

Academic and Behavioral Characteristics of Emotionally Disturbed, Learning-Disabled,  
and General Education Students at a Secondary Residential School

A dissertation submitted in partial fulfillment of the requirements for the degree of  
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By

Courtney Gaskins  
Master of Education  
University of Mary Washington, 2004  
Bachelor of Arts  
George Mason University, 1989

Director: Margo Mastropieri, Professor  
College of Education and Human Development

Summer Semester 2009  
George Mason University  
Fairfax, VA

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## DEDICATION

This dissertation is dedicated to my parents, Louis and Sylvia Gaskins and to my daughter, Shanelle. A special dedication goes the students at Youth for Tomorrow who encouraged me to reach my goal.

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## TABLE OF CONTENTS

|  | Page |
|--|------|
| List of Tables .....   | ix   |
| List of Figures .....  | xii  |
| Abstract .....   | xiv  |
| 1. Introduction .....  | 1    |
| Background of the Problem .....  | 1    |
| Residential Group Homes .....  | 2    |
| Characteristics Associated with Students in Residential Care.....                  | 3    |
| Statement of the Problem.....  | 4    |
| Significance of the Study .....  | 6    |
| Purpose of the Study .....   | 8    |
| Hypothesis and Research Questions .....  | 9    |
| Definition of Key Terms .....  | 13   |
| 2. Literature Review.....  | 18   |
| Residential Facilities .....   | 18   |
| Presenting Issues of Adolescents in Residential Care<br>and Academic Impacts ..... | 19   |
| Foster Care .....  | 21   |
| Juvenile Offenses .....  | 23   |
| Illicit Drug Use .....   | 24   |
| Psychological Disorders including co-morbidity.....                                | 25   |
| Relapse Prevention.....  | 26   |
| Other Variables Impacting on Academic Achievement .....                            | 27   |
| Age and Gender .....   | 27   |
| Geographic Location.....   | 28   |
| Race.....  | 29   |
| Number of Placements .....   | 30   |
| Family Status .....  | 31   |
| Educational Classification .....   | 31   |
| Students with Emotional and Behavioral Disorders .....                             | 32   |
| Students with Other Health Impairment .....  | 33   |
| Residential Care and Academic Achievement.....                                     | 35   |
| Academic Achievement Studies Related to Residential Care .....                     | 36   |
| Academic Achievement and Adolescents in Residential Care .....                     | 40   |

|  |    |
|--|----|
| Summary .....  | 44 |
| 3. Methodology .....   | 46 |
| Population under Study .....                                   | 46 |
| Description of the Secondary Residential School of Study ..... | 47 |
| Sample.....  | 49 |
| Operational Definitions of Predictor Variables .....           | 50 |
| Student Demographics .....                                     | 50 |
| Family Status .....  | 51 |
| Criminal Offenses .....  | 51 |
| Educational Classification .....                               | 51 |
| Psychological Disorders.....                                   | 51 |
| Co-morbidity .....   | 52 |
| Type of Placements .....                                       | 52 |
| Operational Definitions of the Outcome Variables .....         | 52 |
| Woodcock Johnson III Test of Achievement .....                 | 52 |
| School Archival Records Search .....                           | 54 |
| Cognitive-Achievement Discrepancies.....                       | 54 |
| Standard Score .....   | 55 |
| Research Design and Analysis.....                              | 56 |
| Data Source .....  | 57 |
| Data Collection Procedures.....                                | 57 |
| Data Analysis Procedures .....                                 | 57 |
| Descriptive Statistics and Analysis of Variance .....          | 58 |
| Pearson Chi-Square.....  | 59 |
| Logistical Regression Model .....                              | 60 |
| Outcome Variable .....   | 62 |
| Academic Achievement.....                                      | 62 |
| Ability-Achievement Discrepancy.....                           | 62 |
| Predictor Variable .....                                       | 62 |
| Cognitive Factors .....  | 63 |
| 4. Results.....  | 64 |
| Academic and Behavioral Characteristics of Students .....      | 65 |
| General Description of Population under Study .....            | 66 |
| Family Status .....  | 67 |
| Psychological Issues .....                                     | 68 |
| Juvenile Offenses .....  | 70 |
| Illicit Drug Use .....   | 71 |
| Educational Description.....                                   | 73 |
| Placement Issues .....   | 75 |
| Presenting Issue .....   | 76 |
| Number of placements .....                                     | 77 |
| Length of Stay .....   | 78 |
| Reasons for discharge .....                                    | 79 |
| Intelligence.....  | 80 |

|  |     |
|--|-----|
| Relationship between Variables Associated with Residential Placement ..... | 81  |
| Gender .....   | 82  |
| Number of Placements .....   | 87  |
| Race .....   | 92  |
| Length of Stay .....   | 95  |
| Presenting Issue .....   | 100 |
| Geographic Location .....  | 104 |
| Family Status .....  | 108 |
| Educational Classification .....   | 109 |
| Academic Achievement Upon Admissions to Residential School .....           | 114 |
| WJ-III Test of Achievement for the Population .....                        | 115 |
| WJ-III Test of Achievement and Educational Classifications .....           | 120 |
| WJII Test of Achievement and Type of Placement .....                       | 122 |
| Intelligence Quotient (IQ) .....   | 123 |
| Factors Impacting on the Academic Achievement of Students .....            | 125 |
| Gender .....   | 126 |
| Grade Retention .....  | 127 |
| Educational classification .....   | 129 |
| Geographic location .....  | 130 |
| Family Status .....  | 131 |
| Illicit Drug Use .....   | 133 |
| Number of Placements .....   | 135 |
| Presenting issue .....   | 136 |
| ADHD .....   | 137 |
| Intelligence Quotient (IQ) .....   | 138 |
| Full scale IQ .....  | 138 |
| Verbal IQ .....  | 140 |
| Performance IQ .....   | 141 |
| Explaining or Predicting Achievement .....                                 | 142 |
| Academic Growth Over Time .....  | 149 |
| Educational Classifications Over Time .....                                | 150 |
| General Education Students .....   | 150 |
| Students with Specific Learning Disabilities .....                         | 151 |
| Students with Emotional and Behavioral Disorders .....                     | 153 |
| Students with Other Health Impairment .....                                | 153 |
| Gender Differences Over Time .....   | 154 |
| Males .....  | 154 |
| Females .....  | 154 |
| Discrepancies between Ability and Achievement .....                        | 156 |
| 5. Conclusion .....  | 157 |
| Gender .....   | 167 |
| Grade Retention .....  | 170 |
| Family Status .....  | 171 |
| Geographic Location .....  | 172 |

|   |     |
|---|-----|
| Illicit Drug Use .....                  | 172 |
| Number of Placements .....              | 173 |
| Presenting Issues .....                 | 173 |
| Educational Classification .....        | 174 |
| Intelligence Quotient (IQ).....         | 176 |
| Discrepancies .....                     | 176 |
| Passage Comprehension.....              | 178 |
| Unanswered Questions.....               | 179 |
| Assumptions of the Study .....          | 182 |
| Limitations of the Study.....           | 183 |
| Accuracy of Data and Missing Data ..... | 183 |
| Validity of the Study .....             | 184 |
| Ethical Considerations .....            | 184 |
| References .....                        | 185 |



## LIST OF TABLES

| Table  | Page |
|--|------|
| 3.1. Typical Standard Score Scale .....  | 56   |
| 4.1. Age, Gender, Race and Geographic Location of Students Between<br>2001 and 2008 .....  | 66   |
| 4.2. Family Status of Students Between 2001 and 2008.....  | 67   |
| 4.3. Psychological Characteristics of Students Between 2001 and 2008 .....   | 69   |
| 4.4. Juvenile Offenses of Students Between 2001 and 2008 .....   | 71   |
| 4.5. Illicit Drug Use of Students Between 2001 and 2008.....   | 72   |
| 4.6. Level of Substance Abuse (SASSI Scores) Between 2006 and 2008.....  | 73   |
| 4.7. Educational Characteristics of Students Between 2001 and 2008 .....   | 74   |
| 4.8. Educational Classification of Students Between 2001 and 2008.....   | 75   |
| 4.9. Types of Placements for Students Between 2001 and 2008 .....  | 76   |
| 4.10. Number of Placements for Students Between 2001 and 2008.....   | 78   |
| 4.11. Length of Stay for Students Between 2001 and 2008.....   | 79   |
| 4.12. Types for Discharge .....  | 80   |
| 4.13. Pearson Chi-Square for Relationship Between Gender and Grade<br>Retention, Illicit Drug Use, Juvenile Offenses and ADHD .....                  | 87   |
| 4.14. Pearson Chi-Square for Relationship Between Gender and Comorbidity,<br>Psychological Disorder and Psychiatric Medications .....                | 87   |
| 4.15. Pearson Chi-Square for Relationship Between Number of Placements<br>and Grade Retention, Illicit Drug Use, Juvenile Offenses and ADHD .....    | 91   |
| 4.16. Pearson Chi-Square for Relationship Between Number of Placements and<br>Comorbidity, Psychological Disorder, and Psychiatric Medications ..... | 91   |
| 4.17. Pearson Chi-Square for Relationship Between Various Variables.....   | 95   |
| 4.18. Pearson Chi-Square for Relationship Various Variables.....   | 95   |
| 4.19. Pearson Chi-Square for Relationship Between Length of Stay and<br>Grade Retention, Illicit Drug Use, Juvenile Offenders, and ADHD .....        | 99   |
| 4.20. Pearson Chi-Square for Relationship Length of Stay and Comorbidity,<br>Psychological Disorder, and Psychiatric Medications .....               | 100  |
| 4.21. Pearson Chi-Square for Relationship Between Presenting Issues and Grade<br>Retention, Illicit Drug Use, Juvenile Offenders, and ADHD .....     | 104  |
| 4.22. Pearson Chi-Square for Relationship Between Presenting Issues and<br>Comorbidity, Psychological Disorders, and Psychiatric Medications.....    | 104  |

|  |     |
|--|-----|
| 4.23. Pearson Chi-Square for Relationship Between Geographic Location and Grade Retention, Illicit Drug Use, Juvenile Offender, and ADHD .....   | 107 |
| 4.24. Pearson Chi-Square for Relationship Between Geographic Location and Comorbidity, Psychological Disorder, and Psychiatric Medications .....   | 108 |
| 4.25. Pearson Chi-Square for Relationship Between Family Status and Grade Retention, Illicit Drug Use, Juvenile Offender, and ADHD .....   | 109 |
| 4.26. Pearson Chi-Square for Relationship Between Family Status and Comorbidity, Psychological Disorder, and Psychiatric Medications .....   | 109 |
| 4.27. Pearson Chi-Square for Relationship Between Educational Classification and Grade Retention, Illicit Drug Use, Juvenile Offender, and ADHD .....  | 114 |
| 4.28. Pearson Chi-Square for Relationship Between Educational Classification and Comorbidity, Psychological Disorder, and Psychiatric Medication .....   | 114 |
| 4.29. WJ-III Test of Achievement Standard Scores the Population of Student.....  | 120 |
| 4.30. Structure of the Discriminant Function.....  | 121 |
| 4.31. IQ Standard Scores for the Population of Students .....  | 125 |
| 4.32. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Gender.....   | 127 |
| 4.33. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Grade Retention .....   | 128 |
| 4.34. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Educational Classification .....  | 130 |
| 4.35. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Geographic Location .....   | 131 |
| 4.36. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and family status.....  | 133 |
| 4.37. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Academic Categories and Substance Abuse .....  | 134 |
| 4.38. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Academic Categories and Number of Placements .....   | 136 |
| 4.39. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Academic Categories and Presenting Issues.....   | 136 |
| 4.40. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Academic Categories and ADHD .....   | 138 |
| 4.41. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Academic Categories and Full Scale IQ Standard Scores .....  | 139 |
| 4.42. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Academic Categories and Verbal IQ Standard Scores .....  | 141 |
| 4.43. Pearson Chi-Square Relationship Between WJ-III Standard Scores in Academic Categories and Performance IQ Standard Scores .....   | 142 |
| 4.44. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Male Students..... | 144 |

|   |     |
|---|-----|
| 4.45. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Students with SLD .....         | 145 |
| 4.46. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Students with EBD.....          | 146 |
| 4.47. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Students with OHI.....          | 146 |
| 4.48. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Both Parents Incarcerated ..... | 147 |
| 4.49. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Illicit Drug Use .....          | 147 |
| 4.50. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Full Scale IQ Scores.....       | 148 |
| 4.51. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Verbal IQ Scores.....           | 148 |
| 4.52. Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Academic Categories and Empirically Defined Below Average to Average or Above Achievement – Performance IQ Scores .....     | 149 |
| 4.53. Pre- and post WJ-III Standard Scores in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency for the Population of Study.....  | 150 |
| 4.54. Pre- and post WJ-III Standard Score in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency by Educational Classification .....                                      | 151 |
| 4.55. Pre- and post WJ-III Standard Scores in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency by Educational Classification .....                                     | 152 |
| 4.56. Pre- and post WJ-III Standard Scores in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency by Gender .....   | 155 |

## LIST OF FIGURES

| Figure   | Page |
|--|------|
| 1. Percent Full Scale IQ for the Population under Study Relationships Between Variables Associated with Residential Placements ..... | 81   |
| 2. Percent of Students Retained One or More Grades by Gender .....   | 83   |
| 3. Percent of Juvenile Offenders by Gender .....   | 83   |
| 4. Percent of Students Diagnosed with ADHD by Gender .....   | 84   |
| 5. Percent of Students with a Record of Comorbidity by Gender .....  | 84   |
| 6. Percent of Students with Psychological Disorders by Gender .....  | 85   |
| 7. Percent of Students Taking Psychiatric Medications by Gender .....  | 85   |
| 8. Percent of Students Using Illicit Drugs by Gender .....   | 86   |
| 9. Percent of Grades Retained by Number of Placement .....   | 88   |
| 10. Percent of Juvenile Offenders by Number of Placements .....  | 88   |
| 11. Percent of Students Diagnosed with a Psychological Disorder by Number of Placements .....  | 89   |
| 12. Percent of Students Experiencing Comorbidity by Number of Placements .....   | 89   |
| 13. Percent of Students Taking Psychiatric Medications by Number of Placements .....   | 90   |
| 14. Percent of Students Using Illicit Drugs by Number of Placements .....  | 90   |
| 15. Percent of Grades Retention by Race .....  | 92   |
| 16. Percent of Psychological Disorders by Race .....   | 93   |
| 17. Percent Students taking Psychiatric Medications by Race .....  | 93   |
| 18. Percent of Students using Illicit Drugs by Race .....  | 94   |
| 19. Percent of Juvenile Offenders by Race .....  | 94   |
| 20. Percent of Grades Retained by Length of Stay at Residential Facility .....   | 96   |
| 21. Percent of Students with ADHD by Length of Stay at Residential Facility .....  | 97   |
| 22. Percent of Students Comorbidity and Length of Stay at Residential Facility .....   | 97   |
| 23. Percent of Students with Psychological Disorders and Length of Stay at Residential Facility .....                                | 98   |
| 24. Percent of Students taking Psychiatric Drugs and Length of Stay at Residential Facility .....                                    | 98   |
| 25. Percent of Students using Illicit Drugs and Length of Stay at Residential Facility .....   | 99   |

|   |     |
|---|-----|
| 26. Percent of Juvenile Offenders and Type of Placement .....   | 101 |
| 27. Percent of Presenting Issue by Number of Placements .....   | 101 |
| 28. Percent of Students with Psychological Disorders and Type of Placement .....                          | 102 |
| 29. Percent of Students taking Psychiatric Medications and Type of Placement .....                        | 102 |
| 30. Percent of Grades Retained by Geographic Location .....   | 105 |
| 31. Percent of Juvenile Offenders by Geographic Location .....  | 105 |
| 32. Percent of Students Diagnosed with Psychological Disorders by Geographic<br>Location .....            | 106 |
| 33. Percent of Students taking Psychiatric Medications by Geographic Location .....                       | 106 |
| 34. Percent of Students using Illicit Drugs by Geographic Location .....                                  | 107 |
| 35. Percent of Grade Retention by Educational Classification .....  | 110 |
| 36. Percent of Juvenile Offenders by Educational Classification .....                                     | 110 |
| 37. Percent of Students with ADHD by Educational Classification .....                                     | 111 |
| 38. Percent of Students Diagnosed with Psychological Disorders by Educational<br>Classification .....     | 111 |
| 39. Percent of Students with Comorbidity and Educational Classification .....                             | 112 |
| 40. Percent of Student taking Psychiatric Medications and Educational<br>Classification .....             | 112 |
| 41. Percent of Student taking Illicit Drugs and Educational Classification .....                          | 113 |
| 42. Mean Woodcock Johnson III Standard Scores in Academic Categories for the<br>School's Population ..... | 116 |
| 43. Percent Distribution of Student Population's WJ-III Board Reading Standard<br>Scores .....            | 116 |
| 44. Percent Distribution of Student Population's WJ-III Board Math Standard<br>Scores .....               | 117 |
| 45. Percent Distribution of Student Population's WJ-III Broad Written Language<br>Standard Scores .....   | 118 |
| 46. Percent Distribution of Student Population's WJ-III Passage Comprehension<br>Standard Scores .....    | 118 |
| 47. Percent Distribution of Student Population's WJ-III Fluency Standard Scores .....                     | 119 |
| 48. Percent Full Scale IQ for Secondary School Population .....   | 123 |
| 40. Percent Performance IQ Standard Scores for the Secondary School Population .....                      | 124 |
| 50. Percent Verbal IQ Standard Scores for the Secondary School Population .....                           | 124 |
| 51. Mean WJ-III Standard Scores by Gender .....   | 127 |
| 52. Mean WJ-III Standard Scores by Grades Retained .....  | 128 |
| 53. Mean WJ-III Standard Scores by Educational Classification .....                                       | 120 |
| 54. Mean WJ-III Standard Scores by Geographic Location .....  | 131 |
| 55. Mean WJ-III Standard Scores by Family Status .....  | 132 |
| 56. Mean WJ-III Standard Scores by Substance Abuse .....  | 134 |
| 57. Mean WJ-III Standard Scores by Number of Placements .....   | 135 |
| 58. Mean WJ-III Standard Scores by ADHD .....   | 137 |
| 59. Mean WJ-III Standard Scores by Full Scale IQ .....  | 139 |
| 60. Mean WJ-III Standard Scores by Verbal IQ .....  | 140 |
| 61. Mean WJ-III Standard Scores by Performance IQ .....   | 141 |

## ABSTRACT

### ACADEMIC AND BEHAVIORAL CHARACTERISTICS OF EMOTIONALLY DISTURBED, LEARNING-DISABLED, AND GENERAL EDUCATION STUDENTS AT A SECONDARY RESIDENTIAL SCHOOL

Courtney Gaskins, PhD

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Dissertation Director: Dr. Margo Mastropieri

This study provides a description of the academic functioning levels and performance gains of adolescents (n=423) attending a residential school over a seven year period using secondary data. Students ranged in age from 12 to 18 and represented a wide range of cultural and linguistic backgrounds. The vast majority of the sample were males (68%).

The study examined student academic and behavioral characteristics, using uni-variate, bi-variate, and multi-variate analyses. It examined the academic abilities upon entry into the residential school as well as academic gains over time in reading, mathematics, written language, passage comprehension, and fluency. Data on students were grouped and compared based on the presenting academic and behavioral characteristics and educational classifications identified by the residential facility. Twelve

academic and behavioral factors were identified because of their strong association with placement in residential facilities and potential impact on academic success in the program.

Results revealed that adolescents entering this residential school were a homogenous population with similar characteristics and treatment needs as well as numerous barriers to academic achievement. Student group affiliation (i.e., age, gender, race, etc.) or type of placement (i.e., foster care, adjudicated, substance abuse, etc.) revealed similar characteristics. Most students entered the secondary school with one or more academic areas of weakness. Strong relationships were found between academic abilities and gender, educational classification, number of placements, illicit drug use, presenting issue, and IQ. In addition, it was found that gender, educational classification, illicit drug use, and IQ could predict academic achievement in one or more areas examined.

Differences in academic abilities were obtained, based on time spent in the facility. As a population, students made significant academic gains over time in all areas except passage comprehension. Furthermore, students with specific learning disabilities made the most significant academic gains. Lastly, males made significant gains over time in all academic areas.

This study provides educators with a snap shot of the academic, behavioral and demographic outlook of students entering a residential school. It examines the achievement gains made by groups of students over time, as well as looks at the possible predictor factors which lead to academic success.

## 1. Introduction

This introduction provides the background on a broad range of issues commonly associated with students attending secondary residential schools. This is followed by the significance of the problem, the purpose of the study, the researcher's hypothesis and research questions as they relate to the problem, and the definitions of key terms.

### *Background of the Problem*

During the 1990s, there was a growing pessimism toward residential placements for troubled youth (Friman, Osgood, et al., 1996; Pecora, Whittaker, Maluccio, Barth, & Plotnick, 2000; Wells, 1991) and an increased call for family preservation. In addition, many believe there are not enough standards for evidence-based practices within residential settings to justify their continuation (Hair, 2005). This argument has recently accelerated following continued critical reviews of residential care for children and youth (Burns & Hoagwood, 2002; Lyons & McCulloch, 2006). Many of these concerns are based on a general issue within social science research showing that placing troubled youth together is likely to result in an increase in problem behavior (Dishion & Dodge, 2005); however, little research has been done on the outcomes of residential care during the last two decades, and the evidence for its effectiveness remains weak (Farmer, Dorsey, & Mustillo, 2004).



Never the less, residential care services and group living arrangements remain quite common, and some states place more than 50% of their older foster care adolescents in group care (Baker, Archer, & Curtis, 2005; Barth & Chintapalli, 2007; Wulczyn & Zimmerman, 2005). Federal data indicate that at any time, 19% of youth in out-of-home care are placed in group homes and residential care settings (U.S. Department of Health and Human Services [USDHSS], 2005), and an estimated 11% are in treatment foster care (Foster Family-Based Treatment Association [FFTA], 2004). In the United States alone, it can be assumed that between 20,000 and 40,000 children will be placed in various types of residential facilities, and that about 140,000 to 210,000 children will pass through these settings each year (Center for Mental Health Services, 2000; National Advisory Mental Health Council's Workgroup on Child and Adolescent Mental Health Intervention Development and Deployment, 2001). In addition, the cost of residential care is high. In 2001, the State of Colorado reported that the cost for an average length of stay (usually seven months) in a residential facility was \$53,000 per youth. This figure rose to \$67,000 if the residential facility had an approved on-grounds school (Office of the State Auditor, 2002). However, with 3% of all school children exhibiting problems serious enough to warrant residential care, further attention needs to be given to this issue (U.S. General Accounting Office, 1994).

### *Residential Group Homes*

A residential group home is generally thought to be a small residential facility for groups of unrelated youth. However, group homes are often listed under the broader category of residential care (James, Leslie, et al., 2006). A clear operational distinction

between different residential settings do not exist in the research literature (Curtis, Alexander, & Lunghofer, 2001). Some have described group homes as ideal for adolescents who might struggle with issues of independence and individualization or might be too difficult for therapeutic foster parents to manage (Burns, Hoagwood, & Mrazek, 1999). Since most residential facilities are operated by private, not-for-profit organizations, each has a great deal of latitude to design their own program of services and establish their own criteria for the children and adolescents they serve (Little, Kohm, & Thompson, 2005).

Residential group homes continue to fall on a continuum of care for many adolescents, from most restrictive (e.g., group care, residential care) to least restrictive (e.g., foster care, kinship care) care (Goerge, Van Voorhis, Sanfilippo, & Harden, 1996). Each provides specialized services for adolescents who are removed from their homes due to various problems including behavior, educational needs, abuse and neglect, and substance abuse issues. Traditionally, mental health services have been the priority; however, recently, educational services are receiving considerable attention (e.g., Barth & Lee, 2009; Coalition for Residential Education; Jones & Landsdverk, 2006).

#### *Characteristics Associated with Students in Residential Care*

A vast majority of adolescents served in residential group homes have some degree of emotional and behavioral problems (Bates, English, & Kouidou-Giles, 1997). Furthermore, students identified as having emotional and behavioral disorders (EBD) by their local education agency (LEA) constitute 50% of all special education students placed in residential programs (Quinn, Newman, & Cumbald, 1995). The prevalence of

behavioral and mental disorders in residential populations has been well documented. Dale, Baker, and Anastasio (2007) conducted a state-wide survey of the background characteristics of a random sample of young people entering 16 New York residential facilities in 2001. They reported high rates of substance abuse, juvenile delinquency, and prior psychiatric hospitalizations. Baker, Kurland and Curtis (2007) examined data from the national residential study and also found high proportions of young people with histories of behavioral and emotional disorders admitted to residential facilities. Forty percent of the sample of adolescents had histories of substance abuse; half had histories of criminal activity and prior hospitalizations; and almost 80% were on psychotropic medications at the time of admission.

High rates of mental health problems were also found by Lyons, Libman-Mintzer, Kisiel, and Shallcross (1998) in their study of young people in 15 Illinois residential treatment centers. They found that eight out of ten young people met the criteria for a diagnosis on the Children's Severity of Psychiatric Illness measure. Several single-site studies of mental health problems of young people within residential care also provide documentation of similar issues (e.g., Brady & Caraway, 2002; Handwerk, Lazerlee, Soper, & Friman, 1999; Whittaker, Fine, & Grasso, 1989). This is compelling evidence that young people in residential group homes are likely to have serious emotional and behavioral issues prior to admission (Baker et al., 2005).

### *Statement of the Problem*

Major strides are being made in the field of adolescent residential care (Barth & Lee, 2009; Crimmens & Milligan, 2005; Jones & Lansdverk, 2006). Even then, youth

who attend residential facilities continue to be at higher risk of dropping out of school and not attending college or vocational school due to their low academic abilities and achievement (Hair, 2005; Trout, Hagaman, Casey, Reid, & Epstein, 2008; Vacca, 2008). Many of these young people are far behind their peers educationally and are often overlooked by policymakers and social services. These educationally disadvantaged adolescents face a unique set of challenges and risks as they move into adulthood. Accordingly, it is important to identify those variables which impede their academic development. Existing residential programs for these young people could address more effectively the gamut of risks they are exposed to and the unique challenges they face in employment, incarceration, drug and alcohol use, mental health, and other related issues if residential program personnel were to have a better understanding of the their educational and literacy challenges of these youth.

Students attending residential schools come with a host of issues which will significantly impact on their academic achievement. The behaviors that students exhibit within residential educational settings are often difficult for mainstream educators to identify with or to understand. Often, these students have been identified by psychologists or psychiatrists as having psychological disorders, such as depression, conduct disorder, or bipolar disorder. Residential schools tend to serve adolescents from multiple sectors of care, primarily adolescents with mental health needs or those stepping down from juvenile detention centers, or other special populations. These young people experience high rates of absenteeism when attending traditional schools and even higher

rates of school dropouts, thus leaving them unprepared for seeking productive employment.

### *Significance of the Study*

The population of the secondary residential school of study can provide optimal opportunities for not only understanding the academic struggles of special education students, but also general education students who may not have as significant academic issues, but struggle with family separation, psychological disorders, and substance abuse issues. There are numerous public and private organizations across the United States that are presented with the challenge of providing education to economically and socially disadvantaged adolescents, and to adolescents with chronic psychological, behavioral, and educational difficulties. For decades, society has grappled unsuccessfully with how to transform the growing number of adolescents who are homelessness, suffering from psychological issues, in foster care, or abused and neglected into adults with meaning and purpose in their lives. Residential schools may be able to provide one solution.

Findings on the effectiveness of residential placements have been inconclusive (Bates et al., 1997; Whittaker & Pfeiffer, 1994), particularly when it comes to academics. A review of the literature revealed that criteria for residential educational programs are vague, inadequate, and information on outcomes insufficient to guide practice (Gagnon & Leone, 2006; Gagnon & McLaughlin, 2004; Larzelere, Daly, Davis, Chmelka, & Handwerk, 2004). Basically, scientific evidence pertaining to academic achievement within secondary residential schools is in short supply. The interest for this study came from the need to better understand the nature of students often identified as needing

residential programs that include secondary educational schools. Few studies have addressed the long-term benefits of residential care (Little et al., 2005), particularly when most studies have excluded adolescents in long-term residential care and adolescents in need of secondary education. These are the students whose education is most likely to suffer from the out-of-home care experience itself (Bebbington & Miles, 1989). At present, there are very few studies that identify characteristics of adolescents in residential care particularly when it comes to academic achievement (Barth, Greeson, Guo, et al., 2002).

Research has repeatedly shown that academic achievement can be linked to reduced rates of recidivism and increased pro-social behavior (Katsiyannis & Archwamety, 1999; White, 2002; Wolford, Purnell, & Brooks, 2000). Because acquiring academic competence is a major developmental task for all children and adolescents (Havighurst, 1972), it is important to better understand all populations of students, particularly those who are more at risk of academic failure. Without prevention-focused programs, such as those offered by residential facilities, many of these adolescents will end up in juvenile justice facilities, which are generally not focused on education. Demonstrating increases in the academic performance of youth who are placed at residential facilities can be a powerful tool when communicating to policymakers who make decisions regarding the allocation of funding and resources.

There is very little evidence of the critical elements of residential services, including treatment efficacy and practice, cost-effectiveness, performance indicators and outcomes which lead to significant changes. To properly assess the academic gains of

students in residential care, multiple assessments are needed, including pre and post assessment pairings (Gagnon & McLaughlin, 2004; National Council on Crime and Delinquency, 2005). Without evidence of the effectiveness of residential placement, the future provisions for children and adolescents look bleak. Without evidence related to the value of residential care, incentives to send children away from home may be reduced. Likewise, there will continue to be a need for *last resort* provisions for children whose needs are compounded by poverty and abuse.

#### *Purpose of the Study*

This synthesis examines a secondary residential school designed to serve adolescents between the ages of 12-19 years. Specifically, the synthesis addresses the following questions: What are the characteristics and behaviors associated with youth attending a secondary residential school? What is the extent of these young peoples' educational deficits in reading, mathematics, writing, comprehension, and fluency? What characteristics are associated with their academic deficits? To answer these questions, this study focuses on examining existing data on students attending a residential school between the years of 2001-2008. The characteristics and behaviors of these young people have been examined as they relate to educational achievement and barriers commonly associated with educationally disadvantaged adolescents.

The general purpose of this study was to describe the academic achievement of adolescent students attending the secondary residential school. The study aimed to describe several characteristics and behaviors in relation to academic achievement. First, it described the behavior and characteristics of these students, then their abilities in

reading, mathematics, written language, comprehension, and fluency upon admission. Second, the study examined the academic differences between four educational classifications of students – general education students (GE), students with specific learning disabilities (SLD), students with emotional and behavioral disabilities (EBD), and students with other health impairments (OHI). Third, the study examined the differences in academic abilities based on the type of student placement identified by the residential facility of study, as: (1) social services placement, (2) probationary placement, (3) educational placement, (4) private placement, (5) substance abuse related placement, and (6) relapse prevention (sexual offenders). Fourth, the study determined if eleven factors commonly associated with residential placement (i.e., including geographic location, grade, age, gender, ethnicity, family status, foster care, juvenile offenders, substance use, psychological disorder or co-morbidity, and number of placements) can predict or explain academic achievement. In addition, the study examined student academic achievement over time, as well as the discrepancies between cognitive ability and achievement, commonly used to identify learning disabilities. Then, the researcher determined if there are varied differences in discrepancies between students identified as GE, SLD, and EBD. Lastly, student academic gains were described and correlated to the number of months a student was enrolled at the residential facility and attending school.

#### *Hypothesis and Research Questions*

Academic achievement was identified by how well individual students and groups of students performed on the Woodcock Johnson III Test of Achievement (WJ-III) (Woodcock, McGrew, & Mather, 2001, 2007) in broad reading, broad mathematics,



broad written language, comprehension, and fluency. The predictor variables were identified as the following:

(a) Four educational classifications:

- (1) general education students (GE);
- (2) students with specific learning disabilities (SLD);
- (3) students with emotional and behavioral disabilities (EBD);
- (4) students with Other Health Impairments (OHI).

(b) Six types of placements:

- (1) social services placements;
- (2) probationary placements;
- (3) educational placements;
- (4) private placements;
- (5) substance abuse placements;
- (6) relapse prevention placements.

(c) Eleven variables associated with residential placements:

- (1) geographic location;
- (2) age;
- (3) grade;
- (4) gender;
- (5) ethnicity;
- (6) family status;
- (7) foster care;

- (8) juvenile offenders;
- (9) substance use;
- (10) psychological disorder or co-morbidity;
- (11) number of placements.

Based on the outcome variables, the predictor variables, and the literature review, the following hypotheses were made:

1. Upon entry, students from the general education population will outperform students with SLD and students with EBD. Whereas, students with SLD will outperform students with EBD.
2. Students with EBD will show the greatest academic growth after attending the residential school for six months to a year.
3. Students placed at the residential facility through social services will show the smallest academic gains, and will fail to outperform students from other placement categories.
4. The eleven variables will show significance in explaining or predicting academic abilities upon entry into the residential facilities; however, psychological disorders and the number of placements will be the strongest predictors for student academic ability.
5. There will be a very small discrepancy between cognitive-achievement abilities for GE students, less than one standard deviation. For students with SLD, the discrepancy between cognitive-achievement ability will be significant; however, less than one or possibly two standard deviations as

students age. For students with EBD, there will be varied levels of discrepancies, which will lessen as these students age.

This study used existing data to better understand the academic achievement of adolescents attending a secondary residential school between the years of 2001-2008. It examined the literacy demands of reading, mathematics, comprehension, writing, and fluency, which were used to define academic achievement in this study.. Specific research questions included the following:

1. What are the academic and behavioral characteristics of adolescents attending the secondary residential school of study?
2. Upon entry into a secondary residential school, what significant academic deficits do students experience and what behavioral characteristics do students exhibit?
3. Are there academic differences between students based on educational classification, type of placement, and variables commonly associated with students placed in residential facilities?
4. What factors and/or variables (i.e., factors within educational classification, type of placement, or variables often associated with students who attend residential schools) contribute to or explain the academic achievement of adolescents attending a secondary residential school?
5. Do students experience significant academic growth within 6 or more months of attending a secondary residential school?
6. Are there significant discrepancies between cognition and achievement for

students with SLD, EBD, and those in GE? Are the discrepancies different depending on if the student is classified as SLD, EBD, or GE?

### *Definition of Terms*

The following definitions are provided to familiarize the reader with relevant word meaning and to ensure understanding of terms, concepts, and constructs used throughout the study.

Academic Achievement – A student who, according to the WJ-III standard scores in broad reading, broad math, broad written language, and fluency are functioning within the average or above average range.

Academic Fluency – The WJ-III fluency cluster score consists of three subtests: (1) reading fluency (speed of reading sentences and answering “yes” or “no” to each); (2) math fluency (speed of performing simple calculations for three minutes); and, (3) writing fluency (ability to write simple sentences using three given words for each item while describing a picture, as quickly as possible for seven minutes) (Woodcock et al., 2001, 2007).

Adjudicated Youth - An adjudicated youth has been found guilty by a judge of committing a delinquent act and has committed the youth or juvenile to be placed into community control (includes the supervision of youth or juvenile by a case manager or probation officer).

Broad Math – The WJ-III broad math cluster score consists of three subtests: (1) calculation (ability to do arithmetic computation with paper and pencil); (2) math fluency (speed of performing simple calculations for three minutes); (3) applied problems (ability

to solve oral, math "word problems," with paper and pencil) (Woodcock et al., 2001, 2007).

Broad Reading – The WJ-III basic reading cluster score consists of three subtests: (1) letter-word identification (ability to properly read aloud words from a list); (2) reading fluency (speed of reading sentences and answering “yes” or “no” to each); (3) passage comprehension (ability to orally supply the missing word removed from each sentence or a very brief paragraph) (Woodcock et al., 2001, 2007).

Broad Written Language – The WJ-III written language cluster score consists of three subtests: (1) spelling (ability to write letters and words correctly, from dictation); (2) writing fluency (ability to write simple sentences, using three given words for each item while describing a picture, as quickly as possible for seven minutes); (3) writing samples (ability to write sentences according to directions; many items include pictures; spelling does not count on most items)( Woodcock et al., 2001, 2007).

Cognitive Ability – Cognitive ability or IQ describes the process and results of information processing (perception, conceptualization, problem solving, etc.); the term is frequently used in psychological assessments as a synonym for ‘intelligence.’

Co-morbidity - The simultaneous appearance of two or more illnesses, such as the co-occurrence of schizophrenia and substance abuse or of alcohol dependence and depression.

Delinquency - Any action taken by a juvenile under the age of 18 years, who has not been previously transferred to adult criminal court and sentenced as an adult for a felony that would be a violation of law or ordinance if committed by an adult.

Educational Classification – Educational classification consists of educational type to include one of the following: (1) general education; (2) specific learning disability; (3) emotional and behavioral disability; and (4) other health impairment .

Educationally Disadvantaged – Students who are at risk of academic failure due to issues commonly associated with academic failure such as geographic location, socioeconomic status (SES); gender, ethnicity, family status, foster care, juvenile offenses, substance abuse, psychological disorders or co-morbidity, and multiple placements outside the home.

Emotional and Behavioral Disorder (EBD) - A disability that refers to a condition in which behavioral or emotional responses of an individual in school are so different from his/her generally accepted, age-appropriate, ethnic, or cultural norms that they adversely affect educational performance in such areas as self-care, social relationships, personal adjustments, academic progress, classroom behavior, or work adjustment (IDEA, 2004).

Family Status – Family status consists of family type to include one or more of the following categories: (1) two biological parents; (2) single parent home; (3) one biological parent and a stepparent; (4) foster care; and (5) relative care.

Out-of-Home Care – Out-of-home care includes care for children and adolescents in homes with individuals other than their biological parents or legal guardians. It includes, foster care, residential facilities, psychiatric hospitals, and boarding schools.

Passage Comprehension – A WJ-III subtest score assesses the ability to orally supply the missing word removed from a sentence or very brief paragraph (Woodcock et al., 2001, 2007).

Presenting Issue – The reasons for placement provided by the placing agency, such as foster care, psychological disorders (including co-morbidity), juvenile offenses, substance abuses, and family issues.

Relapse Prevention – The treatment model adopted by the residential facility of study to treat male sex offenders. Grays and Pithers (1993) adopted this model as a sex offender treatment to decrease the likelihood of recidivism.

Residential Group Home – A residential group home implies a small residential facility for unrelated youth (Curtis et al., 2001).

Residential Treatment Center – A residential treatment center that provides 24-hour care in a therapeutic environment, with integrated treatment and educational services for children and adolescents who cannot be helped in their own homes (Child Welfare League of America, 1982).

Secondary Residential School - A secondary residential school consists of grades 6<sup>th</sup> through 12<sup>th</sup>, located on a residential campus, where students with behavioral, emotional, and social difficulties reside year-round.

Specific Learning Disability (SLD) - A disability which involves a severe discrepancy between intellectual ability and academic achievement due to a disorder in one or more of the basic psychological processes and is not primarily the result of visual,

hearing or motor disabilities, mental retardation, or of environmental, cultural, or economic disadvantage (IDEA, 2004).

Total Achievement - Total achievement is a score determined by the WJ-III Tests of Achievement. It is obtained by administering nine tests in the standard battery comprised of the broad reading, broad math, and broad written language clusters. The total achievement score from the WJ-III Tests of Achievement can be used in cases where an overall achievement score is needed (Woodcock et al., 2001, 2007).



## 2. Literature Review

This review of the literature on the broad range of issues that impact the academic achievement of adolescents in residential care provided the context and rationale for this study. The review begins with a description of presenting issues associated with adolescents being placed at residential facilities. Then, the author describes various demographic, social, and behavioral factors associated with disparities in academic achievement experienced by many of these adolescents. This is followed by a review of the literature on the benefits of residential care related to academic growth, and the growing body of research on residential education. Lastly, in defining and assessing academic achievement at residential facilities, the author extended the literature review to include the importance of studies on residential education which may contribute to and explain the academic and behavioral characteristics of students upon admission into a residential placement.

### *Residential Facilities*

A clear operational distinction between different residential group care settings does not exist in the research literature (Curtis et al., 2001). A residential group home is generally thought to be a small residential facility for groups of unrelated youth (U.S. Department of Juvenile Justice and Delinquency Prevention). However, group homes are often subsumed under the broader category of residential group care (Curtis et al., 2001).

According to the Child Welfare League of America (CWLA) (1982), residential treatment is a group care setting that provides 24-hour care in a therapeutic environment, with integrated treatment and educational services for children who cannot be helped in their own homes. Since most residential facilities are often operated by private, not-for-profit organizations, each has a great deal of latitude to design their own program of services and establish their own criteria for the children and adolescents they serve (Little et al., 2005).

This lack of distinction has resulted in raised concerns about the benefits of residential group homes and has led to a movement away from residential care (Barth, 2005; Burns & Hoagwood, 2002; Lyons & McCulloch, 2006). Recent opposition is primarily due to cost; however, residential care services and group living arrangements remain quite common, and some states have more than 50% of their older adolescents in group care (Baker, Wulczyn, & Dale, 2005; Barth & Chintapalli, 2007; Wulczyn & Zimmerman, 2005). Many of these concerns are based on a general apprehension within social science research showing that placing troubled youth together is likely to result in an increase in problem behavior (Dishion & Dodge, 2005). Even then, little research has been done on the outcomes of group homes during the last two decades, and the evidence for its effectiveness remains weak (Farmer et al., 2004).

#### *Presenting Issues of Adolescents in Residential Care and Academic Impacts*

Approximately half a million children and young people are in out-of-home care, including foster care and residential placement in the United States (Child Welfare League of America, 2005). Of the children living in out-of-home care in 2006, 40% were

Caucasian, 34% were African-American, 18% were Hispanic, 2% were American Indian/Alaskan Native, and 7% were children of other races and ethnicities (Child Welfare League of America, 2009). Also, children in residential group care are older than those in the general child welfare population (Barth, 2002). In 2004, the average age of children in residential group care was 14 to 15 years. In addition, 20% of the young people in foster care are placed in group homes, and almost half of these are placed in residential treatment facilities (Pecora et al., 1992). The vast majority of these young people were removed from their homes as a result of abuse and neglect and they were placed in foster family settings prior to being placed in residential facilities (Child Welfare League of America, 2005).

Some have described group homes as ideal for adolescents who struggle with issues of independence and individualization or might be too difficult for therapeutic foster parents to manage (Burns, Hoagwood, & Mrazek, 1999). Foster care children who enter residential programs are typically those who have failed at other placements (Baker, Wulczyn, et al., 2005), suggesting that the adolescents who enter group care are the worst cases and have had little success being treated by community services. Yet, there is evidence that a substantial number of foster care youth are entering residential care directly, without previous efforts to treat them in less restrictive settings (James, Leslie, Hurlburt, et al., 2006).

Residential facilities have also become a step-down option for adolescents transitioning from incarceration or rehabilitative centers for substance abuse. For example, in most states, a placement committee may recommend youth for residential

placement, especially adolescents who exhibit severe delinquent, social, behavioral, or mental health problems that prevent adjustment to family, school, or community (Dale et al., 2007). The thought is that residential placement is necessary to restore or develop an acceptable personal or community adjustment and that all other lesser restrictive alternatives cannot meet the needs of the youth (Dale et al., 2007).

For many adolescents entering residential care through foster care, the juvenile court system, or substance abuse rehabilitation, academic performance has already been substantially impacted. Family conflict, truancy, child abuse, or psychological disorders are all possible causes of a decline in academic performance. Webb, Meckstroth and Tolan (1982) observed that adolescents seem to be much more sensitive to conflict and loss. Therefore, any of these out-of-home situations may cause drastic changes in an adolescent's behavior in school. Finally, research is beginning to indicate that adolescents entering residential care are, academically, a homogenous population, with similar characteristics and treatment needs (Trout, Hagamam, Casey, et al., 2008; Veneziano & Veneziano, 2003).

*Foster care.* In recent years there has been a 90% increase in children entering foster care, but a 3% decrease in the number of family foster homes (Coalition for Residential Care). With close to 300,000 children entering foster care each year (USDHHS, 2005), decisions have to be made about placement into the available range of family-based and residential out-of-home care settings. At a child's first entry into the child welfare system, placement is generally attempted into relative or non-relative foster care, which is the least restrictive and preferred out-of-home care option, given their

lesser cost (James, Leslie, et al., 2006). Placement of foster youth into more costly and restrictive settings, such as treatment foster care, group homes, and residential treatment centers, is theoretically intended as a last resort or a response to characteristics or psychosocial problems that cannot be addressed in less restrictive family-based, out-of-home care settings (Barth, 2002; Stroul & Friedman, 1986).

Children entering foster care tend to have more learning and language problems than their peers (Evans, 2001), and educational neglect appears to be a common component to child maltreatment (Helfer, 1987). Very few studies (Fanshel & Shinn, 1978; Gonzalez, 2000) found gains in cognitive development during foster care, while only one study (Tyler, Howard, Espinosa, & Doakes, 1997) found poorer gains while in care (Evans, 2004). Fanshel et al. (1978) described gains in academic performance for children during foster care, particularly those with the greatest deficits and the longest placements (up to 5 years). A Columbia University investigation into children in foster care (Fanshel et al., 1978) looked at the level of academic performance upon entering care and trends over time. At each assessment point the majority of foster children performed at a level below normal for their age. A third was almost two years behind in reading ability. Over a five-year period only a very modest improvement occurred in which 53% were performing below their age levels, compared with 59% at the start of the study. Evans (2004) provided evidence that overall academic development appears neither enhanced nor hindered by foster care placement, but specific groups may be at risk for poor gains.

