

THE RELATIONSHIP BETWEEN STUDENT LITERACY AND STUDENT  
DISCIPLINE: AN ANALYSIS OF STUDENT DATA IN THE  
GWINNETT PUBLIC SCHOOL SYSTEM

by

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A DISSERTATION

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## ABSTRACT

The first purpose of this study was to identify the number of paneled (suspended or removed from school for disciplinary reasons) high school students who read at least 3 years below expected grade level. The second purpose was to examine the relationship between selected variables and literacy.

The study population consisted of all of the paneled students in the 11th and 12th grades during the 2007-2008 school year in three high schools in Gwinnett County, Georgia. The schools from which the sample was drawn are Parkview High School, Berkmar High School, and Duluth High School.

This study identified the number of paneled (suspended or removed from school for disciplinary reasons) high school students who read at least 3 years below expected grade level. The purpose was to identify and describe relationships between selected variables (socioeconomic status, race, discipline referrals, special education) and literacy. These variables were selected because the review of the research indicated that these concepts were of interest, and they may be important for purposes of accountability.

The results indicated that over the course of a student's high school career there is a significant negative correlation between reading level and the number of discipline referrals. On average, the students who had more discipline referrals had lower Georgia High School Graduation Test English/Reading test scores than those students who had fewer discipline referrals.

## DEDICATION

This dissertation is dedicated to John Russo. John Russo, a WWII Veteran, showed up one day at Parkview High School about a community issue. I was the administrator who helped him, and during our conversation he asked me why I did not have my doctorate. My excuse was not sufficient for him and he proceeded to lecture me in some colorful language about the hardships he and his fellow soldiers went through to allow me to waste educational and professional opportunities. The next day I started the process of pursuing my doctorate.

## LIST OF ABBREVIATIONS AND SYMBOLS

|                 |   |
|-----------------|---|
| <i>A</i>        | Chronbach's index of internal consistency   |
| <i>Df</i>       | Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data                             |
| <u><i>F</i></u> | Fisher's <i>F</i> ratio: A ratio of two variances   |
| <u><i>M</i></u> | Mean: the sum of a set of numbers divided by the number of numbers in the set   |
| <u><i>P</i></u> | Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value |
| <u><i>R</i></u> | Pearson product-moment correlation  |
| <u><i>T</i></u> | Computed value of <i>t</i> test   |
| <               | Less than   |
| =               | Equal to  |

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## CHAPTER I

### INTRODUCTION

The ability to accumulate and store data has brought below-grade-level literacy scores to the forefront of the major problems facing American education today (Barr & Parrett, 2007). A substantial amount of research shows that students who have literacy problems early in their academic career fall behind and never fully recover (Ferguson & Lynskey, 1997; Juel, 1988; Sugai, & Sadler, 2009). In fact as early as first grade for some students, an achievement gap exists in letter-sound relationships and letter recognition (West, Denton, & Reaney, 2000). Yet, due to mandatory attendance laws, these students are required to stay in school, even though many of them have given up and become discipline problems (Ferguson & Lynskey, 1997). Frequently this disinterested student drops out of school or is suspended or expelled because of chronic disciplinary infractions. In other words, early deficiency in literacy development may well affect students into adulthood (Velluntino & Scanlon, 2002).

Several predictors of reading difficulties, such as economic status, race/ethnicity, and language status, have been identified (Snow, Burns, & Griffin, 1998). Children who come from a home with more educated parents tend to do better on average than those who do not. According to Letgers (2002), the same can be said for economic levels. A family's economic situation is more of a predictor of school achievement than is race or language. Individual factors are not the only ones contributing to poor literacy levels. School climate with regard to retention, tracking,

and expectations of student progress also contribute to literacy differences (Land & Legters, 2002).

Several theories are used to explain the correlation between reading failure and juvenile delinquency, but school failure theory is referenced most often (Keilitz & Dunivant, 1986; Lane, Menzies, Munton, Von Duering, & English, 2005). Well before 1971, researchers suggested that reading failure in school directly played a major role in chronic misbehavior among students (Miller & Windhauser, 1971). School failure theory was first proposed in the mid 1950s by Cohen (1955) in his research on delinquent boys participating in criminal street gang activity. Cohen's work was reinforced shortly thereafter by Reiss and Rhodes in research on juvenile delinquency within the social class structure (Reiss & Rhodes, 1960). The main tenet of school failure theory is the relationship between academic failure and juvenile delinquency. Data exist from numerous researchers that substantiate the hypothesis of the school failure theory. For example, Murray observed that students with learning disabilities in the late 1960s have made up a disproportionately large percentage of juvenile delinquents (Murray, 1976). Recently, delinquency theorists supported a link between reading/academic failure and the juvenile delinquent subgroup (Barr & Parrett, 2007). These experts explained the natural link between reading deficiency and chronic misbehavior as when students fall behind in their reading level, they become embarrassed or disinterested in school and may become a discipline problem. Many claim the link between the two factors makes sense and can be easily identified in the majority of the schools in America (Horner, Sugai, Todd, & Lewis-Palmer, 2005).

