

Gifted and Talented Identification at One District:
An Analysis of Testing Results

EDPS 621: Statistical Applications in Educational Research

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Abstract

This study details the testing process and analysis of testing results for admitting students to the ACT program – a program for gifted and talented students at Johnsonville Public Schools. Participants for this study ($n = 181$) were students in the second through fifth grades that were nominated for the program. The students represented six different schools within the district. Gender, school, grade, teacher, and involvement in Spanish Immersion data from scores on the *Cognitive Abilities Test* (CogAT) and the *Renzulli Scales for Rating the Behavioral Characteristics of Superior Students* (SRBCSS) was analyzed to determine the nature of testing within the district and whether or not there were major differences between the schools. Correlation and regression analyses were also utilized to determine whether or not there was an association between the SRBCSS, performance on the CogAT, and admittance to the ACT program. Findings showed a slight, positive correlation between the *Renzulli Scales* and the aforementioned variables. The findings are discussed in light of previous research, including limitations of the study. Implications for practice and future research are presented.

Introduction

Gifted education is a field that is continually evolving. Understanding its many facets can be overwhelming, especially for parents of gifted children or for those educators new to the field. Chief among the extraordinary changes and advances in the field of gifted education are the expanding conceptions of giftedness and how we come to understand gifted learners. Even a cursory review of the research on gifted and talented education reveals that gifts and talents among the “gifted” vary widely. While, at the turn of the 20th century, giftedness was equated with high IQ (Jolly, 2008), over the years, researchers have come to define giftedness in terms of multiple qualities, not all of which are related to intelligence (Wallace & Pierce, 1992; Sternberg & Davidson, 1986).

With the works of Renzulli (1978), Gardner (1983), and Sternberg and Davidson (1986), we now know that motivation, creativity, and task-commitment are also reflected in the behaviors of above-average students. Even the United States Department of Education utilizes a multifaceted approach to gifted education viewing gifted youth as those:

Children and youth with outstanding talent [who] 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. (U.S. Department of Education, 1993, p. 26)

Because of their unique abilities, gifted children are students who require differentiated educational programs and/or service beyond that which normally is provided by the traditional school program in order to realize their contribution to self and society. If a school district operationalizes this concept, it fundamentally changes the way it does business. It means that teachers differentiate instruction and assignments within their classrooms. It means that various levels of course work will be made available to all students when appropriate. It also means that options for acceleration and alternative programming will be present.

However, though many schools adopt a multifaceted definition of giftedness to serve as the foundation for their philosophy and programming choices, the identification process for gifted programs is still a very complex and controversial topic. While it is easy to measure IQ and academic achievement, it is certainly much more difficult to measure innovative thinking, creative potential, and task-commitment. This potentially leaves some students with gifts and talents unrecognized and underserved (Lemons, 2011). While there may not be one right answer as to how best identify students for participation in gifted and talented programs, it is certainly very important to review the literature and to stay up-to-date on the research related to this issue. It is along this venue that this analysis is based.

Changes in Gifted and Talented Testing and Identification

Though the testing and identification of gifted students has changed drastically over the years, many educators working in the field credit Terman (1931) and his research as being the catalyst for studying students with above-average abilities. As a faculty member at Stanford University, Terman notably adapted Binet's intelligence test for use in the United States resulting in the *Stanford-Binet Intelligence Scales* (Terman et al, 1917). What's more, in addition to his construction of mental tests, Terman was also well known for his longitudinal study of gifted

elementary-school-aged children (Terman, 1961). This became a defining feature of his career. Entitled the *Genetic Study of Genius*, the basic purpose of the study was to determine how gifted children vary compared to children of average intelligence (Jolly, 2008). Though Terman's study relied on a definition of giftedness that was significantly linked to intelligence, his work was one of the first of its kind in the United States. What's more, as Sally M. Reis, President of *The National Association of Gifted Children*, states, "Some of this 'legacy' survives to the present day as giftedness and high IQ continue to be equated in some conceptions of giftedness (Reis, n.d.).

While Terman's work was essential and helped to begin the conversation in terms of studying gifted students, the way we conceptualize "giftedness" has drastically changed. Soon after Terman's work, other researcher posited that intelligence could be conceptualized as more than just one factor but could, instead, be related to many different skill sets (Thurstone, 1938; Cattell, 1952; and Guilford, 1956).

Purpose of the Study

The intent of this study is to analyze the testing procedures and results of the gifted and talented programming at a small, school district – Johnsonville Public Schools. Johnsonville Public Schools has long been recognized for excellence in education and academic programming. In 1985, administrators from the district worked alongside a dedicated group of Johnsonville parents to create a program for students demonstrating evidence of high intellectual and creative achievement capability. The ACT Program (the acronym a variation of *ACademically Talented*) was the result of their hard work. The ACT class was designed as an academic enrichment pullout program specifically tailored for gifted and talented children. Meeting each school week, the curriculum promotes advanced academics in the core

subject areas of Math, Science, Language Arts and Social Studies. Third through sixth grade students from Johnsonville Public Schools, Johnsonville Christian Schools, or home-schooled students in the Johnsonville area who qualify for the ACT program are provided learning experiences that encourage them to apply their abilities, creativity, and task commitment to solve personally meaningful problems they encounter in their schools, community, and world.

Just as the field of gifted education has evolved, so, too, has the educational programming and, in particular, the identification process for students admitted to the ACT Program at Johnsonville. The question of identification and admittance has by far been one of the most difficult to answer. *How* to test, *what* testing materials to use, and *what* standards to use have been recurring questions throughout the history of the ACT Program. As the program's new Director and Teacher, I wish to review the testing data from the spring of 2014 in order to help make informed decisions for the future.

Research Questions

The following research questions guide this study:

1. How does student performance on the Cognitive Abilities Test (CogAT) differ between the various schools in the district? Are there certain buildings or grade levels in which students perform better?
2. Is there an association between students' scores on the *Renzulli Scales for Rating the Behavioral Characteristics of Superior Students* (SRBCSS), performance on the Cognitive Abilities Test, and acceptance to the ACT Program?
3. How well do students' scores on the *Learning Characteristics* portion of the SRBCSS predict performance on the Cognitive Abilities Test?

Methods

Participants

The participants for this study were students in grades two through five that were nominated by their parents to be evaluated for the ACT Program. Due to special circumstances prearranged with district administration, one first grader also participated in the testing process. In years past, nomination forms were sent to the parents of *all* Johnsonville Public Schools' students in the aforementioned grades through student folders that are taken home at the end of each school week. However, this practice was changed when district administration recognized the need for parents to understand the purpose of the ACT class prior to nominating their child. Now, parents are notified via school newsletters about the ACT program and are instructed to pick up nomination forms in their school's office. What's more, in some instances, parents speak with their child's teacher about nominating. This most often happens around Parent-Teacher Conferences. At other times, classroom teachers may speak with the parents of their high-ability students about the potential benefits of such a program and may encourage parents to nominate their child for testing.