*Juvenile offenses.* In 2007, 1,626,523 children under the age of 18 were arrested, a 1.4% increase from arrests in 2006 (Child Welfare League of America, 2009). Of the arrests in 2007, 73,427 were for violent crimes and 33,187 were for possession of a weapon (Child Welfare League of America, 2009). Incarcerated youth have more truancies, grade retentions, and suspensions than the general population (Baltodano, Harris, & Rutherford, 2005). Disciplinary practices in schools tend to remove students from instruction, compounding their academic difficulties (Scott, Nelson, & Liaupsin, 2001). Many delinquent youth have been expelled from or have dropped out of school. Many of these youth have been essentially pushed out of school because their behaviors were incompatible with school goals.

Baltodano et al. (2005) found that the academic achievement of incarcerated youth was below the mean on all measures of achievement. Although these youth are behind academically, the majority were not more than one standard deviation below the mean. Foley (2001) reviewed studies on the achievement levels of incarcerated youth from 1975 to 1999, and determined that the average reading level of incarcerated boys to be somewhere between the 4th and 7th grade level, while their math scores tended to be between the 5th and 6th grade level.

Katsiyannis and Archwamety (1999) used the Woodcock-Johnson Test of Achievement to determine the achievement levels of 549 delinquent boys, comparing recidivists to non-recidivists. They found that recidivists scored at the 7th grade level in reading and math and the non-recidivists scored between the 8th and 9th grade levels.

This study lends support to the notion that academic achievement may serve as a protective factor in reducing recidivism.

*Illicit drug use.* Among youth ages 12-17, 1.1 million needed treatment for illicit drug use problems in 2007 (Child Welfare League of America, 2009). Of this group, only 111,000 received treatment at a specialty facility, leaving 1 million youth who needed treatment but did not receive it at a specialty facility (Child Welfare League of American, 2009). Adolescents who use alcohol and drugs may be at risk for lowered educational attainment (Chassin, Presson, Sherman, & Edwards, 1992; Lynskey & Hall, 2000; Register, Williams, & Grimes, 2001). Strong correlations exist between drug use and measures of school performance, including attendance, grades, and graduation (Bachman, Johnston, & O'Malley, 1998; Dozier & Barnes, 1997; Ellickson, Bui, Bell, & McGuigan, 1998; Marston, Jacobs, Singer, Widaman, & Little, 1988; Mensch & Kandel, 1988). Cross-sectional relations have been reported between adolescent substance use and lower educational aspirations; lower educational expectations and an increased likelihood of dropping out of high school (Brooks, Adams, Balka, & Johnson, 2002; Ellickson, Martino, & Collins, 2004; Fergusson & Horwood, 1997; Hill, White, Chung, Hawkins, & Catalano, 2000; Macleod, Oakes, Oppenkowski, et al., 2004; Schuster, O'Malley, Bachman, Johnson, & Schulenberg, 2001).

Claims that adolescent substance use interferes with academic performance, thereby causing later school problems, are supported partially by the many longitudinal studies showing that early adolescent drug users in the general population are at risk for poor academic outcomes (Yamaguchi & Kandel, 1984). For instance, Mensch et al.

(1988) found that early substance use reduced the probability of graduation in a longitudinal sample of U. S. adolescents. Taken together, these findings suggest that adolescent substance use may lead to lowered educational attainment in young adulthood.

*Psychological disorders including co-morbidity.* It has been estimated that one fifth of all children and adolescents in North America experience a diagnosable psychological disorder (USDHHS, 1999). Five percent have impairment in functioning that is extreme (USDHHS, 1999). Half of all lifetime cases of mental illness begin by age 14 and 75% have begun by age 24; thus, mental disorders can be considered a chronic disease among adolescents (National Institute of Mental Health, 2005).

Between one-half and three-fourths of adolescents entering foster care exhibit behavior or social competency problems that warrant mental health care (U. S. Public Health Service, 2000). Eighty-five percent of foster care youth are estimated to have an emotional disorder and/or substance abuse problem; 30% have severe behavioral, emotional, or developmental problems (Landsverk, Burns, Stambaugh, & Rolls Reutz, 2006).

Diagnosis of mental disorders in childhood is often a complicated process that requires consideration of contextual issues (family, peers, school, home, and community), and is complicated by the high tendencies toward co-morbidity among disorders (Angold, Costello, & Erkanli, 1999). Co-morbidity occurs when an individual has been diagnosed with more than one psychological disorder. Many adolescents with bipolar also exhibit disorders, such as anxiety disorder (Biederman, Faraone, & Wozniak, 2000; Chen & Dilsaver, 1995; Wozniak, Biederman, Mundy, Mennin, & Faraone, 1995) and substance



use disorder (Biederman, Wilens, & Mick, 1997). Studies have found co-morbidity rates of children with bipolar disorder (BD) and conduct disorder (CD) range from 42% to 75%.

The literature has revealed that there is a strong link between mental health and academic underachievement (DeSocio & Hootman, 2004; Hootman, Houck, & King, 2003; Lamb, Puskar, Sereika, Patterson, & Kaufmann, 2003; Puskar, Sereika, & Haller, 2003). It is believed that 20% of adolescents may have undiagnosed mental health problems that cause difficulty in academic settings. Academic achievement can be improved through early detection of mental health problems, timely referrals, and access to appropriate services (President's New Freedom Commission on Mental Health, 2003).

*Relapse prevention.* Overall, juveniles who commit sex offenses and juveniles who commit other types of offenses share many characteristics. Several studies that have described the backgrounds of juvenile male sexual offenders have found an overlap among adolescent sexual offenders, juvenile delinquents, boys from abusive and neglectful families, and socially isolated boys (Righthand & Welch, 2001). Sex offenders tend to come from dysfunctional families, and they are more likely to have been abused and to have received inadequate support and supervision (Veneziano & Veneziano, 2002). Adolescent sexual offenders' characteristics have been repeatedly described as young people with a history of severe family problems; separation from parents and placement away from home; experience of sexual abuse, neglect, or physical abuse; social awkwardness or isolation; academic and behavioral problems at school; and psychopathology (Veneziano & Veneziano, 2002). Factors such as family instability and

violence have been found to be frequent among adolescents who engage in sexually abusive behavior (Bagley & Shewchuk-Dann, 1991; Kobayashi, Sales, Becker, Figueredo, & Kaplan, 1995).

Academic and behavior problems, psychopathology, and social isolation tend to characterize adolescent sexual offenders. Juvenile sex offenders tend to have more behavioral problems at school, poor verbal skills, lower academic achievement, and higher rates of learning disabilities (Veneziano & Veneziano, 2002). Studies have demonstrated a relationship between lower intelligence, poorer academic performance, truancy, and recidivism among juveniles who commit sex offenses (Ferrara & McDonald, 1996; McCurry, McClellan, Adams, et al., 1998).

#### *Other Variables Impacting on Academic Achievement*

Other variables impacting on academics and associated with residential populations, as well as adolescent populations in general, include age, gender, geographic location, ethnicity, mobility, and educational classification. The literature has shown that these factors can have a significant impact on academic success.

*Age and gender.* As students age, studies reveal that for some, academic ability declines (Chubb & Loveless, 2002). The most recent National Assessment of Educational Progress (NAEP) (2007) data shows that students continue to lose ground after fourth grade, reporting that both 8th and 11th grade scores are lower than 4th grade scores and are on the decline. This is commonly known as the 4th grade slump. Left unchecked, the 4th grade slump can turn into a significant achievement gap by the 8th grade. Since 1971, administrations of reading tests by NAEP have confirmed what has long been part of the

intuitive knowledge of both teachers and school officials, that gaps in academic abilities become greater with increasing age (NAEP, 2002).

Gender has been studied extensively and revealed differences between males and females (Chubb & Loveless, 2002). According to the 2007 NAEP, the academic achievement gap between males and females has not been eliminated, although it has significantly decreased. In elementary school, female 4<sup>th</sup> graders outperformed their male peers in reading and writing assessments. At the secondary school level, the reading achievement gap grew from 1992 to 2007, with males performing lower than females. In writing, the gap between males and females is also narrowing at the elementary and secondary levels in comparison to 2002, but there was no significant change in comparison to the gap in 1998. According to NAEP (2007), even though both males and females showed increases in math, male students scored two points higher on average than their female counterparts. The gap between the two groups in math for 2007 was not significantly different from the gaps in 1990 or 2005.

*Geographic location.* It has been determined that student achievement can be affected by the area in which a student lives (Lee & McIntire, 2000; Theobald, 2005). Some reasons for the variations in achievement based on geographic location include the availability of resources, availability of technology, and quality of teachers. The National Education Association (NEA) has reported that the lowest performing students are located in public rural schools (Brown, 2004). However, using data from the National Education Longitudinal Study of 1988, Fan and Chen (1999) studied achievement differences among rural and non-rural students and found that rural students performed as

well as, if not better, than their peers. Historically, rural areas have lagged behind urban and suburban schools in educational achievement, although some improvements have been made between 1990 and 2000. Typically, the rural areas in the southern states have the lowest achievement due more in part to racial diversity and increased rates of poverty (Brown, 2004). However, rural schools have higher graduation rates and fewer discipline problems than urban schools, a factor that has changed only recently in the past 20 years (Brown, 2004). Truscott and Truscott (2005) suggested that rural and urban schools are being faced with similar issues, including declining enrollments, increasing poverty, and increasing demands of accountability.

*Race.* Despite efforts by educators and policymakers over the past several decades, achievement gaps between racial groups of students stubbornly persist (Chubb & Loveless, 2002). Surveys of student achievement by the NAEP between 1973 and 1999, showed a persistent although slightly narrowing gap between Caucasian and African American students (Donahue, Finnegan, Lutkus, Allen, & Campbell, 2001). The score gap between Caucasian and African American 4<sup>th</sup> graders was smaller in 2002 than in 1994, and the gap between Caucasian and Hispanic 4th graders narrowed between 2000 and 2002, but neither was found to differ significantly from 1992. At grades 8 and 12, no significant change in either gap was seen across the assessment years. In addition, gaps between students of different racial and ethnic backgrounds continue to be of concern (National Center for Education Statistics, 2003). According to the NAEP (2007), when compared to the first assessment year in 1990, only the Caucasian-Black score gap

at grade 4 narrowed in 2007. The Caucasian-Black score gap at grade 8 narrowed between 2005 and 2007. This was not the case for Hispanic students.

*Number of placements.* Schools face numerous administrative and institutional challenges in enrollment changes over the course of the school year with high-need, high-cost students cycling in and out, sometimes several times over the course of any given year (Rumberger, 2003; U. S. General Accounting Office, 1994). Research strongly suggests that frequent student movement not only may have significantly negative consequences for mobile students because of academic and social disruption, but may also have negative effects on non-mobile students in schools with high levels of student movement (Bruno & Isken 1996; Rumberger, Larson, Ream, & Palardy, 1999).

Children in out-of-home care experience multiple placement moves or placement instability. A typical youth who remains in the foster care system until age 18 will move between an average of 10 different homes and attend five high schools within six years (Pardeck, 1984; Usher, Randolph, & Gogan, 1999; Webster, Barth, & Needell, 2000). This is universally considered disadvantageous to children (Barber, 2003).

In a recent discussion of the literature on the effects of placement changes on children, researchers reported that placement changes were associated with behavioral and mental health problems, delayed reunifications with the family of origin, impaired the ability of the child to form strong, effective relationships with adults, and low academic achievement (Harden, 2004; James, Landsverk, & Slyman, 2004; Newton, Litrownik, & Landsverk, 2000). Student instability can only deepen social instability already experienced by these young people. For many adolescents, this movement may

be especially disruptive because of broken social ties and interrupted academic experiences, compounding already unstable experiences.

*Family status.* Parents, through the choices and decisions they make, influence how their children grow and develop over time (Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999). Numerous literature reviews have examined the association between family structure and adolescents' academic outcomes, documenting that students who live in *alternative* families (i.e., reside with a single parent or a stepparent) have more problems in school than do those who live in two-biological-parent families (Astone & McLanahan, 1991; Coleman, 1988; DeLeire & Kalil, 2002; Hill, Yeung, & Duncan, 2001; McLanahan & Sandefur, 1994; Schiller, Khmelkov, & Wang, 2002). Although the magnitude and long-term implications of changes in family structure continue to be debated (Cherlin, 1999; Hetherington & Kelly, 2002; Wallerstein, Lewis, & Blakeslee, 2000), most have generally agreed that those in alternative families are more likely to drop out of high school, score lower on standardized tests, and report lower grades than others (Astone et al., 1991; DeLeire & Kalil, 2002; Hill et al., 2001; McLanahan & Sandefur, 1994; Teachman, Day, Paasch, Carver, & Call, 1998). Therefore, differences in parenting practices may explain why adolescents in less stable families fail to advance in secondary academics.

*Educational classification.* There have been several studies describing the academic differences between general education (GE) students, students with specific learning disabilities (SLD), and students with emotional and behavioral disorders (EBD) (Anderson, Kutash, & Duchnowski, 2001; Lane & Carter, 2006; Sabornie, Cullinan,

Osborne, & Brock, 2005). Academically, general education students typically outperform students with SLD and students with EBD. Research with elementary and middle school children has indicated that students with EBD (Cullinan, Evans, Epstein, & Ryser, 2003; Mattison, Hooper, & Glassberg, 2002; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004) and students with SLD (e.g., Fuchs, Fuchs, Mathes, & Lipsey, 2000) experience academic deficits relative to their same-age peers without disabilities. When comparing students with SLD and EBD, there have been several studies which have found significant differences between the academics and behaviors of these two groups (Nelson, Benner, Lane, & Smith, 2004; Sabornie, Cullinan, Osborne, & Brock, 2005) and others which have found fewer significant differences (Kauffman, Cullinan, & Epstein, 1987; Scruggs & Mastropieri, 1986). There is, however, no disagreement among educators that students with EBD present schools with their greatest academic challenge (Cheney & Harvey, 1994; Cheney & Muscott, 1996; Muscott, Morgan, & Meadows, 1995; Muscott, 1996; Muscott, 1997; Sawka, McCurdy, & Mannella, 2002).

*Students with EBD.* Not only do students with EBD perform below their peers, evidence indicates that there are academic skill differences between students with EBD and students with SLD. A longitudinal investigation by Anderson et al. (2001) indicated that while 61 students with SLD progressed in reading skills over time, 42 students with EBD did not experience similar levels of improvement. The academic deficits characteristic of students with EBD appear to either remain stable (Mattison et al., 2002) or worsen over time (Greenbaum, Johnson, & Petrila, 1996; Nelson et al., 2004). In a cross-sectional study of more than 150 students in grades K through 12, Nelson, Babyak,

Gonzalez and Benner (2003) and Nelson et al. (2004) found that a subset consisting of 42 high school students with EBD displayed substantial academic deficits in the areas of reading, math, and written language. Specifically, more than 80% of adolescents scored below the mean of the norm group on the Broad Reading, Broad Math, and Broad Written Language clusters of the Woodcock-Johnson III Tests of Achievement (WJ-III) (Woodcock, McGrew, & Mather, 2001). Finally, Greenbaum et al. (1996) found that out of a group of 812 students with EBD ranging from elementary school to high school, 58% performed below grade level in reading and 93% performed below grade level in math, as measured by the Wide Range Achievement Test (Jastak & Wilkinson, 1984).

In addition to academics, students with EBD often have been identified by psychologists or psychiatrists as having psychological disorders, such as depression, bipolar disorder, or conduct disorder. Students with emotional and behavioral issues have the highest drop-out rate at 54.8%, compared with 36.1% for students with learning disabilities and 24.4% for the general population (Zinkil & Gilbert, 2000). Public schools may be obligated to provide financial support for students to attend a residential school when their curriculum and support services cannot handle the needs of a particular student. Children with EBD are the most likely to enter residential facilities through educational placements.

*Other health impairment.* Many of the students with OHI classification at residential facilities have Attention Deficit Hyperactivity Disorder (ADHD). The Individuals with Disabilities Education Act's (IDEA) (2004) definition for OHI is "having limited strength, vitality or alertness, including a heightened alertness to



environmental stimuli, that results in limited alertness with respect to the educational environment that is due to chronic or acute health problems, such as asthma, attention deficit disorder or attention deficit hyperactivity disorder, diabetes, epilepsy, a heart condition, hemophilia, lead poisoning, leukemia, nephritis, rheumatic fever, and sickle cell anemia, and adversely affects a child's educational performance" (IDEA, 2004). Little is known about the characteristics or functioning of children with ADHD in residential care as compared to their non-ADHD peers (Trout, Hagaman, et al., 2008). Trout et al. (2008) evaluated data on 538 children with and without ADHD in residential care to determine demographic, mental health, behavioral, and treatment (i.e., medications used) characteristics. Results revealed that both groups presented elevated risks, however, scores for children with ADHD indicated even greater levels of need. Specifically, differences were found between the two groups on demographics (e.g., family reunification status, restrictiveness of prior out-of-home placements), behavior (e.g., attention problems, rule-breaking, and aggressive behaviors) and medication status.

Mayes and Calhoun (2005) found that the discrepancy model has been criticized for identifying too many children as having a learning disability who have high IQs and average academic achievement. The discrepancy debate will not be addressed here. For purposes of this study, discrepancy between ability and achievement were identified only as a means of determining if discrepancies existed within this population, for comparison between educational classification and gender and to determine if discrepancies over time changed. The discrepancies model is not used here to define whether students have learning disabilities, only to understand the academic characteristics of students. Kavale

and Forness (2001) recommended discrepancy identification to be used to document deficits in basic skills, psychological deficits, and exclusion of alternative causes of learning failure. Prentice-Dunn et al. (1981) found there to be a positive correlation between high IQ and academic gains, but a negative correlation between high IQ and behavioral improvement. This information can be used by residential schools in making academic and behavior decisions for students.

### *Residential Care and Academic Achievement*

Most believe that residential care has a place in the continuum of care (Barth, 2005; Bates et al., 1997; Knorth, Harder, Zandberg, & Kendrick, 2008). A recent meta-analysis (Knorth et al., 2008) found some support for the benefits of residential treatment, indicating that residential settings that use behavioral approaches and include a focus on family involvement showed promising short term outcomes. Bates et al. (1997) conducted a literature review comparing residential treatment, family preservation services and treatment foster care and found that residential care was not any less effective when compared to nonresidential alternatives. Some evidence from the research on residential care suggests factors that predict positive outcomes. For example, studies have found that high IQ, low severity of presenting problems, and high family stability at intake are each associated with better outcomes for children in residential settings (Blotcky, Dimperio, & Gossett, 1984; Hussey & Guo, 2002; Vorria, Rutter, Pickles, Wolkind, & Hobsbaum, 1998). Lyons and McCulloch (2006) found that, after placement into residential facilities, age, diagnosis, and race predicted symptom improvement. Lastly, variables related to positive outcomes in education that have been reported at

residential facilities include longer lengths of stay (Blotcky et al., 1984; Daly, Thompson, & Coughlin, 1994), higher parental involvement (Prentice- Dunn, Wilson, & Lyman, 1981), and involvement in aftercare (Blotcky et al.,1984; Prentice-Dunn et al.,1981).

Despite the growing numbers of adolescents being placed in residential facilities, for a long time little information has been available regarding these students' specific academic characteristics. Recently, some attention has been paid to the educational progress of children residing in foster care and residential group homes (Barth & Lee, 2009; Gagnon, 2000; Gagnon & McLaughlin, 2004; Hussey & Guo, 2002; Jones & Landsdverk, 2008; Trout, Hagaman, Casey, Reid, & Epstein, 2008). Much of this research is identifying the fact that adolescents entering residential care have significant learning problems (Jackson, 1994; Jones & Landsdverk, 2008; Trout, Hagaman, Casey, Reid, & Epstein, 2008; Weiner & Weiner, 1990).

#### *Academic Achievement Studies Related to Residential Care*

There are a limited number of studies describing adolescents in residential care and attending residential schools. Only recently have there been several studies attempting to describe residential schools and the academic and behavioral characteristics of these students (Barth & Lee, 2009; Jones & Lansdverk, 2008; Trout et al., 2008). The following studies provide some insight into the academic and behavioral characteristics of students attending residential schools as well as provide comparisons for the present research.

Sonia Jackson (1994) reviewed 20 years of research to show that children in residential and foster care were falling progressively behind in their academic abilities,

especially when compared to children living with their own families. She found that children who had been in foster or residential care achieve significantly poorer test scores at five and ten years of age and were more likely to display behavior problems than were controls, especially if they had been in residential institutions, but the effects were very weak in comparison with those attributed to their social background. Jackson (1994) concluded that the poor performance children in out-of-home care could mainly, though not entirely, be explained by their extremely deprived social backgrounds or by pre-existing behavior disorders that contributed to the likelihood that the children would be placed in care.

Trout, Hagaman, Casey, et al. (2008) reviewed 26 articles between 1940 and 2006 describing the academic functioning of children and youth in out-of-home care. Their review included 13,401 participants and found the following: the mean age of participants to be 12.9; males outnumbered females; 3,035 participants were identified as having special needs; the majority of the participants were Caucasian and had entered out-of-home care through foster care; and the mean weighted IQ of participants to be 87.9 (WISC-III, Wechsler, 1991). In their review, they also identified 13 academic areas addressed in the articles (i.e., reading not otherwise specified [NOS], reading comprehension, reading recognition, math NOS, math reasoning, math calculation, writing, spelling, social studies, science, language, literature, and not specified/general academic area). They determined that all but one-third of participants were reporting below-grade level academic performances, most performing in the low average range.

Trout (2008) conducted a study involving 127 participants (53 girls and 74 boys)

admitted to a Girls and Boys Town (GBT) residential program. They collected the demographic characteristics of participants from intake files. The demographic information included information on age at admission, gender, ethnicity, medication status, court involvement, IQ, age at first placement, number of previous placements, funding type, legal status, referral source, permanency plan, and special education status. They also collected Woodcock-Johnson Test of Achievement (Woodcock et al., 2001) scores at intake, including seven subtests: (1) reading fluency, (2) calculation, (3) spelling, (4) writing fluency, (5) reading comprehension, (6) applied problems, and (7) academic knowledge. They found that of the 127 youth participants, the majority were male (58%) and Caucasian (53%), followed by African American (22%), and other (e.g., American Indian; 25%). They reported that youth were admitted to the residential treatment program at the average age of 15.3 and had attended on average, five schools prior to GBT. Just over 26% were identified with a disability (e.g., learning disabled, behavior disorder). Children with disabilities were more likely to be male Caucasians who were referred to the program for mental health reasons. A majority of the youth entered with significant academic delays (e.g., roughly 50% in the low average ranges) in at least one basic subject area (e.g., reading fluency, math calculation, academic knowledge). Children with disabilities entering care demonstrate elevated academic risks compared to their peers without disabilities.

Trout, Hagaman, Epstein, et al. (2008) examined archival data files of 328 participants to determine if the level of academic functioning of youth changed from the time they entered residential care until the time that they departed, and if there were

factors that could predict a youth's academic functioning over time from admission to departure. The records were taken from the same GBT residential program noted earlier between Fall 2004 and Spring 2005. The GBT used the California Achievement Test (CAT; CTB Macmillan/McGraw Hill, 1992) to assess achievement. In this case they were primarily interested in how participants were functioning in reading, math, and science. The variables identified as possibly impacting on academics included age, gender, ethnicity, age at admission, special education status, IQ, and the presence of a DSM-IV diagnoses. They found statistically significant gains from the time of admission to departure, with effects sizes ranging from .48 to .97. They also determined that at the time of admission, IQ, ethnicity, special education status, level of problem behavior, and the presence of a DSM-IV diagnosis all uniquely contributed to models predicting reading, math, and science scores. At the time of departure, only the variables IQ and ethnicity continued to contribute to the models.

Jones and Lansdverk (2008) provided a description of residential schools for foster care youth. They found that almost 60% of the students were 15 to 16 years old, and they were either in the 10th or 11th grades. About two-thirds of the students were Caucasian or African-American race/ethnicity and 20% of the students were Hispanic. They found that 36% of the students were living in emergency shelter care prior to entering the school. Nineteen percent of the students were admitted to the school from non-relative foster care, 22% were in relative foster care, and 18% had been admitted from a group home. The average length of stay for students who entered the residential school was between 338 to 448 days.

Barth and Lee (2009) surveyed residential facilities and asked them to describe the population of youth served by their residential education program. Most programs were co-educational (85%) and served school-aged youth from diverse backgrounds. Programs reported that most youths were referred by parents (38%) or other family members (12%), as well as social services (28%). Over 60% of the programs served youth in the foster care system. The average student enrollment was 73 students, with about 10% of respondents having eight or fewer students and 20% of respondents having over 100 students. Over three-fourths of programs reported the average length of stay to be at least one year, with 43% of programs reporting 13–24 months and almost 20% reporting 2–3 year durations of stay. Most of the programs offered a family-style component. Most of the programs (85%) arranged their living environments using the cottage model, while a smaller number were organized as dorm-style (12%). A majority of the programs had a live-in houseparent system (82%), while another 18% relied solely on shift-staff or a combination of live-in and shift-staff supervision.

#### *Academic Achievement and Adolescents in Residential Care*

According to the U. S. Department of Education, “Every student should make substantial academic progress every year in every class” (U.S. Department of Education, 2005). Academic achievement is crucial to any adolescent’s quality of life as an adult (Day & Newburger, 2002; Thompson, Huefner, Ringle, & Daly, 2005; Thompson, Smith, Osgood, Dowd, Friman, & Daly, 1996; Wilson, 1990). Educational attainment is an important gateway to successful young adult outcomes, and is especially important for later occupational status and income (Day et al., 2002). Today, more than ever, there are

numerous groups, government agencies, and school systems attempting to define just what it means to be academically successful. Test scores are one dimension of achievement, yet some policymakers and educators use other indicators of academic outcomes, such as school attendance, course grades, standardized tests, and graduation. While success in one of these outcomes does not automatically translate into success of another, these achievement indicators together compose a picture of factors that are related to long-term school success, and later success as an adult.

Many academic skills deficits can be explained by the “Matthew effect.” The metaphor of the “Matthew effect” was introduced to the field of reading by Keith Stanovich (1986) to explain the development of individual differences in both reading and more general cognitive functioning in verbal areas. It takes its name from the “rich get richer and the poor get poorer” discussion in the Gospel according to Matthew. Interweaving inherited and environmental factors, Stanovich argued that relatively small cognitive differences among young children can lead to wide and socially significant differences in adult outcomes, not just in reading but other academic areas, as well as intelligence. This effect can lead to not only problems in reading, but also math, fluency, and comprehension (Perfetti, 1988). If the ability to perform these skills does not develop sufficiently, the child’s ability to acquire vocabulary and concepts is affected, and schoolwork becomes increasingly difficult. Since knowledge in school subjects is cumulative, incomplete acquisition of basic vocabulary and background concepts in middle school can imperil high school learning. Academic success in the earliest grades is largely due to a child’s language and literacy skills (Snow, Porche, Tabors, & Harris,



2007), but as children grow older, academic success becomes more about learning the language of the texts, accessing the knowledge presupposed by the text and the curriculum, as well as freedom from disruptive familial, social, and personal interferences (Snow et al., 2007).

Academic achievement is an important factor in the successful development of adolescents in today's society. Academically successful adolescents delay participation in sexual activity (Schvaneveldt, Miller, & Berry, 2001), have higher self-esteem (Filozof, Albertin, & Jones, 1998), have lower levels of depression and anxiety (Cicchetti & Toth, 1998; Liem, Dillon, & Gore, 2001), are less likely to abuse alcohol and to exhibit socially deviant behavior (Kasen, Cohen, & Brook, 1998), and are less likely to engage in substance abuse (Hallfors, Vevea, Iritani, Cho, Kharapoush, & Saxe, 2002; Schulenberg, Bachman, O'Malley, & Johnston, 1994).

Competency in basic academic skills is also necessary for the type of employment that can provide a steady income, benefits, and opportunities for advancement. Students who master basic reading, writing, and mathematics skills are less likely to drop out of school, making it more likely that they will develop the higher-order thinking skills they need to graduate from high school and post-secondary school. While educational outcomes have improved overall during the past several decades, approximately one-fifth to one-third of 4<sup>th</sup>, 8<sup>th</sup>, and 12<sup>th</sup> grade students still perform below basic levels on the NAEP reading, writing, and mathematics assessments.

Programs with strong academic components may reduce these educational disparities, especially for students from disadvantaged backgrounds or those in

chronically underperforming schools and school districts. Weiner and Weiner (1990) found that for children in residential care who had maintained a healthy and emotionally involved relationship with an adult, usually a parent, had fewer educational difficulties. Meta-analytic studies have also reported decreases in arrest rates for delinquent youth from before intake and after discharge from residential programs using specific family program models (Lipsey, 1999; Lipsey & Wilson, 1998).

Agencies supporting out-of-home placements need to be aware of the importance in adequately evaluating and reporting the academic performance of youth enrolled in residential facilities. In doing so, both the placing agency and the facility can better identify particularly effective education programs to serve as models for others; they can also identify struggling programs, facilitating the effective allocation of resources and technical assistance. Melmotte (1979) found that social workers of children in custody do not view school or education as a high priority. This finding was later confirmed by a much larger study which looked at the relationship between the stated objectives of social workers and their attainment (Knapp, Bryson, & Lewis, 1985). Of 285 objectives listed by social workers, only 16 related to education, even though half the children were assessed as having school-related difficulties. Retrospective accounts by people who have grown up in care frequently complain about the lack of attention given to their schooling (Kahan, 1979; Jackson, 1987) and this anecdotal evidence is strongly supported by research in progress (which is discussed later) and by recent consumer studies (Fletcher, 1993).

The emerging concerns faced by educators and policymakers are extremely complex. Contributing factors rarely stand alone. More often, they are interactive and interdependent. These factors include such issues as geographic area, age, socioeconomic status, gender, ethnicity, family status, juvenile crime, educational classification, substance abuse issues, foster care, type and number of placements, and psychological disorders including co-morbidity.

### *Summary*

This study seeks to determine which demographic, social and behavioral issues impact on the academic achievement of students residing at a residential facility and is designed to characterize the academic abilities of students attending the facility's residential school. It targets adolescents who attended the school between 2001 and 2008, many of whom experienced academic failure, psychological disorders, substance abuse issues, and other issues. The main goal is to examine reading, mathematics, writing, fluency, and comprehension abilities using statistical methodology to describe the characteristics and behaviors of students and to determine which variables impact on academic ability. It does not seek to identify instructional practices or institutional factors contributing to success, but seeks to identify variables which students bring with them upon entry that impede their academics, and whether or not achievement can be obtained given a certain length of stay at a residential facility.

This study used longitudinal student achievement data to measure the influence of various educational entities on student academic abilities in reading, mathematics, writing, fluency, and comprehension. Adolescents in residential care are at high risk of

academic failure, but it is difficult for research to obtain primary data given the mobility and vulnerability of the population. Few studies have addressed the issue of the long-term benefits of residential facilities with residential schools (Barth et al., 2009; Jones & Landsdverk, 2008). A secondary data analysis of existing data is a reasonable alternative; however, the data may have questionable internal validity, lack documentation, and contain missing data sets.

### 3. Methodology

This chapter is designed to address how the data collected at a residential secondary school answered the proposed research questions. It describes the population under study and the method of analysis, as well as operationally defines the predictors and outcome variables. It concludes with a description of the model specifications used in performing the a logistical regression used to predict or explain academic achievement in reading, math, written language, passage comprehension and fluency based on variables commonly associated with adolescent residential populations.

#### *Population under Study*

The subjects used in this study were students receiving educational services at a secondary residential school located in an urban community, outside of a major American city, in a mid-Atlantic state. The study used the secondary data of 423 students between the ages of 12 and 19 attending the school beginning in August of 2001 and ending in June of 2008.

Student classifications were based on school records at the time of admissions. These classifications included: (1) general education (GE) students; (2) students with specific learning disabilities (SLD); (3) students with emotional and behavioral disorders (EBD); (4) and students with other health impairment (OHI.) Student special education disability identification was based on the student's primary disability noted on their last

IEP at the time of entry into to the residential facility. Only students qualifying for SLD, EBD, and OHI were used in the data analysis.

All of the students were placed at the residential school by one of six presenting issues: foster care placement, adjudicated youth, educational placement, substance abuse issues, relapse prevention, and private placement. Placement was determined from information provided in the school's database as one of these six presenting issues.

*Description of the secondary residential school of study.* The residential school under study is located in a large urban community, outside of a major American city, in a Mid-Atlantic state. The residential facility first opened in 1986. The secondary school is one of three program areas offered by the residential facility. The other programs are identified as counseling and residential services.

The secondary residential school identified has experienced several changes in the last decade. Historically, the facility was known for being an all male residential program. In 2003, the residential program began servicing female students. Since 2001, the program has served over 400 males and females. As the program has grown, the students at the facility represent a more challenging population of students who are at an elevated risk for educational and social-emotional success. Many of the young people admitted to the facility exhibit antisocial behavior, have been involved with the juvenile justice system, foster care, or have been diagnosed with psychological disorders requiring on-going counseling.

The residential school of study is part of a residential group home. The school is accredited through the state's Department of Education as well as through the state's

private school accreditation system. The school is open year-round. The academic year begins in August and ends in June, while the summer session takes place over a ten week period between June and August. The average school attendance is 75 and the typical teacher to student ratio is 1:12 for general education students and 1:8 for special education students. Presently, there are 10 general education teachers, including a reading specialist, and two special education teachers. There is also six administration staff, to include the principal, guidance counselor and special education director.

The school is one of three components within the residential group home. The program includes a family-style component known as residential in which the students live with house parents who are located on campus. There are five homes (i.e., cottage-style) and one dormitory, all with a total capacity to house 100 students. The third component is counseling and case management services. There are four full-time counselors and three full-time case managers available to assist students, daily.

Students are enrolled in the residential program by a referring or placing agency or parents. Placing agencies are identified as individuals representing social service agencies, probation/courts, and educational institutions. Students are categorized by a “presenting issue”, which is a general term used to describe the type of reason for placement, such as foster care, adjudicated youth, substance abuse, relapse prevention (sex offenders) or educational. Private placements are usually represented by parents whose presenting issue is typically termed, “family issue”.

The psychological profile of students plays a role in their admittance to the program. Only students considered within the low to moderate levels of educational

functioning are considered. Clinical issues identified by the staff members requiring counseling, include: substance abuse, sexual abuse, depression, anger management, sexual offenses, grief, loss, abandonment, identity issues and emotional and behavioral disturbances. Psychological profiles are required for each student and are typically conducted by the student's previous education institution or an outside licensed clinician.

Since opening in 1986, over eight hundred adolescents have been served by the group home. For purposes of this study, only students enrolled between 2001 and 2008 were used, beginning with the school year 2001-2002, and ending with the school year 2007-2008. These years were selected by the researcher based on the likelihood of complete academic profiles on each student enrolled in the facility. The ages of students range from 12-19, and the school includes grades 6<sup>th</sup> through 12<sup>th</sup>.

### *Sample*

In answering two of the research questions: (1) academic achievement over time; and (2) the range of discrepancy between ability and achievement, a sample of students was selected within the study population from each group - GE, SLD, EBD or OHI - based on the following criteria: (a) admissions between August 2001 and June 2008; (b) scores on Woodcock Johnson Test of Achievement based on two points within 18 months of enrollment; (c) an IQ score of 80 or higher; and, (d) the availability of all of the data sets required to conduct an analysis. The first two criteria ensured that the study samples did not contain unnecessary amounts of missing data for this phase in the study and the third criterion was included because measures of intelligence are directly related to academic achievement (Kauffman, Cullinan, & Epstein, 1987; McKinney, Osborne, &



Schulte, 1993). By restricting the lower range of IQ to 80, the influence that intelligence has on academic achievement will be reduced. However, it has also been demonstrated that students with EBD and students with SLD function within one standard deviation of the norm on typical measures of intelligence (Scruggs & Mastropieri, 1986).

#### *Operational Definitions of Predictor Variables*

Placement of students in residential school is assumed to be a function of the students' background, their disability, clinical diagnosis, the risk inherent in their families, and students' behavior (i.e., substance abuse, and criminal offenses). Most of the predictor variables are coded as either individual dichotomous variables or into design sets as multiple variables. Age and days, and at times standard scores, in care are the only continuous variable. Variables selected from the school's data represent aspects of students' achievement and behavior. They are described according to how they were coded for various types of statistical analysis.

*Student demographics.* Demographic information consisted of four variables: geographic area, age, ethnicity, and gender. A data set of three dichotomous variables was used to assess the effect of geographic area. Students in urban, suburban, and rural communities were compared. Age was a continuous variable measured at baseline. The data set for the ethnicity variables consists of Caucasian, African-American, Hispanic and Other. Gender was assessed by comparing female with male students. All variables within each category are mutually exclusive.

*Family status.* Family status data sets were based on who the student lived with at the time of admissions, including both parents, single parent, parents and step parent,

family member, or foster care. An additional identification of family status included whether one or more of the parents were deceased (both parents deceased, mother deceased, or father deceased) or incarcerated (both parents incarcerated, mother incarcerated or father incarcerated).

*Criminal offenses.* This data set identified: (1) whether a student had committed a juvenile offense and not; and, (2) the type of offenses committed: assault, property destruction, weapons charges, sexual offenses, drug/narcotics, stolen property, truancy, and multiple offenses.

*Substance abuse.* Three categories were identified under substance abuse: (1) students were identified as using or not using alcohol and other drugs and (2) scores on the adolescent Substance Abuse Subtle Screen Inventory-Adolescent 2 (SASSI-A2) (Miller & Lazowski, 2001). SASSI-A2 scores were provided in the school database. The SASSI-A2 is a psychological screening measure that helps identify adolescents, ages 12-18, who have a high probability of having a substance use disorder. Three categories are noted by the SASSI-A2: 1 = experimental, 2 = abuser, and 3 = dependent.

*Educational classification.* All students in this population were identified as general education (GE), specific learning disability (SLD), emotional and behavioral disorder (EBD), and other health impairment (OHI). Within special education, only primary disabilities were identified when found eligible for SLD, EBD, or OHI. Secondary disabilities were not included as a predictor variable.

*Psychological disorders.* Psychological disorder data sets included: (1) whether a student had a psychological disorder or not, and (2) the type of disorder or disorders

identified (i.e., oppositional defiant disorder (ODD), conduct disorder (CD), mood/depressive disorders, anxiety disorders, bipolar, and Attention Deficit Disorder (ADD)/Attention Deficit Hyperactivity Disorder (ADHD), and multiple disorders).

*Co-morbidity.* A data set of dichotomous variables was used to assess the effect of co-morbidity. 1 = comorbid, 2 = not comorbid, or 3 = none listed.

*Type of placement.* Placement into out-of-home care was defined as any removal from home by social services, court official, educational agency or parent/guardian. Court placement were broken down into three additional categories: (1) adjudicated youth; (2) relapse prevention (sexual offender); and (3) substance abuse. The decision to use seven placements was based on the classifications currently used by the residential school under study. The type of placement were numerically categorized as 1 = social services, 2 = juvenile court, 3 = educational, 4 = relapse prevention, 5 = substance abuse, 6 = family issue, and 7 = none listed.

#### *Operational Definitions of Outcome Variables*

*Woodcock-Johnson III tests of achievement.* The WJ-III (Woodcock, McGrew, & Mather, 2001, 2007) contains a range of tests that constitute the following clusters: reading (broad reading, basic reading skills, and reading comprehension), math (broad math, math calculation skills, and math reasoning), and written language (broad written language, basic writing skills, and written expression). This nationally normed instrument has reliability estimates of .80 and higher (Woodcock, McGrew, & Mather, 2001, 2007). Prior to 2004, the Woodcock Johnson Test of Achievement-III (2001) was used to assess academic progress. In 2004, the school under study began using the Woodcock Johnson

Test of Achievement-III Revised (2007). In this investigation, academic success was defined by WJ-III (Woodcock, McGrew, & Mather, 2001) standard scores (See Table 3.1) in broad reading, broad math, broad written language, passage comprehension and fluency when students were functioning in the average or above average range.

The purpose of the WJ-III is to "provide a set of individually administered, norm referenced tests for measuring academic achievement" (Blackwell, 2001). The broad reading score represent a student's decoding ability, reading speed, and comprehension ability. The broad reading score is derived from scores on the following subtests: Letter-Word Identification, Reading Fluency, and Passage Comprehension (Mather & Jaffe, 2002). The WJ-III passage comprehension subtest was included in this study but was not a cluster score based on other subtests. Even though the WJII passage comprehension test is more closely correlated to a test of word recognition (Fuchs, Fuchs & Mazwell, 1988), it has also been used to measure how well the student understands what is being read (Woodcock et al., 2001). The subtest requires vocabulary knowledge and the ability to make inferences from context. The student reads a short passage and then provides the missing key word that makes sense in the context of that passage. Students who perform well on this test have well-developed linguistic and cognitive skills, in addition to the ability to notice and use textual information (Woodcock et al., 2001).

Over two hundred students in this study were administered portions of the WJ-III at least once between 2001 and 2008. One hundred of the sample had been re-administered the same portions at discharge and/or six to twelve months after admissions. For purposes of this study, standard scores for the broad reading cluster test, broad math

cluster tests, and broad written language cluster test were obtained from the students' cumulative files and used for the analysis. These were three clusters most consistently used by the school to monitor student progress. Broad reading, which includes Letter-Word Identification and Word Attack subscales, assesses sight vocabulary, phonics, and structural analysis. Broad math, which includes Calculation, Math Fluency, and Applied Problems subscales, assesses math achievement in the areas of problem solving, number facility, automaticity, and reasoning. Additional standard scores on passage comprehension and fluency were also examined.

*School archival records search.* The researcher did most of the data collection and hired two school staff members to collect information from student's records when information to complete data sets appeared incorrect or was missing from the database. Prior to collecting the data, these staff members participated in a training session by the researcher to ensure accuracy of data collection.

*Cognitive-achievement discrepancies.* Discrepancies between aptitude and achievement have been used to identify students as having a learning disability. The WJ-III Intra-Individual Discrepancy procedure was used to evaluate achievement abilities in any particular domain with the cognitive abilities correlated with those skills. The WJ-III Intra-Individual Discrepancy procedure allowed the examiner to evaluate a pattern of strengths and weaknesses among a referred individual's reading, mathematics, and written language. In addition, if only the WISC-3 (Calculating Ability/Achievement Discrepancies Between the Wechsler Intelligence Scale for Children—Third Edition) is available, the researcher followed the procedures for calculating discrepancies, outlined

on Riverside Publishing Company, who developed the WJ-III. The procedure is based on correlations between the measures obtained from a broad sample of non-referred individuals (Calculating Ability/Achievement Discrepancies Between the Wechsler Intelligence Scale for Children–Third Edition).

*Standard score.* Standard scores for both the cognitive and achievement test were used to indicate a student's relative standing in the group when compared to age- or grade-peers. A standard score describes a student's performance relative to the average performance of the comparison group. It is based on an average score being assigned a value of 100, with a standard deviation, an indication of the variability of scores in the population, assigned a value of 15 (See Table 3.1). The range of standard scores is 0 to over 200 (Mather & Jaffe, 2002). To compare scores in a uniform manner, raw scores from each subtest are converted to a standard score. According to the Woodcock-Johnson III manual (Woodcock, McGrew, & Mather, 2001, 2007), a standard score has a mean of 100 with an average range from 90 to 110. High average has a range of 111 to 120. The superior range is from 121 to 130. Very superior range is 131 and above. Low average falls within the range of 80 to 89. A low performance range is from 70 to 79. Very low is 69 and below.

Table 3.1

| <i>Typical Standard Score Scale</i> |                      |
|-------------------------------------|----------------------|
| Standard Score Range                | WJIII Classification |
| 131 and above                       | Very Superior        |
| 121 to 130                          | Superior             |
| 111 to 120                          | High Average         |
| 90 to 110                           | Average              |
| 80 to 89                            | Low Average          |
| 70 to 79                            | Low                  |
| 69 and below                        | Very Low             |

### *Research Design and Data Analyses*

The aim of this study was tri-fold. First, the researcher described the characteristics and behaviors commonly appearing among this sample of residential students. This was followed by a description of the differences between the three educational classifications, and the four types of placements, and the eleven variables identified in the literature review that are commonly associated with students enrolled in secondary educational schools (i.e. geographic location, ages, SES, gender, ethnicity, family status, foster care, juvenile offenders, substance use, psychological disorder, number of placements). Second, the researcher explored the relationships between academic achievement and the types of placements, and the relationship between academic achievement and variables commonly associated with students placed in residential educational settings. Lastly, the researcher examined how these variables (i.e., educational placements, types of placements, and variable commonly associated with students placed in residential educational settings) can explain or predict academic achievement.

### *Data Sources*

In this secondary data analysis, data was aggregated from five sources: (1) Education Edge, a database system used by the school of study; (2) Woodcock Johnson III Test of Achievement (2001, 2007) reports, (3) special education documentation, including Individual Education Plans (IEPs), (4) psychological and sociological reports; and (5) admission application. Most of the information was obtained from the facilities primary database, Education Edge, and from archived files located at the facility.