According to Stroup and Robins (1972), chronic misbehavior or juvenile delinquency can be directly linked to educational failure within a system that either does not understand the problem or elects to do nothing about it. School failure theory can be characterized as learning

disabilities/difficulties that create academic failure, which results in chronic misbehavior/juvenile delinquency (Beebe & Mueller, 1993). Many times students fall into a common pattern of academic frustration. The following is a typical scenario. A student fails several classes over a period of years and is tested for special education. The student is found to have a learning disability and is placed in special education courses that take him or her out of the regular academic track. The student begins to feel the negative interpretations associated with being in special education or intervention courses. The student accepts these connotations and becomes disinterested in school, becomes a disciplinary problem, and eventually drops out (Alexander, Entwisle, & Horsey, 1997).

According to Rumberger (1983), children with learning disabilities often gravitate toward peer groups that display chronic poor or delinquent behavior. They may do this in search of recognition, acceptance, achievement, or defiance. They do not enjoy the academic successes of other students so they become disinterested and turn towards other ways of making a name for themselves. According to the theory, dropping out of school is the culmination of this sequence.

According to Rumberger (1983), school failure theory comes from assessments of basic academic skills, school records, and clinical observation. Longitudinal studies (National Assessment of Educational Progress, 2005) consistently link learning disabilities to chronic misbehavior and then to the high school dropout problem. This phenomenon can be found at most traditional schools in the United States. Studies have also been conducted comparing adolescents with learning disabilities and those without. Students with learning disabilities have a considerably higher dropout rate and discipline record than those without learning disabilities (Perry, Steele, & Hilliard, 2003).

The main criticism of the school failure theory is that it assumes a simple solution for a complex problem, which is seldom reality. Those who disagree with school failure theory argue that (1) the school setting is the only place chronic misbehavior takes place, (2) poor reading and/or academic performance is only a part of why a student becomes a chronic behavior problem, and (3) illiteracy/learning disabilities are seen as only a part of the process that leads to academic/school failure (Beebe & Mueller, 1993).

### Study Purpose

While researching information about literacy and reading programs in the county, I was able to talk to several educators who were familiar with the topic. The prevailing belief among Gwinnett County Public School teachers and reading specialists is that there is a correlation between low level readers and behavior issues. Many stated that their students seemed to be frustrated about being behind and acted out as a result. Others said they feel many of their students became behavior problems to gain attention because they were not getting any positive recognition from academics or athletics. With this in mind, the purpose of this study is to examine whether relationships exist between the number of discipline referrals received by students and their reading achievement scores.

### Study Importance

The results of the study have the potential to assist school leaders to address issues that may be perpetuating student dropouts. I hope that administrators will be able to pinpoint the grade levels where a trend begins to develop and then to create specific interventions that will remediate the problem.

Identifying potential links between poor literacy and chronic misbehavior in Gwinnett County Public Schools has implications for the broader society. In the early 1970s, Miller and Windhauser (1971) found that academic failure had a direct correlation with delinquent actions by school age children. Miller and Windhauser identified reading deficiency as the academic area that had the highest percentage of juvenile delinquent students in the early 1970s. Brier (1989) did extensive research in the mid 1970s and early 1980s that indicated a similar trend of discipline problems related to academic failure. Brier's academic failure findings also reinforced the concept that adjudicated youth had a highly disproportionate academic failure rate that specifically pointed to reading disabilities as the biggest problem. Brier's academic failure studies are examples of the link between youth literacy deficiencies and juvenile delinquency. Identifying a link between academic failure and discipline problems in Gwinnett County Public Schools would allow the school system the opportunity to implement programs to curb this trend. This would not only benefit individual students by providing them more opportunities with better literacy, but it would also ultimately help lower juvenile delinquency within the community.

#### Definition of Terms

*Academic Knowledge and Skills (AKS)*: The Academic Knowledge and Skills initiative is Gwinnett County Public Schools curriculum guide and benchmark system.

*Criterion Referenced Competency Test (CRCT)*: The Criterion Referenced Competency Test is a test given every year starting in the first grade and ending in the eighth. This test measures reading, math, language arts, science and social studies.



*Discipline:* Training that corrects, molds, or perfects the mental faculties or moral character. A rule or system of rules governing conduct or activity.

*Dropout rate:* The percentage of students who drop out and quit school.

*Ethnicity:* Relating to large groups of people classed according to common racial, national, tribal, religious, linguistic, or cultural origin or background.

*Georgia High School Graduation Test (GHS GT):* Georgia High School Graduation Test, all high school students in the state of Georgia must take and pass the GHS GT in order to graduate.

*Individual Education Plan (IEP):* Individual Education Plan.

*Literacy level:* The level in which a person is able to read and write.

*Panel:* A discipline tribunal in the Gwinnett County Public School system.

*Poverty:* The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps; United States Census Bureau, 2007; see Appendix A).

*Pre-K:* Gwinnett County Public School's pre-kindergarten state and county funded preschool.

*Reading Recovery:* A reading program Gwinnett County Public Schools use to support low level readers in elementary school.

*Socioeconomic status* (SES): A person's status relating to, or involving a combination of social and economic factors.