The parent nomination form is a modified version of the *Renzulli Scales for Rating the Behavioral Characteristics of Superior Students* (SRBCSS) (Renzulli, Smith, White, Callahan, Hartman, & Westberg, 2002) that is explained further below (to view the entire nomination form, see Appendix A). Upon receiving the parent nomination forms, separate *Renzulli Scales* are then sent to classroom teachers for all of the nominated students. Prior to filling out the scales, teachers are required to attend a short meeting explaining how the *Renzulli Scales* work and how to fill them out. Using this format for the 2013-2014 school year, the number of students

nominated for the program was one hundred eighty-one ($n=181$). Of these participants, there were more female testers (56.9%, $n=103$) than male testers (43.1%, $n=78$). Participants from each grade level were represented as follows:

- First Grade: 0.6%, $n =1$
- Second Grade: 35.9%, $n=65$
- Third Grade: 27.6%, $n=50$
- Fourth Grade: 22.1%, $n =40$
- Fifth Grade: 13.8%, $n=25$

It is important to note that this is not a random sample; thus, it is not representative of the entire second through fifth grade population. Rather, this group of students represents those parents who feel the ACT Program may be beneficial for their child. Nomination can happen for many reasons. There are parents who have the knowledge and a sound understanding of the traits of giftedness and academic talent to provide rationale for nominating their child. However, parents nominate for other reasons, and this reasoning can vary greatly. Based on conversations with district administrators and former directors of the ACT program, parents will also nominate their child because an older sibling was in the program. Other reasoning includes the fact that the child *wants* to be in the ACT Program, the child's *friends* are in the program, or because the parents simply *believe* that their child is gifted and could qualify.

Instruments

Cognitive Abilities Test (CogAT). Cognitive ability tests that measure verbal, quantitative, and nonverbal reasoning skills are widely used by schools to provide valuable information to teachers hoping to differentiate instruction to their students' cognitive strengths (Lohman, 2009; Lohman & Hagen, 2001b). All students nominated for the ACT program take

the *Cognitive Abilities Test* (CogAT) (CogAT, Form 6; Lohman & Hagen, 2001a). Issaquah School District 411 in Washington administers the CogAT to test students for admittance into their Highly Capable programs. In a section about the CogAT on their website, the district states,

The CogAT is a test of reasoning skills. It's not like a spelling or a math test where if you know the words or the facts you can get 100%. There is no defined curriculum for the CogAT. It is a norm-referenced test and the national average is 50th percentile (Issaquah School District, n.d.).

Currently, JPS uses Form 6 of the CogAT written by Lohman and Hagen. To identify students for the ACT Program, Johnsonville Public Schools administers advanced versions of the CogAT to the nominated students as students are tested one full year ahead.

There are three parts to the CogAT: Verbal Battery, Quantitative Battery, and Non-Verbal Battery. The figure below illustrates the breakdown of each test battery on CogAT (Lohman & Hagen, 2002).

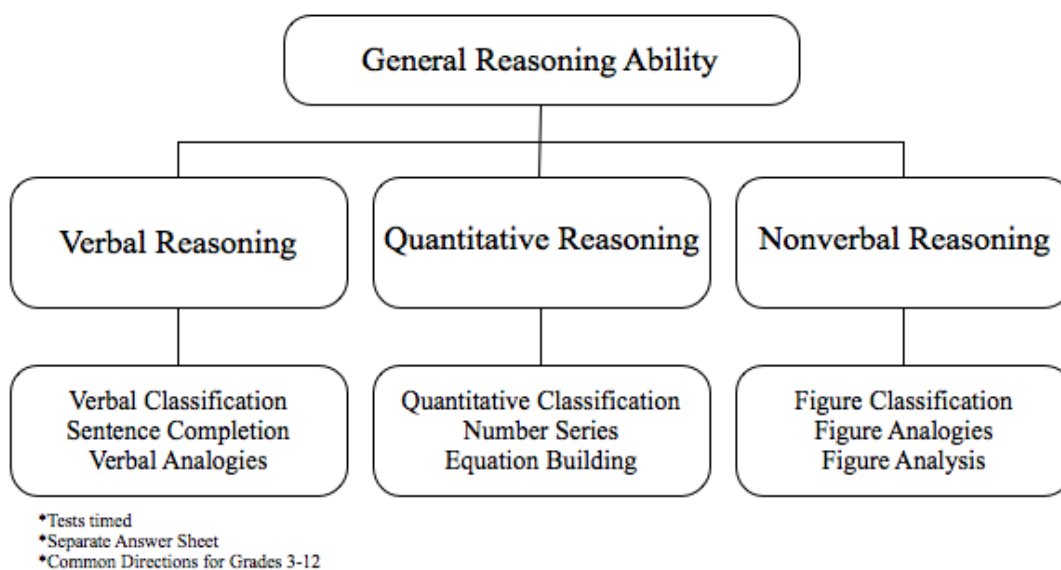


Figure 1. Breakdown of Cognitive Abilities Test.

Each section of the multilevel battery (for grades 3-12) is timed and students are required to fill in their answers on a bubble sheet. There are also common directions, thus, students from various grades could take the test at the same time, if necessary.

The CogAT is scored and performance is reported in a number of ways. The raw score is the number of correct items a student got on any particular section of the test. This raw score can then be converted to a Universal Scale Score (USS). This USS allows test administrators to map the number correct on different levels of the test onto a single, common developmental scale.