### *Data Collection Procedures*

First, University Human Subjects Review Board granted permission to use the data in the study after approval was obtained from the residential facilities' governing body and officials from the state department of social services. Once permission was obtained, the data collection process was initiated. Throughout data collection, procedures were implemented to ensure that data collected and entered into computer programs were reliable and valid. To ensure a minimum 80% reliability was maintained, a second data collector independently coded every fifth file and a point-by-point evaluation of inter-rater agreement was calculated and was checked for reliability of data entry. This confirmed that data were being reliably collected and entered in Excel and SPSS statistical programs.

### *Data Analysis Procedures*

This study used a quantitative methodology to analyze secondary data. Data were analyzed using uni-variate, bi-variate, and multi-variate procedures comparing three difference groups with 3 or more categories (i.e., educational classifications; types of



placement; and demographic and behavioral variables) to various aspects of academic achievement. Statistical techniques include descriptive statistics, analysis of variance, chi-square, correlations, and logistic regression models. The data were entered into an SPSS database for analysis (SPSS, 2008).

*Descriptive statistics and analysis of variance.* Descriptive statistics were used to describe the demographic information of the students gathered by the researcher, providing a summary of the populations and the measures. The demographic information was grouped according to gender, race, age, educational classification, type of placement, co-morbidity, SES, number of students with substance abuse issues, and family status. This included frequencies and distributions of the variables; as well as the mean and range of the variables.

A factorial analysis of variance (ANOVA) statistical test was used to compare the academic achievement of EBD, SLD, and GE students using Woodcock Johnson-III Test of Achievement (2001, 2007) scores for total achievement, broad math and broad reading, comprehension, and fluency. An ANOVA was used to determine if there is a significant difference between WJ-III scores upon admissions and scores after 6 months, 12 months or more months of attending the residential school. The ANOVA was used to test for academic differences among the various categories:

- between GE, SLD, and EBD
- between the four types of placements
- between SES status
- between gender

- between race
- between type of family status
- between students with substance abuse issues and those without
- between students with co-morbidity and those without.

A series of one-way multi-variate analyses of variance (MANOVAs) was conducted to examine differences between GE students and students with SLD, EBD, and OHI, and academic achievement (i.e., WJ-III broad math, broad reading, broad written language, comprehension, and fluency). Mean scores were inspected to determine the direction of group differences (Kleinbaum, Kupper, Muller, & Nizam, 1998). Effect sizes were computed using the pooled standard deviation in the denominator (Busk & Serlin, 1992) to examine the magnitude of differences between groups.

After completing the above analyses, descriptive and predictive discriminant function analyses were conducted using a cross-validate option (Kleinbaum et al., 1998). The descriptive discriminant function analysis was conducted to ascertain the extent to which the full set of variables from all academic categories identified as significant in the MANOVAs could discriminate group membership (GE, EBD, and SLD). The predictive discriminant function analysis was used to determine classification rates. The variables included in the descriptive discriminant function were used as classification variables to predict group membership.

*Pearson chi-square.* A Pearson chi-square statistical test was used to determine if there was an association between achievement and each variable identified within the three categories: (1) educational classification; (2) type of placement; and (3) issues

commonly associated with students placed in residential facilities. The chi square ( $\chi^2$ ) statistic was used to investigate whether various categories of achievement can be associated with various categories of variables. Essentially, this test was used to infer whether the distribution of students across gender, age, SES, type of placement, co-morbidity, substance abuse issues, family status, and educational classification had a relationship to the academic areas under study (i.e., fluency and comprehension, broad math and broad reading or broad reading and broad writing).

In addition, the *Cramer's V* Coefficient was determined in comparing multiple  $\chi^2$  test statistics to determine the strength of the relationship. The range of the *Cramer's*'s coefficient is 0 to 1. A *Cramer's V* coefficient of .10 suggests there is a substantive relationship between two variables.

#### *Logistic Regression Model*

A multiple logistical regression was be used to predict or explain the academic achievement of students based on educational categories, type of placement and factors associated with adolescents residing at secondary residential schools. Both a binary (used when the dependent is a dichotomy and the independents are of any type) and a multi-variate (dependents with more classes than two) logistical regression was used. The logistic regression model was chosen for this study to predict the variable that distinguishes between a student's functioning average or above average academics and those functioning below or low average academics according to the WJ-III standard scores. This model is specifically designed for use in situations where the outcome variable is dichotomous (coded 1 or 0) or binary, though the predictor variable can be

continuous or discrete. Predicted probability for outcomes in logic regressions therefore cannot be negative or greater than 1 (Menard, 1995).

In the case of the logistical regression models, the predictor variables are not linearly related or of equal variance within each outcome variable, and it makes no assumptions regarding the distribution of the predictor variables (Tabachnick & Fidell, 1996). Levels of achievement were derived through multiple logistic regression models. All models applied the same discrete response variable (Achievement vs. no Achievement) and several sets of explanatory factors (age, gender, substance abuse, psychological disorders, etc.). For one of the models, the response variable was based on the ability– achievement discrepancy definition of SLD. For each type of definition, separate models were constructed for each educational classification in reading, mathematics, and writing. Similarly, under each educational classification, nested models were constructed to test the influence of risk and protective factors in the presence and absence of other factors.

Multiple logistic modeling is a procedure especially suited to epidemiologic inquiry (Hosmer & Lemeshow, 2000; Swanson, Borum, Swartz, & Monohan, 1996). It is ideal for circumstances that entail dichotomous response variables (Achievement vs. no Achievement) and numerous sets of explanatory variables that should be represented as dichotomies (referred to as dummy variables) rather than continuous variables. To yield the variety of advantages associated with multiple logistic modeling, we formed design variables as described in the following sections.

### *Outcome Variables*

*Academic achievement.* The response variable defining academic achievement was formed by using the scale provided by Woodcock Johnson Test of Achievement Revised – R protocol identify scores average and above (1 = Achievement) and scores below average and lower (0 = No Achievement).

*Ability-achievement discrepancy.* The response variable defining any ability–achievement discrepancy was formed by regressing achievement scores in a given area (e.g., reading, math and writing) to estimate expected achievement, subtracting the actual achievement score from this value, and dividing by the standard error of estimate based on the correlation between Full Scale IQ and achievement (McDermott & Watkins, 1985).

### *Predictor Variables*

This set of variables included student age, gender, ethnicity, geographic area, psychological disorders, substance abuse issues, juvenile offenses, comorbidity, and family status. Age was allowed to vary as a continuous variable in 1-year age increments from 12 to 19 years. *Gender* was coded male = 1, with female = 0 as the reference group, inasmuch as prior literature (Grim, Tighe, & McDermott, 2001) has portended higher morbidity levels for male students. *Ethnicity* was represented by three dichotomous variables, African American (1 = yes, 0 = no, etc.), Hispanic, and Other ethnic minority (Asian, Pacific Islander, etc.), with Caucasian serving as the reference group for each dichotomy. *Psychological Disorder* = 1 included those students who were medically diagnosed as having such. *Substance Abuse* = 1 included those students who were

identified as using drugs. *Juvenile Offenses* = 1 included those students who were identified as committing a juvenile crime. *Comorbidity* = 1 included those students who were medically diagnosed as having such. *Geographic Area* was coded 1 if a student lived in an urban or rural area, or coded 0 if not. *Family Status* was modeled with four design variable denoting that a student's residing parents were married (1 = yes, 0 = no, etc.) and another denoting single parents, bio parent and step parents, living with family member, with foster care parents as the reference group. Two additional variables indicated family structure: incarcerated parent or parents and deceased parent or parents.

*Cognitive factors.* Seven design variables composed this set: one representing general cognitive ability; four the associated subdomains (verbal comprehension, processing speed, perceptual reasoning and word memory). Higher general cognitive ability was coded 1 if the Full Scale IQ  $\geq 90$  or 0 if Full Scale  $< 90$ .

#### 4. Results

The objective of this study is to describe the academic abilities of individual students residing at a residential facility with a secondary school, and to identify behaviors and characteristics that influence their academics. The research questions are:

1. What are the academic and behavioral characteristics of adolescents attending the secondary residential school of study?
2. What significant academic deficits do students experience, and what behavioral characteristics do students exhibit upon entry into a secondary residential school?
3. Are there academic differences between students based on educational classification, type of placement, and variables commonly associated with students placed in residential facilities?
4. What factors and/or variables (i.e., factors within educational classification, type of placement, or variables often associated with students who attend residential schools) contribute to or explain the academic achievement of adolescents attending a secondary residential school?
5. Do students experience significant academic growth within six or more months of attending a secondary residential school?

6. Are there significant discrepancies between ability and achievement for students with specific learning disabilities (SLD), student with emotional and behavioral disorders (EBD), students with other health impairments (OHI), and general education (GE) students? Are the discrepancies different depending on if the student is classified as GE, SLD, EBD, or OHI?

This chapter describes the academic and behavioral characteristics of students followed by an examination of the relationship between variables identified for study. Next, the academic achievement of students upon admissions to the residential school and the factors impacting on the academic achievement of students are described. In addition, this study attempts to explain and predict student achievement based on the identified variables. Lastly, academic achievement over time was examined along with the discrepancies between student ability and achievement. Statistical analyses were conducted using SPSS (SPSS, 2008).

#### *Academic and Behavioral Characteristics of Students*

Tables 4.1 through 4.8 provide the frequency and percentage distribution of the students' age, gender, educational classification, and other variables identified as commonly associated with the population of study. Incomplete data occurred with several variables, particularly for Woodcock Johnson-III (WJ-III) Test of Achievement (Woodcock, McGrew, & Mather, 2001, 2007) scores and the Intelligence Quotients (IQ) of students whose enrollment at the facility was less than three months.



### *General Description of Population under Study*

The total population of students attending the residential school of study between 2001-2008 was 423. The mean weighted age of students was 15 years, 8 months. The ages ranged from 11 to 18 years old, and the grades ranged from 6<sup>th</sup> to 12<sup>th</sup>. In addition, male students outnumbered female students. Males comprised 68% of the population under study, while females made up 32%. The majority of students were Caucasian (49%). Forty-one percent were African Americans and other minority groups, mainly, Hispanic and Native American/Pacific Islanders, together, represented 10%. Fifty-three percent of the residents were placed at the residential facility from jurisdictions classified as suburban. Thirty-eight percent were from rural jurisdictions, and 11% were from urban jurisdictions.

Table 4.1

#### *Age, Gender, Race and Geographic Location of Students Between 2001 and 2008*

|                            | <i>N</i> | Percent |
|----------------------------|----------|---------|
| Ages of Students at Intake |          |         |
| 11                         | 2        | < 1     |
| 12                         | 11       | 3       |
| 13                         | 34       | 8       |
| 14                         | 70       | 16      |
| 15                         | 93       | 22      |
| 16                         | 114      | 27      |
| 17                         | 85       | 20      |
| 18                         | 12       | 3       |
| 19                         | 2        | < 1     |
| Gender                     |          |         |
| Male                       | 288      | 68      |
| Female                     | 135      | 32      |

Table 4.1 (Continued)

*Age, Gender, Race and Geographic Location of Students Between 2001 and 2008*

|                           | <i>N</i> | Percent |
|---------------------------|----------|---------|
| Geographic Location       |          |         |
| Suburban                  | 221      | 52      |
| Rural                     | 156      | 37      |
| Urban                     | 44       | 10      |
| Information Not Available | 2        | < 1     |
| Race                      |          |         |
| Caucasian                 | 206      | 49      |
| African American          | 175      | 41      |
| Hispanic                  | 38       | 9       |
| Other                     | 4        | < 1     |

*Family status.* There were two issues under consideration when family status was being aggregated from the data. The first issue concerned student's residency at the time of admissions, while the second addressed whether or not one or more of the students' biological parents were deceased or incarcerated at the time of admissions. A summary of family status at admissions is provided in Table 4.2.

Table 4.2

*Family Status of Students Between 2001 and 2008*

|                                  | <i>N</i> | Percent |
|----------------------------------|----------|---------|
| Foster Care                      | 250      | 59      |
| Single Parent                    | 81       | 19      |
| Both Parents                     | 32       | 8       |
| Family Member                    | 21       | 5       |
| Biological Parent and Stepparent | 18       | 4       |
| Adopted                          | 10       | 2       |
| Information Unavailable          | 11       | 3       |

Initially, a student's family status was divided into six categories depending on where the student resided or in whose custody the student was remanded upon admissions into the residential facility. Approximately 59% of the student population was in foster care upon admissions. The next largest population of students was from single family homes (19%). Eight percent were living with both biological parents, and five percent were living with family members other than their biological parents (i.e., grandparents, aunts and/or uncles). Four percent were living with one biological parent and a step parent. Two percent were listed as living with adopted parents, and the family status of three percent was unavailable.

Lastly, students were identified as to whether or not one or both of their parents were deceased or incarcerated at the time of admission. Thirty-eight students had one or more parents who were incarcerated at the time of admission. Twenty-nine students had one or more parents who were deceased at the time of admissions.

*Psychological issues.* Seventy-four percent of the student population had an identified psychological disorder. Of the 423 students in the study, specific psychological diagnoses were available for 315 students. A review of these records revealed five primary DSM-IV Axis I (American Psychiatric Association [APA], 2000) diagnoses that occurred with some frequency, to include Depressive Disorders (52%), Attention Deficit/Hyperactivity Disorder (ADHD) (39%), Oppositional Defiant Disorder (ODD) (32%), Conduct Disorder (CD) (16%) and Bipolar Disorder (12%). Other diagnoses, making up less than 10% of the population, included: Posttraumatic Stress Disorder (PTSD), Anxiety Disorder, Reactive Attachment Disorder, Borderline Personality

Disorder, Schizoid Personality Disorder, Antisocial Personality Disorder, and Pervasive Developmental Disorders.

Table 4.3 provides the psychological characteristics of students between 2001 and 2008. It was determined that 52% of the population (or 70% of those identified with a disorder) were prescribed psychiatric medications to address their diagnosis and more than 40% of the population (or 54% of those identified with a disorder) were identified as comorbid. Comorbidity is defined as having been diagnosed with two or more psychological disorders. A majority of the students diagnosed with depressive disorders and ADHD were found to have a comorbid diagnosis, having been diagnosed with their primary disorder and one or more additional disorders such as PTSD, Bipolar Disorder and ODD.

Table 4.3

*Psychological Characteristics of Students Between 2001 and 2008*

|   | <i>N</i> | Percent |
|---|----------|---------|
| Record of Psychological Disorders           |          |         |
| Record of Psychological Disorders           | 313      | 74      |
| No Record of Psychological Disorders        | 110      | 26      |
| Record of Comorbidity                       |          |         |
| Record of Comorbidity                       | 168      | 40      |
| No Record of Comorbidity                    | 255      | 60      |
| Psychiatric Medications                     |          |         |
| Record of taking Psychiatric Medications    | 220      | 52      |
| No Record of taking Psychiatric Medications | 202      | 48      |
| Information Not Available                   | 1        | < 1     |

Table 4.3 (Continued)

*Psychological Characteristics of Students Between 2001 and 2008*

|  | <i>N</i> |
|--|----------|
| Psychological Disorders                          |          |
| Depressive Disorders                             | 162      |
| Oppositional Defiant Disorder (ODD)              | 101      |
| ADHD/ADD   | 93       |
| Conduct Disorder (CD)                            | 51       |
| Bipolar Disorder                                 | 38       |
| Types of Comorbidity                             |          |
| Depressive Disorders with Some Other Disorder(s) | 94       |
| ADHD/ADD with Some Other Disorder(s)             | 90       |
| ODD with Some Other Disorder(s)                  | 61       |
| CD with Some Other Disorder(s)                   | 32       |
| Bipolar with Some Other Disorder(s)              | 29       |

*Juvenile offenses.* Of the total population under study, information regarding juvenile offenses was available for 263 students, which accounted for 62% of the population of students having a juvenile offense recorded in their files. Information regarding juvenile offenses of students between 2001 and 2008 is depicted in Table 4.4. More than a quarter of these students had committed multiple offenses. Of those having a juvenile record, 26% had committed an assault, 21% had stolen property or committed a property offense, 15% had committed a sexual offense to include sexual offenses against others and prostitution, 14% had drug or narcotics related charges, 13% had committed truancy, and 11% had been charged with property damage and weapons related charges. Other offenses, making up less than 5% of the population of juvenile offenders, included arson, manslaughter, trespassing and disorderly conduct.

Table 4.4

*Juvenile Offenses of Students Between 2001 and 2008*

|  | <i>N</i> | Percent |
|--|----------|---------|
| Record of Juvenile Offenses                |          |         |
| Record of Committing a Juvenile Offense    | 263      | 62      |
| No Record of Committing a Juvenile Offense | 160      | 38      |
| Juvenile Offenses                          |          |         |
| Assault                                    | 70       | 26      |
| Stolen Property                            | 55       | 21      |
| Sexual Crimes                              | 39       | 15      |
| Drugs/Narcotics                            | 36       | 14      |
| Truancy                                    | 34       | 13      |
| Property Damage                            | 15       | 6       |
| Weapons                                    | 14       | 5       |
| Other                                      | 12       | < 5     |
| Multiple Offenses                          | 66       | 25      |
| Unknown Offense                            | 60       | 23      |
| No Record of Juvenile Offenses Available   | 160      | 61      |

*Illicit drug use.* The number and percentage of adolescents using illicit drugs upon entry into the residential facility appears in Table 4.5. Of the total population, a record of illicit drug use was available for 243 students (57%). Often, the types of drugs students used were available in the data base. This information was made available by the placing agency or from student interviews with the facility's counseling staff. From the data base, 37% percent of the students reported not ever having used alcohol or drugs prior to intake.

Table 4.5

*Illicit Drug Use of Students Between 2001 and 2008*

|  | <i>N</i> | Percent |
|--|----------|---------|
| Record of Illicit Drug Use                     |          |         |
| Record of Illicit Drug Use                     | 243      | 57      |
| No Record of Illicit Drug Use                  | 180      | 43      |
| Types of Illicit Drugs Used                    |          |         |
| Marijuana and Alcohol                          | 94       | 38      |
| Marijuana Only                                 | 44       | 18      |
| Multiple Drug User (combination of drug usage) | 36       | 15      |
| Marijuana and/or Alcohol and Stimulants        | 15       | 6       |
| Alcohol Only                                   | 9        | 4       |
| Marijuana and/or Alcohol and PCP               | 8        | 3       |
| Marijuana and/or Alcohol and Opiates           | 7        | 3       |
| Marijuana and/or Alcohol and Hallucinogens     | 4        | 2       |
| Marijuana and/or Alcohol and Solvents          | 5        | 2       |
| Information On Drug Type Not Available         | 21       | 8       |

Table 4.5 also provides a breakdown of the types of illicit drugs said to be used by students at the facility. Of those students reported as using illicit drugs, 38% of the students were reported using alcohol and marijuana, whereas 18% reported only using marijuana and four percent reported only using alcohol. Often students reported using alcohol and/or marijuana in combination with stimulants, hallucinogens, solvents or opiates. Another, 15% reported using a combination of drugs, across all categories (i.e., stimulants, opiates, etc.).

Ninety-two residents were administered the adolescent Substance Abuse Subtle Screen Inventory (SASSI) (Miller, 1989) between 2006-2008. The SASSI is a behavior

checklist which relates respondents' answers to their suspected level of drug use. Based on individual scores, 45% of those administered the SASSI were reported as drug dependent, 36% were reported as having a low probability of drug use, and 20% were reported as drug abusers. See Table 4.6 for these results.

Table 4.6

*Level of Substance Abuse (SASSI Scores) Between 2006 and 2008*

|                                    | <i>N</i> | Percent |
|------------------------------------|----------|---------|
| Drug Dependent                     | 41       | 45      |
| Low Probability of Substance Abuse | 33       | 36      |
| Drug Abuser                        | 18       | 19      |
| N=92                               |          |         |

*Educational description.* The school under study is a secondary school that includes middle and high school students, grades 6<sup>th</sup> through 12<sup>th</sup>. The school admits students from both general education and special education populations. Table 4.7 provides a distribution of grades by number of students and by percentage as well as educational classification and the number of years students are behind in their chronological grade based on data from original admissions. Upon admissions, 40% of the students were registered for the 9<sup>th</sup> grade, 22% were registered for 10<sup>th</sup> grade, 13% were registered for the 11<sup>th</sup> grade, 10% were registered for the 8<sup>th</sup> grade, approximately seven percent were registered for the 12<sup>th</sup> and 7<sup>th</sup> grades, and less than two percent were registered for the 6<sup>th</sup> grade.



Table 4.7

*Educational Characteristics of Students Between 2001 and 2008*

|                    | <i>N</i> | Percent |
|--------------------|----------|---------|
| Grade at Intake    |          |         |
| 6th Grade          | 6        | 1       |
| 7th Grade          | 29       | 7       |
| 8th Grade          | 42       | 10      |
| 9th Grade          | 169      | 40      |
| 10th Grade         | 91       | 22      |
| 11th Grade         | 53       | 12      |
| 12th Grade         | 33       | 8       |
| Grade Retention    |          |         |
| Not Behind a Grade | 170      | 40      |
| Behind 1 Year      | 131      | 31      |
| Behind 2 Years     | 79       | 19      |
| Behind 3 Years     | 35       | 8       |
| Behind 4 Years     | 5        | 1       |
| Behind 5 Years     | 3        | < 1     |

In addition to grade at admissions, the number of years students were behind in their chronological grade was obtained. Forty percent of the students entered on grade level. Other students were identified as being one to as many as five years behind their chronological grade. Thirty-one percent were behind by one year, 19% were two years behind, eight percent were three years behind, one percent were four years behind, and less than one percent were five years behind.

The residential facility identified four different educational classifications presented in Table 4.8. In addition to GE students, they included students with Specific Learning Disabilities (SLD), students with Emotional and Behavioral Disorders (EBD), and students with Other Health Impairment (OHI). Fifty-two percent of the students

attending the secondary school between 2001 and 2008 were general education students. Of those students with special education classifications, 27% were students identified as EBD, 14% were students identified as SLD, and seven percent were students identified as OHI.

Only primary special education categories were used as identifiers. Three special education students within the population were identified with speech and language or mental retardation (MR) as their primary disability. In this case, their secondary categories were used to fold them into the larger primary categories.

Table 4.8

*Educational Classification of Students Between 2001 and 2008*

|                                      | <i>N</i> | Percent |
|--------------------------------------|----------|---------|
| General Education Student            | 218      | 52      |
| Student with Emotional Disturbance   | 115      | 27      |
| Student with Learning Disability     | 59       | 14      |
| Student with Other Health Impairment | 28       | 7       |

*Placement issues.* There were four subcategories noted in this study in relationship to placement. First, students were identified by their type of placement. This was usually based on their presenting issues (i.e., substance issues, educational issues, etc.). Second, the number of placements a student had experienced prior to intake could be determined from their placing agency's records. This will be explained later. Third, student length of stay at the facility was calculated from the admissions date and the date at which they were discharged. Fourth, upon discharge, students were given an identifier

for the type of discharge and noted in the facility's database. Tables 4.9 and 4.12 provide a clear break down of these subcategories.

*Presenting issue.* Various groups and agencies have been identified by the residential facility of study as the “placing agency.” These were categorized into six areas and based on a students presenting issues: foster care, adjudicated youth, family issues, substance abuse, relapse prevention (sexual offenders), and education. Table 4.7 provides the number and percentage of students by their type of placement. Foster care was the presenting issue for students being placed at the facility by social service agencies. Adjudicated youth, relapse prevention and substance abuse were the presenting issue of students being placed at the facility as terms of their probation. Family issues typically involved private placements by parents or guardians. Lastly, education typically meant the student was being placed due to educational issues that could not be addressed in a traditional educational setting.

Table 4.9

*Types of Placements for Students Between 2001 and 2008*

|                           | <i>N</i> | Percent |
|---------------------------|----------|---------|
| Foster care               | 221      | 52      |
| Adjudicated youth         | 82       | 19      |
| Family issues             | 52       | 12      |
| Substance abuse           | 29       | 7       |
| Education                 | 14       | 3       |
| Relapse prevention        | 13       | 3       |
| Information Not Available | 12       | 3       |

Fifty-two percent of the population was placed at the residential facility through social services (i.e., foster care). Almost 19% were adjudicated youth. This did not include youth who had been adjudicated under relapse prevention (i.e., sexual offenders) (3%) and those remanded from drug rehabilitation centers (7%). Another 12% were admitted for presenting issues related to the family and three percent were admitted for educational issues.

*Number of placements.* Using school records and court documents, an estimate of the number of placements a student had experienced prior to intake could be determined. Three categories were identified as: (1) multiple placements; (2) first placement following discharge from juvenile detention center; and, (3) first placement. The number of placements are presented in Table 4.10.

First, 58% of the population had experienced multiple placements (i.e., two or more out-of-home placements) prior to admittance at the residential facility of study. Second, 18% were experiencing their first out-of-home placement following discharge from a juvenile detention center, or rehabilitative center for sexual offenders or substance abuse. Thirdly, 17% were experiencing their first out-of-home placement mostly due to family or educational related issues. This information was not available for 7% of the population.

Table 4.10

*Number of Placements for Students Between 2001 and 2008*

|  | <i>N</i> | Percent |
|--|----------|---------|
| Multiple Placements                          | 243      | 58      |
| Juvenile Facility then Residential Placement | 75       | 18      |
| First Placement                              | 71       | 17      |
| None Listed                                  | 33       | 8       |

*Length of stay.* Admissions and discharge dates were available for the entire population. Because each of the 423 students had differing figures for the number of days they had been in care, length of stay was divided into six month periods (see Table 4.11.). It was determined that the average length of stay at the residential facility under study was approximately 335 days. The minimum number of days was one, while the maximum stay during this period was 1,761 days (equating to 59 months or almost five years). The majority of students' length of stay was less than six months (36%). There were several students who had to be discharged for various reason, then were readmitted to the program at a later date. The days these students were absent from the facility were not included in their total length of stay.

Table 4.11

*Length of Stay for Students Between 2001 and 2008*

|                      | <i>N</i> | Percent |
|----------------------|----------|---------|
| 0 to 6 months        | 151      | 36      |
| 6 months to 1 year   | 104      | 25      |
| 1 year to 1.5 years  | 96       | 23      |
| 1.5 years to 2 years | 33       | 7.8     |
| 2 years to 2.5 years | 19       | 4.5     |
| 2.5 years to 3 years | 11       | 2.6     |
| 3 years to 3.5 years | 5        | 1.2     |
| 3.5 years and beyond | 4        | .9      |

*Reasons for discharge.* The residential facility identified reasons for a student's eventual discharge in their database using five identifiers: (1) discontinued; (2) dismissal; (3) graduation; (4) program completion; and (5) reasons not given (see Table 12). When a student was noted as discontinued this typically involved an outside agency or parent deciding to discontinue serves. Most often these were students who were being reunited with family members, or students who were being placed in a foster care or adoptive homes. Students dismissed by the facility were identified as those who were noncompliant, transferred to a detention center, students who were overly aggressive or students who were hospitalized. Forty-seven percent of the students were identified as discontinued, 25% were dismissed, 17% percent completed the program, 11% graduated from the high school and one percent did not provide a reason for leaving.

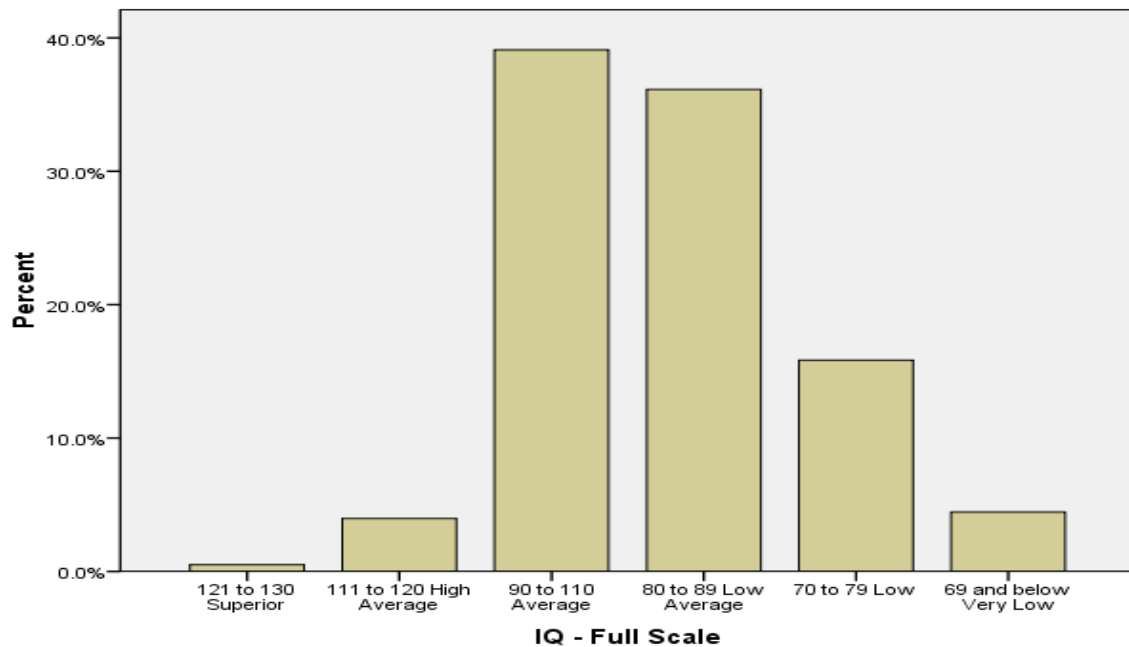
Table 4.12

*Types for Discharge*

|                    | <i>N</i> | Percent |
|--------------------|----------|---------|
| Discontinued       | 197      | 47      |
| Dismissal          | 105      | 25      |
| Program Completion | 72       | 16      |
| Graduation         | 45       | 11      |
| Reason Not Given   | 6        | 1       |

*Intelligence.* Full Scale intelligence quotient (IQ) standard scores were available for 201 students. Fewer standard scores were available for other IQ ability scores and subtests (i.e., performance and verbal IQ, working memory, etc.). Several types of IQ test scores were available in the data base (i.e., Stanford Benet, Kauffman, WJ-III Test of Cognitive Ability, etc.). A majority, almost 80%, of the scores in the database were WISC-III. To increase validity in analyses, only the WISC-III scores were used in this study.

The mean weighted IQ was 87 (WISC-III, Wechsler, 1991; Wechsler & Matarazzo, 2004). Figure 1 shows the distribution of Full Scale IQ scores for the entire population. Almost 57% had standard scores below average whereas approximately 43% of the students' Full IQ standard scores were average or above.



*Figure 1. Percent Full Scale IQ for the Population under Study*

#### *Relationships Between Variables Associated with Residential Placements*

Chi-square statistical tests and descriptive statistics were used to examine the relationships between variables associated with residential care. This information provided further descriptions of the population under study as well as provided information needed for later statistical analysis (i.e., logistical regression). Crosstabs were used to describe the frequency and percentage of variables (i.e., the number of male students with substance abuse issues). In addition, a chi square statistical test was used to determine if there were significant relationships between these same variables. The frequencies were used to describe the direction of the relationships between variables.

Variables used in the crosstabulation procedure in SPSS (SPSS, 2008) were divided into two groupings. The first included: gender, number of placements, race,



length of stay, type of placement, geographic location, family status, and educational classification. The second, which was crosstabbed with the first, included: grade retention, illicit drug use, juvenile offenders, ADHD, comorbidity, psychological disorders, and psychiatric medications.

*Gender.* There were more males attending the secondary school of study than females. When examining the crosstabulation between gender and the seven variables in the second grouping it was determined that males outnumbered females in all areas (see Figure 2). More males entered the school below grade level than females. Even then, when examining females as a group, 60% of females entered the school behind in their chronological grade whereas only 50% of males encountered significant grade retention. In addition, when compared to females, it was determined that males were more likely to commit juvenile offenses (70%) (Figure 3); were more likely to be diagnosed with ADHD (74%) (Figure 4); were more likely to be comorbid (64%) (Figure 5); were more likely to be diagnosed with a psychological disorder (62%) (Figure 6); were more likely to be taking psychiatric medications (61%) (Figure 7); and, were more likely to have used illicit drugs (66%) (Figure 8).

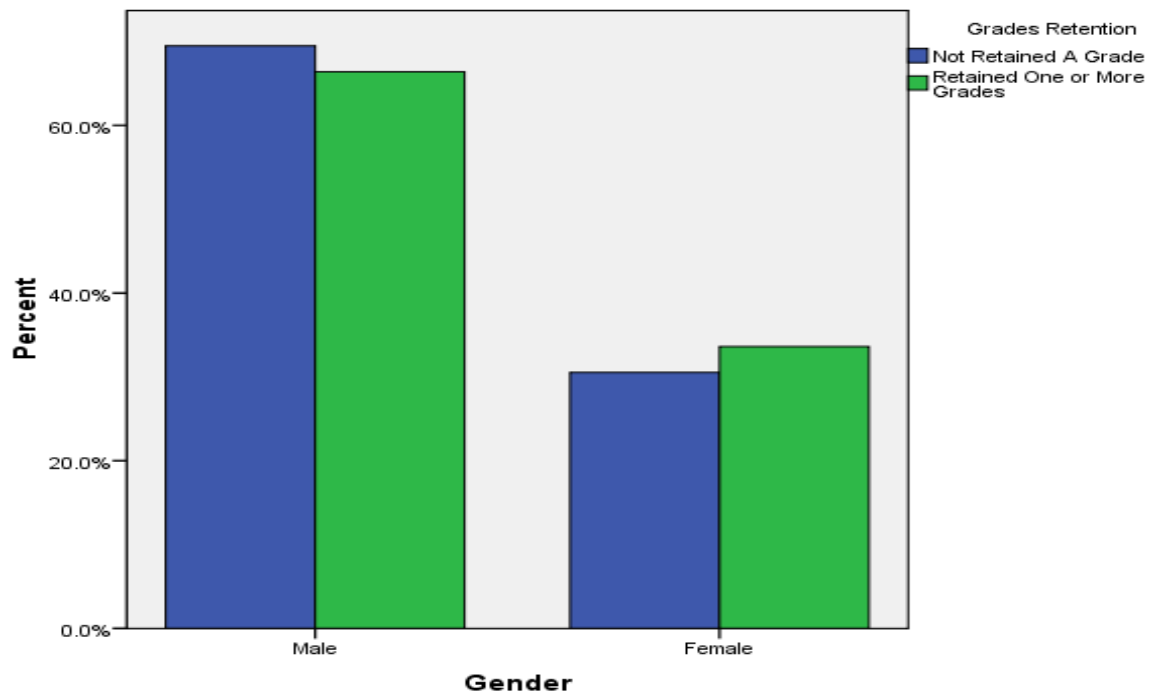


Figure 2. Percent of Students Retained One or More Grades by Gender

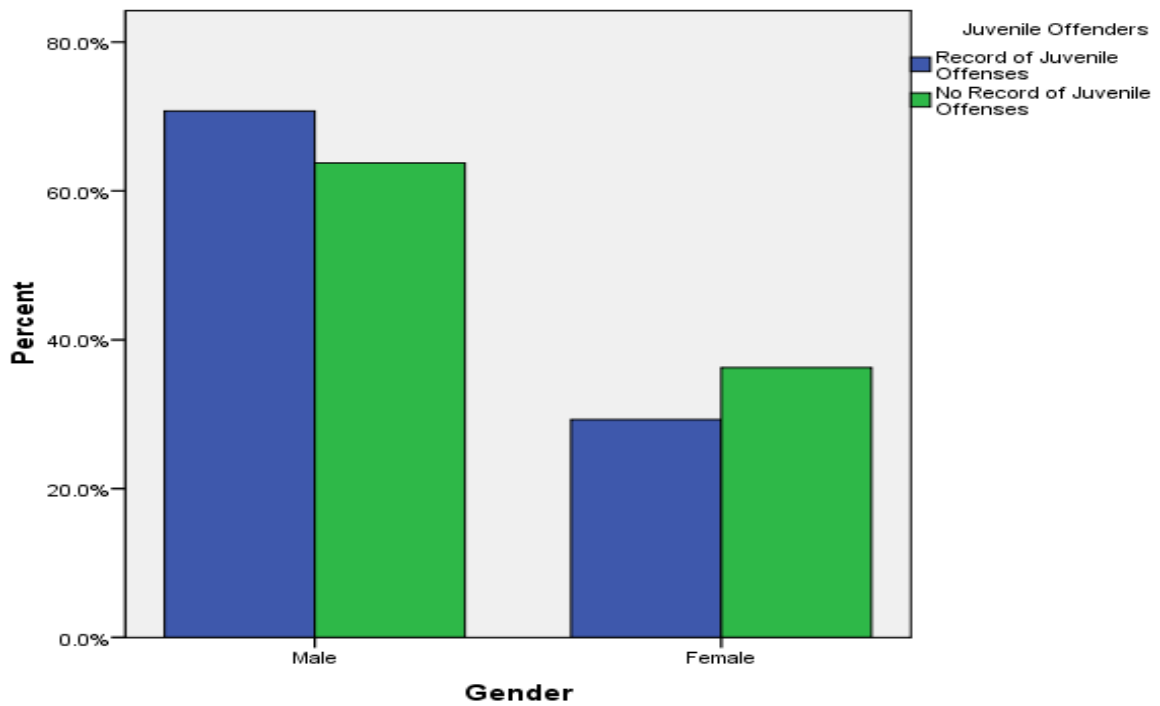


Figure 3. Percent of Juvenile Offenders by Gender

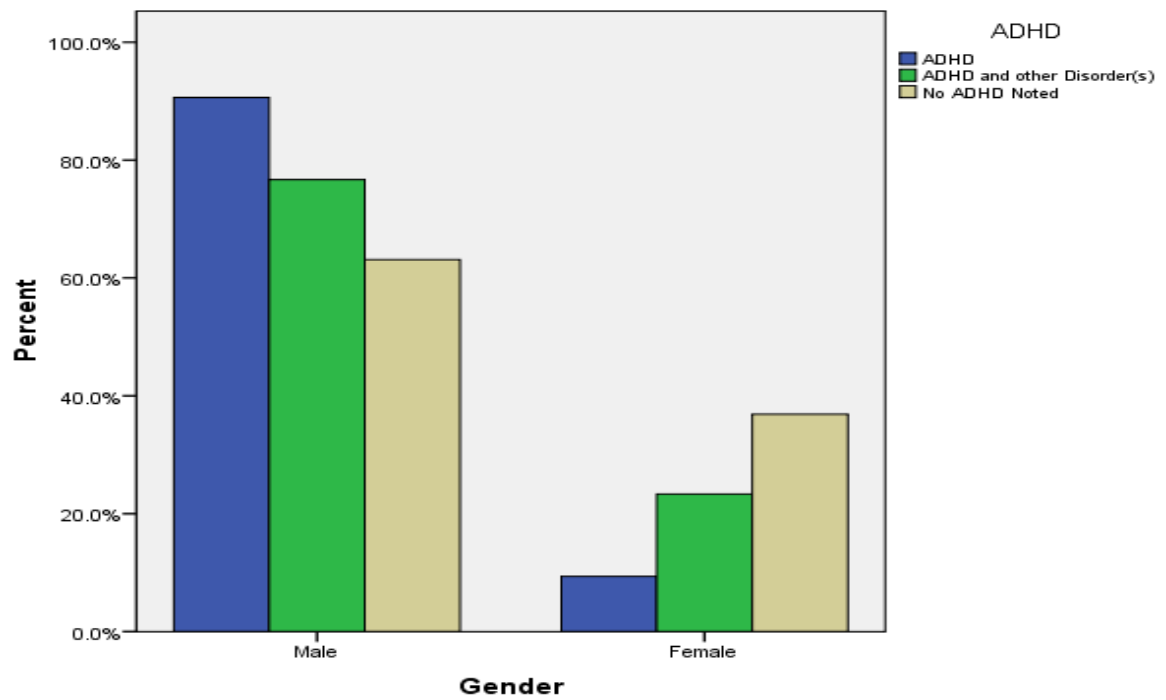


Figure 4. Percent of Students Diagnosed with ADHD by Gender

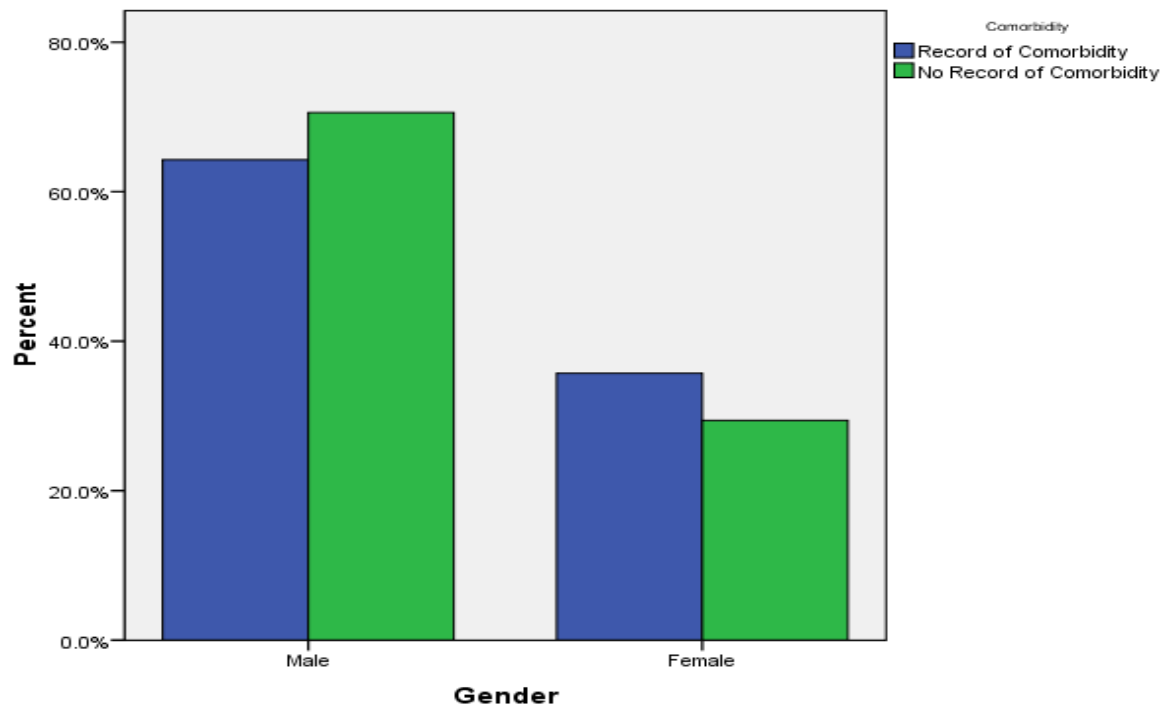


Figure 5. Percent of Students with a Record of Comorbidity by Gender

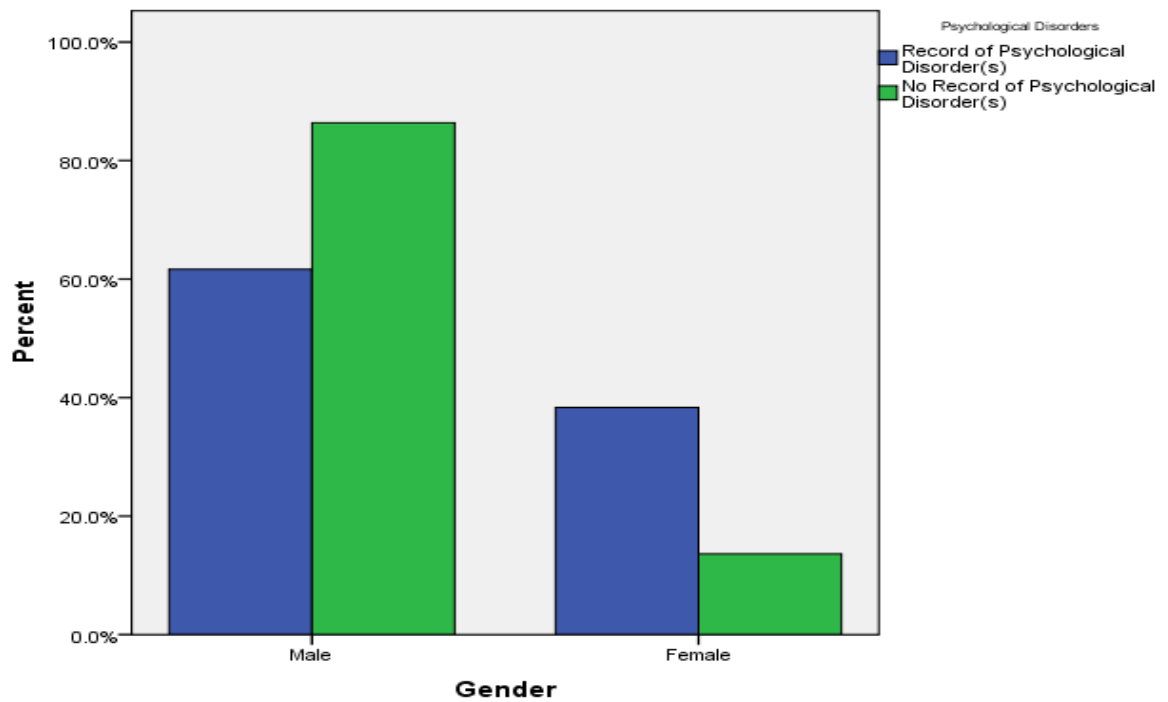


Figure 6. Percent of Students with Psychological Disorders by Gender

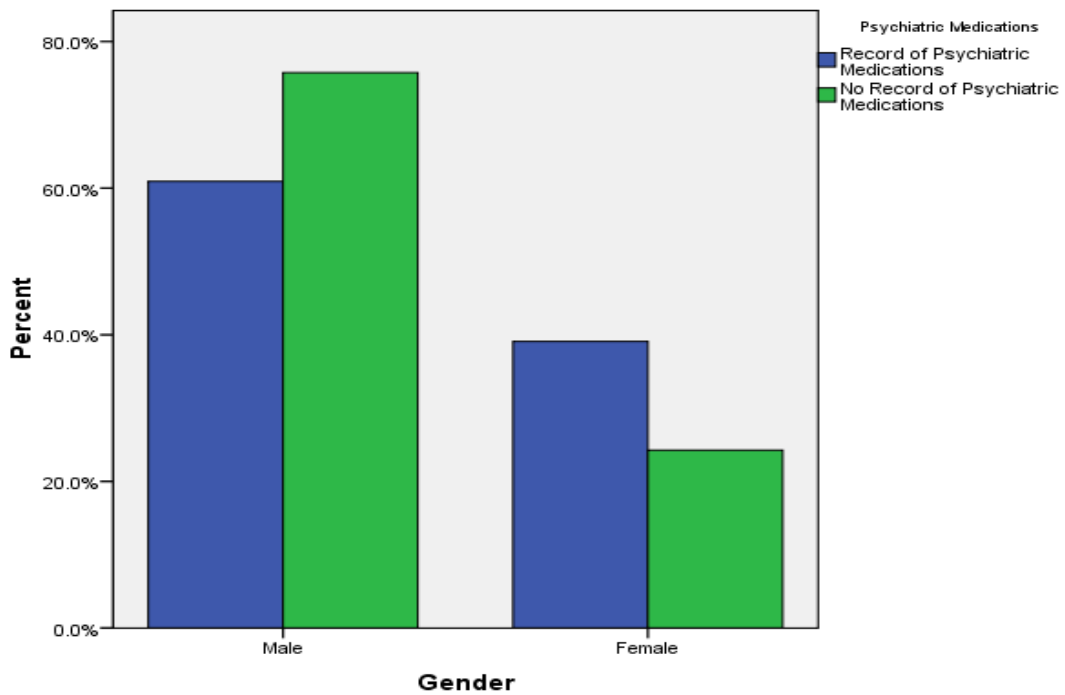


Figure 7. Percent of Students Taking Psychiatric Medications by Gender

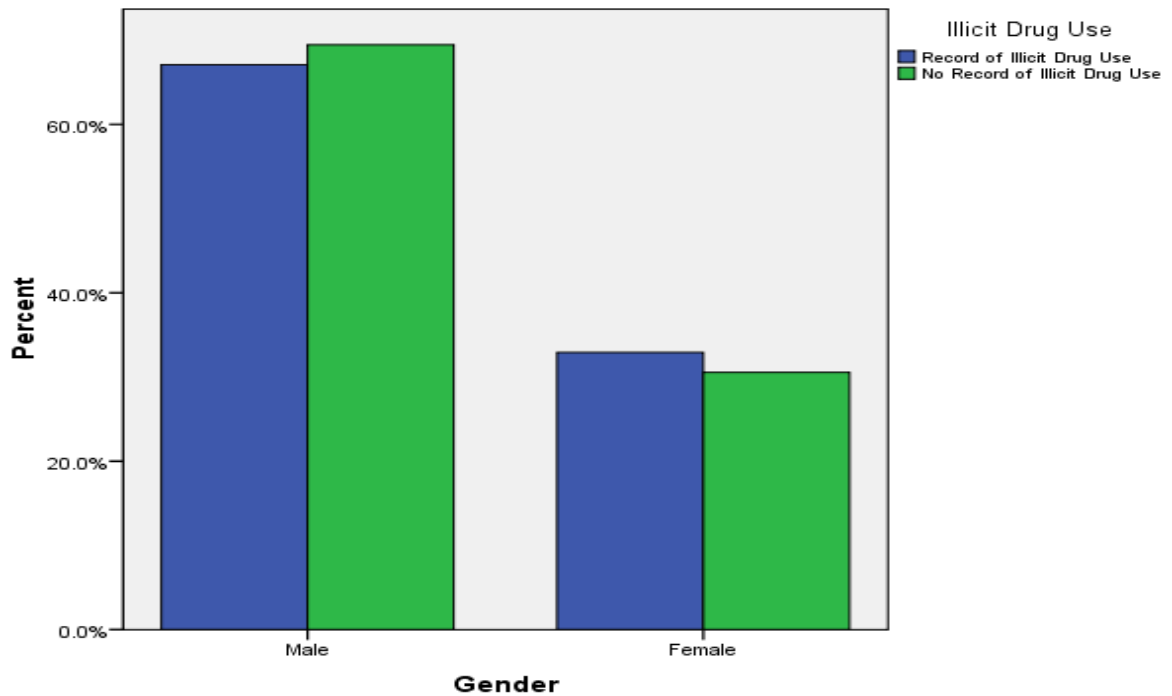


Figure 8. Percent of Students Using Illicit Drugs by Gender

The Pearson chi-square ( $p = .05$ ) results are provided in Tables 4.13 and 4.14, showing that the relationship between gender and psychological disorders, gender and psychiatric medications, and gender and ADHD were significant. Given the *Cramer's V*, the strongest relationship was between gender and psychological disorders. There was no significant relationship between gender and grade retention, gender and illicit drug use, gender and juvenile offenses, and gender and comorbidity.

