Scaled Scores by Achievement Levels

Grade	Level 1	Level 2	Level 3	Level 4	Level 5
3	140-181	182-197	198-209	210-226	227-260
4	154-191	192-207	208-220	221-237	238-269
5	161-199	200-215	216-229	230-245	246-277
6	167-206	207-221	222-236	237-251	252-283
7	171-212	213-227	228-242	243-257	258-289
8	175-217	218-234	235-248	249-263	264-296
9	178-221	222-239	240-252	253-267	268-302
10	188-227	228-244	245-255	256-270	271-302

(Florida Department of Education, 2013)