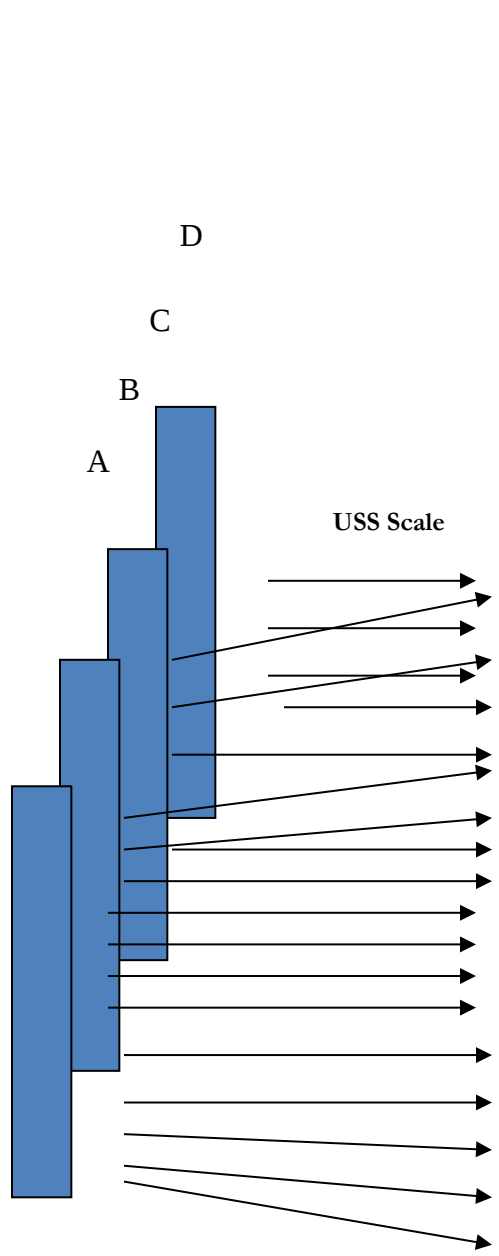


Figure 2. Illustration of how raw scores from various test levels can map onto the same, universal scale (USS).

The USS scores are used to determine a tester's grade percentile rank on each portion of the test. What's more, Johnsonville Public Schools averages these percentile ranks to obtain an overall CogAT average score.

Reliability & Validity. For years, the Cognitive Abilities Test has been one of the most trusted and widely used group abilities tests in the United States and abroad (Lohman, 2011). As described by Lohman (2011), author of the Cognitive Abilities Test Forms 6 & 7, and one of the leading voices in gifted education, "Each battery has subtests that make use of three different test formats. Measuring with multiple formats rather than the same format on all items increases both the fairness and the validity of the scores students obtain" (Lohman, 2011, p. 1). These batteries were also found to provide strong predictive validity for achievement in non-ELL populations (Lohman & Hagen, 2002).

Renzulli Scales for Rating the Behavioral Characteristics of Superior Students. The Cognitive Abilities Test has been the primary means for acceptance into the ACT program. However, starting in 2005, some changes were made in the testing process. One such change was the addition of using the *Renzulli Scales for Rating the Behavioral Characteristics of Superior Students* (SRBCSS) (Renzulli, Smith, White, Callahan, Hartman, & Westberg, 2002) in tandem with the Cognitive Abilities Test. The *Renzulli Scales* are designed to obtain teacher estimates of a student's characteristics in the following areas (those denoted with an asterisk are new to the latest version of the scales):

- Learning Characteristics
- Creativity Characteristics
- Motivation Characteristics
- Leadership Characteristics

- Artistic Characteristics
- Musical Characteristics
- Dramatics Characteristics
- Communication Characteristics (Precision)
- Communication Characteristics (Expressiveness)
- Planning Characteristics
- Mathematics Characteristics*
- Reading Characteristics*
- Technology Characteristics*
- Science Characteristics*

A description on the Prufrock Press website about the *Renzulli Scales* states,

Research shows that gifted children tend to exhibit certain observable behaviors, such as using advanced vocabulary, grasping underlying principles, and making generalizations from complex information. The *Renzulli Scales* asks teachers to rate children in comparison to their peers on a host of these observable behaviors. The children who score high on the scales are more likely to be gifted. Using a tool like the *Scales*, a school can narrow the number of students who will be fully evaluated for a gifted program (Prufrock Press, n.d.).

Appendix A displays a sample copy of the *Renzulli Scales* for each of the areas that Johnsonville Public Schools uses in the process for identifying potentially gifted and talented students (learning, creativity, motivation, and leadership). As seen in the sample instruments, each scale contains multiple items relating to student characteristics that are rated using a Likert-type scale.

Reliability & Validity. School districts have utilized teacher rating scales such as the SRBCSS for many years to help with the identification process and to make decisions regarding the range of services provided to high ability students (Renzulli, Siegle, Reis, Gavin, & Reed, 2002). Joseph Renzulli first developed the first three scales in the SRBCSS series – learning, motivation, and creativity, in 1978 (Renzulli, 1978). As the definition and conceptions of giftedness changed and began to encompass a range of talent areas in addition to cognitive abilities, the other scales were then created. A manual that accompanies the scales includes teacher training activities in an effort to ensure that teachers understand how to fill out the scales, thus increasing the reliability of the scores (Renzulli et al., 2002b). What’s more, as noted by Renzulli and colleagues, “Each scale was subjected to a standard instrument development research process to ensure technical characteristics such as validity, reliability, objectivity, and practicality” (Renzulli et al., 2002b, p. 86).

Procedures

Currently, *all* students nominated by their parents are tested, and teachers fill out the *Renzulli Scales* for each student in his or her classroom who will be taking the CogAT. Prior to testing, teachers attend a small informational session in which directions on how to fill out the SRBCSS are given. Testing for the ACT program is completed at each of the five elementary buildings in April. Participants from Johnsonville Christian School are bused to Poplar Grove Elementary in order to take the Cognitive Abilities Test. Students from grades two and three (levels A & B) are tested in the morning, while students from grades four and five (levels C & D) are tested in the afternoon on the given testing day. The district hires a proctor for the test, this individual used to be a former principal in the district. After testing is completed, the proctor then scores the tests and sends the information to Central Administration where the data is

entered into a spreadsheet. The current spreadsheet weights various pieces from the testing: CogAT Avg is weighted at 50%, while each of the *Renzulli Scales* are weighted at 10% (for a total of 40% of the final, overall score). The parent profile (See Appendix A) and a separate Student Application are also each weighted at 5%. This produced an “Overall Score” that was used for admittance purposes.

Data Analysis

The first step in the analysis was the generation of frequencies for all qualitative variables to present an accurate view of the testing participants within the various schools in the district. This information was used to draw conclusions about the consistency of the nominating and testing process and to inform any changes for the future. Next, descriptive statistics were run on each of the quantitative variables to provide more information about the performance on the individual portions of the CogAT and SRBCSS. Correlation coefficients were calculated for each of the *Renzulli Scales* with the admittance to the program and performance on the CogAT variables to see if there was an association. Finally, a linear regression analysis was conducted to evaluate how well students’ scores on the *Learning Characteristics* portion of the SRBCSS predict performance on the *Cognitive Abilities Test*. The results from these analyses follow along with a discussion of the findings.

Results

Information about the participants was collected on six qualitative variables: gender, grade, building, participation in Spanish Immersion, classroom teacher, and whether or not the student was accepted to ACT. Students in grades two through five tested for the program, including one first grade student. Additionally, there are six categorical options for building: Scenic Knoll, Red Cedar, Poplar Wood, Birchwood, Burbank, and Johnsonville Christian.