Table 4.13

*Pearson Chi-Square for Relationship Between Gender and Grade Retention, Illicit Drug Use, Juvenile Offenses and ADHD*

| Variables  | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD  |
|------------|-----------------|------------------|-------------------|-------|
| Gender     |                 |                  |                   |       |
| $\chi^2$   | 7.21            | .85              | 4.90              | 13.94 |
| sig.       | .206            | .654             | .086              | .001  |
| N          | 423             | 423              | 423               | 423   |
| Cramer's V | .131            | .045             | .108              | .182* |

p < .05 level of significance \*Cramer's V with significance.

Table 4.14

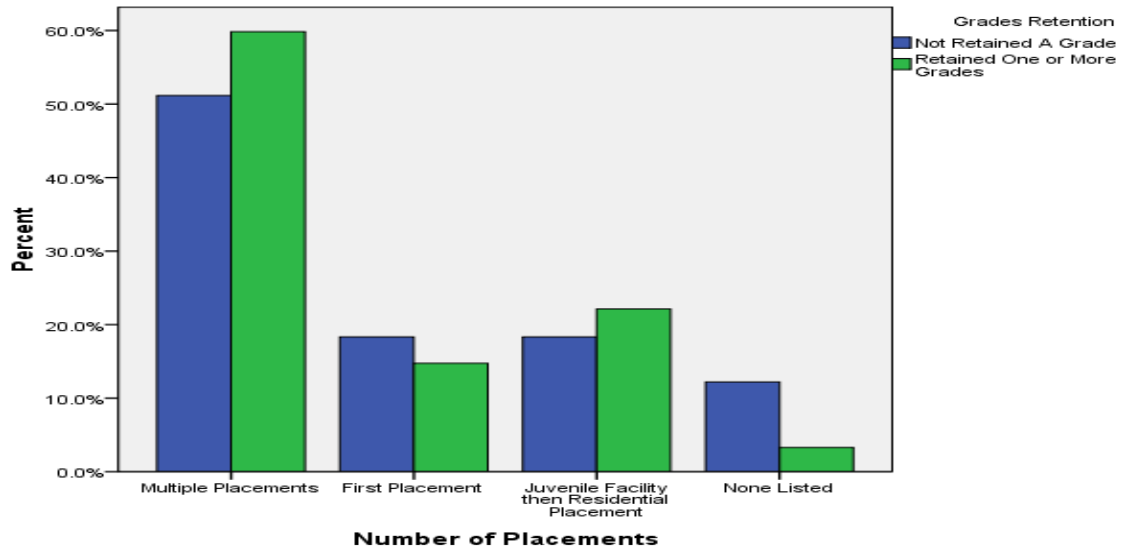
*Pearson Chi-Square for Relationship Between Gender and Comorbidity, Psychological Disorder and Psychiatric Medications*

| Variables  | Comorbidity | Psychological Disorder | Psychiatric Medications |
|------------|-------------|------------------------|-------------------------|
| Gender     |             |                        |                         |
| $\chi^2$   | 1.85*       | 22.86**                | 10.56**                 |
| sig.       | .201        | .000                   | .000                    |
| N          | 423         | 423                    | 422                     |
| Cramer's V | .066        | .232*                  | .159*                   |

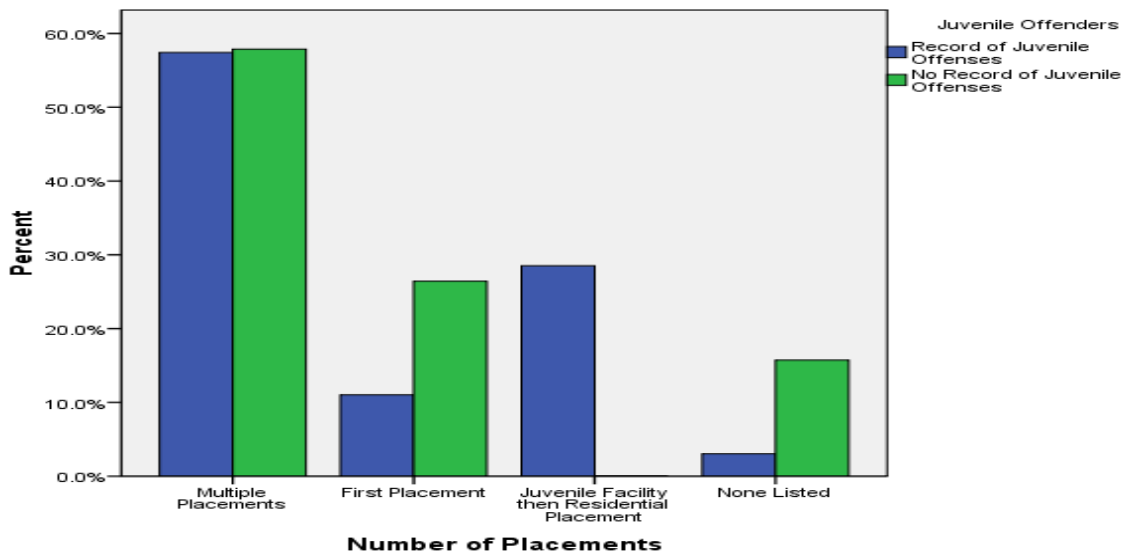
p < .05 level of significance \*Cramer's V with significance \*\*Fisher Exact Test

*Number of placements.* As defined earlier, there were three categories to identify the number of placements, including (1) multiple placements, (2) first placement after a period of time in a juvenile detention or rehabilitation center, and (3) first placement. It was determined from the crosstabulations that students who experienced multiple placements were more likely to be retained one or more grades (58%) (Figure 9). These students were also more likely to commit juvenile offenses (59%) (Figure 10), and more likely to be diagnosed with a psychological disorder (67%) (Figure 11); be comorbid

(72%) (Figure 12); and, take psychiatric medications (70%) (Figure 13). They were also almost twice as likely to be substance abusers as students from other placement categories (Figure 14).



*Figure 9. Percent of Grades Retained by Number of Placement*



*Figure 10. Percent of Juvenile Offenders by Number of Placements*

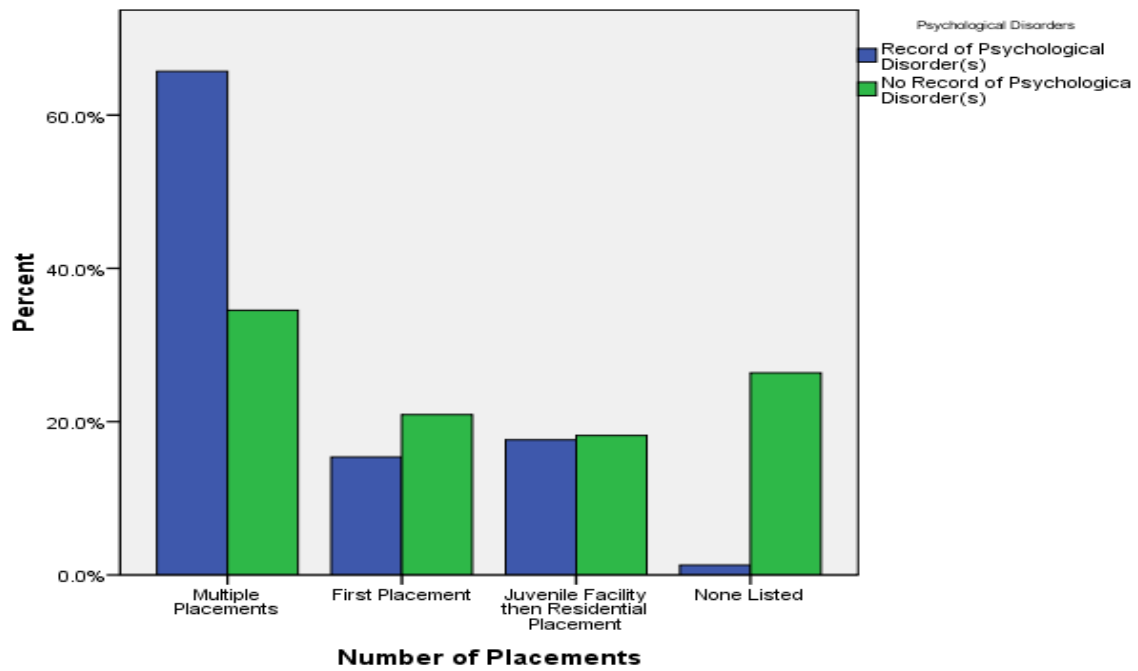


Figure 11. Percent of Students Diagnosed with a Psychological Disorder by Number of Placements

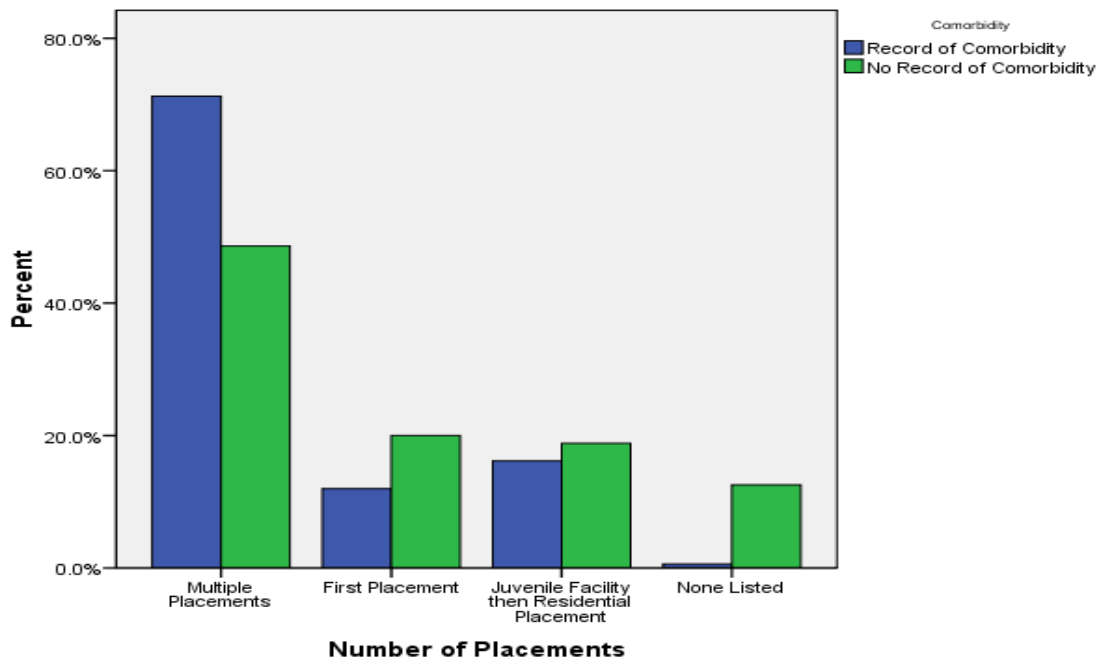


Figure 12. Percent of Students Experiencing Comorbidity by Number of Placements



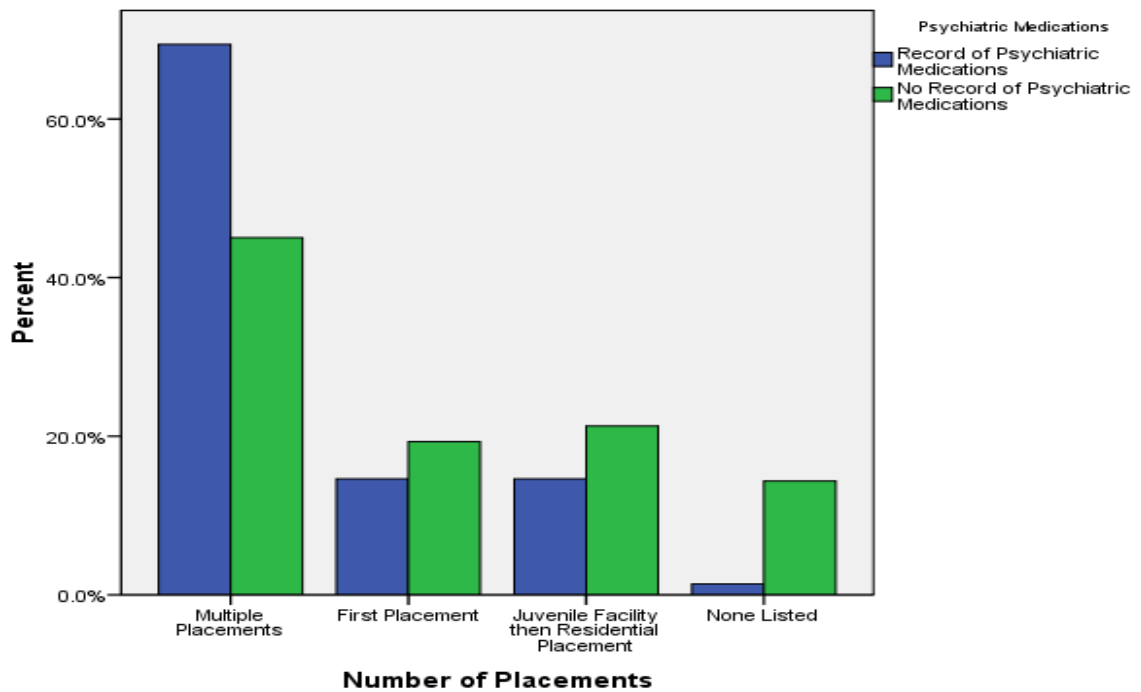


Figure 13. Percent of Students Taking Psychiatric Medications by Number of Placements

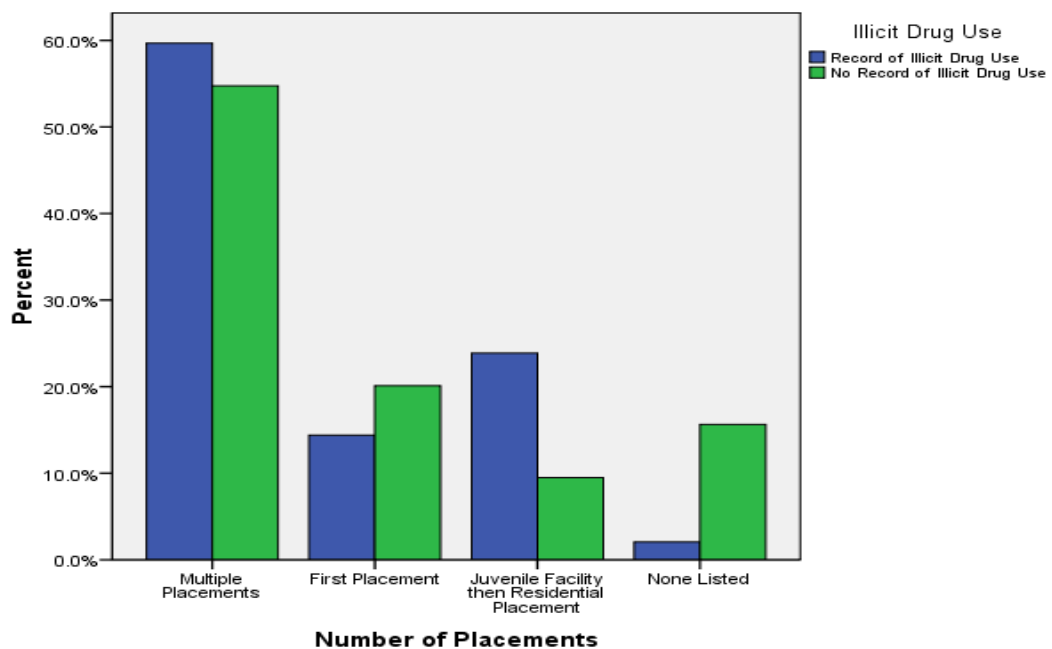


Figure 14. Percent of Students Using Illicit Drugs by Number of Placements

According to the chi-square values in Tables 4.15 and 4.16 there was a significant relationship between number of placements in all categories except for grade retention. The *Cramer's V* values show a strong relationship between the number of placements and juvenile offenders, psychological disorders, psychiatric medications, comorbidity, and illicit drug use.

Table 4.15

*Pearson Chi-Square for Relationship Between Number of Placements and Grade Retention, Illicit Drug Use, Juvenile Offenses and ADHD*

| Variables            | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD  |
|----------------------|-----------------|------------------|-------------------|-------|
| Number of Placements |                 |                  |                   |       |
| $\chi^2$             |                 |                  |                   |       |
| sig.                 | 14.994          | 39.752           | 80.70             | 33.00 |
| N                    | .452            | .000             | .000              | .000  |
|                      | 422             | 422              | 422               | 422   |
| <i>Cramer's V</i>    | .109            | .217*            | .437*             | .198* |

p < .05 level of significance \**Cramer's V* with significance

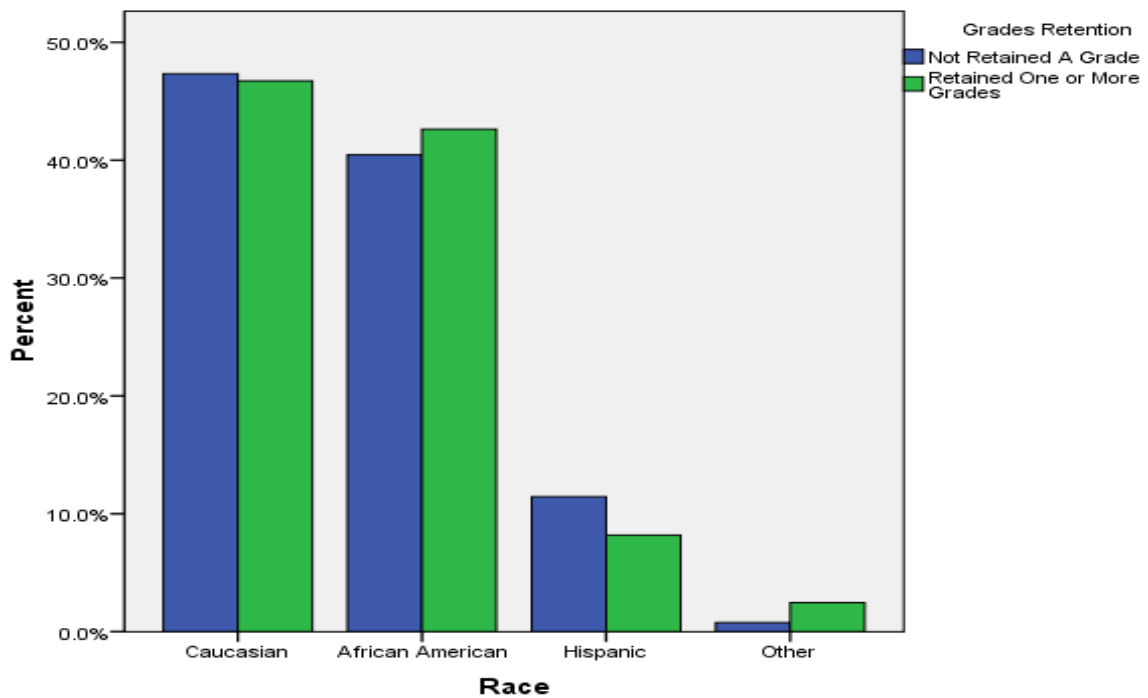
Table 4.16

*Pearson Chi-Square for Relationship Between Number of Placements and Comorbidity, Psychological Disorder, and Psychiatric Medications*

| Variables            | Comorbidity | Psychological Disorder | Psychiatric Medications |
|----------------------|-------------|------------------------|-------------------------|
| Number of Placements |             |                        |                         |
| $\chi^2$             |             |                        |                         |
| sig.                 | 31.67       | 80.63                  | 38.12                   |
| N                    | .000        | .000                   | .000                    |
|                      | 422         | 422                    | 421                     |
| <i>Cramer's V</i>    | .274*       | .309*                  | .301*                   |

p < .05 level of significance \**Cramer's V* with significance

*Race.* There were four categories for race identified, of which Caucasian was the largest, followed by African American, Hispanic and other (i.e., Native American/Pacific Islander). Even though Caucasians outnumbered African Americans, the differences varied only slightly amongst the seven variables. Both groups had high percentages of grade retention (Figure 15), students with psychological disorders (Figure 16), students taking psychiatric medications (Figure 17), and students using illicit drugs (Figure 18). Even then, only in juvenile offenses did African American students outnumber Caucasian students, but by fewer than five percentage points (Figure 19).



*Figure 15.* Percent of Grades Retention by Race

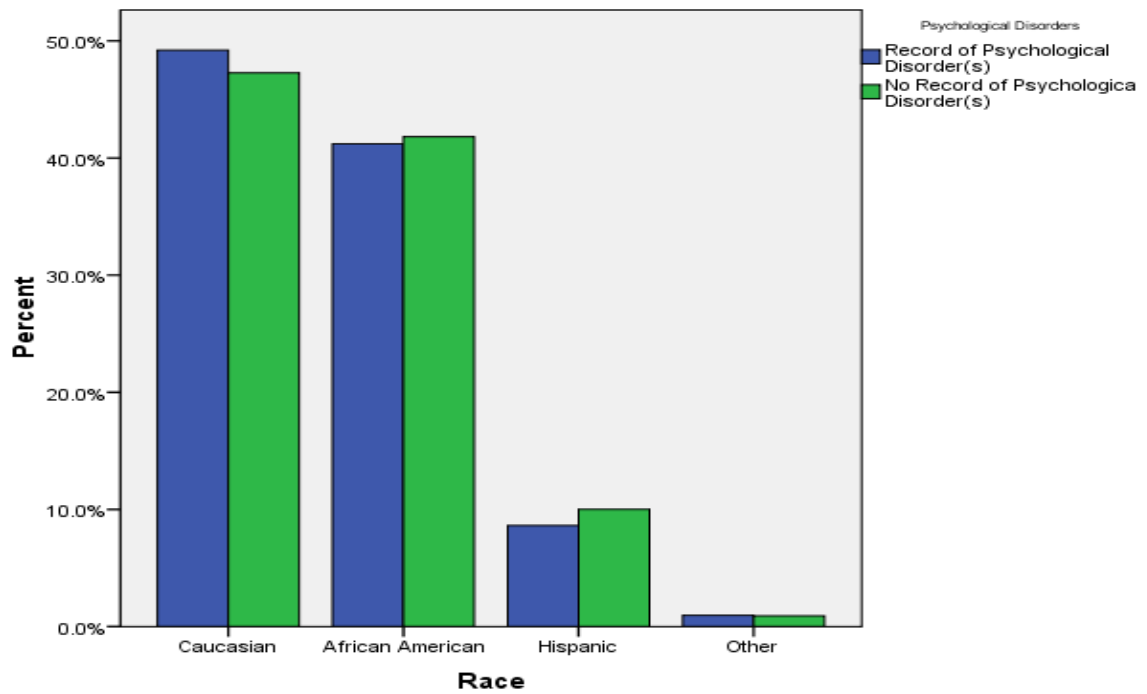


Figure 16. Percent of Psychological Disorders by Race

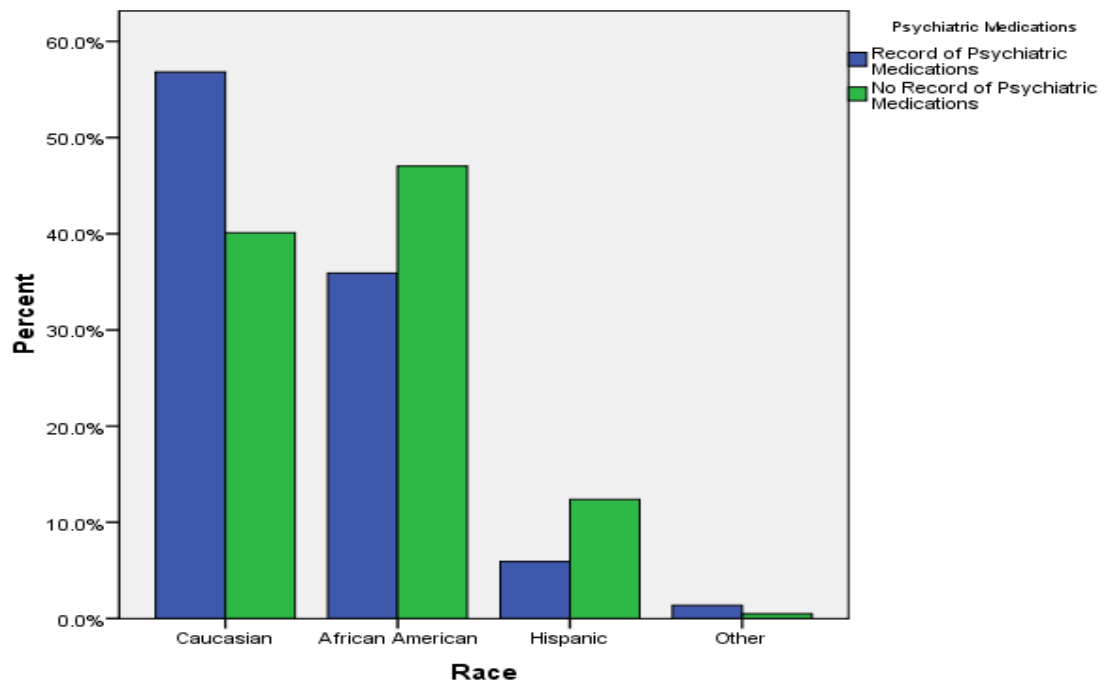


Figure 17. Percent Students taking Psychiatric Medications by Race

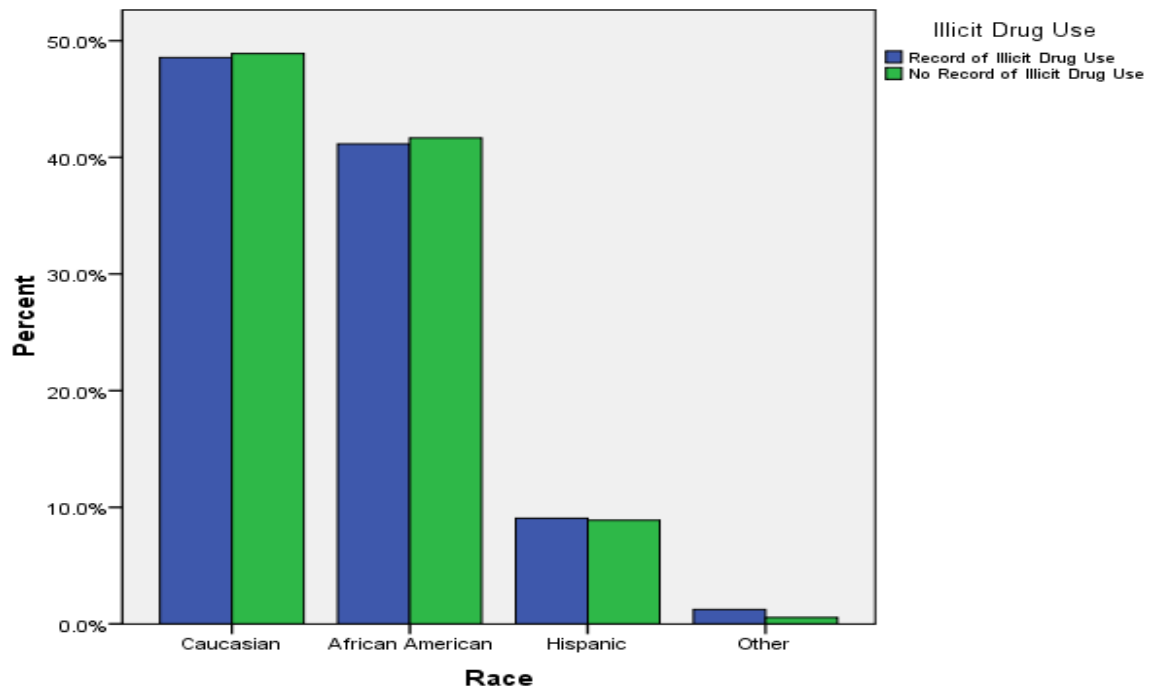


Figure 18. Percent of Students using Illicit Drugs by Race

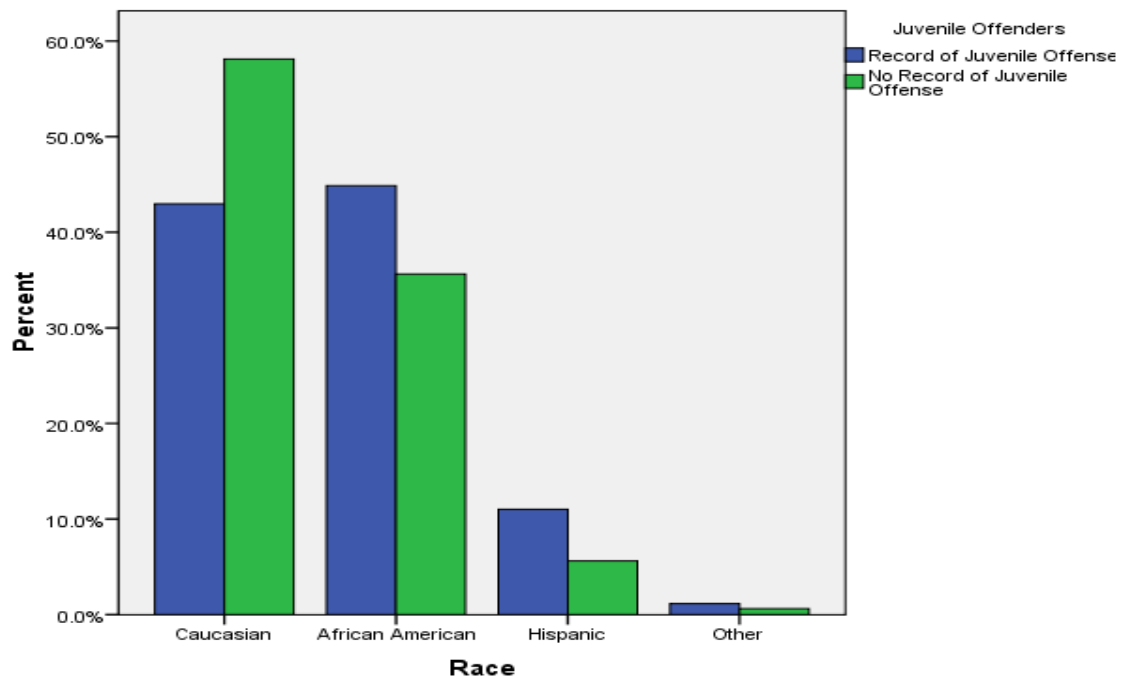


Figure 19. Percent of Juvenile Offenders by Race

The chi-square analysis found only a significant relationship between race and psychiatric medications. There was no significant relationships between race and ADHD; race and psychological disorders; race and grade retention; race and illicit drug use; race and juvenile offenses; and race and comorbidity. See Tables 4.17 and 4.18 for chi square results.

Table 4.17

*Pearson Chi-Square for Relationship Between Various Variables*

| Variables  | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD   |
|------------|-----------------|------------------|-------------------|--------|
| Race       |                 |                  |                   |        |
| $\chi^2$   | 11.281          | 2.119            | 11.893            | 11.947 |
| sig.       | .732            | .908             | .064              | .063   |
| N          | 423             | 423              | 423               | 423    |
| Cramer's V | .094            | .050             | .119              | .119   |

p < .05 level of significance

Table 4.18

*Pearson Chi-Square for Relationship Various Variables*

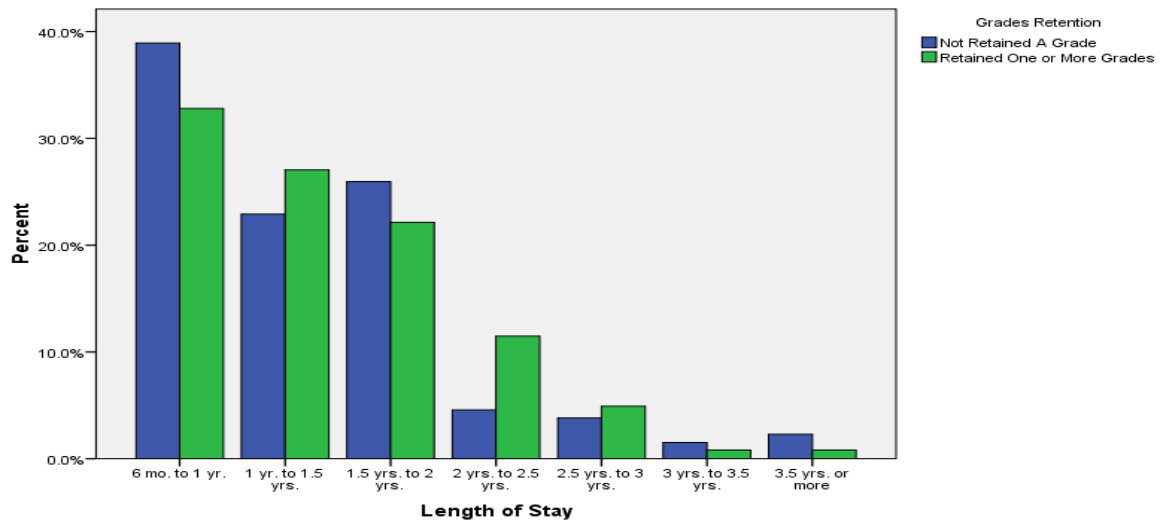
| Variables  | Co-morbidity | Psychological Disorder | Psychiatric Medications |
|------------|--------------|------------------------|-------------------------|
| Race       |              |                        |                         |
| $\chi^2$   | 2.461        | .242                   | 14.92                   |
| sig.       | .482         | .971                   | .002                    |
| N          | 423          | 423                    | 422                     |
| Cramer's V | .076         | .024                   | .188*                   |

p < .05 level of significance \*Cramer's V with significance

*Length of stay.* Students who entered the program behind in their chronological grade were more likely to stay at the facility for longer periods of time than students who entered at their expected chronological grade level. The likelihood of a students staying at

the school for longer than six months increased with the number of years a student was behind chronologically. For example, as depicted in Figure 20, only 35% of the students who entered the program at the expected grade level extended their stay past the six month period, but for students who entered a year behind, 38% were more likely to extend their stay past six months. Sixty-five percent of students, whose chronological grade was two years behind, 69% of students who were behind three years, and finally, 80% of the students who were four or more years behind, extended their stay past six months.

Students with ADHD (61%) were more likely to stay at the facility past six months (Figure 21), as were students with comorbidity (Figure 22). Similarly, 63% of students with psychological disorders (Figure 23), 61% of those taking psychiatric drugs (Figure 24), and 60% of those using illicit drugs were likely to stay at the school longer than six months (Figure 25).