Table 1

Frequency of Participants by Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
F	103	56.9	56.9	56.9
M	78	43.1	43.1	100.0
Total	181	100.0	100.0	

Table 2

Frequency of Participants by Grade

	Frequency	Percent	Valid Percent	Cumulative Percent
1	1	.6	.6	.6
2	65	35.9	35.9	36.5
3	50	27.6	27.6	64.1
4	40	22.1	22.1	86.2
5	25	13.8	13.8	100.0
Total	181	100.0	100.0	

Table 3

Frequency of Participants by Building

	Frequency	Percent	Valid Percent	Cumulative Percent
Birchwood	29	16.0	16.0	16.0
Burbank	48	26.5	26.5	42.5
JC	10	5.5	5.5	48.1
Poplar Wood	29	16.0	16.0	64.1
Red Cedar	34	18.8	18.8	82.9
Scenic Knoll	31	17.1	17.1	100.0
Total	181	100.0	100.0	

Table 4

Frequency of Participants in Spanish Immersion

	Frequency	Percent	Valid Percent	Cumulative Percent
No	157	86.7	86.7	86.7
Yes	24	13.3	13.3	100.0
Total	181	100.0	100.0	

Table 5

Frequency of Students Accepted to Program

	Frequency	Percent	Valid Percent	Cumulative Percent
No	95	52.5	52.5	52.5
Yes	86	47.5	47.5	100.0
Total	181	100.0	100.0	

Table 6

Frequency of Female Students Accepted to Program

	Frequency	Percent	Valid Percent	Cumulative Percent
No	57	55.3	55.3	55.3
Yes	46	44.7	44.7	100.0
Total	103	100.0	100.0	

Table 7

Frequency of Male Students Accepted to Program

	Frequency	Percent	Valid Percent	Cumulative Percent
No	38	48.7	48.7	48.7
Yes	40	51.3	51.3	100.0
Total	78	100.0	100.0	

As depicted in Table 1 above, the number of female testers (56.9%, $n=103$) was greater than the number of male students who tested for the program (43.1%, $n=78$). All grade levels permitted to test for the program were represented, including one student from first grade who tested under special circumstances. A little more than one-third of the participants represented came from second grade (35.9%, $n=65$). The other grade levels were represented as follows and are

depicted in Figure 3: First Grade—0.6%, $n=1$; Third Grade—27.6%, $n=50$; Fourth Grade—22.1%, $n=40$; Fifth Grade—13.8%, $n=25$). The greatest number of testers came from Burbank Elementary (26.5%, $n=48$) as illustrated in Figure 4. The number of participants in Spanish Immersion was 13.3% ($n=24$), as shown in Table 4. Finally, descriptive Tables 5, 6, and 7 show that eighty-six of the one hundred eighty one students who tested were accepted to the program. Of these, forty-six were female (25.4% of the total number of testers) and forty were male (22.1% of the total number of testers). This further indicates that almost half of the students (47.5%) who tested for the ACT Program during the 2013-2014 school year were accepted.

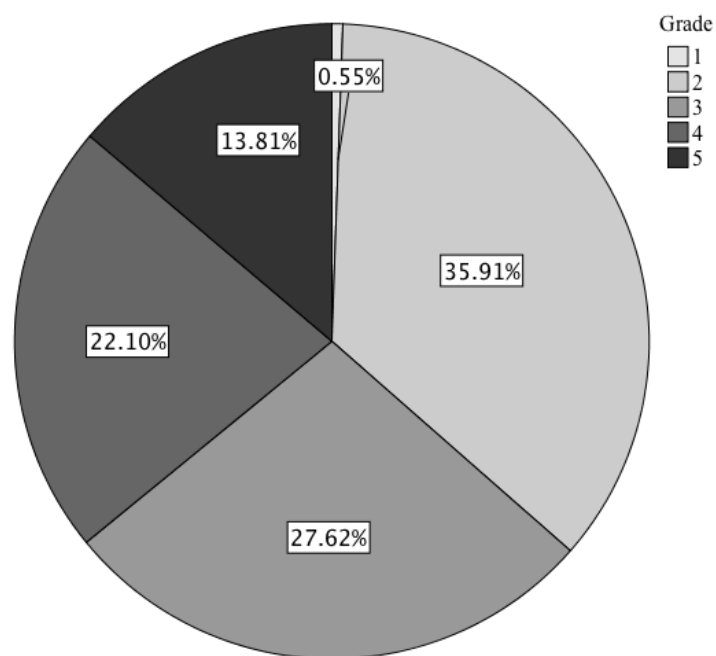


Figure 3. Percent of testers from each grade.

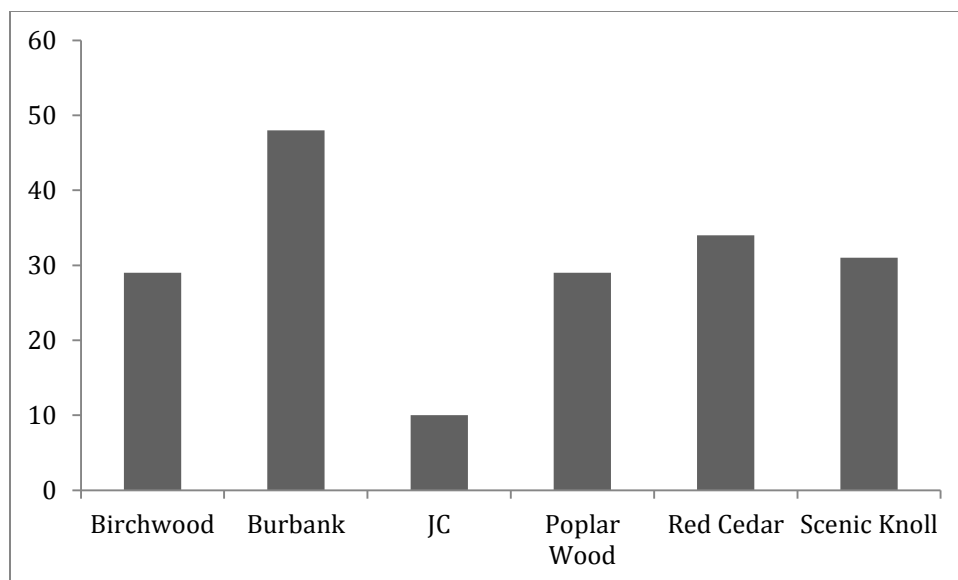


Figure 4. Number of testers per school building.