*Figure 20. Percent of Grades Retained by Length of Stay at Residential Facility*

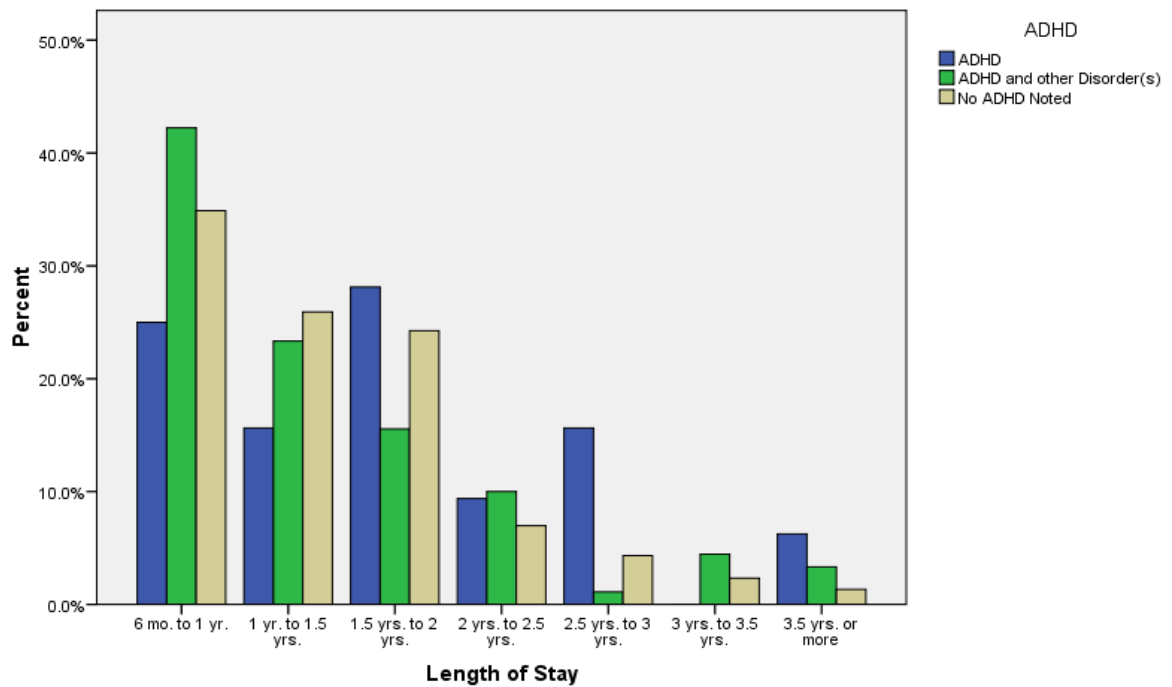


Figure 21. Percent of Students with ADHD by Length of Stay at Residential Facility

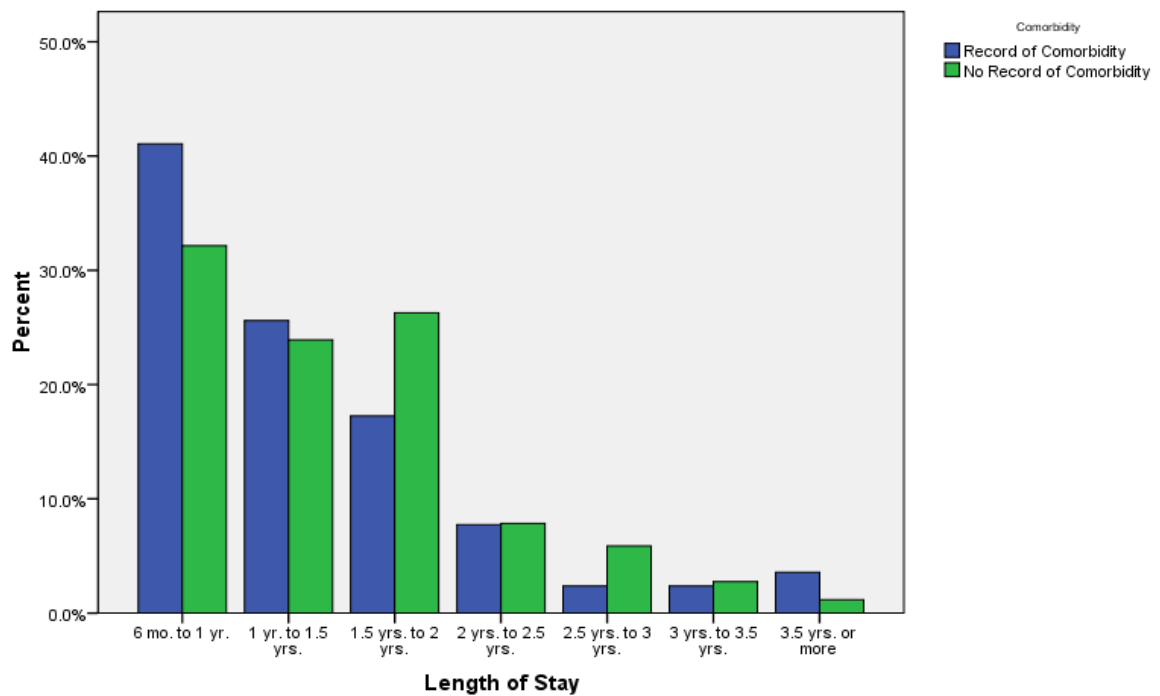


Figure 22. Percent of Students Comorbidity and Length of Stay at Residential Facility



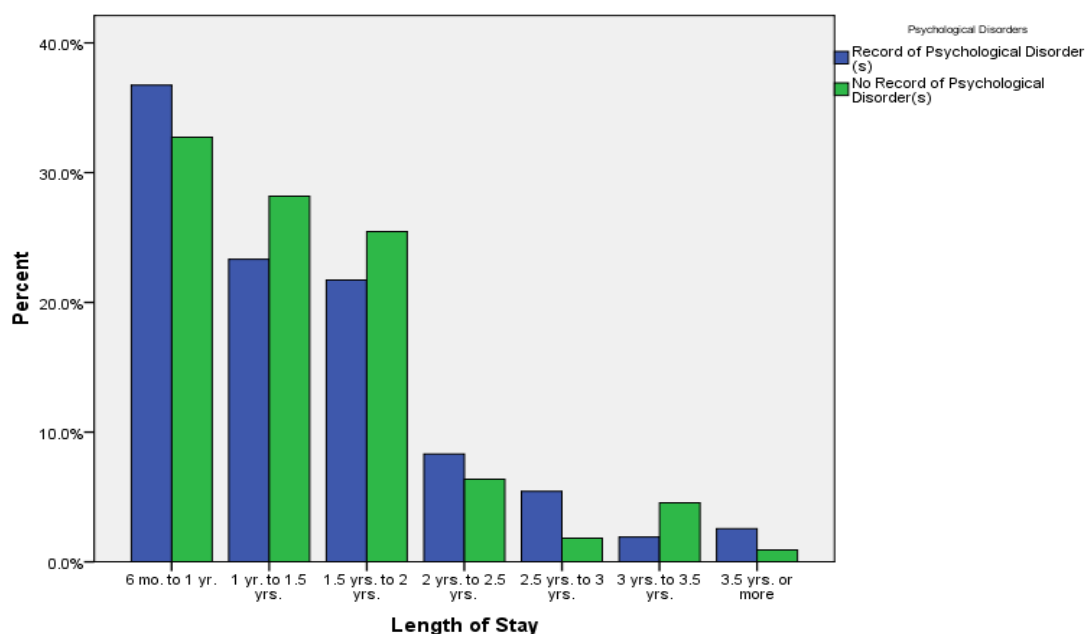


Figure 23. Percent of Students with Psychological Disorders and Length of Stay at Residential Facility

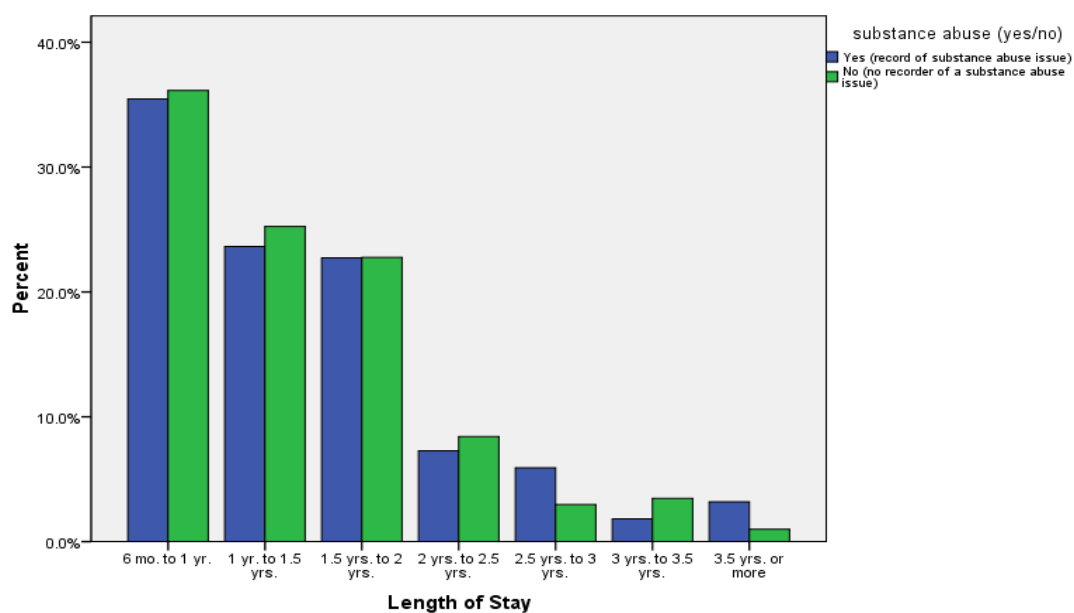


Figure 24. Percent of Students taking Psychiatric Drugs and Length of Stay at Residential Facility

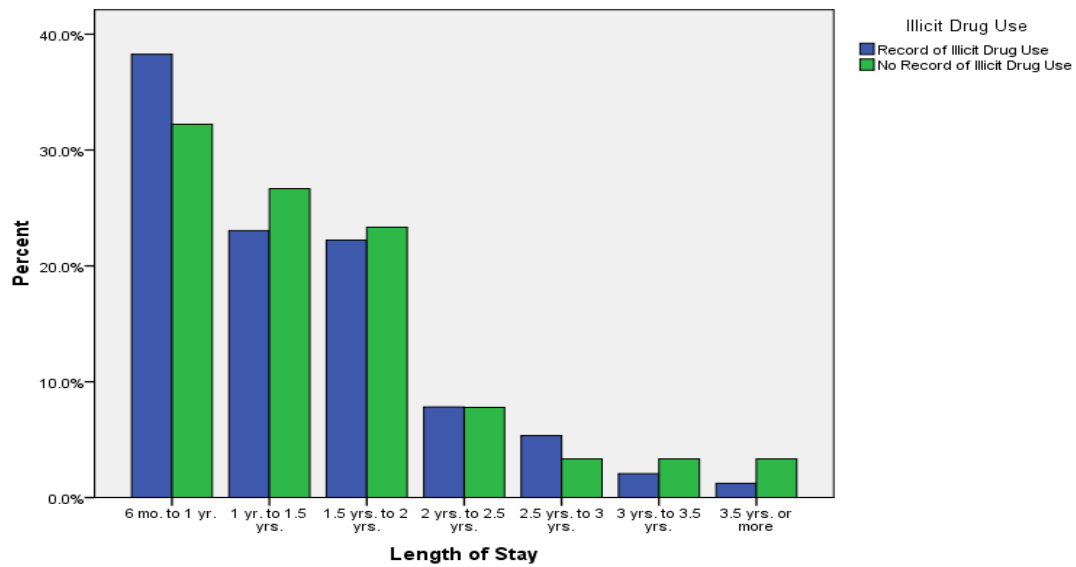


Figure 25. Percent of Students using Illicit Drugs and Length of Stay at Residential Facility

The chi-square statistical test shown in Tables 4.19 and 4.20 determined there to be a relationship between length of stay to three of the seven variables including grade retention, juvenile offenders, and ADHD. There was no significant relationships found between length of stay and illicit drug use psychological disorders, psychological medication, educational classification, and comorbidity.

Table 4.19

*Pearson Chi-Square for Relationship Between Length of Stay and Grade Retention, Illicit Drug Use, Juvenile Offenders, and ADHD*

| Variables      | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD  |
|----------------|-----------------|------------------|-------------------|-------|
| Length of Stay |                 |                  |                   |       |
| $\chi^2$       | 56.61           | 9.173            | 28.27             | 24.80 |
| sig.           | .012            | .820             | .013              | .037  |
| N              | 423             | 423              | 423               | 423   |
| Cramer's V     | .164*           | .104             | .183*             | .171* |

p < .05 level of significance \*Cramer's V with significance

Table 4.20

*Pearson Chi-Square for Relationship Length of Stay and Comorbidity, Psychological Disorder, and Psychiatric Medications*

| Variables      | Comorbidity | Psychological Disorder | Psychiatric Medications |
|----------------|-------------|------------------------|-------------------------|
| Length of Stay |             |                        |                         |
| $\chi^2$       | 11.571      | 8.069                  | 5.812                   |
| sig.           | .109        | .327                   | .562                    |
| N              | 423         | 423                    | 422                     |
| Cramer's V     | .167        | .138                   | .117                    |

p < .05 level of significance

*Presenting issue.* Under presenting issue, the two largest populations of students were students in foster care followed by adjudicated youth. Even then, of those students placed at the facility through foster care, 54% had committed a juvenile offense (Figure 26). Foster care students were more likely to have committed a crime than students placed at the facility by educational institutions or because of family issues. As expected, foster care students were more likely to experience multiple placements (65%), followed by adjudicated youth (13%) (Figure 27). Fifty-five percent of foster care youth had an identified psychological disorder of which 52% were taking medications (Figures 28 and 29).

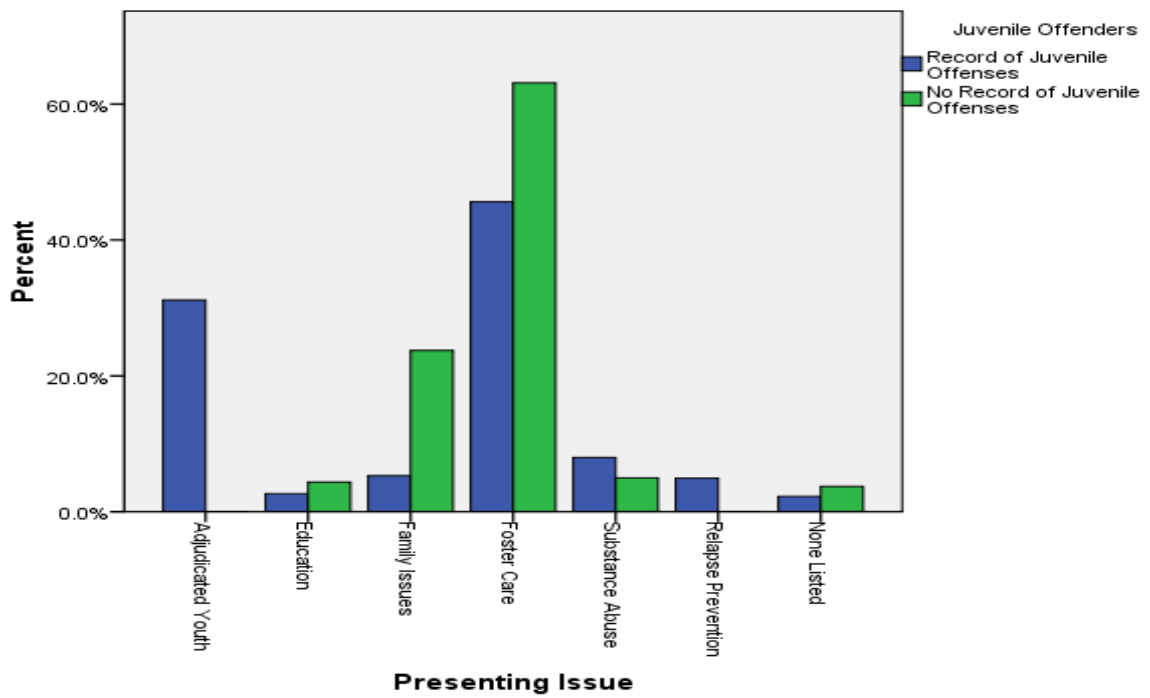


Figure 26. Percent of Juvenile Offenders and Type of Placement

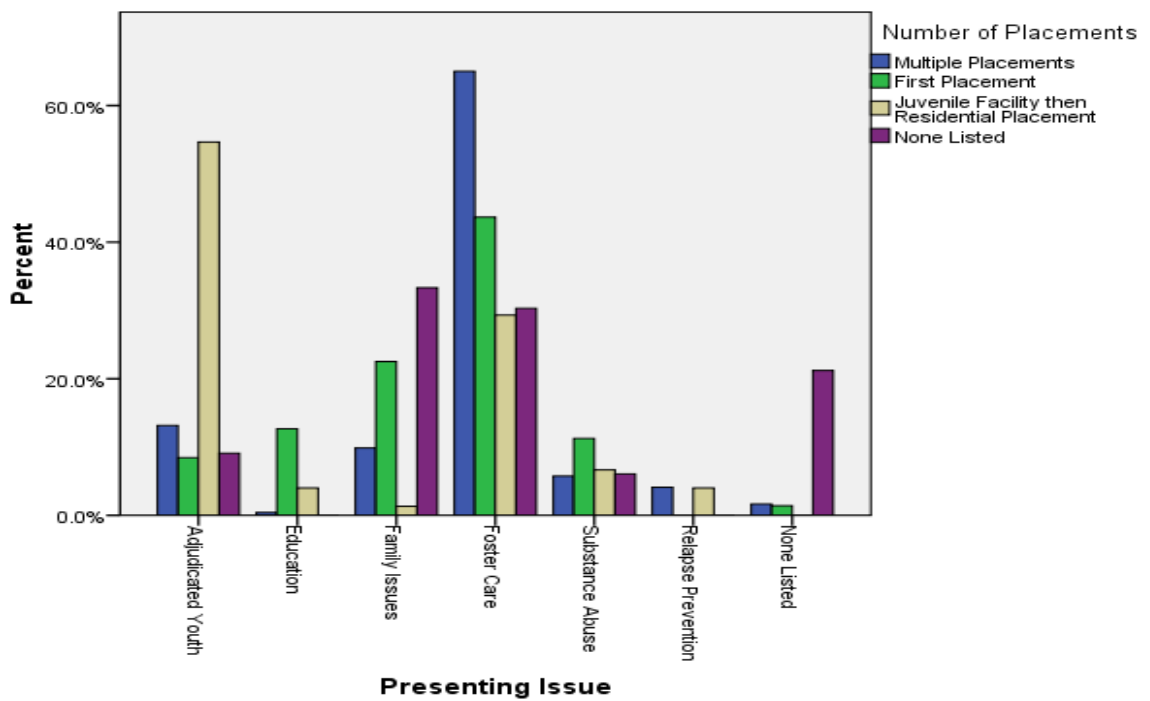


Figure 27. Percent of Presenting Issue by Number of Placements

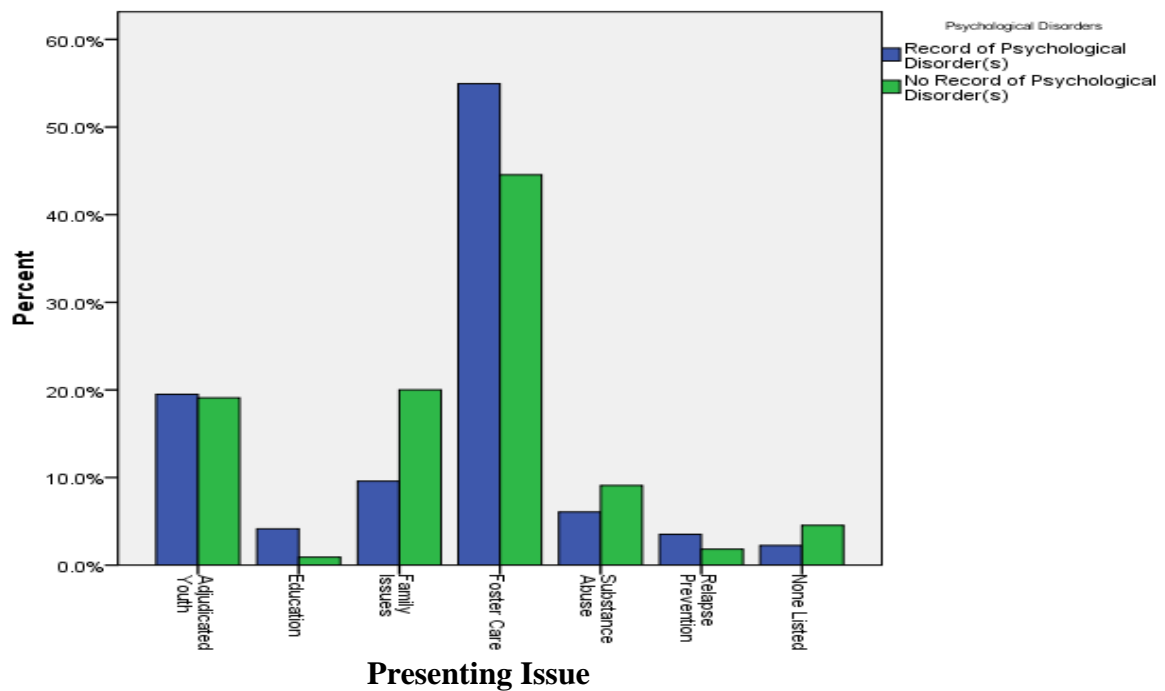


Figure 28. Percent of Students with Psychological Disorders and Type of Placement

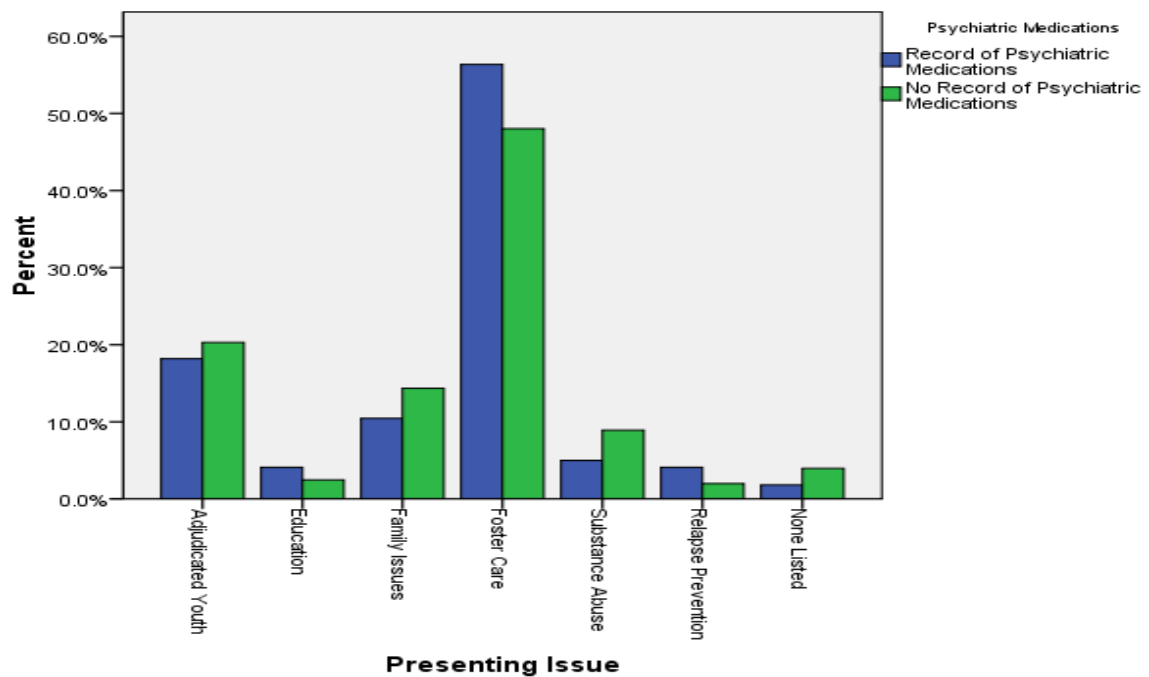


Figure 29. Percent of Students taking Psychiatric Medications and Type of Placement

It was more likely for Caucasian students (53%) to be placed at the residential facility through foster care, followed by African American students (48%). Males accounted for 58% of foster care youth and 42% were females. Foster care students were also more likely to have substance abuse problems (49%) and more likely to be drug dependent (63%).

Adjudicated youth were more likely to have been diagnosed with a psychological disorder, accounting for 77% of the population identified as having psychological disorders. This number included students identified in foster care as well as on probation. African Americans consisted of 43% of the adjudicated youth, followed closely by Caucasians (42%). Seventy percent of males were more likely than females to be adjudicated. Lastly, adjudicated youth accounted for 71% of the population identified as using illicit drugs.

The chi-square statistical test revealed a relationship between type of placement and five of the seven variables including grade retention, illicit drug use, juvenile offenders, ADHD, psychiatric medication, and educational classification. Only comorbidity and psychological disorder did not show a significant relationship. *Cramer's V* showed strong relationships between all of the categories found to be significant. See Tables 4.21 and 4.22 for chi-square values.

Table 4.21

*Pearson Chi-Square for Relationship Between Presenting Issues and Grad Retention, Illicit Drug Use, Juvenile Offenders, and ADHD*

| Variables        | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD   |
|------------------|-----------------|------------------|-------------------|--------|
| Presenting Issue |                 |                  |                   |        |
| $\chi^2$         | 47.42           | 45.25            | 102.40            | 37.159 |
| sig.             | .023            | .000             | .000              | .000   |
| N                | 423             | 423              | 423               | 423    |
| Cramer's V       | .150*           | .231*            | .348*             | .210*  |

p < .05 level of significance \*Cramer's V with significance

Table 4.22

*Pearson Chi-Square for Relationship Between Presenting Issues and Comorbidity, Psychological Disorders, and Psychiatric Medications*

| Variables        | Comorbidity | Psychological Disorder | Psychiatric Medications |
|------------------|-------------|------------------------|-------------------------|
| Presenting Issue |             |                        |                         |
| $\chi^2$         | 5.379       | 14.84                  | 9.341                   |
| sig.             | .496        | .022                   | .155                    |
| N                | 423         | 423                    | 422                     |
| Cramer's V       | .113        | .187*                  | .149                    |

p < .05 level of significance \*Cramer's V with significance

*Geographic location.* Students attending the school from suburban and rural jurisdictions accounted for 89% of the population. Students from these areas had only slight differences in their numbers, and together made up the highest percentage of students who were behind in their chronological grade (Figure 30), committed juvenile offenses (Figure 31), were diagnosed with psychological disorders (Figure 32), took psychiatric medications (Figure 33), and used illicit drugs (Figure 34).

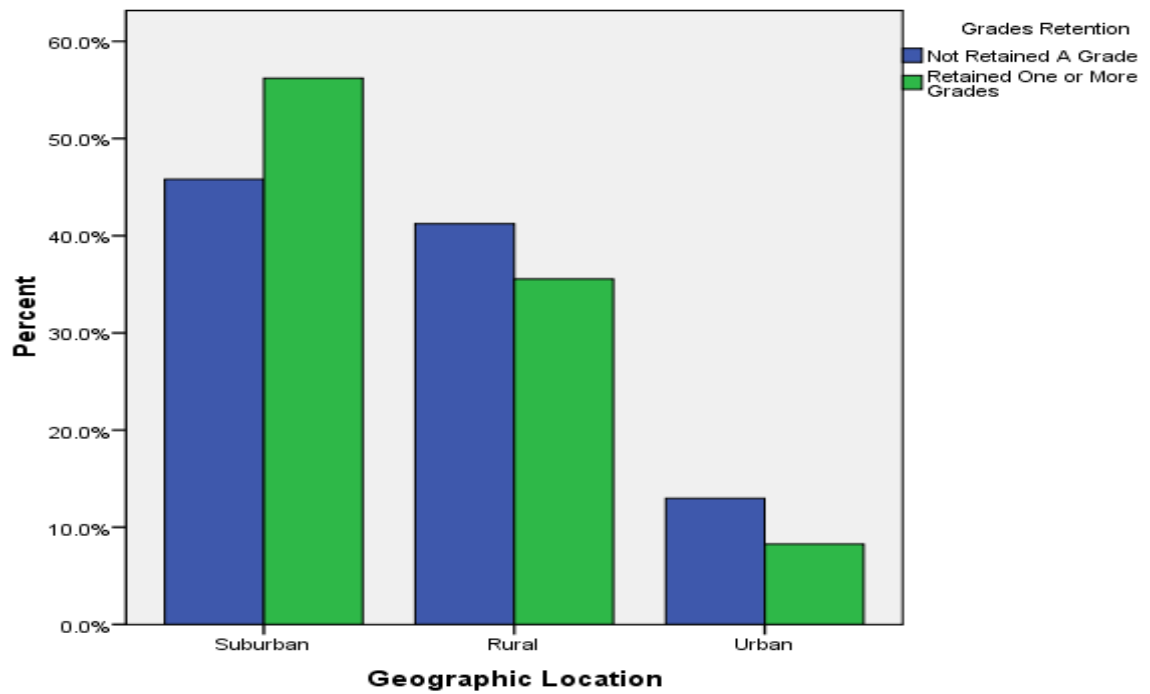


Figure 30. Percent of Grades Retained by Geographic Location

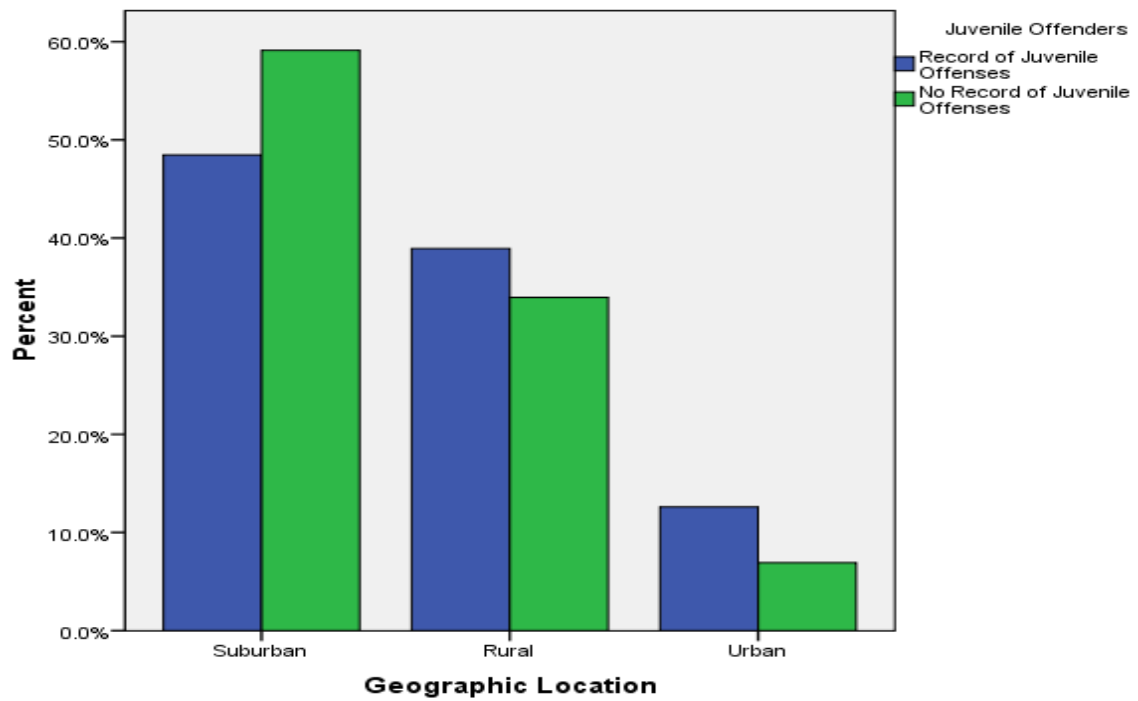


Figure 31. Percent of Juvenile Offenders by Geographic Location



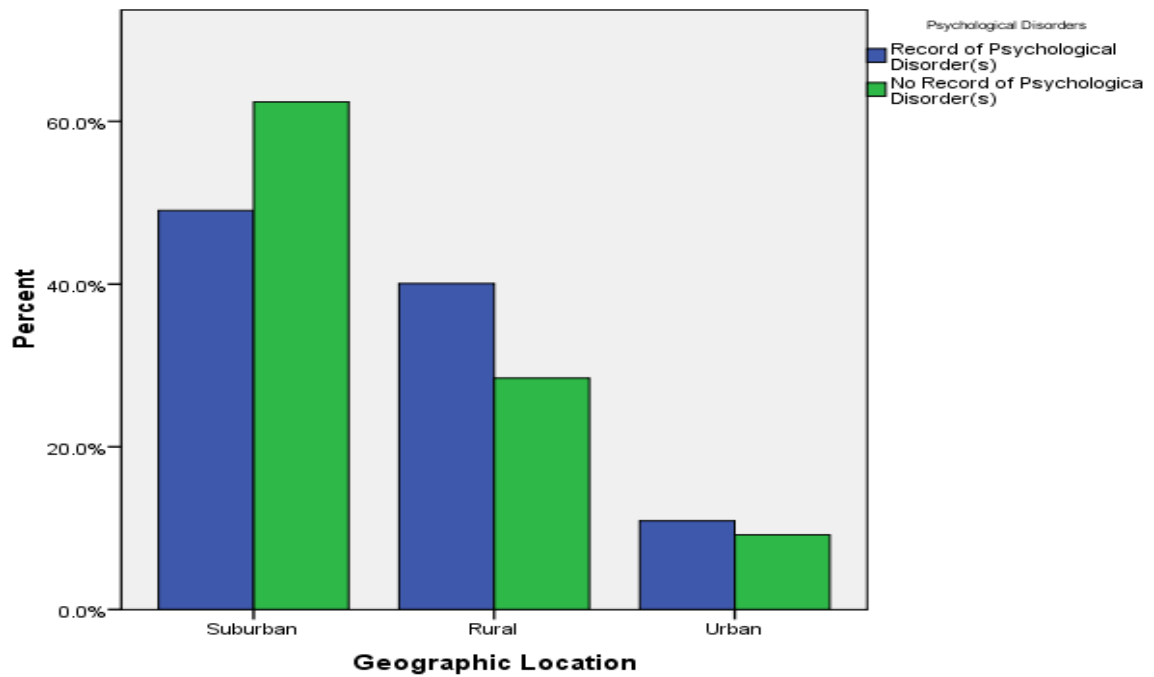


Figure 32. Percent of Students Diagnosed with Psychological Disorders by Geographic Location

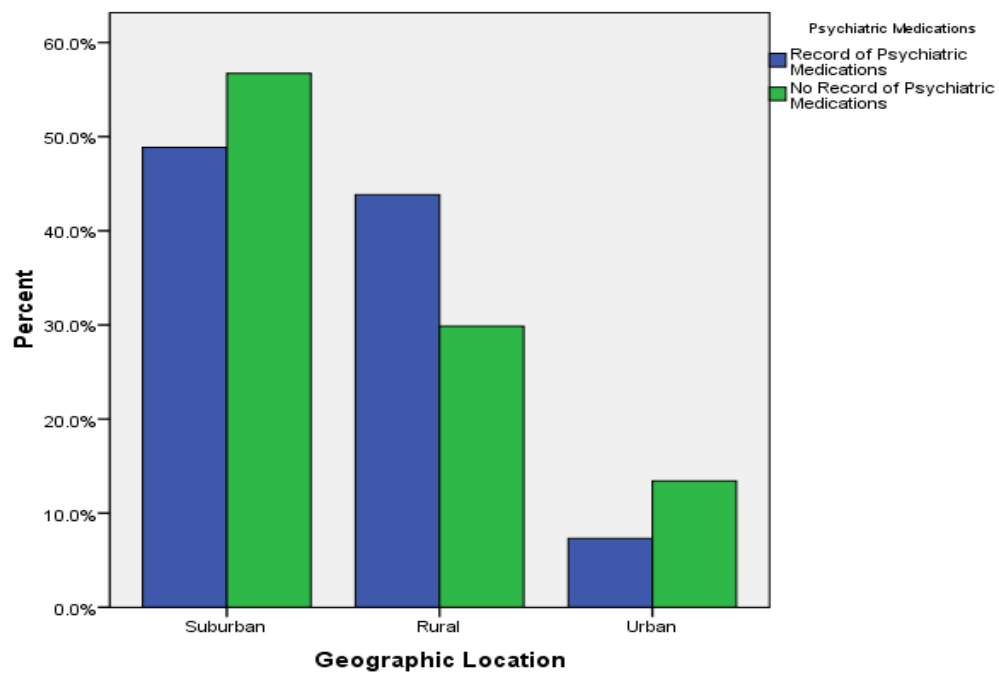


Figure 33. Percent of Students taking Psychiatric Medications by Geographic Location

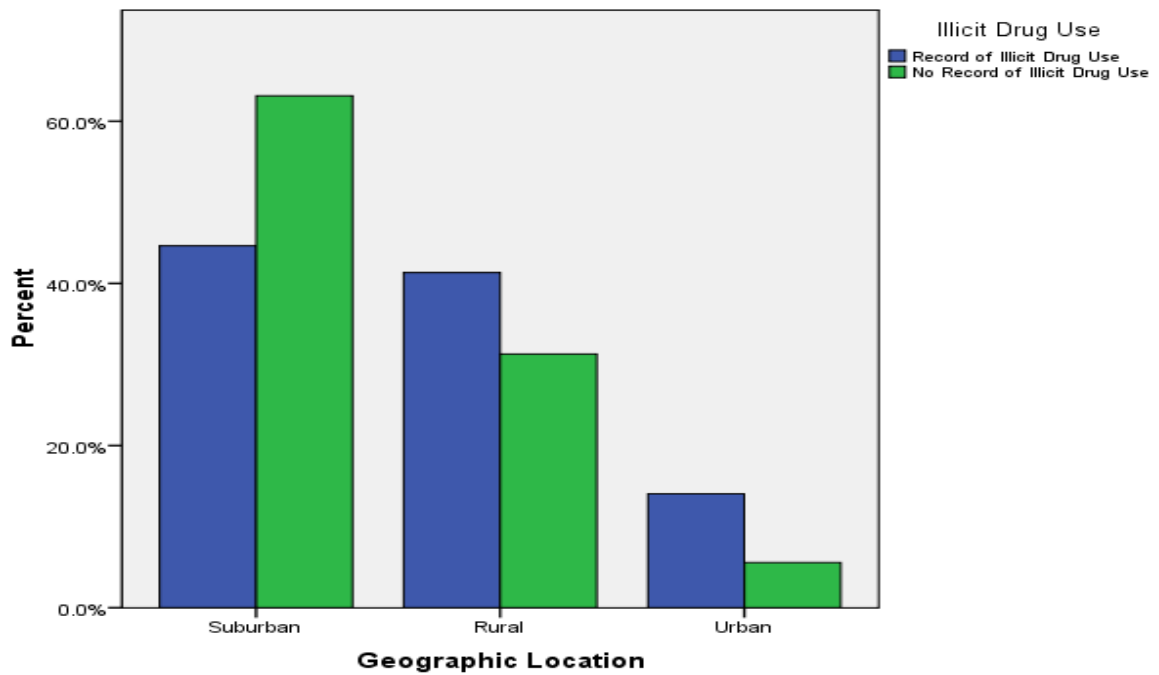


Figure 34. Percent of Students using Illicit Drugs by Geographic Location

The chi-square analysis determined that there was a significant relationship between geographic location and illicit drug use and geographic location and students taking psychiatric medications. The chi-square values are represented in Tables 4.23 and 4.24.

Table 4.23

*Pearson Chi-Square for Relationship Between Geographic Location and Grade Retention, Illicit Drug Use, Juvenile Offender, and ADHD*

| Variables           | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD  |
|---------------------|-----------------|------------------|-------------------|-------|
| Geographic Location |                 |                  |                   |       |
| $\chi^2$            | 9.816           | 17.241           | 6.951             | 3.072 |
| sig.                | .457            | .002             | .138              | .546  |
| N                   | 421             | 421              | 421               | 421   |
| Cramer's V          | .108            | .143*            | .091              | .060  |

p < .05 level of significance \*Cramer's V with significance

Table 4.24

*Pearson Chi-Square for Relationship Between Geographic Location and Comorbidity, Psychological Disorder, and Psychiatric Medications*

| <i>Variables</i>    | <i>Comorbidity</i> | <i>Psychological Disorder</i> | <i>Psychiatric Medications</i> |
|---------------------|--------------------|-------------------------------|--------------------------------|
| Geographic Location |                    |                               |                                |
| $\chi^2$            | .675               | 5.916                         | 10.59                          |
| <i>sig.</i>         | .713               | .052                          | .005                           |
| <i>N</i>            | 421                | 421                           | 420                            |
| <i>Cramer's V</i>   | .040               | .119                          | .159*                          |

p < .05 level of significance \**Cramer's V* with significance

*Family status.* Family status was broken into five categories (see Table 4.1).

Given that the majority of students were in foster care at intake, this population experienced higher rates than other family status categories in all of the seven variables. The chi square test, portrayed in Tables 4.25 and 4.26, found there to be a significant relationship between family status and illicit drug use; family status and ADHD; family status and comorbidity; family status, and psychological disorders; and, family status and psychiatric medications. In addition, the *Cramer's V* found a strong relationship between family status and psychological disorders, and family status and psychiatric medications. There was no significant relationship found between family status and grade retention, and family status and juvenile offenders.

Table 4.25

*Pearson Chi-Square for Relationship Between Family Status and Grade Retention, Illicit Drug Use, Juvenile Offender, and ADHD*

| Variables     | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD  |
|---------------|-----------------|------------------|-------------------|-------|
| Family Status |                 |                  |                   |       |
| $\chi^2$      | 19.439          | 25.559           | 18.953            | 21.57 |
| sig.          | .930            | .012             | .090              | .043  |
| N             | 243             | 423              | 243               | 423   |
| Cramer's V    | .096            | .174*            | .150              | .160* |

p < .05 level of significance \*Cramer's V with significance

Table 4.26

*Pearson Chi-Square for Relationship Between Family Status and Comorbidity, Psychological Disorder, Psychiatric Medications*

| Variables     | Co-morbidity | Psychological Disorder | Psychiatric Medications |
|---------------|--------------|------------------------|-------------------------|
| Family Status |              |                        |                         |
| $\chi^2$      | 16.71        | 25.19                  | 21.75                   |
| sig.          | .010         | .000                   | .001                    |
| N             | 423          | 423                    | 422                     |
| Cramer's V    | .199*        | .244*                  | .227*                   |

p < .05 level of significance \*Cramer's V with significance

*Educational classification.* Students were identified as being in one of four educational classifications: GE students, students with SLD, students with EBD, and students with OHI. Students within all categories were 53% to 65% more likely to be behind in their chronological grade upon admissions (Figure 35). General education students had the highest level of incidence within all seven variables. Within special education categories, students with EBD had the highest level of incidence in committing juvenile offenses (58%) (Figure 36), having ADHD (57%) (Figure 37), being diagnosed

with a psychological disorder (61%) (Figure 38), comorbidity (65%) (Figure 39), taking psychiatric medications (60%) (Figure 40), and taking illicit drugs (Figure 41).

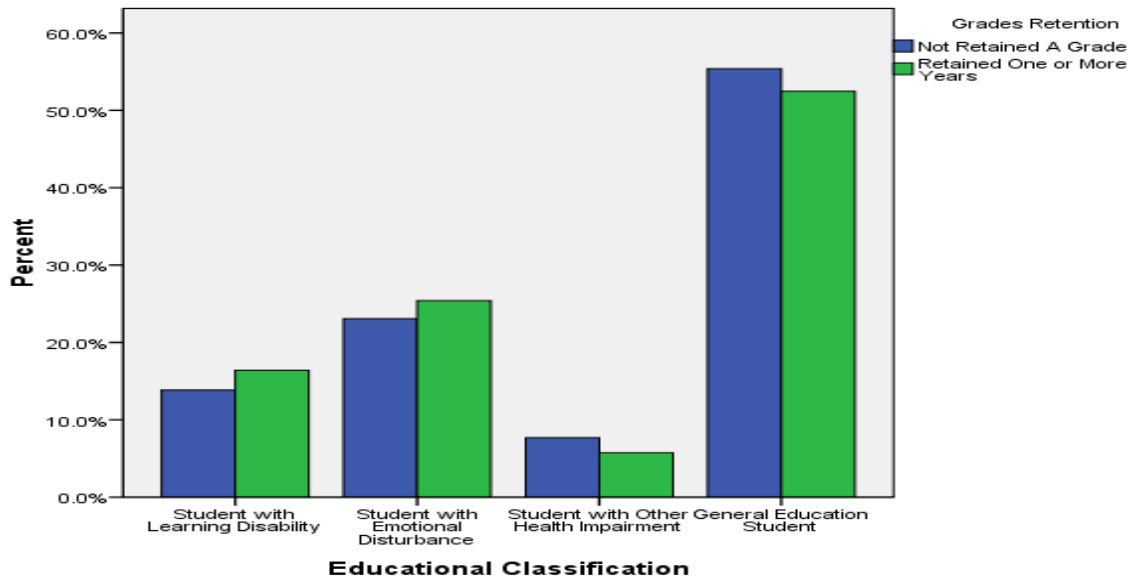


Figure 35. Percent of Grade Retention by Educational Classification

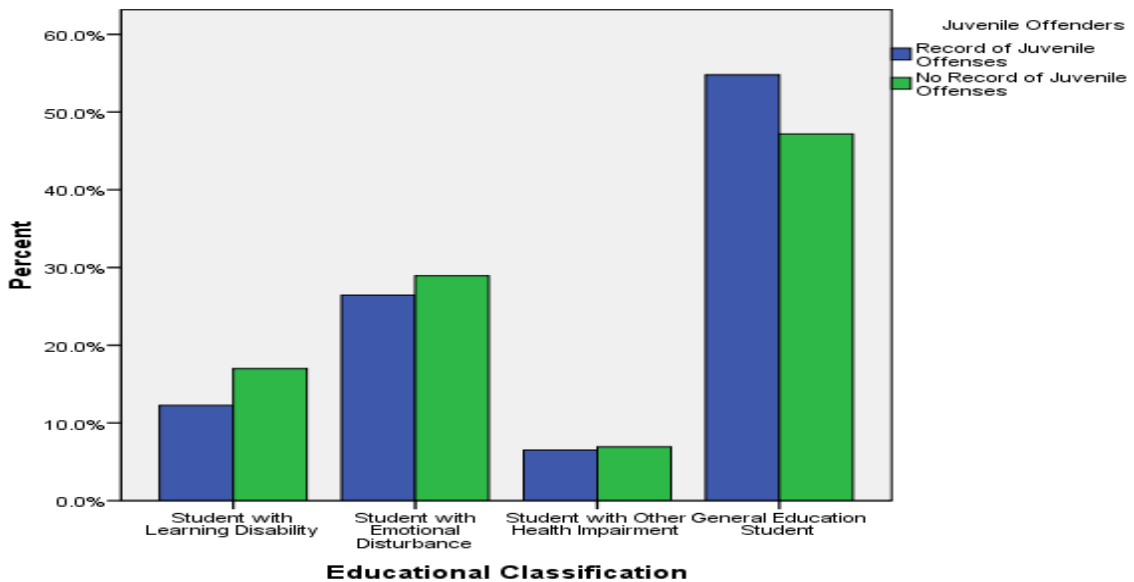


Figure 36. Percent of Juvenile Offenders by Educational Classification

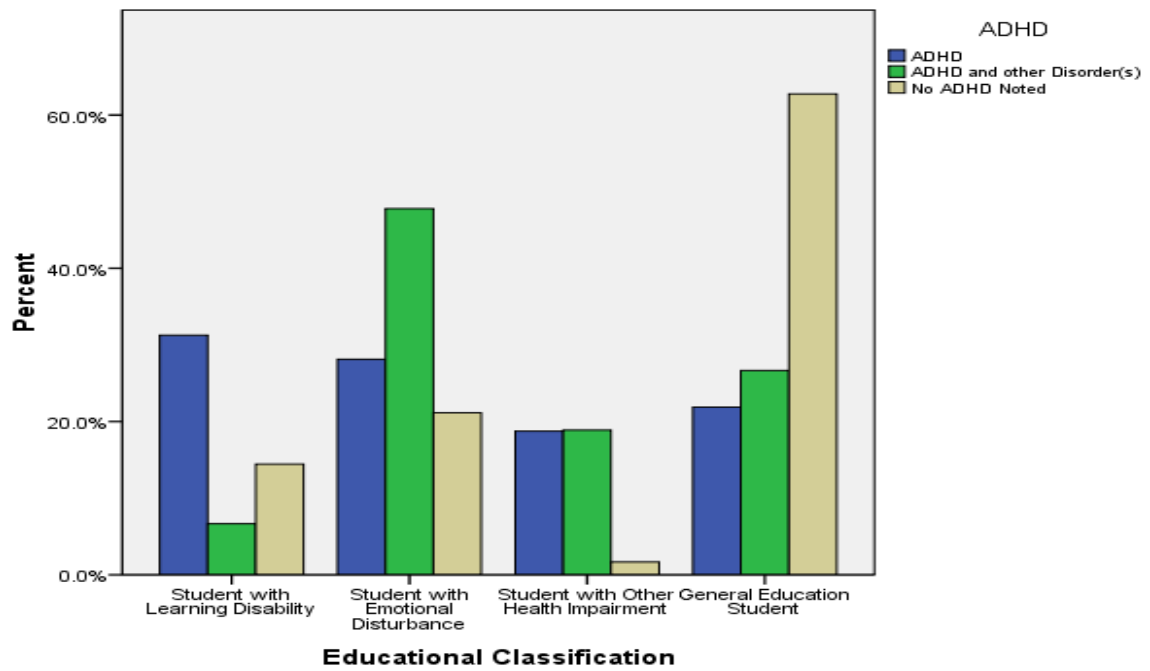


Figure 37. Percent of Students with ADHD by Educational Classification

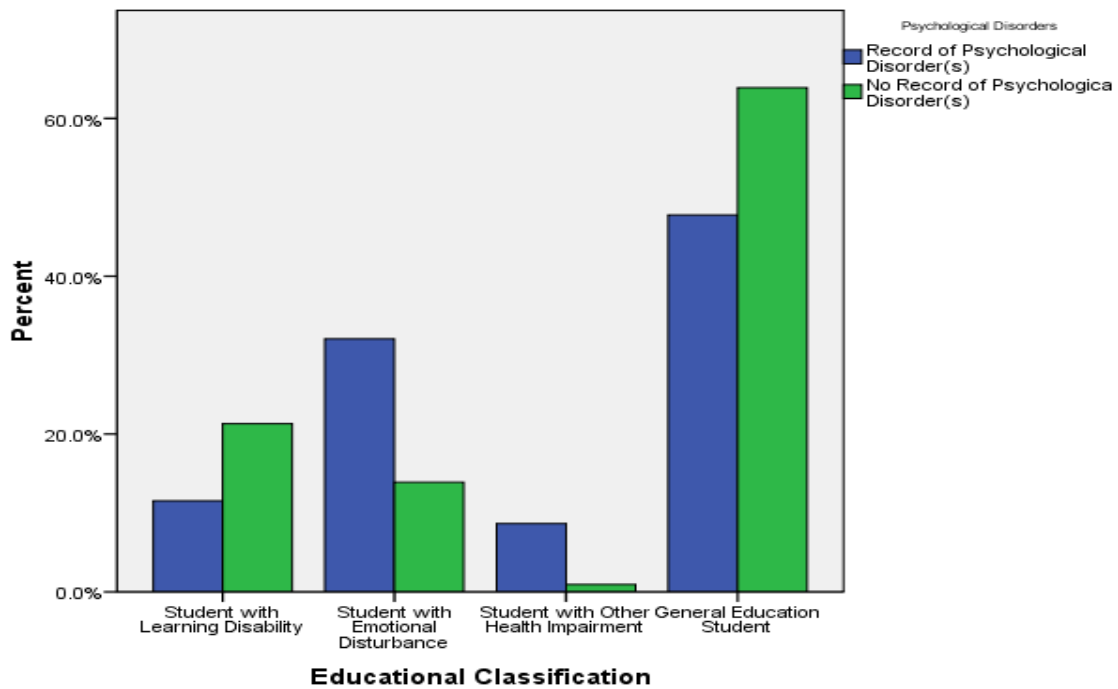


Figure 38. Percent of Students Diagnosed with Psychological Disorders by Educational Classification

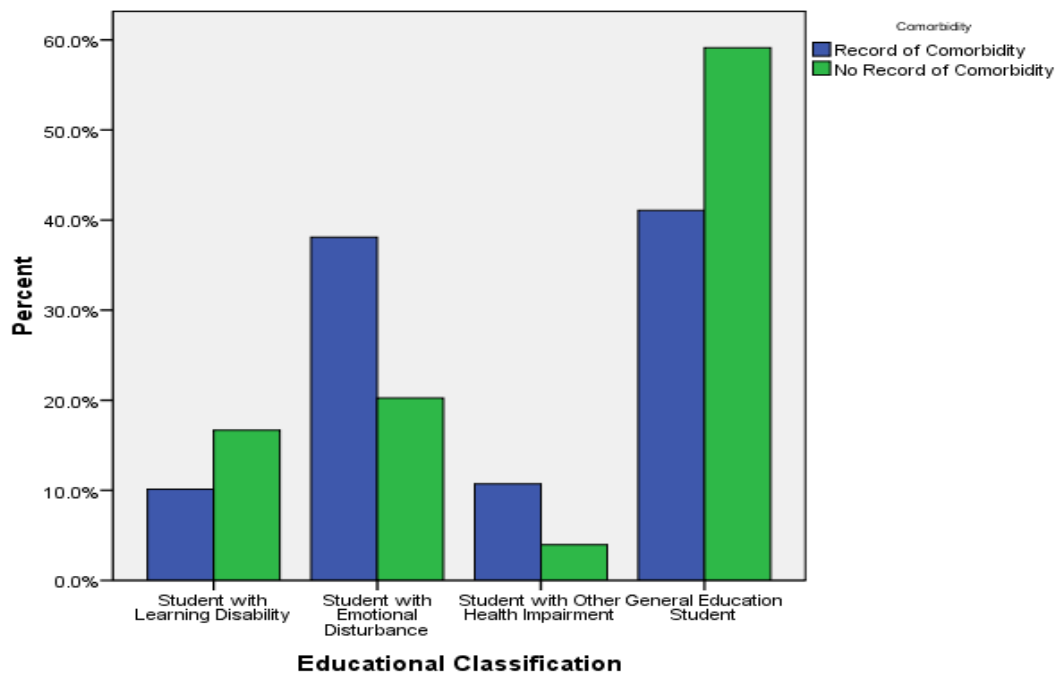


Figure 39. Percent of Students with Comorbidity and Educational Classification

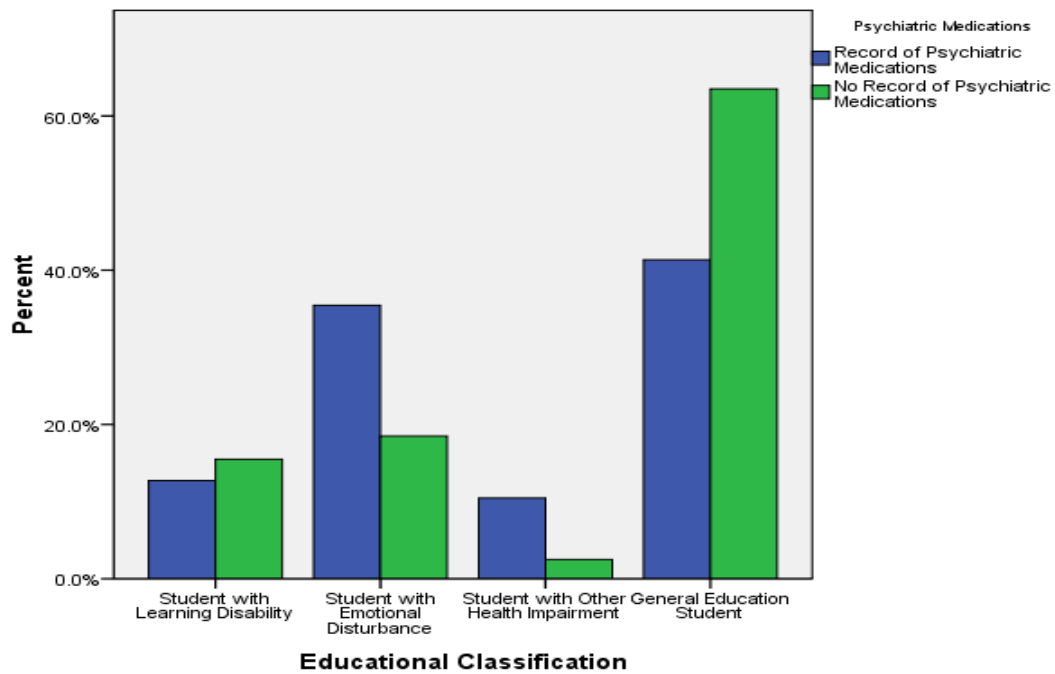


Figure 40. Percent of Student taking Psychiatric Medications and Educational Classification

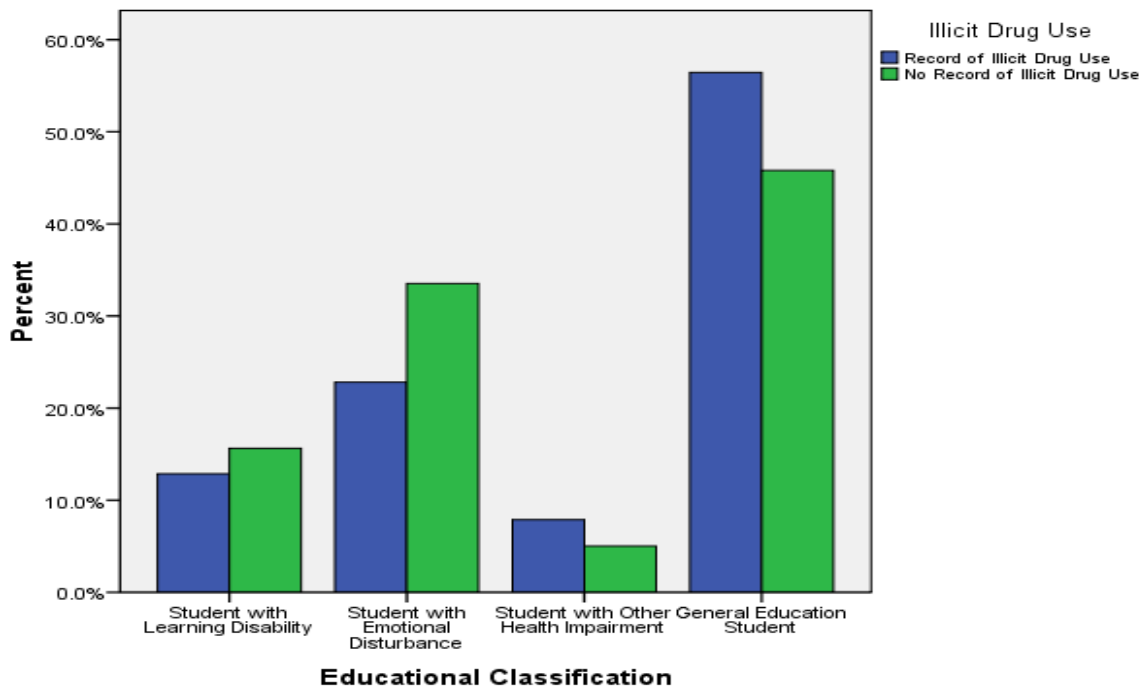


Figure 41. Percent of Student taking Illicit Drugs and Educational Classification

Tables 4.27 and 4.28 reveal both the chi square analysis along with the *Cramer's V*, showing a significant and strong relationship between educational classification and five of the seven variables, including: grade retention, ADHD, comorbidity, psychological disorders, and psychiatric medication. There was no significant relationship between educational classification and illicit drug use and educational classification and juvenile offenses.



Table 4.27

*Pearson Chi-Square for Relationship Between Educational Classification and Grade Retention, Illicit Drug Use, Juvenile Offender, and ADHD*

| Variables                  | Grade Retention | Illicit Drug Use | Juvenile Offender | ADHD  |
|----------------------------|-----------------|------------------|-------------------|-------|
| Educational Classification |                 |                  |                   |       |
| $\chi^2$                   | 27.97           | 10.107           | 3.972             | 89.84 |
| sig.                       | .022            | .120             | .680              | .000  |
| N                          | 420             | 420              | 420               | 420   |
| Cramer's V                 | .149*           | .110             | .069              | .327* |

p < .05 level of significance \*Cramer's V with significance

Table 4.28

*Pearson Chi-Square for Relationship Between Educational Classification and Comorbidity, Psychological Disorder, and Psychiatric Medication*

| Variables                  | Comorbidity | Psychological Disorder | Psychiatric Medications |
|----------------------------|-------------|------------------------|-------------------------|
| Educational Classification |             |                        |                         |
| $\chi^2$                   | 28.03       | 26.31                  | 31.41                   |
| sig.                       | .000        | .000                   | .000                    |
| N                          | 420         | 420                    | 420                     |
| Cramer's V                 | .258*       | .250*                  | .273*                   |

p < .05 level of significance \*Cramer's V with significance

### *Academic Achievement Upon Admissions to Residential School*

The mean and standard deviations for the WJ-III Test of Achievement's cluster scores in broad reading, broad math, and broad written language, and the subtest in passage comprehension and fluency are presented in this section. The mean and standard deviations for IQ and related subtests are also presented. These scores are provided for examination as a population and for comparison between groups. A uni-variate and bi-

variate analysis was used to analyze the significance difference between groups in SPSS. In addition, frequency distributions, percentages, and mean values were identified.

*WJ-III test of achievement for the population.* Students entering the program are typically tested within three months of admissions using the Woodcock Johnson Test of Achievement (2004, 2007). Of the 423 students in this study, approximately 299 were given the WJ-III Test of Achievement. Upon entry into the facility, many of these students were below average in at least one of the academic achievement areas (i.e., broad reading, broad math, broad written language, passage comprehension and fluency). Figures 39 through 45 provide the distribution of students according to standards scores as presented in Table 3.1 in Chapter 3.

Figure 42 provides the means WJ-III scores for the entire population, showing board math to be below average at intake for most students. Figures 43 and 44 provides the standard scores distribution from very low average to superior average range of achievement for WJ-III total broad reading and broad math. In broad reading, 57% of the students are performing average and above; however, for broad math, 43% of students are performing below average.

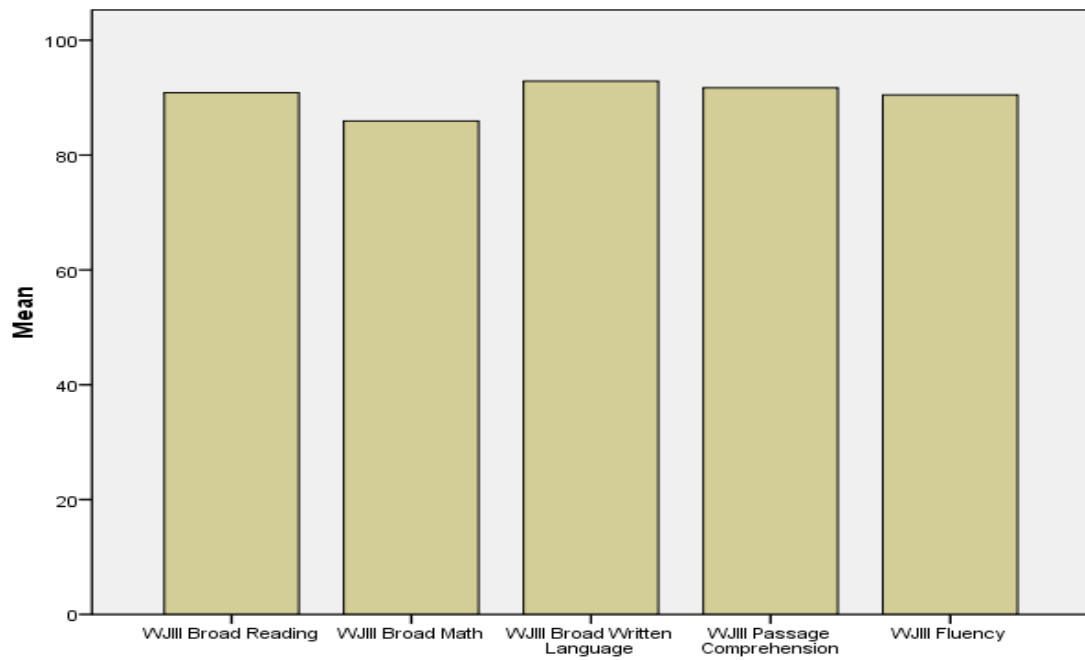


Figure 42. Mean WJ-III Test of Achievement Standard Scores for the Population of Students

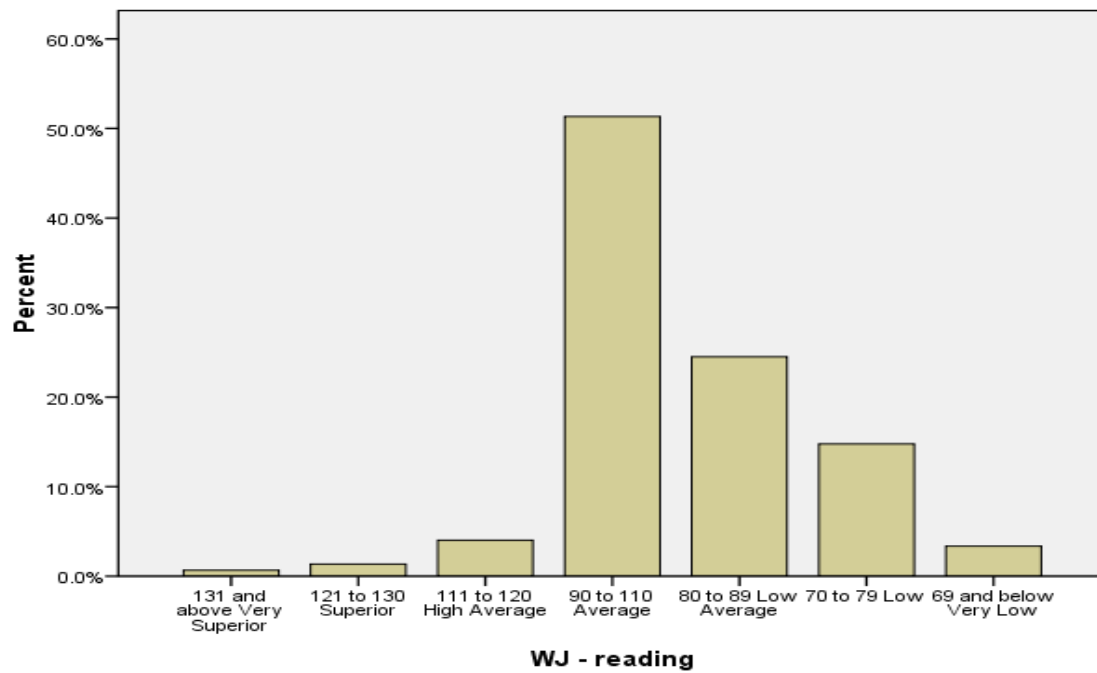
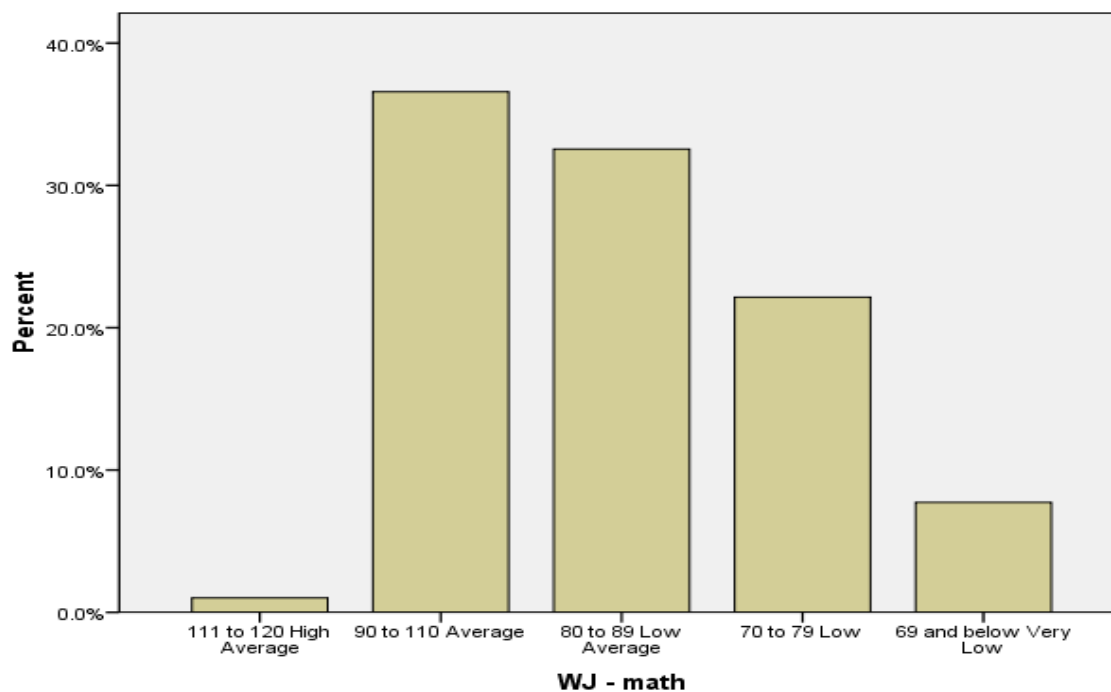


Figure 43. Percent Distribution of Student Population's WJ-III Board Reading Standard Scores



*Figure 44.* Percent Distribution of Student Population's WJ-III Board Math Standard Scores

Figures 45, 46 and 47 show this same distribution for broad written language, passage comprehension, and fluency. In this case, 59% of students were performing in the average or above average range for broad written language and 61% of the students were performing in the average and above average range for passage comprehension. In fluency; however, only forty-nine percent of students were performing in the average or above average range.

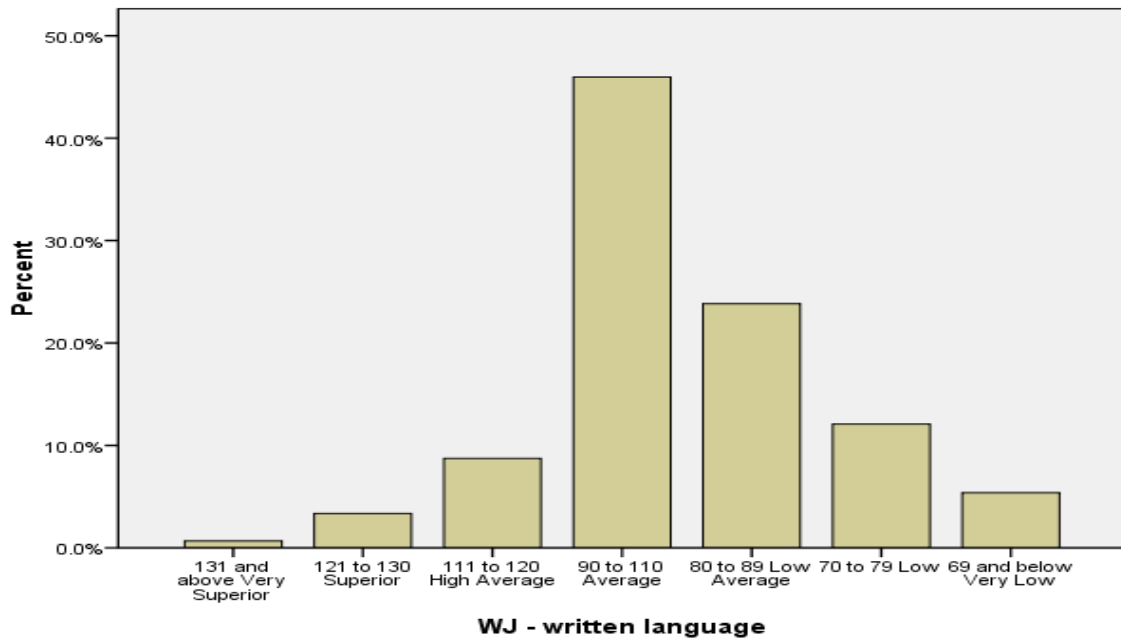


Figure 45. Percent Distribution of Student Population's WJ-III Broad Written Language Standard Scores

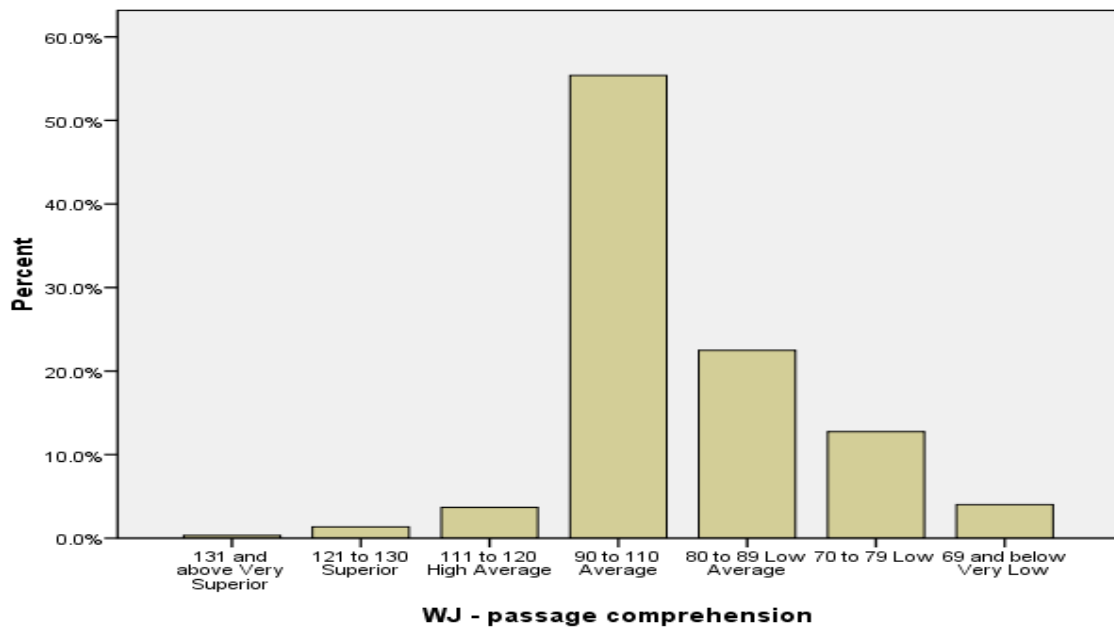
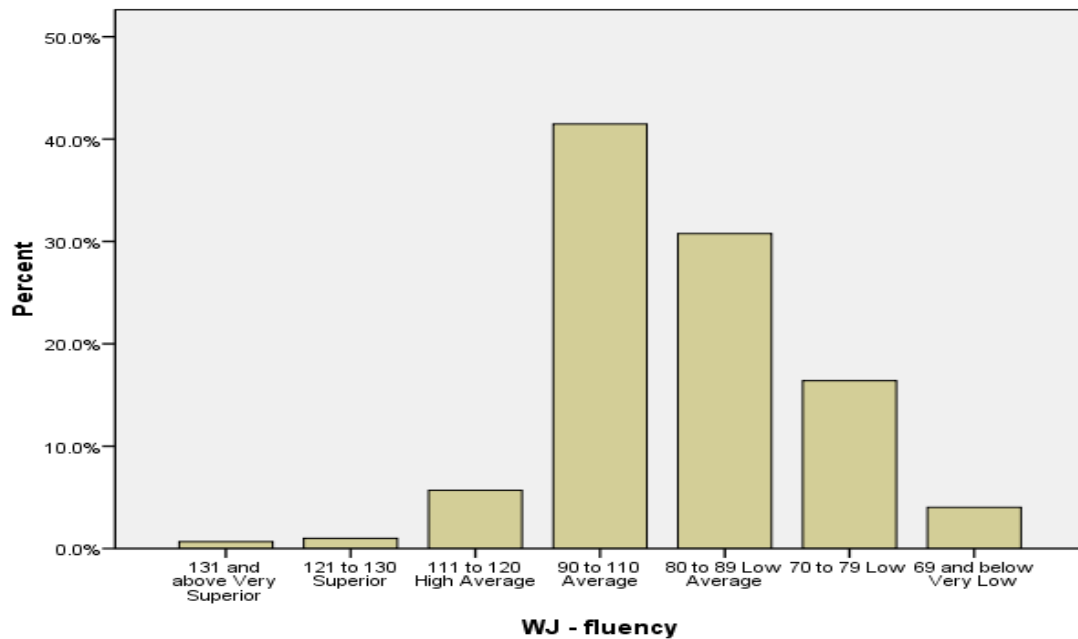


Figure 46. Percent Distribution of Student Population's WJ-III Passage Comprehension Standard Scores



*Figure 47. Percent Distribution of Student Population's WJ-III Fluency Standard Scores*

A one sample t-test was conducted for each WJ-III academic area to test whether a sample mean (of a normally distributed interval variable) significantly differs from a hypothesized value. As shown in Table 4.29 the mean values for broad math, broad written language, passage comprehension, and fluency are statistically significantly different from the test value of 90 (i.e., 90 denotes a standard cut-score for average or above achievement, see Table 3.1). It can be concluded that students within the school's population scored significantly lower in broad math than the mean on these test, 90. As for broad written language and passage comprehension, they scored significantly higher. There was not significant different between the population mean and the mean in broad reading.

Table 4.29

*WJ-III Test of Achievement Standard Scores for the Population of Students*

| WJ-III Test            | <i>N</i> | <i>t</i> | <i>M</i> | <i>SD</i> | <i>Sig.</i> |
|------------------------|----------|----------|----------|-----------|-------------|
| Broad Reading          | 299      | 1.137    | 90.88    | 13.33     | .257        |
| Broad Math             | 299      | -5.933   | 85.94    | 11.84     | .000        |
| Broad Written Language | 299      | 3.305    | 92.87    | 15.01     | .001        |
| Passage Comprehension  | 299      | 2.272    | 91.73    | 13.16     | .024        |
| Fluency                | 299      | -4.525   | 87.43    | 11.19     | .006        |

$p < .05$  level of significance

*WJ-III test of achievement and educational classifications.* A one-way analysis of variance (ANOVA) was used to test whether or not the mean of Woodcock Johnson III Test of Achievement standard scores in broad reading, broad math, broad written language, passage comprehension, and fluency differed significantly between the four education classifications (i.e., GE, SLD, EBD, and OHI). The mean of each standard score in broad reading,  $F(3, 297) = 10.64, p = .001$ , broad math,  $F(3, 297) = 9.66, p = .001$ , broad written language,  $F(3, 297) = 12.57, p = .001$ , passage comprehension,  $F(3, 297) = 6.10, p = .001$ , and fluency,  $F(3, 297) = 13.38, p = .001$ , differed significantly among all levels of educational classifications.

From this it can be determined that students in GE had the highest mean scores in broad reading ( $M = 94.75$ ), broad math ( $M = 89.35$ ), broad written language ( $M = 97.48$ ), passage comprehension ( $M = 94.47$ ), and fluency ( $M = 95.21$ ), while students with SLD and students with EBD had the lowest. Students with OHI showed little significant difference between their scores and GE student's score, nor did their scores differ significantly from students with SLD and students with EBD. Specifically, a *post hoc*

analysis showed that there was a significant difference between GE students and students with SLD and EDB in broad reading, broad written language, passage comprehension, and fluency. As for broad math, there was a significant difference between GE and all three educational categories.

A discriminant function analysis was conducted to ascertain the extent to which the full set of outcome variables from all academic categories would identify as significant in the MANOVAs to discriminate group membership (GE, SLD, EBD, and OHI). The discriminant function was statistically significant for the first function in educational classifications,  $\Lambda = .817$ ,  $\chi^2(18, N = 44) = 58.97$ ,  $p < .000$ , but the second,  $\Lambda = .957$ ,  $\chi^2(10, N = 82) = 12.83$ ,  $p = .234$  and third,  $\Lambda = .990$ ,  $\chi^2(4, N = 22) = 2.95$ ,  $p = .467$ , were not. As shown in Table 4.30 high scores on the discriminant function were associated with higher WJ-III scores. In this case, general education students scored higher on written language and total achievement than in passage comprehension and other categories.

Table 4.30

*Structure of the Discriminant Function*

| Variables                  | Loading |
|----------------------------|---------|
| WJ - written language      | .954    |
| WJ - fluency               | .891    |
| WJ - reading               | .794    |
| WJ - math                  | .725    |
| WJ - passage comprehension | .589    |

p < .05 level of significance

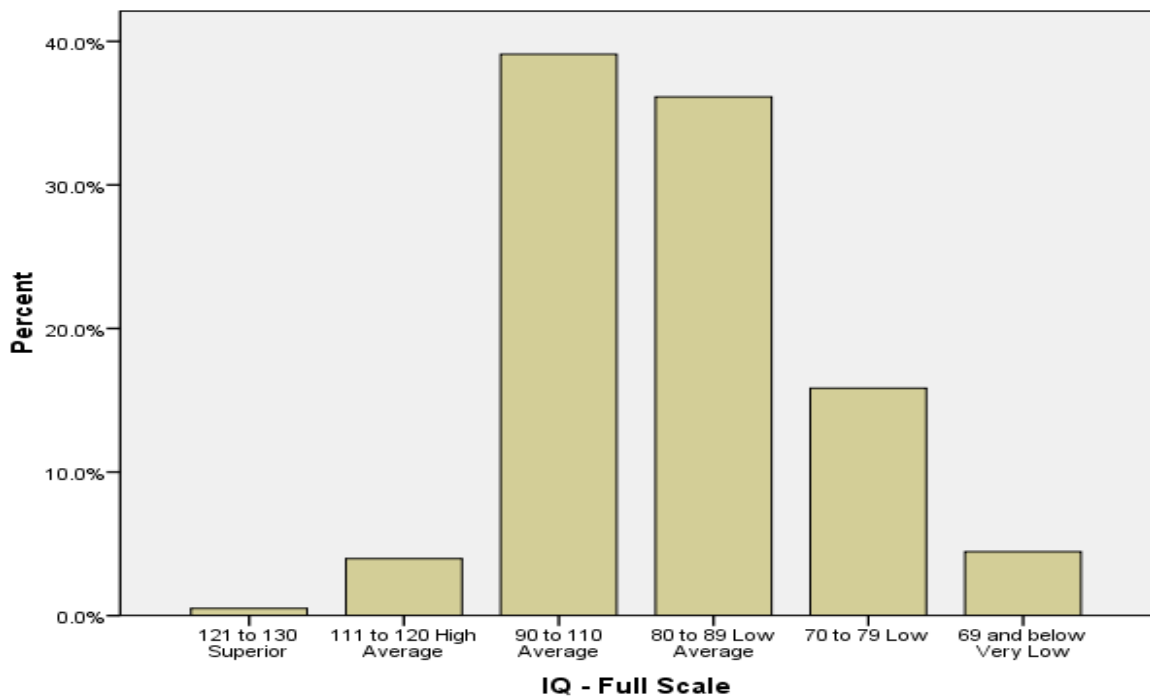


Uni-variate analysis showed that educational classification groups differed significantly in broad reading,  $F(3, 294) = 10.64$ ,  $MSE = 0.90$ ,  $p < .000$ , broad math,  $F(3, 294) = 9.66$ ,  $MSE = .91$ ,  $p = .000$ , broad written language,  $F(3, 294) = 15.45$ ,  $MSE = 0.88$ ,  $p < .000$ , passage comprehension,  $F(3, 294) = 6.10$ ,  $MSE = 0.94$ ,  $p < .000$ , and fluency,  $F(3, 294) = 13.38$ ,  $MSE = 0.88$ ,  $p < .000$ .

*WJIII test of achievement and type of placement.* Again, using a one-way analysis of variance (ANOVA), it was determined if the mean of Woodcock Johnson III Test of Achievement standard scores in broad reading, broad math, broad written language, passage comprehension and fluency differed between the six types of placements (i.e., foster care, adjudicated youth, illicit drug use, relapse prevention, education and family issues). There were not significant differences between the mean scores and the types of placements in broad reading,  $F(3, 297) = 10.64$ ,  $p = .001$ , broad math,  $F(3, 297) = 9.66$ ,  $p = .001$ , broad written language,  $F(3, 297) = 12.57$ ,  $p = .001$ , passage comprehension,  $F(3, 297) = 6.10$ ,  $p = .000$ , and fluency,  $F(3, 297) = 13.38$ ,  $p = .001$ .

From this it can be determined that students placed at the facility under the category of relapse prevention had the highest mean scores in broad reading ( $M = 96.88$ ), broad math ( $M = 90.25$ ), passage comprehension ( $M = 97.00$ ), and fluency ( $M = 96.25$ ), while students placed based on education, adjudicated youth and foster care had the lowest. Only in written language did students placed by foster care have a higher mean ( $M = 94.29$ ). Even then, based on the *post hoc* test there were no significant differences between placement types and WJ-III standard scores in broad reading, broad math, broad written language, passage comprehension, and fluency.

*Intelligence quotient (IQ).* Many of the students entering the facility have psychological evaluations on file which include their IQs. Of the 423 students in this study, approximately 203 had Full Scale IQs available, 130 had Performance IQ, and 144 had Verbal IQs from the WISC-III. Table 4.48 provides the distribution of students according to standard scores as presented in Table 3.1. in Chapter 3.



*Figure 48.* Percent Full Scale IQ for Secondary School Population

Figure 48 provides the standard score distribution from very low average to superior average range for ability for Full Scale IQ. Figures 49 and 50 provide the distribution of Performance IQ, and Verbal IQ standard scores. Only 44% of their Full

Scale IQs and 49% of their Verbal IQs were in the average to above average range, whereas almost 58% of the Performance IQs were in the average to above average range.

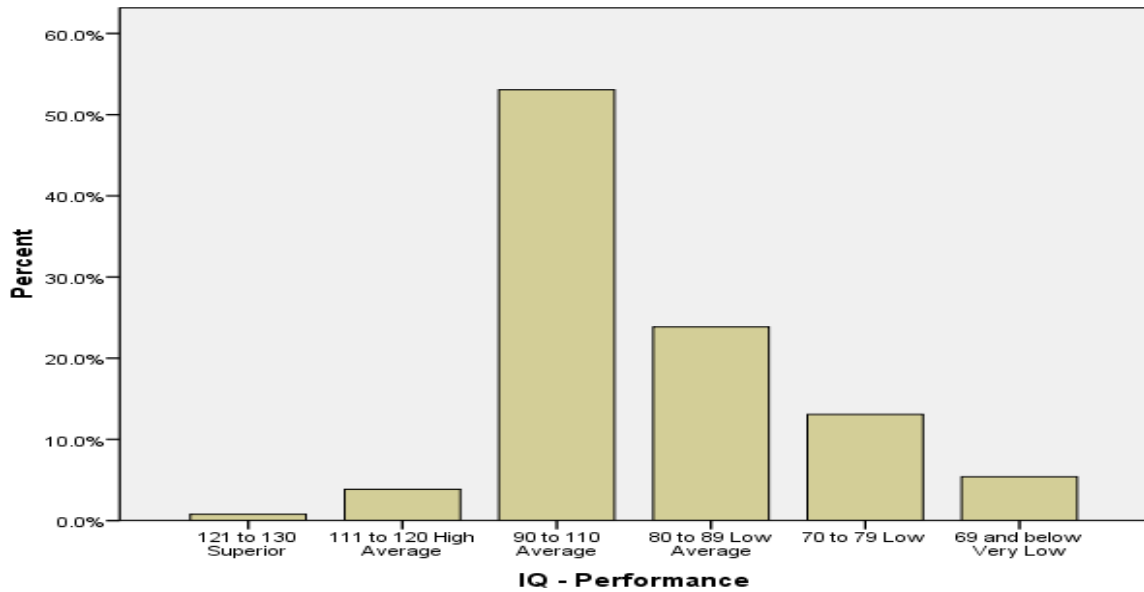


Figure 49. Percent Performance IQ Standard Scores for the Secondary School Population

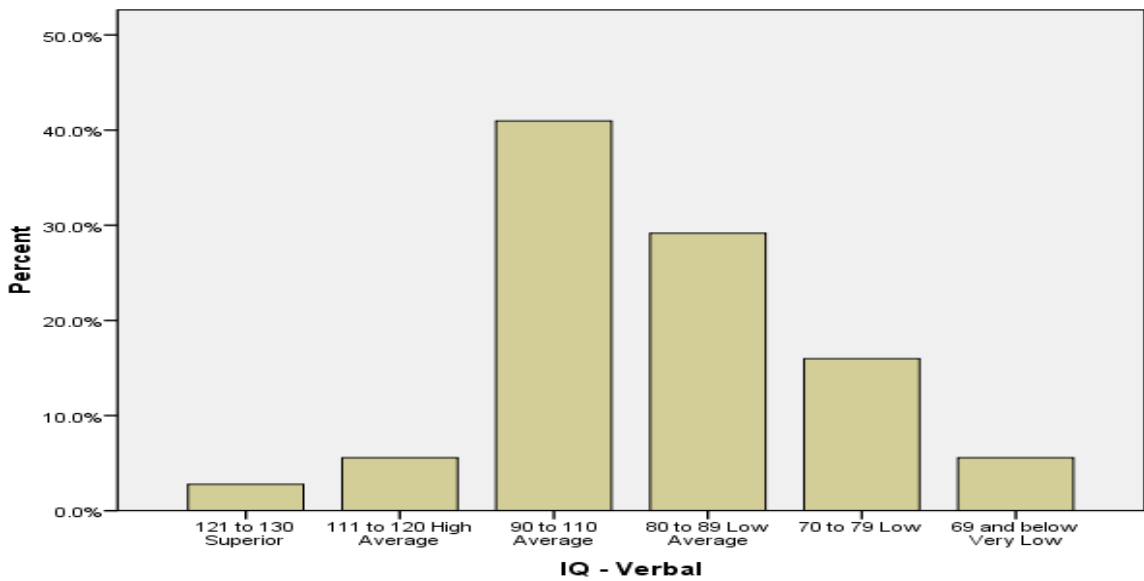


Figure 50. Percent Verbal IQ Standard Scores for the Secondary School Population

Another one sample t-test was conducted to test whether the mean IQ differed significantly from a hypothesized value. Table 4.31 shows the mean values for standard scores of the student population as they relate to Full Scale IQ, and Performance IQ.

Table 4.31

*IQ Standard Scores for the Population of Students*

| WJ-III Test          | <i>N</i> | <i>t</i> | <i>M</i> | <i>SD</i> | <i>Sig.</i> |
|----------------------|----------|----------|----------|-----------|-------------|
| Full Scale           | 203      | -1.569   | 88.66    | 12.21     | .118        |
| Performance          | 129      | 1.063    | 91.22    | 13.00     | .290        |
| Perceptual Reasoning | 41       | 1.140    | 92.32    | 13.01     | .261        |
| Processing Speed     | 41       | .635     | 91.39    | 14.02     | .529        |
| Verbal Comprehension | 42       | -.336    | 89.40    | 11.48     | .739        |
| Verbal               | 144      | .138     | 90.16    | 13.89     | .890        |
| Working Memory       | 40       | 2.560    | 95.42    | 13.40     | .014        |

p < .05 level of significance

*Factors Impacting on the Academic Achievement of Students*

A Pearson chi-square statistical test was used prior to conducting the logistical regression to: (1) determine if there was an association between achievement and each variable identified within the three educational classifications, type of placement, and issues commonly associated with students placed in residential facilities; and, (2) investigate whether various categories of achievement can be associated with variables commonly associated with students attending a residential school. Only variables with expected values of three or higher could be used to perform the chi square. When this assumption was not met Fisher's exact test was used.

There were a total of 299 individual Woodcock Johnson-III Test of Achievement scores for analysis within the population of study. These test were administered within three months of admissions. This sample represents 71% of the total population under study. The chi- square results can be found in Tables 4.18 through 4.20. Next, it was determined if there was a relationship between the Woodcock Johnson III Test of Achievement scores and each of the variables identified in this study (i.e., age, gender, geographic location, psychological disorders, comorbidity, psychiatric medications, substance use, juvenile offenses, type of placement, grade at intake, number of placements, family status, presenting issue, race, and IQ).

*Gender.* As shown in Figure 51, females tended to outperform males in all academic areas except for math. The results indicated that there is a statistically significant relationship between a student's family status and achievement in broad written language and passage comprehension. There was no significant relationship between achievement in broad reading, broad math, and fluency. The *Cramer's V* shows only a more than substantive relationship between gender and board written language and gender and passage comprehension. See Table 4.32.

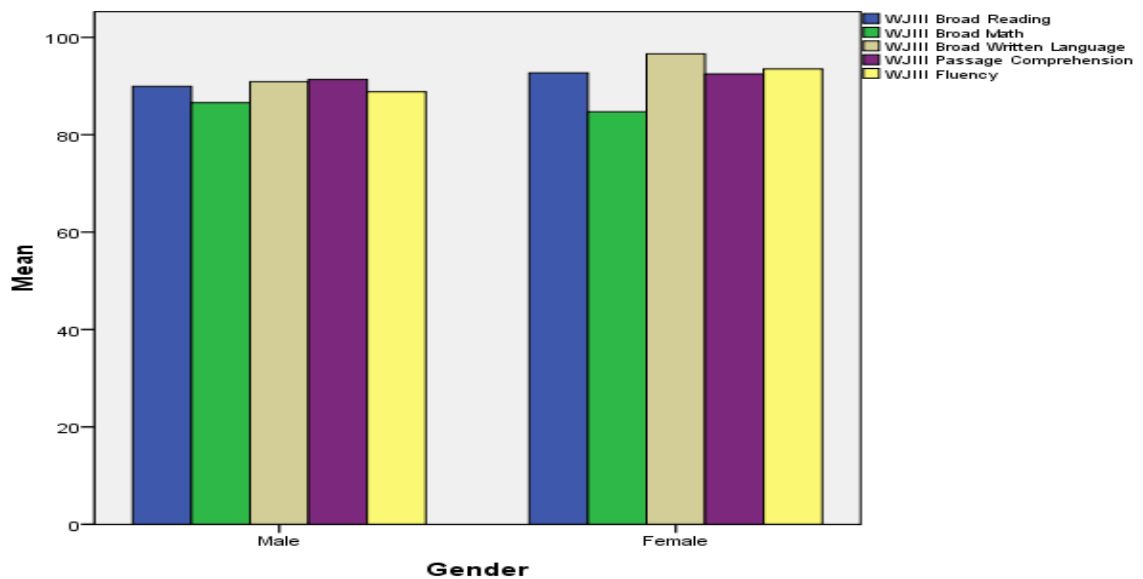


Figure 51. Mean WJ-III Standard Scores by Gender

Table 4.32

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Gender*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Gender                |   |                   |                        |                       |         |
| $\chi^2$              | 5.794   | 5.123             | 28.934                 | 13.537                | 10.836  |
| sig.                  | .447  | .275              | .000                   | .035                  | .094    |
| N.                    | 298   | 298               | 298                    | 298                   | 299     |
| Cramer's V            | .139  | .131              | .312                   | .213                  | .190    |

p < .05 level of significance

*Grade retention.* Figure 52 compares WJ-III Scores of students who were not retained a grade and those who were retained one or more years. Students who were retained one or more years scores lower than students who were not retained. The chi

square values in Table 4.33 revealed a significant relationship grade retention and reading. There was no significant relationship found between grade retention and the other academic areas under study. The *Cramer's V* also signifies that the relationship is fairly strong.