In addition to collecting information on qualitative variables, data was also gathered from various quantitative variables. As mentioned earlier, the *Cognitive Abilities Test* measures students' learned reasoning abilities in the three areas most linked to academic success in school: Verbal, Quantitative, and Nonverbal. Students' performance on these three test batteries is represented in Table 8 in two forms – the Universal Scale Score (USS) and percentile rank. The USS scores for the CogAT provide a continuous measure of cognitive development from Kindergarten through Grade 12. These scores are the means by which raw scores from different levels of the test are placed on a common scale. This makes it possible to compare performance on one level of a test battery with performance on any other level of that test battery. The USS scores were converted to percentile ranks for each of the test batteries. The percentiles from each portion of the test were then averaged to create another variable called *CogAT Avg.* This overall score is what is used for admittance purposes. Finally, data collected from the *Renzulli*

Scales for Rating the Behavioral Characteristics of Superior Students were locally normed resulting in percentile ranks in the areas of learning, creativity, leadership, and motivation.

Table 8

Descriptive Statistics of Quantitative Variables

	N	Range	Minimum	Maximum	Mean	Median	Std. Deviation
Verb USS	181	123	129	252	190.44	192.00	20.924
Verbal Percentile	181	98	1	99	69.56	76.00	23.419
Quant USS	181	127	139	266	190.05	189.00	21.555
Quantitative Percentile	181	87	12	99	65.85	69.00	21.700
Nonverbal USS	181	116	143	259	200.27	201.00	20.190
Nonverbal Percentile	181	92	7	99	69.29	75.00	23.882
CogAT Avg	181	93	4	97	68.16	71.00	19.000
Learning Percentile	181	94	5	99	74.76	83.00	21.163
Creativity Percentile	181	98	2	100	71.83	80.00	25.496
Leadership Percentile	181	100	0	100	69.29	78.00	26.397
Motivation Percentile	181	94	4	98	71.52	79.00	22.790

The ranges for the percentile scores on the various portions of the CogAT were as follows:

- Verbal: 1st percentile to 99th percentile (range of 98)
- Quantitative: 12th percentile to 99th percentile (range of 87)
- Nonverbal: 7th percentile to 99th percentile (range of 92)
- CogAT Avg: 4th percentile to 97th percentile (range of 93)

The arithmetic mean of each of each of these scores is lower than the median score for each as shown listed below:

- Verbal: $M = 69.56$, $Mdn = 76.00$
- Quantitative: $M = 65.85$, $Mdn = 69.00$
- Nonverbal: $M = 69.29$, $Mdn = 75.00$
- CogAT Avg: $M = 68.16$, $Mdn = 71.00$

Thus, some participants scoring rather low on the various portions of the test negatively skew the

distribution of each. Figures 5 and 6 on the next page show the distribution of the participants' average Cognitive Abilities Test score. It is very easy to see that this distribution has a strong negative skew just by looking at the Stem-and-leaf plot and the histogram of the data.

A boxplot and means comparison of the CogAT Average scores by building illustrates how the various buildings compare to one another. Figure 7 and Table 9 depict this and show that the average performance of students on the Cognitive Abilities Test at Bursley is lower than the performance of students at other schools within the district. Though each building had outliers, the lower range of scores at Bursley Elementary was certainly greater than those at the other buildings. This might suggest that there are some students at Bursley who are nominated for testing purposes for which the ACT Program may not truly be the best fit – this will be addressed further in the discussion portion of this study.

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2 . 0 1 1
2 . 6 7 9
3 . 1 3
3 . 6 6 8 9 9 9
4 . 1 1 1 2 2 3
4 . 5 5 5 6 7 8 8 9
5 . 0 0 1 2 2 2 2 3 3 3 4
5 . 5 5 5 6 6 6 6 7 7 8 8 9 9
6 . 0 1 1 1 1 2 3 3 3 3 3 4 4
6 . 5 5 6 6 7 7 7 8 8 8 9 9 9 9
7 . 0 0 1 1 1 1 1 1 1 2 2 2 3 3 4 4 4 4 4
7 . 5 5 5 5 5 6 6 6 6 6 6 7 7 8 8 8 9 9 9 9
8 . 0 0 0 1 1 1 1 1 2 2 2 3 3 3 4 4 4 4 4
8 . 5 5 5 5 5 6 6 6 6 6 7 7 7 7 8 8 8 8 9 9 9
9 . 0 0 0 0 0 0 1 2 2 2 3 3 4 4 4
9 . 5 6 6 6 7

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Figure 5. Stem & Leaf plot of CogAT Avg