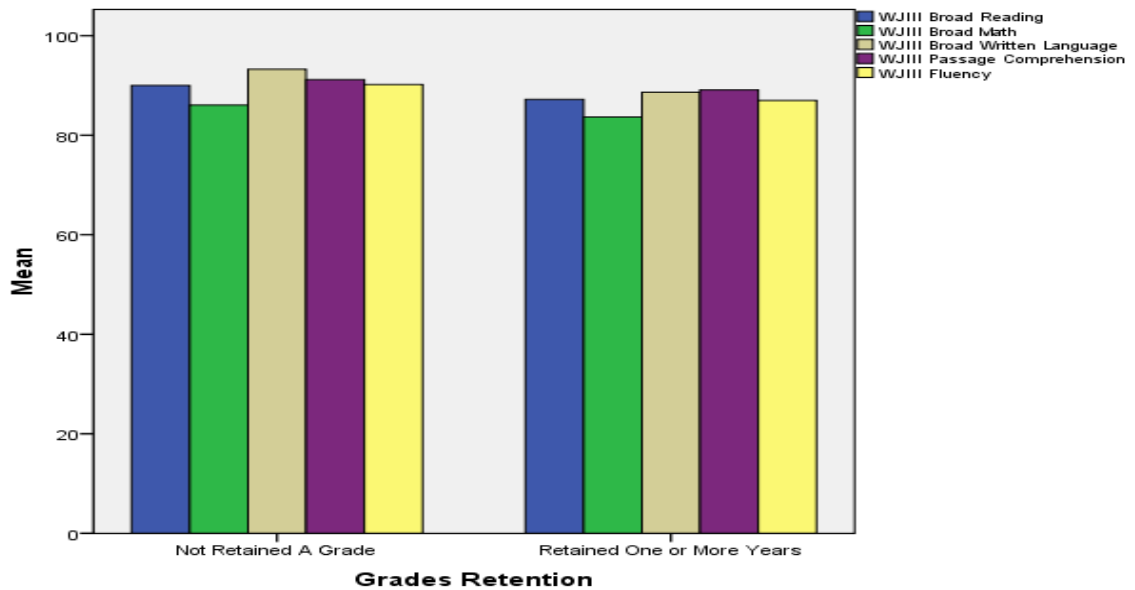


Figure 52. Mean WJ-III Standard Scores by Grades Retained

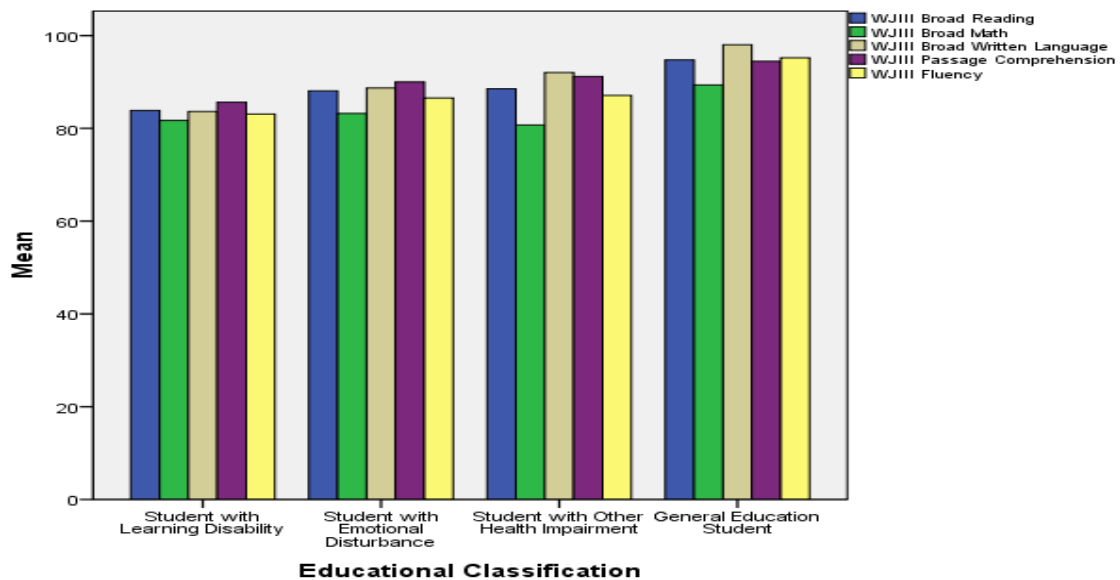
Table 4.33

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Grade Retention*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Grade Retention       |   |                   |                        |                       |         |
| $\chi^2$              | 49.13   | 26.218            | 36.575                 | 19.982                | 30.236  |
| sig.                  | .015  | .159              | .190                   | .917                  | .454    |
| N                     | 298   | 298               | 298                    | 298                   | 299     |
| <i>Cramer's V</i>     | .182  | .148              | .157                   | .116                  | .142    |

p < .05 level of significance

*Educational classification.* As shown in Figure 53, GE students tended to score higher in all areas of the WJ-III. Students with SLD scored the lowest in broad reading, broad written language, passage comprehension and fluency whereas students with OHI scored the lowest on broad math.



*Figure 53.* Mean WJ-III Standard Scores by Educational Classification

Student results on the chi-square analysis in Table 4.34 indicated that there is a statistically significant relationship between a student's educational classification and achievement in broad reading, broad math, broad writing, passage comprehension, and fluency.



Table 4.34

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Educational Classification*

| Explanatory Variables      | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|----------------------------|---|-------------------|------------------------|-----------------------|---------|
|                            | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Educational Classification |   |                   |                        |                       |         |
| $\chi^2$                   | 50.25   | 35.37             | 52.743                 | 32.44                 | 36.09   |
| sig.                       | .000  | .000              | .000                   | .019                  | .007    |
| <i>N</i>                   | 297   | 297               | 297                    | 297                   | 298     |
| <i>Cramer's V</i>          | .237  | .199              | .243                   | .191                  | .201    |

p < .05 level of significance

*Geographic location.* Figure 54 provided the WJ-III standard scores for each of the geographic areas represented in the population under study. Even though there were few notable differences between the three group, students from urban communities tended to score slightly lower. The chi square values in Table 4.35 revealed fluency as having the only statistically significant relationship to a student's geographic location. The *Cramer's V* showed this to be a strong relationship.

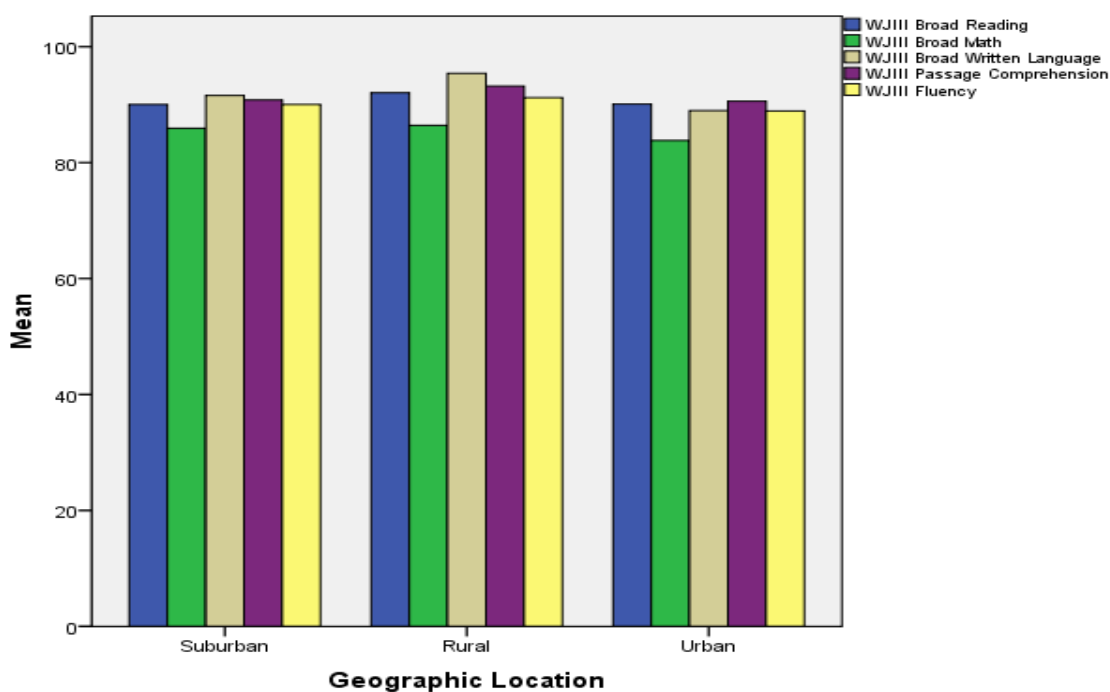


Figure 54. Mean WJ-III Standard Scores by Geographic Location

Table 4.35

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Geographic Location*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Geographic Location   |   |                   |                        |                       |         |
| $\chi^2$              | 12.988  | 6.489             | 17.116                 | 9.065                 | 23.72   |
| sig.                  | .370  | .593              | .145                   | .697                  | .022    |
| N                     | 297   | 297               | 297                    | 297                   | 298     |
| Cramer's V            | .148  | .105              | .170                   | .124                  | .200    |

p < .05 level of significance

*Family status.* As for the family status at intake (See Table 4.3.), students living with family members and adopted students tended to score the lowest on WJ-III

achievement areas. These were small populations when compared to students in foster care at the time of admissions. Students living with both parents and students living with a biological parent and a stepparent tended to score the highest in all areas. See Figure 55.

The chi-square test showed there was a relationship between family status and broad written language and fluency. The chi square results indicated that there is a statistically significant relationship between a student's family status when a parent or both parents were incarcerated and achievement in broad math. There was no significant relationship between achievement in broad reading, broad written language, passage comprehension and fluency. The *Cramer's V* also signified that the relationship is minimally strong. Chi square results are presented in Table 4.36.

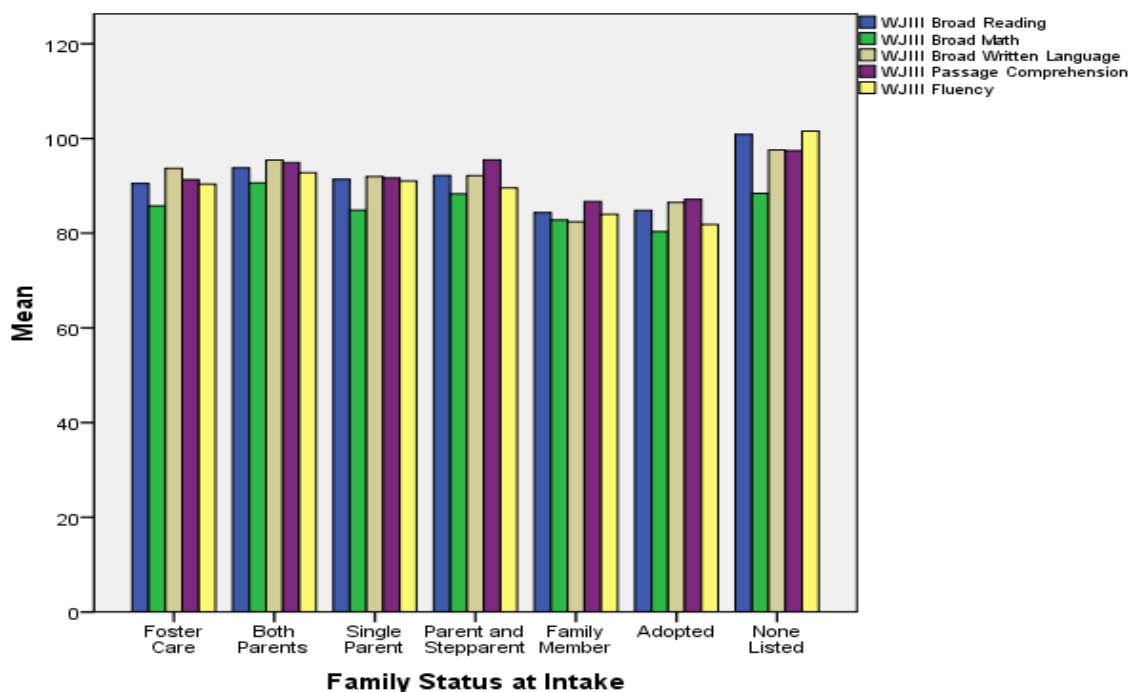


Figure 55. Mean WJ-III scores by Family Status

Table 4.36

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Family Status*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Family Status         |   |                   |                        |                       |         |
| $\chi^2$              | 48.899  | 20.592            | 54.59                  | 46.808                | 55.58   |
| <i>sig.</i>           | .074  | .663              | .024                   | .107                  | .020    |
| <i>N</i>              | 298   | 298               | 298                    | 298                   | 299     |
| <i>Cramer's V</i>     | .165  | .131              | .175                   | .162                  | .176    |
| Incarcerated Parent's |   |                   |                        |                       |         |
| $\chi^2$              | 12.645  | 22.44             | 15.428                 | 16.445                | 16.010  |
| <i>sig.</i>           | .812  | .033              | .632                   | .562                  | .592    |
| <i>N</i>              | 298   | 298               | 298                    | 298                   | 299     |
| <i>Cramer's V</i>     | .119  | .158              | .131                   | .136                  | .134    |

p < .05 level of significance

*Illicit drug use.* Figure 56 shows that students who use illicit drugs tended to do slightly poorer in broad reading, broad written language, and fluency. There were only slight differences in broad written language and passage comprehension.

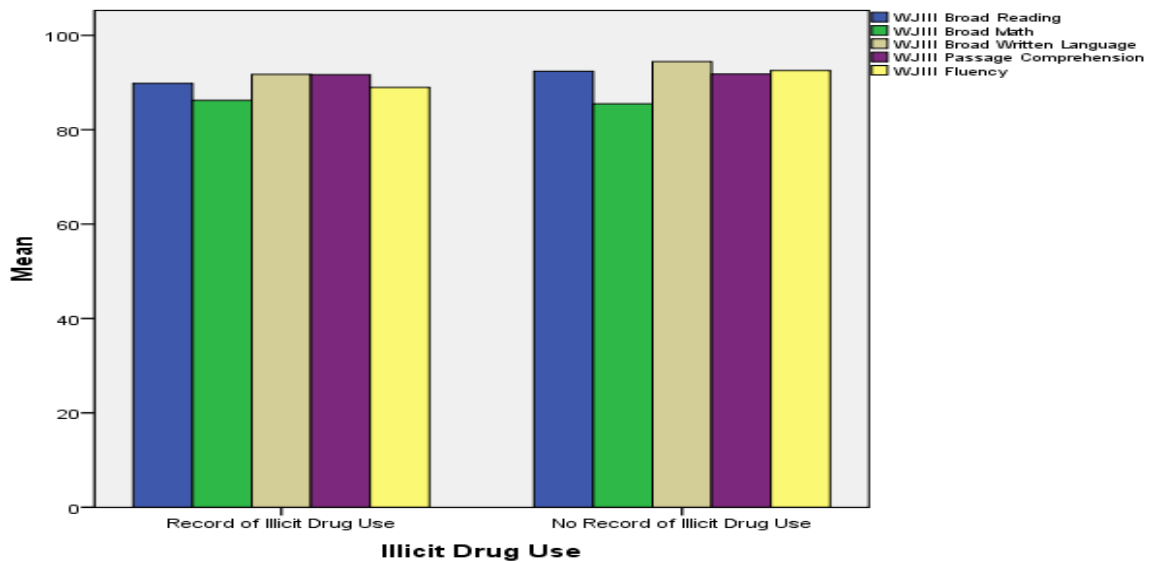


Figure 56. Mean WJ-III Standard Scores by Illicit Drug Use

The chi square test, depicted in Table 4.37, identified a statistically significant relationship between illicit drug use and broad reading, broad written language, and fluency. No significant relationship was found between illicit drug use and broad math and passage comprehension.

Table 4.37

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Illicit drug use*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Illicit drug use      |   |                   |                        |                       |         |
| $\chi^2$              | 28.70   | 14.512            | 25.27                  | 13.288                | 33.08   |
| sig.                  | .018  | .069              | .014                   | .348                  | .001    |
| N                     | 299   | 298               | 298                    | 298                   | 299     |
| Cramer's V            | .287  | .156              | .206                   | .149                  | .235    |

p < .05 level of significance

*Number of placements.* Figure 57 shows that students experiencing multiple placements scored slightly lower in reading, passage comprehension and fluency. Students experiencing their first placement after time in a juvenile detention center scored the lowest in board math.

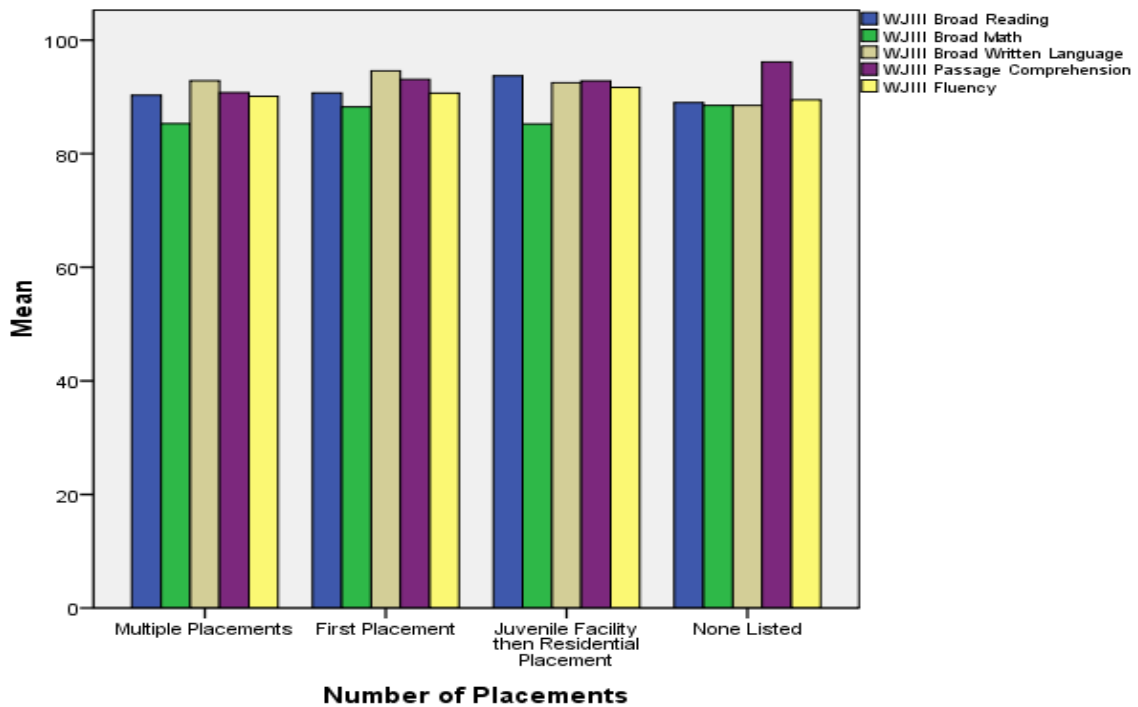


Figure 57. Mean WJ-III Standard Scores by Number of Placements

Table 4.38 presents the chi-square results. The number of placements a student experienced was found to only have a statistically significant relationship to passage comprehension. According to the Cramer *V*, this relationship is strong.

Table 4.38

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Number of Placements*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Number of Placements  |   |                   |                        |                       |         |
| $\chi^2$              | 17.152  | 12.200            | 19.394                 | 40.716                | 14.816  |
| sig.                  | .513  | .430              | .368                   | .002                  | .675    |
| N                     | 297   | 297               | 297                    | 297                   | 298     |
| Cramer's V            | .139  | .117              | .148                   | .214                  | .129    |

p < .05 level of significance

*Presenting issue.* Presenting issue was attributed the type of placement (i.e., foster care, adjudication, illicit drug use, etc.). According to the chi-square test results in Table 4.39, the relationship between presenting issue and board reading, broad written language, and passage comprehension was significant.

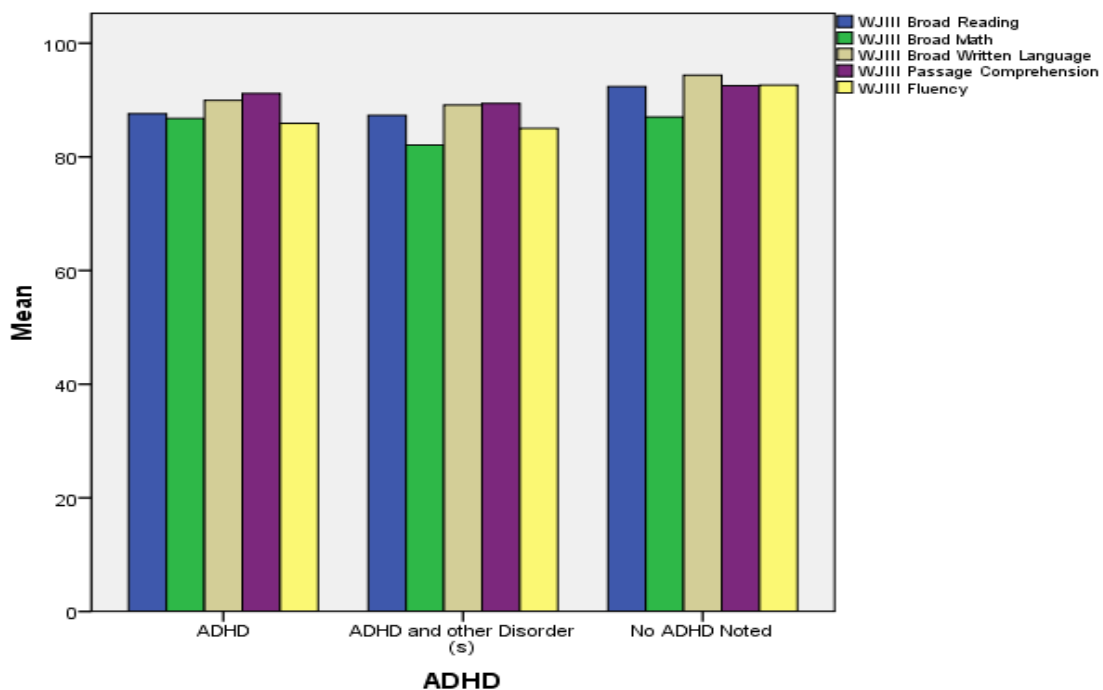
Table 4.39

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Presenting Issues*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Presenting Issue      |   |                   |                        |                       |         |
| $\chi^2$              | 53.533  | 24.961            | 53.94                  | 63.63                 | 46.716  |
| sig.                  | .030  | .408              | .028                   | .003                  | .109    |
| N                     | 298   | 298               | 298                    | 298                   | 299     |
| Cramer's V            | .173  | .145              | .189                   | .175                  | .161    |

p < .05 level of significance

*ADHD.* Figure 58 compares WJ-III standard scores for students with ADHD and those without. Students with ADHD did slightly poorer than students with out ADHD in fluency and board reading. Students with ADHD and other diagnosis, when compared to students without ADHD, did slightly poorer board reading, broad math, broad written language, and fluency.



*Figure 58.* Mean WJ-III Standard Scores by ADHD

Table 4.40 shows the chi-square results which reveals a relationship between a student was diagnosed with ADHD and broad reading, passage comprehension and fluency. There was not significant relationship found between ADHD and broad math and broad written language.



Table 4.40

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and ADHD*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| ADHD                  |   |                   |                        |                       |         |
| $\chi^2$              | 17.771  | 20.664            | 15.676                 | 8.366                 | 23.86   |
| sig.                  | .123  | .008              | .207                   | .756                  | .021    |
| N                     | 298   | 298               | 298                    | 298                   | 299     |
| Cramer's V            | .173  | .186              | .162                   | .118                  | .200    |

p < .05 level of significance

### *Intelligence Quotient (IQ)*

Figures 60 through 62 and Tables 4.41 through 4.43 provide the WJ-III standard scores and chi-square results for IQ. The IQ standard scores included Full Scale, Verbal, and Performance. The *Cramer's V* revealed a strong relationship in all comparisons.

*Full scale IQ.* Figure 59 shows an expected decrease in overall achievement as a students IQ decreases. Students with higher Full Scale IQs tended to score higher on the WJ-III in all academic areas.

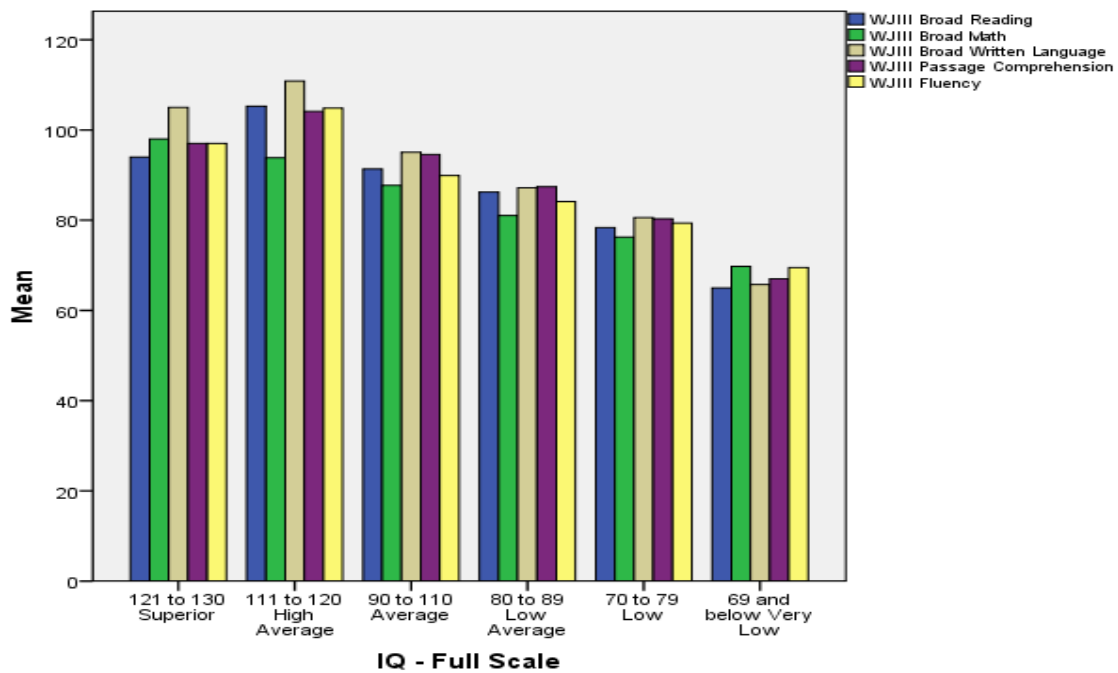


Figure 59. Mean WJ-III Standard Scores by Full Scale IQ

Chi-square results indicated that there is a statistically significant relationship between a student's Full Scale IQ and achievement in broad reading, broad math, broad writing language, passage comprehension, and fluency.

Table 4.41

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Full Scale IQ Standard Scores*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Full Scale IQ         |   |                   |                        |                       |         |
| $\chi^2$              | 79.157  | 40.439            | 88.922                 | 75.014                | 72.770  |
| sig.                  | .000  | .019              | .000                   | .000                  | .000    |
| N                     | 150   | 150               | 150                    | 150                   | 151     |
| Cramer's V            | .297  | .260              | .314                   | .316                  | .283    |

p < .05 level of significance

*Verbal IQ.* Figure 61 reveals a decline in WJ-III scores as Verbal IQ decreases. Most of the students scoring above 90 SS in Verbal IQ, scores above 90 in all areas of achievement.

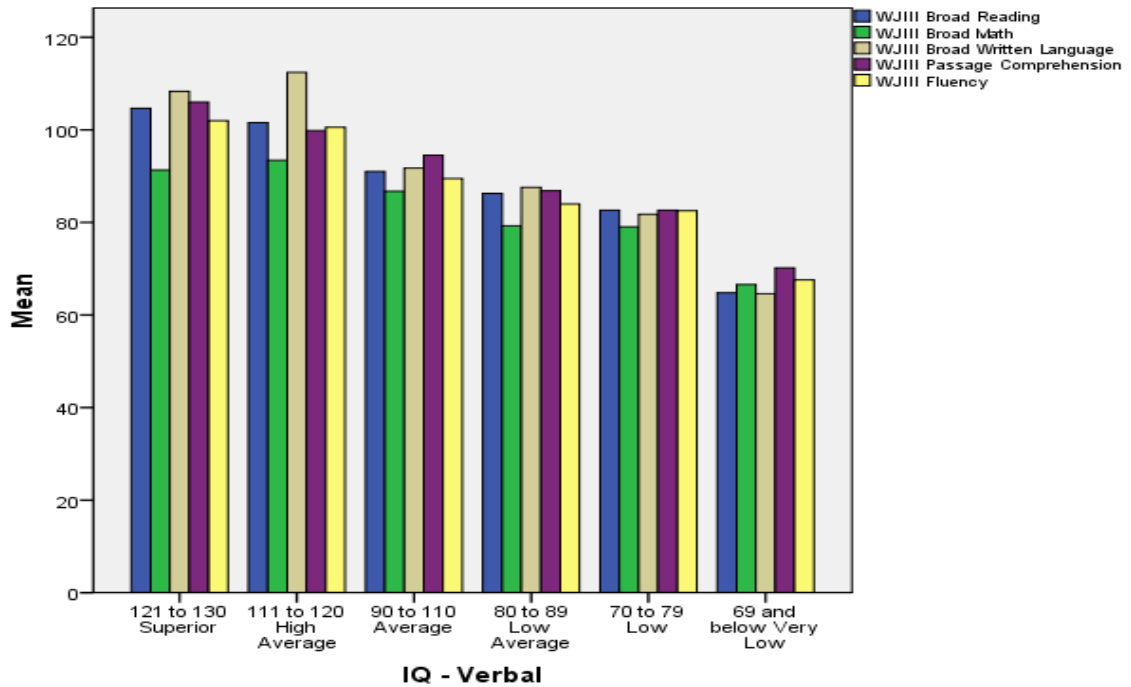


Figure 60. Mean WJ-III Standard Scores by Verbal IQ

Chi-square results in Table 4.42 indicate that there is a statistically significant relationship between a student's Verbal IQ and achievement in broad reading, broad math, broad writing language, passage comprehension, and fluency.

Table 4.42

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Verbal IQ Standard Scores*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Verbal IQ             |   |                   |                        |                       |         |
| $\chi^2$              | 115.60  | 38.849            | 103.00                 | 57.312                | 128.80  |
| sig.                  | .000  | .003              | .000                   | .002                  | .000    |
| N                     | 108   | 108               | 108                    | 108                   | 109     |
| Cramer's V            | .422  | .346              | .399                   | .326                  | .444    |

p < .05 level of significance

*Performance IQ.* Again, WJ-III standard scores decreased as Performance IQ decreased. Only in board math and passage comprehension was there a decrease in standard scores for students with high performance scores..

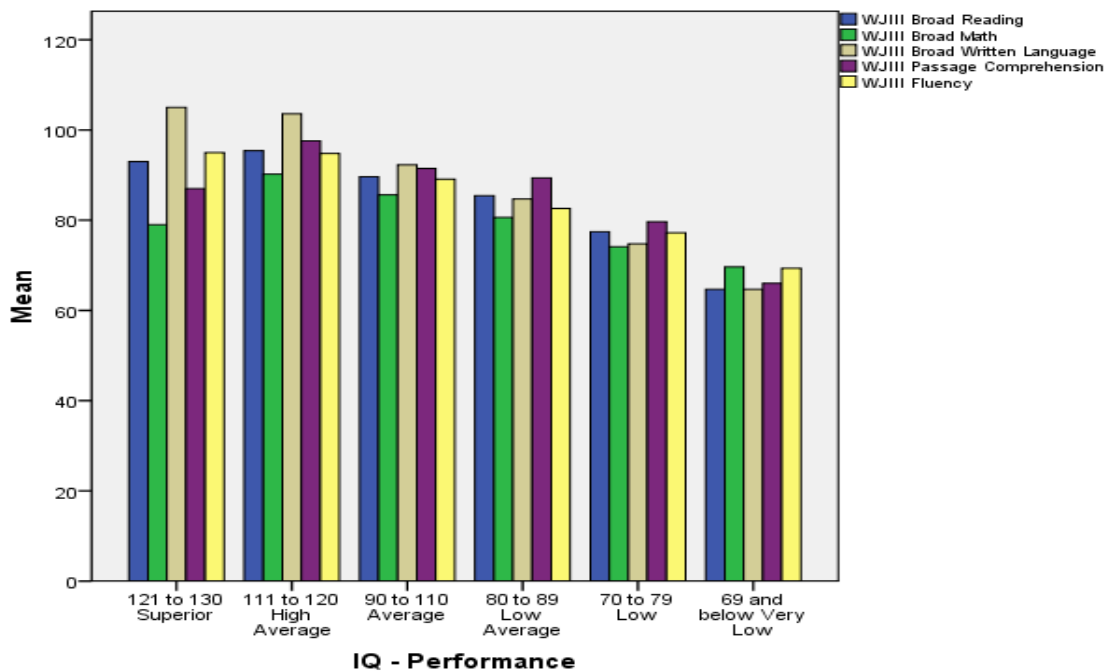


Figure 61. Mean WJ-III Standard Scores by Performance IQ

Chi-square results in Table 4.43 indicate that there is a statistically significant relationship between a student's Full Scale IQ and achievement in broad reading and broad math.

Table 4.43

*Pearson Chi-Square Relationship Between WJ-III Standard Scores in Achievement Categories and Performance IQ Standard Scores*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Performance IQ        |   |                   |                        |                       |         |
| $\chi^2$              | 46.653  | 27.653            | 36.475                 | 34.324                | 29.620  |
| sig.                  | .027  | .024              | .193                   | .101                  | .485    |
| N                     | 99  | 99                | 99                     | 99                    | 100     |
| Cramer's V            | .307  | .305              | .271                   | .263                  | .243    |

p < .05 level of significance

### *Explaining or Predicting Achievement*

Two binary logistic regression analyses were run to examine which variable could predict or explain achievement based on the WJ-III scores at the time of admission. Analyses indicated that at the time of admission gender, family status, and illicit drug use uniquely contributed to models predicting broad reading, broad math, broad written language, passage comprehension, or fluency.

Tables 4.44 and 4.52 present the results of the logistic regression analysis. In this analysis five binary logistic regression models were created to examine direct effects of various variables on academic achievement. Each model involved examining academic success in (1) broad reading, (2) board math, (3) broad written language, (4) passage

comprehension, and (5) fluency. The model represented the 11 variables associated with students attending a residential facility. For purposes of conducting the logistic regression, these 11 variables were divided into a total of 45 subvariables (i.e., psychological disorders were divided into subcategories such as students with ADHD, ODD, CD, and so on). Initially, these variables were entered into each model, and the model included all significantly contributing explanatory factors hypothesized to impact on academic achievement of students attending a secondary school at a residential facility.

Next, only the variables from previous chi-square analysis which showed a relationship between the outcome variables were entered into the model for examination. The entry of these individual variables was determined by their ability to significantly improve the fit of a model to the data. The first model included all significant contributing factors while the second included only the variables formed to be relational based on chi-square results where entered. They included gender, grade, educational classification, students with incarcerated parents, substance abuse issues, length of stay, psychological disorders, psychiatric mediations and family status in which the parents were incarcerated.

Odds ratios may vary from lower boundaries of 0.00 to upper boundaries that approach infinity, with 1.00 being the scales center. In this case, values significantly higher than 1.00 indicate average to above average achievement, whereas those significantly lower than 1.00 indicate below average achievement. An examination of Table 4.44, for example, shows an odds ratio of 2.67 for male students as average or

below average in broad math, indicating that being male provides significant increases in academic success in math and, given the difference between 2.67 and the scale center of 1.00 ( $2.67 - 1.00 = 1.67$ ), it specifies that male students are 167% more likely to score average or above average in math than females. Moreover, to the extent that this factor is directly controlled for all other factors in the model (covariates), the achievement of male students is unique and the fact that they had substance abuse issues made virtually no difference in the identification of their achievement. Male students were 5% percent more likely to underachieve in broad written language when compared to females.

Table 4.44

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Male Students*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Males                 |   |                   |                        |                       |         |
| <i>Odds ratio</i>     | —   | 2.671             | .49                    | —                     | —       |
| <i>95% CI</i>         |   | 1.34-5.34         | .02-.92                |                       |         |
| <i>sig.</i>           |   | .005              | .028                   |                       |         |

p < .05 level of significance

Underachievement for students with SLD was evident in Table 4.45 in all academic areas. In reading, students with SLD were 21% more likely to achieve below average in mathematics than other educational categories. This was also true for passage comprehension where they were 24% more likely to underachieve than other groups. Only in board math, broad written language, and fluency did they share

underachievement with other disability groups. In broad math, students with SLD were 11% more likely to underachieve, whereas students with EBD (Table 4.46) were 39% more likely to underachieve and students with OHI (Table 4.47) were 22% more likely to underachieve. In broad written language, students with SLD were 11% more likely to underachieve and students with EBD were 29% more likely to underachieve. Lastly, in fluency, students with SLD were 14% more likely to underachieve, but students with EBD were 39% more likely to underachieve.

Table 4.45

Binary Logistic Regression Model Explanation of WJ-III *Standard Scores in Achievement Categories* and Empirically Defined Below Average to Average or Above Achievement – Students with SLD

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Students with SLD     |   |                   |                        |                       |         |
| Odds ratio            | .21   | .15               | .11                    | .24                   | .14     |
| 95% CI                | .08-.49   | .06-.38           | .04-.27                | .11-.56               | .05-.35 |
| sig.                  | .000  | .000              | .000                   | .001                  | .000    |

p < .05 level of significance



Table 4.46

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Students with EBD*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Students with EBD     | —   |                   |                        | —                     |         |
| Odds ratio            |   | .39               | .29                    |                       | .39     |
| 95% CI                |   | .10-.81           | .13-.62                |                       | .19-.79 |
| sig.                  |   | .012              | .001                   |                       | .010    |

p < .05 level of significance

Table 4.47

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Students with OHI*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Students with OHI     | —   |                   | —                      | —                     | —       |
| Odds ratio            |   | .22               |                        |                       |         |
| 95% CI                |   | .06-.86           |                        |                       |         |
| sig.                  |   | .030              |                        |                       |         |

p < .05 level of significance

Other factors noted by the logistic regression impacting underachievement included students whose parents were incarcerated (Table 4.48) and substance abuse issue (Table 4.49). Students whose parents were incarcerated (both parents) were 11% more likely to underachieve in passage comprehension and students who were identified

as having substance abuse issues were 46% more likely to underachieve in fluency when compared to students were not abusing substances.

Table 4.48

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Both Parents Incarcerated*

| Explanatory Variables     | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|---------------------------|---|-------------------|------------------------|-----------------------|---------|
|                           | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Both Parents Incarcerated |   |                   |                        |                       |         |
| Odds ratio                | 1.41  | —                 | —                      | .11                   | —       |
| 95% CI                    | 1.11-1.79                                       |                   |                        | .02-.59               |         |
| sig.                      | .000  |                   |                        | .010                  |         |

p < .05 level of significance

Table 4.49

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Illicit Drug Use*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |         |
|-----------------------|---|-------------------|------------------------|-----------------------|---------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency |
| Illicit Drug Use      |   |                   |                        |                       |         |
| Odds ratio            | —   | —                 | —                      | —                     | .46     |
| 95% CI                |   |                   |                        |                       | .25-.85 |
| sig.                  |   |                   |                        |                       | .013    |

p < .05 level of significance

Table 4.50 represents the model addressing IQ as a factor to explain or predict achievement. Intelligence quotients (IQ) were additional factors used to identify how well

students will achieve at the residential school of study as expected. This analysis revealed that as a student's Full Scale IQ, Performance IQ (Table 4.51), and Verbal IQ (Table 4.52) increased, student's ability to achieve in broad reading, broad math, broad written language, passage comprehension, and fluency increased by 100% to 132% when compared to students whose IQs were below average.

Table 4.50

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Full Scale IQ Scores*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |           |
|-----------------------|---|-------------------|------------------------|-----------------------|-----------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency   |
| Full Scale IQ         |   |                   |                        |                       |           |
| Odds ratio            | 1.12  | 1.02              | 1.13                   | 1.13                  | 1.10      |
| 95% CI                | 1.07-1.17                                       | 1.06-1.15         | 1.08-1.19              | 1.08-1.19             | 1.06-1.15 |
| sig.                  | .000  | .000              | .000                   | .000                  | .000      |

p < .05 level of significance

Table 4.51

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Verbal IQ Scores*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |           |
|-----------------------|---|-------------------|------------------------|-----------------------|-----------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency   |
| Verbal IQ             |   |                   |                        |                       |           |
| Odds ratio            | 1.13  | 1.09              | 1.16                   | 1.16                  | 1.11      |
| 95% CI                | 1.07-1.20                                       | 1.03-1.15         | 1.08-1.23              | 1.08-1.24             | 1.05-1.17 |
| sig.                  | .000  | .002              | .000                   | .000                  | .000      |

p < .05 level of significance

Table 4.52

*Binary Logistic Regression Model Explanation of WJ-III Standard Scores in Achievement Categories and Empirically Defined Below Average to Average or Above Achievement – Performance IQ Scores*

| Explanatory Variables | Woodcock Johnson Test of Achievement Categories |                   |                        |                       |           |
|-----------------------|---|-------------------|------------------------|-----------------------|-----------|
|                       | Broad Reading                                   | Broad Mathematics | Broad Written Language | Passage Comprehension | Fluency   |
| Performance           |   |                   |                        |                       |           |
| <i>Odds ratio</i>     | 1.15  | 1.02              | 1.19                   | 1.20                  | 1.13      |
| <i>95% CI</i>         | 1.08-1.24                                       | 1.03-1.18         | 1.09-1.30              | 1.10-1.32             | 1.06-1.21 |
| <i>sig.</i>           | .000  | .008              | .000                   | .000                  | .000      |

p < .05 level of significance

### *Academic Growth Over Time*

Ninety-nine to 100 students had pre and post Woodcock Johnson-III Test of Achievement for comparison over time. This represented almost 24% of the population who stayed long enough for pre and post testing to take place, beginning in 2001 to 2008. To assess the changes in levels of academic functioning across time, a paired samples t-tests were run to examine each WJ-III academic assessment (e.g., broad reading, broad math, broad written language, passage comprehension, and fluency). Each of the analyses indicated that students made statistically significant gains from the time of admission to departure with effect sizes ranged from .42 to .91.

A paired *t*-test was used to determine if the means of the pre and post test scores differed from one another. Table 4.53 provides the standard scores mean values and standard deviations for each pre and post tests. These results found in Table 4.53, indicate that the mean of pre-tests for all tests except passage comprehension, was significantly different ( $p < .05$ ) than the mean of the post-test: total achievement,  $t(98) = -4.636$ ,  $p =$

0.000, broad reading,  $t(99) = -2.068$ ,  $p = 0.041$ , broad math,  $t(98) = -2.004$ ,  $p = 0.048$ ,

broad written language,  $t(99) = -2.161$ ,  $p = 0.033$ , and fluency,  $t(98) = -2.527$ ,  $p = 0.013$ .

Passage comprehension pre-test mean was not statistically significantly different from the mean of the post-test,  $t(98) = -1.647$ ,  $p = 0.103$ .

Table 4.53

*Pre- and post WJ-III Standard Scores in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency for the Population of Study*

|   | <i>N</i> | <i>M</i> | <i>SD</i> |
|---|----------|----------|-----------|
| Pre - WJ-III Total Achievement Standard Score       | 99       | 89.57    | 13.055    |
| Post - WJ-III Total Achievement Standard Score      | 99       | 91.66    | 12.988    |
| Pre - WJ-III Broad Reading Standard Score           | 100      | 91.32    | 13.314    |
| Post - WJ-III Broad Reading Standard Score          | 100      | 92.61    | 13.116    |
| Pre - WJ-III Broad Math Standard Score              | 99       | 86.94    | 11.816    |
| Post - WJ-III Broad Math Standard Score             | 99       | 88.08    | 11.491    |
| Pre - WJ-III Broad Written Language Standard Score  | 100      | 93.49    | 14.748    |
| Post - WJ-III Broad Written Language Standard Score | 100      | 95.46    | 15.826    |
| Post - WJ-III Passage Comprehension Standard Score  | 99       | 92.13    | 14.189    |
| Pre - WJ-III Passage Comprehension Standard Score   | 99       | 93.90    | 14.092    |
| Post - WJ-III Fluency Standard Score                | 99       | 90.70    | 13.894    |
| Pre - WJ-III Fluency Standard Score                 | 99       | 92.48    | 14.219    |

$p < .05$  level of significance

### *Educational Classifications Over Time*

*General education students.* Of the 99 students with pre and post Woodcock Johnson III Test of Achievement for comparison over time, 34 represented GE students. This was representative of 1% of the total population and 34% of the sample. A paired t-test was used to determine if the means of the pre and post tests scores differed from one another. The results in Table 4.44 indicate that for GE students, the mean of pre-tests for

all tests, except total achievement, was not significantly different ( $p < .05$ ) than the mean of the post-test: broad written language,  $t(33) = -.851$ ,  $p = .401$ , and passage comprehension,  $t(33) = .092$ ,  $p = 0.927$ . The results indicate that for GE students, the mean of pre-tests for total achievement,  $t(33) = -2.381$ ,  $p = .023$ , broad reading,  $t(33) = -2.002$ ,  $p = 0.032$ , broad math,  $t(33) = -2.145$ ,  $p = 0.026$ , and fluency,  $t(33) = -2.465$ ,  $p = 0.015$ , was significantly different ( $p < .05$ ) than the mean of the post-tests.