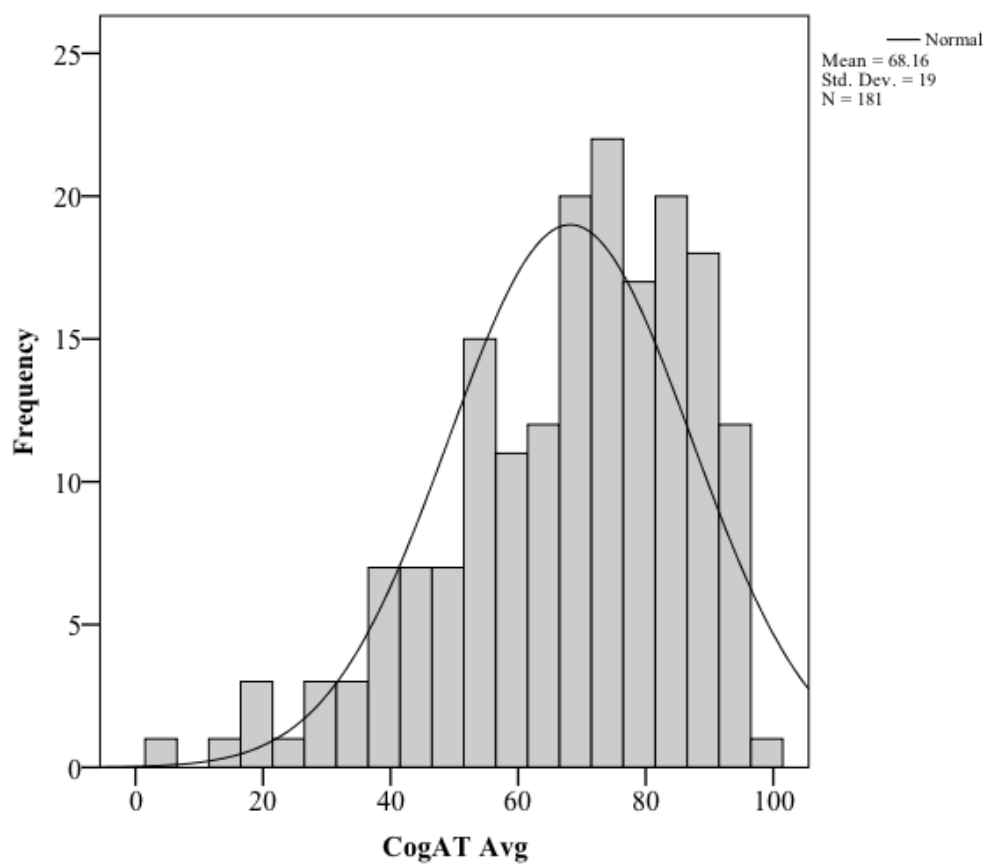


Figure 6. Distribution of participants' Cognitive Abilities Test Score Average

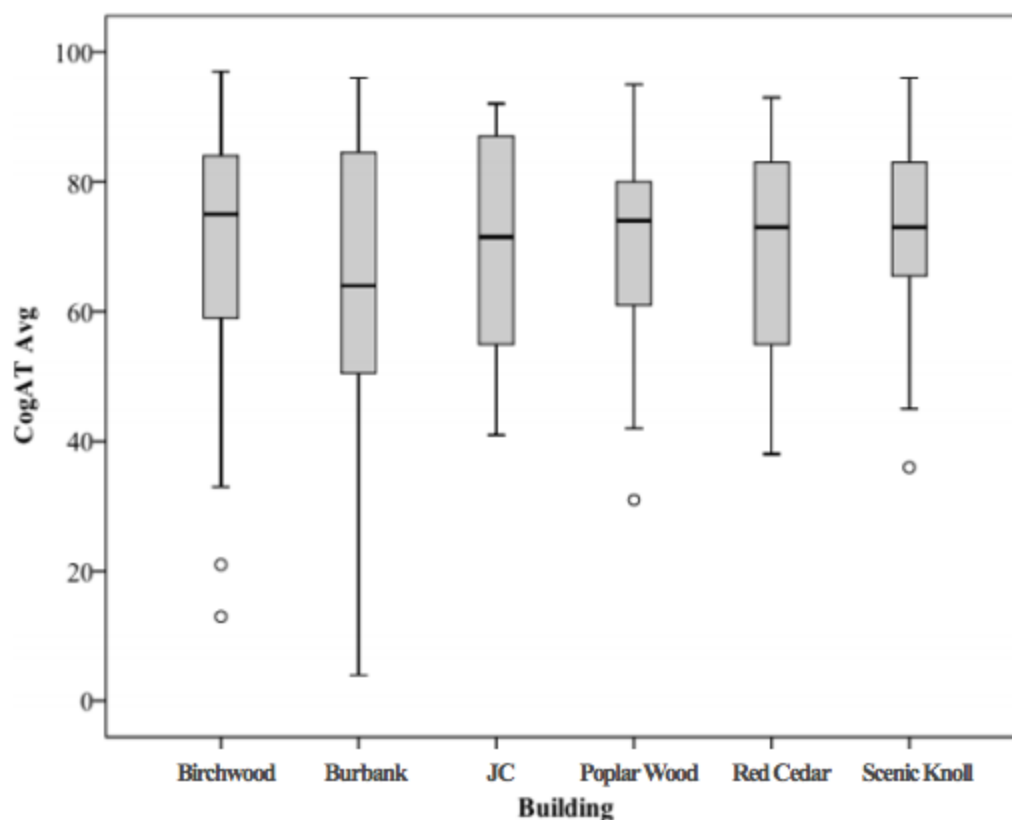


Figure 7. Boxplot of CogAT Avg by Building.

Table 9

Comparison of Means

CogAT Avg			
Building	Mean	N	Std. Deviation
Birchwood	69.62	29	22.611
Burbank	62.96	48	22.635
JC	69.40	10	18.506
Pine Wood	69.10	29	15.896
Red Cedar	69.21	34	15.573
Scenic Knoll	72.42	31	14.635

One of the purposes of this study was to review the addition of using the *Renzulli Scales* as part of the testing procedures for the ACT class. The review of the literature and common experience might suggest a positive association between the scores on these scales and either

performance on the *Cognitive Abilities Test* or admittance into the program. In order to see if this is truly the case, correlation coefficients were calculated for each of the *Renzulli Scales* and the aforementioned variables. The *Learning Characteristics* scale correlation coefficient was calculated with the CogAT Average variable (See Table 10) along with a scatterplot to help picture any possible association (Figure 8).

Table 10

Correlation between Learning % and Acceptance to Program

	CogAT Avg	Learning %
CogAT Avg		
Pearson Correlation	1	.252**
Sig. (2-tailed)		.001
N	181	181
Learning %		
Pearson Correlation	.252**	1
Sig. (2-tailed)	.001	
N	181	181

**. Correlation is significant at the 0.01 level (2-tailed).

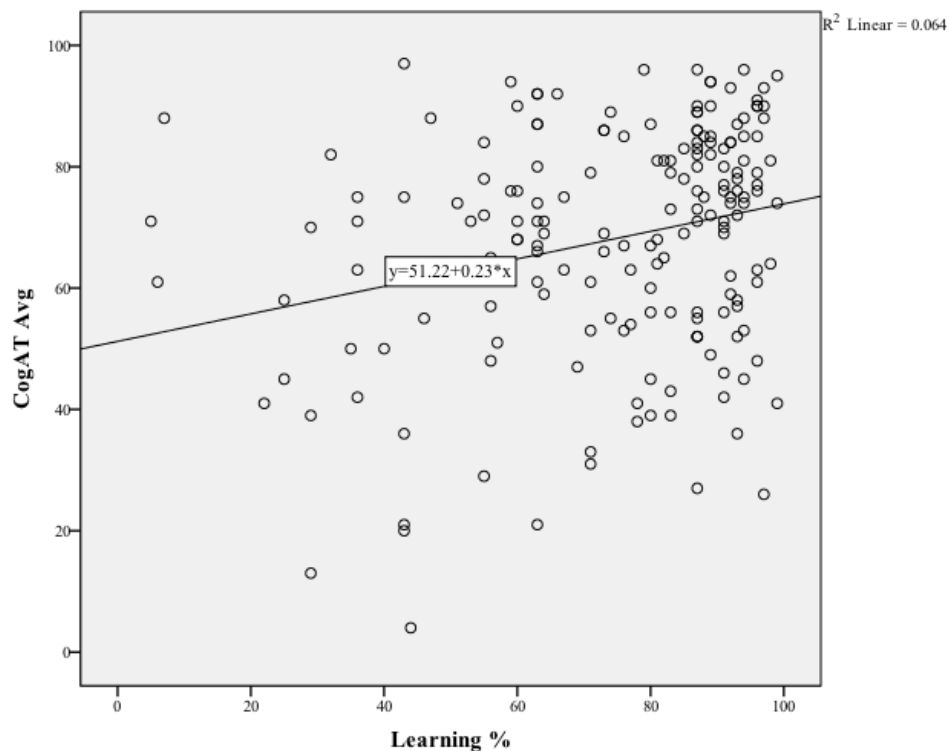


Figure 8. Scatterplot depicting the association between Learning % and CogAT Avg

The other scales, *Motivation*, *Creativity*, and *Leadership* were calculated with acceptance to the program, as shown in Tables 11, 12, and 13.

Table 11

Correlation between Motivation % and Acceptance to Program

		Accepted to Program	Motivation %
Accepted to Program	Pearson Correlation	1	.200**
	Sig. (2-tailed)		.007
	N	181	181
Motivation %	Pearson Correlation	.200**	1
	Sig. (2-tailed)	.007	
	N	181	181

** . Correlation is significant at the 0.01 level (2-tailed).

Table 12

Correlation between Creativity % and Acceptance to Program

		Accepted to Program	Creativity %
Accepted to Program	Pearson Correlation	1	.219**
	Sig. (2-tailed)		.003
	N	181	181
Creativity %	Pearson Correlation	.219**	1
	Sig. (2-tailed)	.003	
	N	181	181

** . Correlation is significant at the 0.01 level (2-tailed).

Table 13

Correlation between Leadership % and Acceptance to Program

		Accepted to Program	Leadership %
Accepted to Program	Pearson Correlation	1	.177*
	Sig. (2-tailed)		.017
	N	181	181
Leadership %	Pearson Correlation	.177*	1
	Sig. (2-tailed)	.017	
	N	181	181

*. Correlation is significant at the 0.05 level (2-tailed).

A positive correlation coefficient ($r = +.252$) was found for the association between students' percentile ranking on the *Learning Characteristics* portion of the SRBCSS and performance on the CogAT. While the correlation was significant at the 0.01 level, the strength of the relationship was low. Positive correlations were also found for *Motivation* ($r = +.200$), *Creativity* ($r = +.219$), and *Leadership* ($r = +.177$), and each were significant, though the strength of the correlations were also low. A linear regression analysis was conducted to evaluate how students' scores on the *Learning Characteristics* portion of the SRBCSS might predict performance on the Cognitive Abilities test. As shown in the scatterplot in Figure 8, the regression equation for predicting performance on the CogAT is

$$\text{CogAT Avg} = +51.22 + (+0.23)\text{Learning \%}$$

Table 14 describes the linear relationship between CogAT Avg and Learning %.

Table 14

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.252 ^a	.064	.058	18.436

a. Predictors: (Constant), Learning %

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4139.476	1	4139.476	12.178	.001 ^b
	Residual	60842.878	179	339.904		
	Total	64982.354	180			

a. Dependent Variable: CogAT Avg

b. Predictors: (Constant), Learning %

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	51.221	5.044		10.155	.000
	Learning %	.227	.065	.252	3.490	.001

a. Dependent Variable: CogAT Avg

The correlation between Learning % and CogAT Avg was +.252. Approximately 6.4% ($R^2 = .064$) of the variance of CogAT Avg was accounted for by its linear relationship with scores on the *Learning Characteristics* portion of the SRBCSS. The model is statistically significant ($F_{1,179} = 12.178, p = .001$), but it does not really explain a whole lot of the variability in the scores on the CogAT. The little bit it does explain (6.4%), it explains well. In interpreting this information, there must be other explanatory factors that may be worth investigating that could better explain the variability in students' scores on the Cognitive Abilities Test. This will be discussed further below.

Discussion

The findings from the current study are certainly very interesting and will help to guide future decisions within the Johnsonville Public Schools district in terms of how to best admit students to the ACT program. The first research question guiding this study attempted to ascertain differences between students testing from various buildings and grade levels throughout the district. Based on the findings, it is clear to see that the number of students testing decreases with each grade level. The majority of student testers represented in the sample came from second grade or third grade, while there were fewer students represented for testing at fifth and sixth grade. The reasons for this may vary, but a few possibilities follow. First, the option to have students tested becomes available to families at the end of second grade. Thus, after hearing about the ACT program from classroom teachers, district publications, or other families within the district, there is probably quite a bit of interest generated and parents may look to have their child test for the program. This in turn, acts as a system to “weed out” students from testing in subsequent years. Often, when parents receive the rejection letter or see that their child's performance on the test was quite low, they choose not to test again in

subsequent years. This finding might indicate that we work to educate parents and classroom teachers at our lower grade levels more about gifted and talented students and the ACT program, in general.

Findings from this study also showed differences between the individual school buildings. Almost one-third of the total students tested (26.5%) came from Burbank Elementary School. Yet, Burbank had lowest mean score of the average percentile ranking on the *Cognitive Abilities Test* ($M = 62.96$). From discussions with the ACT program's previous director, this pattern seemed to occur each year, though further analysis of past data would serve as evidence of this. Thus, it might be worthwhile to ensure that all buildings have a consistent understanding of how to nominate students.

Analysis of the data also revealed that a number of the students who tested for the program had very low test scores – some even as low as the fourth percentile. This was certainly quite revealing as the participants were tested for admittance into a program for gifted and talented students. Though there might be a few factors that contribute to these lower scores, such as the fact that the test is timed, the novelty of a “bubble test,” and, quite possibly, test anxiety, this finding does indicate that some of the students testing for the program would most likely not be considered academically gifted and talented. To ameliorate this problem, a better screening process may need to be implemented so as to not test students unnecessarily.

The second and third research questions that guided this study sought to evaluate the *Renzulli Scales for Rating the Behavioral Characteristics of Superior Students* and determine if there might be an association between the various scales and admittance to the program. What's more, a linear regression was conducted to evaluate whether or not the *Learning Characteristics Scale* on the SRBCSS served as a good predictor of student performance on the CogAT. The

Learning Characteristics Scale (See Appendix A) asks teachers to rate student behaviors of student learning tendencies, such as having “a large storehouse of information about a variety of topics” or “keen and insightful observations” (Renzulli et al., 2002a). The findings showed that there really was not a strong relationship between the *Learning Characteristics Scale* and performance on the CogAT. In fact, there was a weak relationship between all of the other *Renzulli Scales – Motivation, Creativity, & Leadership* – and admittance the ACT program, too. This is somewhat contrary to the literature and what we would *think* would be the case for these students. Most educators would probably assume that ratings on the *Learning Characteristics Scale* of the SRBCSS would mean that a student would perform well on the CogAT. Because there was not truly a relationship found in this study, it begs the question whether or not the *Renzulli* learning scale accurately measures students’ general reasoning abilities. It seems somewhat hard to believe that an eleven-item scale could capture a child’s capabilities in the areas most linked to success in school. What’s more, because the scales are based on teacher *impressions*, it may not be as valid as we might think. Renzulli et al. (2002b) have definitely brought to light an important idea about the giftedness – it is most likely more than just pure intellect. However, the degree to which the *Scales* are taken into consideration during identification processes, and how they might be used in tandem with other instruments, warrants further exploration. We know there are exceptions to every rule. Some students may perform poorly on the CogAT, but do well in school because of pure grit. Other students may perform well on the Cognitive Abilities Test but, because they lack social skills or intrinsic motivation, they may perform poorly in school. Further multi-factor analysis will need to be completed to help understand this dynamic more. What’s more, as the ACT program’s new director, I will need to establish my own philosophy in order to guide the direction of the program and to help

determine what kinds of students will fit best.