Table 4.54

*Pre- and post WJ-III Standard Scores(SS) in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency by Educational Classification*

|   | General Education |          |           | Students with SLD |          |           |
|---|-------------------|----------|-----------|-------------------|----------|-----------|
|   | <i>N</i>          | <i>M</i> | <i>SD</i> | <i>N</i>          | <i>M</i> | <i>SD</i> |
| Pre - WJ-III Total Achievement SS       | 34                | 95.03    | 10.561    | 18                | 80.50    | 10.159    |
| Post - WJ-III Total Achievement SS      | 34                | 96.97    | 11.259    | 18                | 83.44    | 9.919     |
| Pre - WJ-III Broad Reading SS           | 34                | 96.65    | 10.301    | 18                | 82.28    | 8.245     |
| Post - WJ-III Broad Reading SS          | 34                | 97.68    | 10.342    | 18                | 84.00    | 9.016     |
| Pre - WJ-III Broad Math SS              | 34                | 91.79    | 9.948     | 18                | 82.94    | 10.608    |
| Post - WJ-III Broad Math SS             | 34                | 92.74    | 11.128    | 18                | 84.11    | 9.311     |
| Pre - WJ-III Broad Written Language SS  | 34                | 99.50    | 11.309    | 18                | 82.61    | 10.689    |
| Post - WJ-III Broad Written Language SS | 34                | 101.26   | 15.729    | 18                | 86.17    | 10.188    |
| Pre - WJ-III Passage Comprehension SS   | 34                | 96.26    | 10.780    | 18                | 79.83    | 12.060    |
| Post - WJ-III Passage Comprehension SS  | 34                | 96.12    | 9.856     | 18                | 84.33    | 10.488    |
| Pre - WJ-III Fluency SS                 | 34                | 95.94    | 13.068    | 18                | 83.67    | 9.362     |
| Post - WJ-III Fluency SS                | 34                | 97.91    | 13.419    | 18                | 85.89    | 9.164     |

$p < .05$  level of significance

*Students with specific learning disabilities.* Of the 99 students with pre and post Woodcock Johnson III Test of Achievement for comparison over time, 18 represented students with SLD. This was representative of less than one percent of the total

population and 18% of the sample. A paired t-test was used to determine if the means of the pre and post test scores differed from one another. The results in Table 4.54 indicate that for students with SLD, the mean of pre-tests for all tests, except total achievement and passage comprehension, was significantly different ( $p < .05$ ) than the mean of the post-test: broad reading,  $t(17) = -2.492$ ,  $p = 0.050$ , broad math,  $t(17) = -2.063$ ,  $p = 0.033$ , broad written language,  $t(17) = -2.034$ ,  $p = .050$ , and fluency,  $t(17) = -2.044$ ,  $p = 0.050$ . The results indicate that for SLD students, the mean of pre-test for total achievement,  $t(17) = -4.339$ ,  $p = .000$ , and passage comprehension,  $t(17) = -2.226$ ,  $p = 0.040$ , was also significantly different ( $p < .05$ ) than the mean of the post-test.

Table 4.55

*Pre- and post WJ-III Standard Scores in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency by Educational Classification*

|   | Student with EBD |          |           | Students with OHI |          |           |
|---|------------------|----------|-----------|-------------------|----------|-----------|
|   | <i>N</i>         | <i>M</i> | <i>SD</i> | <i>N</i>          | <i>M</i> | <i>SD</i> |
| Pre - WJ-III Total Achievement SS       | 33               | 88.30    | 14.72     | 13                | 90.54    | 12.03     |
| Post - WJ-III Total Achievement SS      | 33               | 90.06    | 14.15     | 13                | 92.62    | 12.73     |
| Pre - WJ-III Broad Reading SS           | 33               | 90.91    | 16.32     | 14                | 90.43    | 11.97     |
| Post - WJ-III Broad Reading SS          | 33               | 92.39    | 15.45     | 14                | 91.14    | 12.80     |
| Pre - WJ-III Broad Math SS              | 33               | 84.70    | 12.21     | 13                | 84.69    | 13.88     |
| Post - WJ-III Broad Math SS             | 33               | 86.15    | 11.60     | 13                | 85.62    | 12.15     |
| Pre - WJ-III Broad Written Language SS  | 33               | 93.12    | 16.01     | 14                | 94.14    | 17.03     |
| Post - WJ-III Broad Written Language SS | 33               | 94.12    | 15.86     | 14                | 96.64    | 17.62     |
| Pre - WJ-III Passage Comprehension SS   | 33               | 92.52    | 15.81     | 13                | 96.54    | 12.05     |
| Post - WJ-III Passage Comprehension SS  | 33               | 94.33    | 17.723    | 13                | 98.69    | 12.26     |
| Pre - WJ-III Fluency SS                 | 33               | 89.42    | 15.53     | 13                | 89.62    | 13.42     |
| Post - WJ-III Fluency SS                | 33               | 90.45    | 15.92     | 13                | 92.00    | 14.02     |

$p < .05$  level of significance

*Students with emotional and behavioral disorders.* Of the 99 students with pre and post Woodcock Johnson-III Test of Achievement for comparison over time, 33 represented students with SLD. This was representative of one percent of the total population and 33% of the sample. A paired t-test was used to determine if the means of the pre and post test scores differed from one another. The results in Table 4.55 indicate that for students with EBD, the mean of pre-tests for all tests was significantly different ( $p < .05$ ) than the mean of the post-test: achievement,  $t(32) = -2.985$ ,  $p = .050$ , broad reading,  $t(32) = -2.385$ ,  $p = 0.016$ , broad math,  $t(32) = -1.166$ ,  $p = 0.052$ , and passage comprehension,  $t(32) = -2.744$ ,  $p = 0.045$ . Only in broad written language and fluency was it found not to be significant.

*Students with other health impairment.* Of the 99 students with pre and post Woodcock Johnson III Test of Achievement for comparison over time, 13 represented students with OHI (i.e., ADD/ADHD). This was representative of less than 1% of the total population, but 13% of the sample. A paired t-test was used to determine if the means of the pre- and post test scores differed from one another. The results in Table 5.55 indicate that for students with OHI, the mean of pre-tests for all tests was significantly different ( $p < .05$ ) than the mean of the post-test in total achievement,  $t(12) = -2.166$ ,  $p = .016$ , broad written language,  $t(12) = -2.032$ ,  $p = .012$ , passage comprehension,  $t(12) = -2.363$ ,  $p = .008$ , and fluency,  $t(12) = -2.948$ ,  $p = 0.000$ . There was no significant difference between broad reading,  $t(12) = -.300$ ,  $p = 0.769$  and broad math,  $t(12) = -.599$ ,  $p = 0.561$ .



### *Gender Differences Over Time*

*Males.* Of the 99 students with pre and post Woodcock Johnson III Test of Achievement for comparison over time, 66 represented male students. This was representative of 16% of the total population and 66% of the sample. A paired t-test was used to determine if the means of the pre and post test scores differed from one another. The results in Table 4.56 indicate that for male students, the mean of pre-tests for all tests was significantly different ( $p < .05$ ) than the mean of the post-test: achievement,  $t(65) = -5.131, p = .000$ , broad reading,  $t(66) = -2.175, p = 0.034$ , broad math,  $t(65) = -3.271, p = 0.002$ , broad written language,  $t(66) = -2.305, p = .024$ , passage comprehension,  $t(65) = -2.875, p = 0.005$ , and fluency,  $t(65) = -3.171, p = .002$ .

*Females.* Of the 100 students with pre and post Woodcock Johnson III Test of Achievement for comparison over time, sixty-six represented students with SLD. This was representative of one percent of the total population and 34% of the sample. A paired t-test was used to determine if the means of the pre and post test scores differed from one another. The results in Table 4.56 indicate that for female students, the mean of pre-tests for all tests was not significantly different ( $p < .05$ ) than the mean of the post-test: achievement,  $t(33) = -1.055, p = .299$ , broad reading,  $t(33) = -.630, p = 0.533$ , broad math,  $t(33) = .593, p = .557$ , broad written language,  $t(33) = -.181, p = .858$ , passage comprehension,  $t(33) = 1.157, p = 0.256$ , and fluency,  $t(33) = -.333, p = .741$ .

Table 4.56

*Pre- and post WJ-III Standard Scores in Total Achievement, Reading, Math, Written Language, Passage Comprehension and Fluency by Gender*

|   | Male     |          |           | Female   |          |           |
|---|----------|----------|-----------|----------|----------|-----------|
|   | <i>N</i> | <i>M</i> | <i>SD</i> | <i>N</i> | <i>M</i> | <i>SD</i> |
| Pre - WJ-III Total Achievement SS       | 66       | 90.44    | 13.99     | 34       | 88.09    | 10.89     |
| Post - WJ-III Total Achievement SS      | 66       | 93.11    | 13.91     | 34       | 89.09    | 10.54     |
| Pre - WJ-III Broad Reading SS           | 67       | 91.03    | 14.25     | 34       | 92.00    | 11.20     |
| Post - WJ-III Broad Reading SS          | 67       | 92.72    | 14.35     | 34       | 92.65    | 10.31     |
| Pre - WJ-III Broad Math SS              | 66       | 88.42    | 12.70     | 34       | 84.41    | 9.49      |
| Post - WJ-III Broad Math SS             | 66       | 90.53    | 11.50     | 34       | 83.79    | 10.42     |
| Pre - WJ-III Broad Written Language SS  | 67       | 92.33    | 16.43     | 34       | 95.94    | 10.25     |
| Post - WJ-III Broad Written Language SS | 67       | 95.10    | 17.36     | 34       | 96.18    | 12.16     |
| Pre - WJ-III Passage Comprehension SS   | 66       | 92.62    | 16.25     | 34       | 91.21    | 8.76      |
| Post - WJ-III Passage Comprehension SS  | 66       | 96.41    | 15.17     | 34       | 89.29    | 10.21     |
| Pre - WJ-III Fluency SS                 | 66       | 90.08    | 14.15     | 34       | 91.76    | 13.33     |
| Post - WJ-III Fluency SS                | 66       | 92.52    | 14.77     | 34       | 92.24    | 13.12     |

$p < .05$  level of significance

Significant gains were made by males in all academic areas, including total achievement,  $t(65) = -5.131, p = .000$ , broad reading,  $t(66) = -2.171, p = .034$ , broad math,  $t(65) = -3.271, p = .002$ , broad written language,  $t(66) = -2.343, p = .022$ , passage comprehension,  $t(65) = -2.875, p = .005$ , and fluency,  $t(65) = -3.171, p = .002$  at  $p < .05$  level of significance. Females also made gains in most academic areas; these gains were not significant. In comparing pre and post means, females made negative gains in broad math,  $t(33) = .593, p = .557$ , and passage comprehension,  $t(33) = 1.157, p = .256$  although these losses were not significant.

### Discrepancies between Ability and Achievement

A small sample of 50 students (representing 12% of the total population under study) had been administered the Woodcock Johnson III Test of Achievement (Woodcock, McGraw, & Mather, 2001, 2004) Scores and Intelligence Scale for Children (WISC-III) (Wechsler, 1991; Wechsler & Matarazzo, 2003), allowing for calculation of the discrepancies between ability and achievement for broad reading, broad math, and broad written language. Using a common calculation for ability/achievement discrepancies (Schrunk, Becker, & Decker, 2001), it was determined that 20 students had discrepancies in broad reading (40%), 13 had discrepancies in broad written language (26%), and 12 had discrepancies in broad math (24%).

A paired t-test was used to determine if the means over time for student discrepancies differed from one another. These results indicated that the mean of the first discrepancy for broad math,  $t(49) = -2.159$ ,  $p = 0.036$ , and broad reading,  $t(49) = -2.095$ ,  $p = 0.041$ , was significantly different ( $p < .05$ ) than the mean of the second discrepancy. The first discrepancy for broad written language was not statistically significantly different from the second discrepancy,  $t(49) = -1.072$ ,  $p = 0.289$ . When comparing students by educational classification and gender, the sample sizes were too small to draw any conclusions.

## 5. Conclusion

This synthesis summarizes the evidence available on the academic and behavioral characteristics of adolescents attending a residential school between 2001 and 2008, and describes factors that impact on their academic achievement. In addition, a description of the student populations' achievements is provided along with various subgroups (i.e., educational placements, type of placement, etc.) in the academic areas of math, reading, written language, passage comprehension, and fluency. This information was aggregated from student files and the school's database. Findings are complex and compounded by numerous issues impacting students attending the school.

It was determined during the course of research that the facility kept student files in two locations: the case managers' offices and in the school's guidance office. It was the practice of case managers, individuals who managed student participation in the residential program, to destroy files after residents had been discharged for five years. This meant that there were no case management files available for students between 2001 and 2003. Fortunately, demographic information was available in the database on all students since the facility opened in 1986; and more importantly, the guidance office maintained school records of all students since the facility opened. Even though the case managers' files were more comprehensive than the other sources (i.e., contained court records, medical information, etc.) the other sources provided enough information to fully

describe the population under study. Absence of the case managers' files meant that although psychological issues, substance abuse issues, and juvenile offenses could be determined, the specifics of those issues were often coded as unknown.

Descriptive information on 423 students was available to determine each student's age, gender, grade, geographic location, educational classification, type of placement, family status at intake, length of stay, psychological diagnoses, psychiatric medications taken, and juvenile offenses. From the information gathered on psychological diagnoses, it was determined if students were comorbid. Woodcock Johnson III Test of Achievement (Woodcock, McGrew, & Mather, 2001, 2007) scores were only available for 299 students; and typically, only for students who had resided at the facility for longer than three months. In addition, information on student IQs was available only if the individuals conducting the psychological evaluation upon entry believed this type of testing was warranted. Even though every student had a psychological evaluation on file, IQ scores were not always included in these reports. This resulted in the availability of 203 Full Scale IQ scores used to describe this variable and any defined discrepancies found between the ability and achievement of students.

The complexity of the population under study was evident in the descriptive statistics. As reported by the facility's administrators, this residential program is best described as a group home. A group home was defined by the U. S. Office of Juvenile Justice, Delinquency and Prevention (OJJDP) as a residential facility for groups of unrelated youth. The Child Welfare League of America (CWLA) (2009) described children living in out-of-home care in 2006 as 40% Caucasian, 34% African American,

and 27% children of other races and ethnicities. This facility's student population consisted of 48% Caucasian, 41% African American and 10% of other minority groups, mainly Hispanic and Native American/Pacific Islanders. This slight difference could be attributed to the increased number of older youth in the program or to location of the facility and not to over identification or representation of any one group. Barth (2002) noted that older foster care youth were more likely to be placed in residential care. Similar demographic information was reported for adolescent populations in other studies (Trout, Hagaman, & Epstein, et al., 2008).

Similar to CWLA's national statistics and other studies (Barth; 2002; Barth & Lee, 2009; Jones & Lansdverk, 2008; Trout, 2008), the average age of the adolescent residential population was 15.8, and served more males than females (Trout, Hagaman, & Epstein, et al, 2008). The majority of the population under study was foster care youth who had experienced multiple placements. Similar to Baker et al. (2005) this can probably be attributed to the fact that these are adolescents who have had little success in other placement types or with being treated through community services.

This program was described by the facility's administration as a step-down option for adolescents transitioning from incarceration or rehabilitative centers similar to what was described by Dale et al. (2007). Students stepping down from these types of centers made up 20% of the student population under study and was identified as the second largest population of students, the largest being students placed at the facility through foster care (52%). Differing from what Barth and Lee (2009) found, most of the adolescents in this program were referred by social services and not by parents. Similar to

Barth and Lee (2009) findings, the average student enrollment was 65-70 students; a majority of the students were served from the foster care system (52%); the school served males and females (albeit separately); the average length of stay was almost one year (335 days) [Jones and Lansdverk (2009) had similar findings]; the program offered a family-style model with live-in house parents; and the living environment was cottage and dormitory style.

The present findings indicate that adolescents entering residential care and attending a residential school, experience numerous risks across demographic, mental health, behavioral, and academic domains. Students educated at the school under study had high incidents of substance abuse issues, psychological disorders, juvenile offenses, and were primarily accepted through foster care mostly attributed to family issues. As determined by Bates, English and Kouidou-Giles (1997), the vast majority of adolescents served in residential group homes have some degree of emotional and behavioral problems. Research is beginning to indicate that adolescents entering residential care are a homogenous population with similar characteristics and treatment needs (Trout et al. 2008; Veneziano & Veneziano, 2003) no matter their group affiliation (i.e., age, gender, race, etc.) or type of placement (i.e., foster care, adjudicated, substance abuse, etc.).

Adolescents in residential care have been described as having a history of severe family problems. The fact that 52% of the population under study resided in foster care and the others were in some way separated from family members, alone, strengthens the argument for familial problems resulting in out-of-home care. In addition to the number of students whose parents are incarcerated or whose parents are deceased, the family

status of students at intake points to adolescents whose presenting issues could be attributed to issues in the home. After foster care, only 8% of the population at intake had both biological parents in the home. Additionally, upon admissions in the residential school, 19% were living in single family homes, 5% were living with one biological parent and a step parent; 4% were living with a relative (i.e., grandparents, aunts, etc.); and 2% had been adopted. A recent meta-analysis (Knorth et al., 2008) found some support for the benefits of residential treatment that included a focus on family involvement.

Seventy-four percent of the students at the residential school of study had an identified diagnosis found in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychological Association [APA], 2000). As evidenced in the research, there is a prevalence of behavioral and emotional disorders within residential populations (Bates et al., 1997; Quinn, Newman, & Cumbald, 1995). In a recent study of the Girls and Boys Town program in Nebraska, it was determined that 54% of the population had a diagnosed psychological disorder (Trout, 2008). With a third of the population of study identified as having psychological disorders, this presents an even greater need for this particular residential facility. This higher percentage is more in line with the U. S. Public Health Service's (2000) estimate that between one-half and three-fourths of adolescents entering foster care exhibit behavior or social competency problems that warrant mental health care. The most prevalent psychological disorders were: Attention Deficit/Hyperactivity Disorder (ADHD), Bipolar and other Depressive Disorders, Oppositional Defiant Disorder, and Conduct Disorder. In addition,



comorbidity rates were also high amongst this population (40%) as well as students who were taking psychiatric drugs (52%). Many of the students admitted to the program had a history of hospitalization for mental health problems, whereas 4% were discharged to a hospital setting for stabilization.

Lastly, students within the special education population who had been identified as having emotional and behavioral disorders were also found in significant numbers at this residential facility of study. The students identified as EBD consisted of 57% of the special education population and 27% of the entire population under study.

The use of illicit drugs was prevalent amongst the population under study. Even though only 7% of the population was admitted after stepping down from a substance rehabilitative center, 57% had admitted to using illicit drugs, and 14% had committed juvenile offenses involving drugs or narcotics. For those students who were administered the SASSI, a substance abuse behavior checklist, 64% could be classified as drug dependent or drug abusers. When crosstabulated, 65% of the students under study had both a psychological disorder as well as admitted to using illicit drugs. In addition, of those who were classified as drug dependent or drug abusers on the SASSI, 63% also had psychological disorders. Of those students in foster care, 65% had both a psychological disorder as well as admitted to using illicit drugs. This is not quite in line with the findings that 85% of foster care youth are estimated to have an emotional disorder and/or substance abuse problem (Landsverk, Burns, Stambaugh, & Rolls Reutz, 2006), but taken as a whole, substance abuse is a prevalent issue amongst students in residential care.

The number of students with juvenile records was 62%, and 19% had been placed at the facility of study through probation. If substance abuse and relapse prevention were included in that number, placement through probation would increase to 29%. Given the predominance of the types of crimes committed by this population, assault and multiple offenses, this is a challenging population to serve. In addition, 15% of these adolescents were dismissed from the program due to continued aggressive and assaultive behaviors or were returned to juvenile detention centers.

These findings with regards to psychological disorders, illicit drug use, and juvenile offenses were substantiated in the literature. Dale, Baker and Anastasio (2007) conducted a state-wide survey of 16 New York residential facilities in 2001 and found high rates of substance abuse, juvenile delinquency, and prior psychiatric hospitalizations. Baker, Kurland and Curtis (2007) examined data from the national residential study and found high proportions of young people with histories of behavioral and emotional disorders admitted to residential facilities. Forty percent of the sample of adolescents in their study had histories of illicit drug use; 50% had histories of criminal activity and prior hospitalizations; and almost 80% were on psychotropic medications at the time of admission. Lyons, Libman-Mintzer, Kisiel and Shallcross (1998) found high rates of mental health problems in their study of 15 Illinois residential treatment centers. They found that eight out of 10 young people met the criteria for a diagnosis on the Children's Severity of Psychiatric Illness measure. Similar to Baker et al. (2005) this provides compelling evidence that adolescents in residential group homes are likely to have serious emotional and behavioral issues prior to admission.

Just as the factors previously discussed can be justified through the literature as contributing to the severity of problems experienced by adolescents entering residential care, this study also found academic problems existed upon admissions and was able to identify relationships between the variables under study and academic achievement. Whereas Culbertson (1998) emphasized the inevitable roles that gender, ethnicity, social class, and environment play in influencing early learning in general, they also concede to the unsettling knowledge that these same factors will relate to achievement as children grow into adolescents. Several variables were identified as possible contributors to academic failure in specific areas, including: gender, grade retention, family instability, geographic location, psychological disorder, psychiatric medications, illicit drug use, number of placements, presenting issues, and educational classification. It is not to say that other variables identified in this study did not contribute to academic problems, only that further evidence is needed. More importantly, correlations were difficult to conclusively determine given the number of dichotomous variables in the study, and the absence of a control group for comparison.

Trout, Hagaman, Epstein, et al. (2008) identified age, gender, ethnicity, age at admission, special education status, IQ, and the presence of a DSM-IV diagnosis as possibly impacting on academics. Similar to these findings, they also showed that there were statistically significant gains from the times of admission to departure, with effects sizes ranging from .48 to .97. Trout, Hagaman, Epstein, et al. (2008) determined that at the time of admission, IQ, ethnicity, special education status, level of problem behavior, and the presence of a DSM-IV diagnosis all uniquely contributed to models predicting

reading, math, and science scores. Trout, Hagaman, Epstein, et al. (2008) found that only IQ and ethnicity continued to contribute to the models when students departed.

Many of the students attending the school under study had some degree of academic deficits in reading, mathematics, written language, passage comprehension, and fluency. In overall achievement, more than 50% of the population were achieving below average. A majority of the students entered the school with significant academic delays in math, passage comprehension, and fluency, which possibly caused further difficulty for students with special education needs. This equated to approximately 50% of the population functioning in the low average range on at least one of WJ-III areas assessed, whereas students with special education needs experienced two or more, especially students with SLD and EBD. Even then, academic delays were found in most group affiliation (i.e., race, gender, educational classification) upon intake. Similar results were found in the Girls and Boys Town study in Nebraska (Trout, Hagaman, Epstein, et al., 2008), strengthening the argument that students enter residential care as a homogenous population with similar characteristics and treatment needs (Trout, Hagaman, Epstein, et al., 2008; Veneziano & Veneziano, 2003).

Worth noting here is the relationship between many of these variables and fluency. There is a growing body of research associating delays in reading, math, and writing fluency to student achievement and behavior. In this study, out of the 12 variables identified as having a relationship to academics within the residential setting, more than 65% accounted for a relationship between these variables and fluency, whereas on average, reading, math, written language, and passage comprehension were impacted by

less than 50% of the variables. McDowell and Kennan (2001) confirmed that building fluency can help to improve attention span and endurance in students who otherwise experience difficulty staying on task.

Roberts, Torgesen and Boardman (2008) identified fluency as one of five areas critical to reading development for adolescents. They found that if fluency fails to develop, reading is less enjoyable, leading students to read less, and as students progress from grade to grade the problem becomes compounded leading to problems in comprehension. There is a strong empirical relation between children's fluency and comprehension skills (Fuchs, Fuchs, Hosp, & Jenkins, 2001; Hosp & Fuchs, 2005). Theoretically, fluency is important because it means that the student can expend enough attention beyond word recognition to comprehend the meaning of text (Kuhn & Stahl, 2000).

In addition to reading fluency, educators and cognitive scientists agree that the ability to recall basic math facts fluently is necessary for students to attain higher-order math skills (Ashcraft, 1992; Dehaene, Piazza, Pinel & Cohen, 2003; Delazer, Domahs, Barth, Brenneis, Locky & Trieb, 2004; Delazer, Domahs, Bartha, Brenneis, Locky, Trieb & Benke, 2003; Loveless, 2003; Whitehurst, 2003; Woodward & Baxter, 1997). The implication for mathematics is that some of the sub-processes, particularly basic facts, need to be developed to the point that they are done automatically. If this fluent retrieval does not develop, then the development of higher-order mathematics skills — such as multiple-digit addition and subtraction, long division, and fractions — may be severely impaired.

## *Gender*

Gender and achievement in written language and in passage comprehension had a substantive relationship. Males were not performing as well in written language and in passage comprehension as females at intake; however, according to mean scores at intake, males were found to outperform females in mathematics. The logistic regression forecasted that by just being male at this facility predicted achievement in math whereas being female predicted achievement in written language.

Gender has long been thought to predict academic achievement gaps between males and females (Chubb & Loveless, 2002; NAEP, 2007). NAEP (2002, 2007) scores support that males will outperform females in math, whereas females will outperform males in reading and writing; however, in this study the gap between males and females in reading did not exist. There were no significant differences found between girls and boys in reading and fluency at intake.

As for achievement over time, males had a greater level of progress than females. Males had significant increases in academic achievement across all academic areas, whereas females, as a group, experienced little progress over time, and even digressed in math and passage comprehension.

Females typically outperform males over time in reading and writing (NAEP, 2008). Although females do not always outperform males in mathematics, they have, over time, lessened the achievement gap in mathematics with males. Even though this is the case in the general population, this is not always true for high risk populations. One of the most significant risk factor relating to poor academic performance for females is early

onset of delinquency (Dryfoos, 1990; Greenwood, Model, Rydell & Chiesa, 1996; Yoshikawa, 1994). It has been determined that a disproportionate number (26 percent) of female juvenile offenders have learning disabilities (U. S. Department of Justice, 1994) and that by the time they enter the system, they may be at least a grade level behind their peers. Similar to males, females who are juvenile offenders may respond to their inability to meet academic demands by skipping school or dropping out altogether (Bergsmann, 1994; Hugo & Rutherford, 1992).

In addition to delinquency, there is some evidence in the research that females who are suffering from mental illness, significant behavior issues, and have been subjected to neglect and abuse, tend to experience increased levels of academic failure (McCarty, Mason, Kosterman, Hawkins, Lengua, & McCauley, 2008; Roeser, Galloway, Casey-Cannon, Watson, Keller, & Tan, 2008). Lipschitz, Rasmusson, Anyan, Cromwell and Southwick (2000) identified the clinical and functional correlates of posttraumatic stress disorder (PTSD) in trauma-exposed urban adolescent females. They examined the records of 90 female adolescents aged 12 to 21 years of age who presented for routine medical care at an adolescent primary care clinic for trauma exposure, posttraumatic stress symptoms, other psychopathology, and psychosocial, family, and school function. When compared with females without these psychological issues, females experiencing psychological trauma were significantly more depressed, used more cigarettes and marijuana, and were more likely to have failed a school grade, been suspended from school, or been arrested.

Many of the females in this study were juvenile offenders and experienced multiple types of psychological trauma. This could be a contributing factor to their decrease in academic performance over time. Whereas most males who experience learning difficulties are more likely to be disruptive, externalizing their frustration, females are more likely to exhibit internalizing behaviors (American Association of University Women, 1991). Females placed at residential facilities may be extreme cases of disruptive and externalizing behavior. This could be a factor in determining why females did not perform as well overtime as males.

In addition, the residential facility under study identified a nine month period in which the school began to offer co-ed instruction. Some research supports increased academic performance for females when separated from males (American Association of University Women, 1992; Daly, 1996; National Coalition of Females' School, 2003). This is not the case for males whose performance typically stays the same in separated educational settings. This could also have been a factor in explaining why females did not perform as well as males over time. Further research would be needed to identify the reasons for the academic differences between males and females at the residential school under study. Never the less, the small variance between males and females at intake gives rise to the argument that in the case of residential populations, there is a greater level of homogeneity that surpasses gender. This facility, and possibly others like it, will need to address the postential lack of academic progress experienced by females who are juvenile offenders and suffer psychological issues.



### *Grade Retention*

Only in reading did grade retention play a role in achievement. This only validates the “Matthew effect” which states that “the rich get richer and the poor get poorer,” a metaphor used to explain the development of individual differences in reading over time (Stanovich, 1986). The most recent NAEP (2007) data showed that students lose ground after the fourth grade. In addition, Chubb and Loveless (2002) in their research on the achievement gap, revealed that for some students, as they age, their academic abilities decline (Chubb & Loveless, 2002).

This can easily be translated into grade retention for students who are already underperforming at intake. This population has multiple issues (i.e., long stays in juvenile detention centers, psychiatric issues, family conflicts) which can attribute to truancy and absences from school. These are two primary factors in grade retention. The research is already supportive in identifying this population at high risk of dropping out of school (DeLeire & Kalil, 2002; McLanahan & Sandefur, 1994; Teachman, Day, Paasch, Carver, & Call, 1998) and experiencing academic failure.

The fact that students in residential school are often, for the first time, attending school daily and in smaller classrooms, could attribute to the significant gains they experience while attending the residential school. In addition, the logistical regression found the higher the grade level, the more likely students would achieve in reading, written language, and fluency.

### *Family Status*

The results of this study found a relationship between family status and written language and between family status and fluency. In addition, there was a relationship determined to be between whether or not a student's parents were incarcerated and achievement in math. From the review of the literature, it was determined that family structure could contribute to a student dropping out of high school, scoring lower on standardized tests, and reporting lower grades than others (Astone et al., 1991; DeLeire & Kalil, 2002; Hill et al., 2001; McLanahan & Sandefur, 1994; Teachman, Day, Paasch, Carver, & Call, 1998). Therefore, the family dynamics of the students attending the residential school may explain why many fail to succeed academically. Students who live with both biological parents are more likely to succeed in school. Therefore, differences in parenting practices can explain why adolescents in less stable families fail to advance in secondary academics.

The logistical regression determined that students with parents who are incarcerated could predict or explain underachievement in passage comprehension. However, the same logistic regressions determined that students with incarcerated parents could predict or explain achievement in reading. There is no explanation for this in the literature. The analysis of progress over time also showed that there were significant gains in reading and not in passage comprehension. This could be attributed to students increasing in their level of reading, but not at the level of comprehension. Also, the data supports that many of these students entered the facility with average or above average

passage comprehension skills and the lack of progress could be attributed to regression toward the mean.

### *Geographic Location*

Geographic location did not play a role in predicting achievement but was identified as having a relationship to fluency. Other than the research supporting lower achievement for students who live in rural areas (Brown, 2004), there was little evidence supporting any significant difference between students being admitted from suburban, rural, and urban communities. As reported by Truscott and Truscott (2005), these students are coming from jurisdictions that are faced with many of the same issues as they relate to academic achievement.

### *Illicit Drug Use*

The logistical regression examined the relationship between illicit drug use and achievement and found that the use of illicit drugs could predict or explain achievement in fluency. In addition, the chi-square analysis determined that there was a relationship between illicit drug use and reading; illicit drug use and written language; and illicit drug use and fluency. The research supports these findings in demonstrating a strong correlation between drug use and measures of school performance, including attendance, grades, and graduation (Bachman et al., 1998; Marston et al., 1988; Mensch & Kandel, 1988; Ellickson, Bui, Bell, & McGuigan, 1998; Dozier & Barnes, 1997).

### *Number of Placements*

There was a relationship found between students' number of placements and passage comprehension. Students who were in foster care at the time of admissions were more likely to have below average scores in passage comprehension upon admissions. Research strongly suggests that frequent student movement can be attributed to behavioral and mental health problems, and low academic achievement (Harden, 2004; James, Landsverk, & Slyman, 2004; Newton, Litrownik, & Landsverk, 2000). The number of placements has been shown here to interrupt academic experiences, compounding academic failure.

### *Presenting Issues*

It was hypothesized that students placed at the residential facility through social services will show the smallest academic gains and will fail to outperform students from other placement categories. In this case, foster care students exhibited greater risk of academic failure in reading, broad written language, and passage comprehension. These were the students who were more likely to have issues related to multiple placements, grade retention, substance abuse, juvenile offense, etc. There is numerous research which supports the fact that children entering foster care tend to have more learning and language problems than their peers (Evans, 2001) and experience educational neglect (Helfer, 1987).

A Columbia University investigation into children in foster care (Fanshel et al., 1978) examined at the level of academic performance upon entering care and trends over time. At each assessment point the majority of foster children performed at a level below

normal for their age. A third was almost two years behind in reading ability. Over a five-year period only a very modest improvement occurred in which 53% were performing below their age levels, compared with 59% at the start of the study. This study contradicts those findings. As a group, foster care students' academic achievement over time tended to be reflective of the entire population in which gains were made in all academic areas including math, reading, written language, passage comprehension, and fluency. This could be attributed to the stability offered by the residential facility, the school being on campus, with small classroom sizes, as well as the use of the family-style model (i.e., use of full-time house parents) which has been attributed to academic gains for foster care populations in the past (Lipsey, 1999; Lipsey & Wilson, 1998).

#### *Educational Classification*

It was hypothesized that upon entry, students from the general education population would outperform students with specific learning disabilities and students with emotional and behavioral disabilities. This was found to be the case. General education students were more likely to enter the facility with average or above-average achievement scores in all areas (i.e., broad reading, broad math, broad written language, passage comprehension, and fluency) when compared to students in other categories.

As noted by the logistical regression, educational classification played a significant role in predicting or explaining achievement. Upon admissions, if a student was identified as SLD, they were more likely to be achieving below average in all academic areas including reading, math, written language, passage comprehension, and fluency. As a group, students with SLD and EBD were, together, more likely to

underachieve in written language and fluency. As a group, students with SLD, EBD and OHI could predict or explain below average achievement in math. The research supports these findings. General education students typically outperform students with SLD and students with EBD. This supports the findings that there are significant differences between the academics and behaviors of these two groups (Nelson, Benner, Lane, & Smith, 2004; Sabornie, Cullinan, Osborne, & Brock, 2005) and differs from other findings which found no significant differences (Kauffman, Cullinan, & Esptein, 1987; Scruggs & Mastropieri, 1986).

It was also hypothesized that students with emotional and behavioral disabilities will show the greatest academic growth after attending the residential school for six months to a year. This was not to be the case. Students with SLD showed the most significant gains across all academic categories; whereas students with EBD showed significant growth in reading, math, and passage comprehension. This contradicts the longitudinal investigation of Anderson et al. (2001) in which it was determined that while students with SLD progressed in reading skills over time, students with EBD did not experience similar levels of improvement. Even then, students with SLD did not significantly outperform students with EBD as expected. The variance in these two populations could be attributed to IQ; but there were no significant differences between IQ scores of students with SLD and students with EBD. Students with EBD scored lower mean values in Full Scale IQs, as well as Performance and Verbal IQs. Even general education students who tended to outperform special education students did not have significantly higher IQs than other students. This gives evidence of existing discrepancies

between the ability and achievement of students with SLD. Their inability to perform as well as other groups could be attributed to actual processing disorders.

In addition, Benner, Allor and Mooney (2008) investigated the academic processing speed of students with EBD served in public school settings. Of significance to the finding in this study is the fact that their findings indicated that a majority of students with EBD (57%) exhibited academic fluency deficits. They also determined that academic fluency predicted social adjustment issues.

#### *Intelligence Quotient (IQ)*

As predicted there was a strong relationship between all academic areas (reading, math, written language, passage comprehension, fluency) and Full Scale IQ, Performance IQ, and Verbal IQ. It was determined that the average Performance IQ was higher than the average Verbal IQ for the population. This is common among lower socioeconomic status students (Hubble & Groff, 1980; Schram, Huntington, Valim, McCormick & Schonwald, 2006). One of the most common scenarios for this kind of underachievement is a situation in which a student's performance and verbal IQs vary significantly. Often high performance IQs will obscure the fact that the student has only average verbal abilities. It will be important for this residential school to offer students activities that tap into their strengths in spatial-visual ability. They will need to offer a balanced curriculum which does not focus solely on verbal skills.

#### *Discrepancies*

It was hypothesized that there would be small discrepancies between cognitive-achievement abilities for GE students, less than one standard deviation. For students with

specific learning disabilities, the discrepancy between cognitive-achievement ability were hypothesized to be significant; however, less than one or possibly two standard deviations as these students age. For students with EBD, it was hypothesized that discrepancies would be smaller as these students age.

A small sample of 50 students (representing 12% of the total population under study) had been administered the Woodcock Johnson-III Test of Achievement (Woodcock, McGraw, & Mather, 2001, 2004) Scores and Intelligence Scale for Children (WISC-III) (Wechsler, 1991; Wechsler & Matarazzo, 2004). This allowed for a calculation of discrepancies between ability and achievement in broad reading, broad math, and broad written language. Even though it was determined that 20 students had discrepancies in broad reading (40%), 13 had discrepancies in broad written language (26%), and 12 had discrepancies in broad math (24%), the sample population was too small within each educational classification to draw any conclusions or make comparisons.

When discrepancies are noted because a student's achievement does not match that student's scores on IQ tests, it becomes essential to explore the possible meanings of these discrepancies and to describe behaviors associated with the discrepancies. Reasons for discrepancies can be attributed to problems with the measure itself, but also could be attributed to students not working to their full potential and hiding their true abilities. Determining the reasons behind this behavior and offering the appropriate counseling can impact tremendously on an individual student's academic performance. Lastly, discrepancies could be due to a specific learning disability, which if identified early can



be addressed, and the student could be provided the appropriate accommodations and instructional strategies for academic success.

### *Passage Comprehension*

Wagner, Newman, Cameto and Levine (2006) conducted a national longitudinal study on the academic achievement and functional performance of youth with disabilities. Scores on the WJ-III passage comprehension subtest suggest that students with disabilities do not fare as well as their peers in the general population. In this study, for the general population, the distribution of test scores on the passage comprehension subtest was equally divided above and below the mean (i.e., 50% score above and 50% below). Students with disabilities experience the greatest difficulty with passage comprehension. When compared with the 50% of students in the general population who scored 100 or below, 83% of the students with disabilities scored 100 or below on the passage comprehension ( $p < .001$ ). On average, they received a score of 79 on this subtest. Passage comprehension also differed considerably across disability categories. Students with OHI received below average scores (86,  $p < .01$ ) on the passage comprehension subtest, as did students with EBD (84,  $p < .01$  and  $p < .05$ ). Students with SLD scored the lowest on the passage comprehension subtest (82;  $p < .001$ ).

As presented in this study, GE students performed above average in passage comprehension whereas students with disabilities scored at or below average. As presented in the longitudinal study by Wagner, Newman, Cameto and Levine (2006) students with OHI scored highest, followed by students with EBD. Students with SLD scored the lowest. Students who perform poorly in passage comprehension have less

developed linguistic and cognitive skills, in addition to an inability to notice and use textual information (Woodcock et al., 2001).

### *Unanswered Questions*

This study sought to characterize the academic abilities of students attending the facility's residential school and to determine which issues commonly associated with residential school impacted on the academic achievement of students. It targeted adolescents who attended the school between 2001 and 2008, many of whom had experienced academic failure, psychological disorders, substance abuse issues, and other issues upon entry. The main goal was to examine reading, mathematics, writing, fluency, and comprehension abilities using statistical methodology to describe the characteristics and behaviors of students and to determine which variables impact on academic ability. This study did not seek to identify instructional practices or institutional factors contributing to success, but sought to identify variables which students bring with them upon entry that impede their academics, and whether or not achievement can be obtained given a certain length of stay at a residential facility. There is significant literature; however, which could attribute student achievement to the school's small class sizes (Murphy & Rosenberg, 1998; Nye, Hedges & Konstantopoulos, 2000) and the fact that for the first time many of these students are attending school on a regular basis (Christenson, Sinclair, Lehr, & Godber, 2001; Pearson & Banerji, 1993).

During recent years, there has been a growing concern regarding problem behavior among adolescents, including violence, drugs and alcohol, and abuse or other dysfunctional behaviors experienced by children in foster and/or residential care. Young

people are experiencing stress not only in their personal life situations but carrying these issues over into the academic settings. Stressors such as these, particularly among adolescents who grow up without the essential conditions for healthy psychological development, can contribute to long-term, severe academic deficits. In our hectic and rapidly changing society, it would not be surprising if behavioral and emotional disturbances among our students are becoming more prevalent. Probably no other adult population has more ongoing contact with our nation's young people than schools. For residential schools this becomes, sometimes, a 24-hour opportunity to make a difference by not only recognizing the subtle signs of trouble among students, but changing these young peoples' lives forever. Teachers working with these young people can benefit from research that will better enable them to understand the complex factors in psychological disturbance and social maladjustment.

As various agencies continue to develop services to address the needs of adolescents in residential care, continued research investigating alterable risk, such as academic functioning, needs to play a more significant role in identifying effective and necessary interventions. In addition, the social, behavioral, and mental health risk of these populations and the significant academic deficits, will likely present considerable challenges to youth as they move through the system and eventually apply for employment and post-secondary education. To better address the needs of adolescents in residential care, it is critical to continue to address educational needs, specific areas of strengths and limitations, and the existence of subpopulations (i.e., students experiencing

comorbidity, students with incarcerated parents, etc.) within the system in order to develop the services that support and promote academic gains.

There are numerous public and private organizations across the U. S. that are presented with the challenge of providing residential education to economically and socially disadvantaged adolescents, and to adolescents with chronic psychological, behavioral, and educational difficulties. For decades, society has grappled unsuccessfully with how to transform the growing number of adolescents who are homeless, suffering from psychological issues, in foster care, and abused and neglected, into adults with meaning and purpose in their lives. Residential facilities can provide one solution.

Residential facilities that include secondary schools should remain an option within a comprehensive continuum of services for adolescents who are experiencing psychological, familial, behavioral and emotional problems. Regrettably, few programs for educationally disadvantaged adolescent youth have been evaluated rigorously. As a result, many questions about the effects of such programs remain unanswered and little practical information is available for practitioners. Additional studies on factors that influence academic achievement find that these adolescents experience problems in both residential or non-residential settings, are essential. To provide sound, practical suggestions for practitioners, experimental studies of the programs that exist must be carried out and evidence about successful program implementation strategies needs to be developed.

Given the current research, this investigation raises one main question: What institutional factors contributed to the academic gains many of these students experience

over time? Does the residential program under study offer enough to make a difference in the lives of out-of-school youth? The research reviewed here suggests that there are more factors impacting on the academic achievement of these young people than behavioral, familial, and emotional issues.

#### Assumptions of the Study

This investigation makes the following assumptions:

1. The data used in this study could be trusted and enabled the researcher to answer the studies research questions.
2. The agencies collecting the data were reliable and used appropriate methodology.
3. All of the data sets were available either within the school's database or within student records.
4. The individuals who entered the data into the database did so correctly and accurately.
5. Outside organizations and agencies provided reliable information at the time of enrollment into the secondary educational school.
6. The individual trained to collect data for the researcher followed the correct and accurate process, as instructed.
7. Logistical Regression models assume that :
  - a. The relationship between the predictor and the outcome variables are nonlinear (Wright, 1997).

- b. The outcome variable can be given a value of 1 for those students who achieve at or above grade level, and a value of 0 for those who achieve below or low average levels.
- c. The categories in the outcome variables are statistically independent and mutually exclusive (Wright, 1997).

#### Limitations of the Study

The following limitations underlie the study:

1. Student participants were limited to those students attending school from the 2001-2002 school-year to the 2007-2008 school-year.
2. Students currently attending the school were not included in the study.
3. Students with missing data sets were included in the study.
4. Data were collected and processed by people other than the researcher.
5. The number of variables used in the analysis were numerous, but essential to evaluating the academic and behavioral characteristics which impact on academic achievement.

#### Accuracy of Data and Missing Data

The school data for this research were retrieved from a database and from student files by the researcher and a trained staff member of the school. The accuracy of the data is dependent on the data collection process and the availability of data sets, which the researcher had little to no control over. This data was used to develop a data set of variables described above. Every effort was made to cross-reference the data to eliminate the problems of missing data.

### Validity of the Study

The generalizability of this study is limited because the sample is not randomized and will only be representative of one residential school located in an urban setting, in which students grades 6<sup>th</sup> through 12<sup>th</sup> attend.

### Ethical Considerations

This study underwent review by a full Institutional Review Board, even though no identifiable data were collected on an individual level. The study was not exempt from the review board process because information will be collected on individuals which is relevant to substance abuse issues and psychological evaluations. The secondary data that was used did not have identifiable information, but collected according to student identification numbers. Once the data set had been developed only the researcher, the researcher's advisor and a paid staff member from the school had access to data for purpose of analysis.

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## CURRICULUM VITAE

Courtney Gaskins lives and works in Prince William County, Virginia. She has been in education for more than twenty years, and has worked as a special education teacher for eight years. She has been working with at-risk children, youth, and families for most of her professional career. She is currently teaching at a residential school in Virginia.