Conversations with the previous two directors of the program help to understand different philosophies for admitting students. One director, who only used scores from the CogAT, most likely had many bright students, but it could probably be inferred that not all of the students were highly motivated or showed strong leadership skills. The other director of the program sought to expand the definition of giftedness to include other traits, such as leadership, motivation, and creativity, as consistent with Renzulli and his colleagues (Renzulli et al., 2002b). With the findings from this study, the challenge going forward will be to determine the appropriate direction to take in terms of what *students* should be admitted, what *instruments* to use to find those students, and how best to prepare *administrators*, *teachers*, and *parents* for any changes that may result.

Implications of the Study

The findings from this study help to open the discussion for what course of action to take when trying to address the very difficult and controversial topic of finding the best system to identify students for admittance to the ACT program at Johnsonville Public Schools. The following recommendations will help serve as a catalyst to ameliorate some of the problems with the current system and to stimulate conversation about the future steps. First, the data clearly shows that more work needs to be done up front to ensure that the students who take the *Cognitive Abilities Test* genuinely demonstrate traits of giftedness. Though our conceptions of what it means to be gifted have greatly changed since the early 20th Century (Reis, n.d.), the ACT program's foundation was built on serving students who needed *academic* acceleration and enrichment. Thus, those students testing for the program should demonstrate evidence of high-intellectual and creative achievement capability. One way to assist with this would be to set up a

multi-phase screening process. After being nominated, those individuals on the admittance committee could use students test scores, such as students' scores from the *Discovery Education Assessment*. By analyzing student performance on this test, educators at Johnsonville might be able to make more refined selections for the students that should actually take the *Cognitive Abilities Test*.

Another implication of this study remains in the fact that there seems to be a need to work with all stakeholders – building administrators, classroom teachers, and parents – so that there is a better understanding of the traits of giftedness, what the Johnsonville ACT Program actually *is*, and how to recommend or nominate students. When a parent asks questions about whether or not they should nominate their child for the ACT program, it can certainly be a difficult or somewhat uncomfortable conversation, especially if the student may not demonstrate all of the qualities of someone who would fit best in the program. However, these conversations should happen so as not to confuse families of student ability or provide false hope to students who want to be in the program. There also appears to be a need to have common and consistent guidelines for nominating students to help in making informed selections and to ensure that the students who are nominated are those that *should* be nominated.

Finally, more work needs to be done in trying to determine what instruments should be used in the nomination process. This will be discussed more as part of the *Suggestions for Future Studies*. However, one implication from this study is to review the use of the *Renzulli Scales* and how they are used as part of the admission process. What's more, a firm direction for the program must be established. Will students who are very bright but are lacking in leadership skills and/or motivation be disqualified? Or, should they be admitted so as to have a place to actually work on building those skills while also being challenged academically? What about

those highly motivated students who just do not score high enough on the CogAT? Should we accept them into the program or not? These are all important questions that will need to be addressed in the near future.

Limitations of the Study

There are a few limitations to the current study that should be noted. First and foremost, while the *Cognitive Abilities Test* has been found to be very reliable, there are still many factors that can play into student performance on the test, such as test anxiety, nervousness, and unfamiliarity with “bubble tests” to name a few. What’s more, the reliability of the *Renzulli Scales* should also be considered. Though each year teachers at various buildings are asked to sit in on a “Renzulli Refresher” to help remind them of the procedures for using the scales, teachers have never had a formal training related to SRBCSS, and many have commented on feeling uncomfortable with using them. This certainly could have an effect on *how* students are rated.

There are also many factors and complexities at play when nominating students. Teachers may have differing opinions of student ability – where one teacher may see promise, another may not. This is even more pronounced when teachers see a range of abilities in different subject areas. What’s more, though analyses were not run on either the *Child Profile* filled out by parents or the *Student Application* completed by students at the time of testing, there are questions as to how reliable these instruments truly are. Parents often see their children through the eyes of a *parent* – thus, they may not have the experience or expertise to truly make informed decisions about academic performance. While parent input is important, the fact that some parents *want* their child to be in the ACT program may affect *how* they fill out the *Child Profile*. These are just a few of the limitations to this current study.

Suggestions for Future Studies

With the recommendations mentioned above, there is a lot of room to conduct future studies. One study that could have a great impact on the identification process would be to look back at student scores on the *Discovery Education Assessment* for those students who took the test last school year to see if there is any association between performance on the *Discovery* test and the CogAT. Research questions could include the following:

- Is there an association between student performance on the *Discovery* test and student performance on the *Cognitive Abilities Test*?
- Is student performance on the *Discovery* test a good predictor of performance on the CogAT?

Answering these questions might support the implementation of a multi-phase admittance procedure in which student test scores from *Discovery* are used to screen those students nominated for the ACT program.

Another potential study would be to research the SRBCSS further by interviewing teachers to obtain their perceptions on using the *Scales* and their perceptions on whether or not the *Renzulli Scales* measure what they are supposed to measure. The *Scales* might continue to be a component of the testing process, but it might be more worthwhile to use them after initial student screening.

Finally, more research should be conducted on how to obtain parent perspectives as far as the nomination process is concerned. Parent input is essential, especially if school districts wish to be partners with parents in educating academically gifted and talented children. That being

said, it will be important to find some type of instrument or process that provides parent feedback that is useful and reliable.

Conclusion

Jane Piirto, Professor in the School of Education at Ashland University where she is the Director of Talent Development Education once said,

Gifted children have no greater obligation than any other children to be future leaders or world class geniuses. They should just be given a chance to be themselves, children who might like to classify their collections of baseball cards by the middle initials of the players, or who might like to spend endless afternoon hours in dreamy reading of novels, and to have an education that appreciates and serves these behaviors (Piirto, 1999).

To be sure, all students should have equal opportunity for personal growth, and school districts should seek to establish classrooms in which academically gifted and talented students feel comfortable to take risks, explore their own interests, create, try, make mistakes, and find solutions to real-life problems. It is factors such as these that characterize a program for the qualitatively different learner we call *gifted*. Though the task of identifying students for these programs is not easy, it is certainly important that we learn more so as to help ensure that we are recognizing students in need of qualitatively different educational programs.

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