### Research Questions

1. How many paneled high school students at the three high schools in Gwinnett County, Georgia read at least 3 years below expected grade level?

2. For paneled students who are at least 3 years below reading level on the high school graduation examination, is there a relationship between reading level and the number of discipline referrals over the course of his/her high school career?

3. Will paneled students who are at least 3 years below reading level on the high school graduation examination differ in their number of discipline referrals when compared by socioeconomic status, race, and participation in special education programming?

### Null Hypotheses

This study will seek to address the following: Does chronic discipline play a role in students falling behind expected reading level? The corresponding null hypotheses to this research question are as follows:

Ho1: For paneled students who are at least 3 years below reading level on the high school graduation examination, there will be no relationship between reading level and the number of discipline referrals occurring in high school.

Ho2: Paneled students who are at least 3 years below reading grade level on the high school graduation examination will not differ in their number of discipline referrals when compared by socioeconomic status, race and participation in special education programming.

## Assumptions

Several assumptions were made regarding the research study. These assumptions included the following:

1. The standardized test score data were an accurate measure of literacy.
2. Access to free and reduced lunch data represented an accurate measure of poverty status.
3. Each student received the same free and appropriate education in the Gwinnett County Public School system.
4. Reading curriculum was standardized across the district.

## Limitations

There were limitations beyond the control of the researcher that affected the study. Some of the limitations included the following:

1. Students had experienced different educational experiences and personal backgrounds which, along with low literacy, may have negatively affected their behavior/performance.
2. The study sample limited the findings to the schools or school district where the study was conducted.

## CHAPTER II

### LITERATURE REVIEW

#### Introduction

The purpose of this chapter is to present a review of the research on illiteracy and chronic misbehavior. The chapter is organized from general theories, current research, and specific programs the Gwinnett County Public School district has in place. The related theories section provides the theoretical background for the issue. Current research presents an overview of the studies and research that have been documented in the last 20 years. The final section gives a detailed look at reading intervention programs currently in use in Gwinnett County Public Schools.

#### Related Theories

##### *Differential Treatment Theory*

The differential treatment theory is not as complicated or as in-depth as the school failure theory. This theory states that given equal treatment, students without adolescent illiteracy participate in the same amount of chronic misbehavior as those that do have those problems (Larson, 1988). The difference is that the school administrators, teachers, police officers, social workers, and other justice personnel treat those students with learning disabilities differently. This is the reason why there are a greater number of adolescents with reading difficulties who drop out of school and are incarcerated. Morris and Mather (2007) revealed that adolescents with reading problems were adjudicated twice as often as those without those problems. Both groups

reported similar delinquent behaviors, though the definition of delinquent behavior did not have definite guidelines (Morris & Mather, 2007).

Rutter (1986) stated that the two substantiated explanations for the differential treatment theory described a theory that could be misinterpreted. Experts stated the reason the differential treatment theory exists is because of the social skill inadequacies of students with learning disabilities (Wehrlage & Rutter, 1986). When approached by justice personnel, students who have learning disabilities do not act appropriately and they find themselves in trouble because of their failure to comply or communicate. These adolescents also tend to evade contact with justice personnel because they do not understand the justice system that governs them. When they elude justice personnel, they are treated much more stringently when facing consequences. An adolescent who cannot read or is not on grade level does often not have the same background knowledge and social skills to make him/her successful when dealing with judicial situations. The lack of social skills significantly increases the chance of differential treatment (Luiselli, Putnam, Handler, & Feinberg, 2005).

### *Susceptibility Theory*

Another theory that is used to explain the correlation between reading difficulties and chronic misbehavior is the susceptibility theory. The basis of this theory is that different types of learning disabilities are associated with different personality characteristics (Broder, Dunivant, Smith, & Sutton, 1981). Examples of these characteristics are lack of emotional maturity, impulsivity, failure to understand consequences for decisions and actions, difficulty responding properly to social cues, and not responding to interventions and redirection. These characteristics

perpetuate the inability to adapt to social situations and therefore elevate the likelihood of this group participating in delinquent behaviors (Wadsworth, 1979).

Jule (1988) conducted a longitudinal study stating that the susceptibility theory was not proven invalid in that certain personality traits manipulate the adolescents with learning disability into misbehavior. This study contradicted the school failure theory. Poor judgment was the main variable in the study. The adolescents felt this was the most difficult skill in reasoning to overcome. The understanding of social clues, which lead to the poor judgment in situations dealing with authority figures, was the major variable in the susceptibility theory (Rumberger, 1987). Impulsivity is frequently exhibited by those with poor social skills; this is consistent with the behavior of most juvenile delinquents who have learning disabilities (Fleming, Harachi, Cortes, Abott, & Catalano, 2004).

Beebe and Mueller (1993), who are critics of the susceptibility theory, offer two criticisms. First is that learning disabilities are only one of the many variables to enhance chronic misbehavior among adolescents, and second, personality grouping based on negative qualities in adolescent behavior only occurs in a small part of the juvenile delinquent sample.

### Sociological Theories

The theories described above are not the only explanations for the relationship between reading disabilities and chronic misbehavior among adolescents. There are five other sociological theories that support this link and need to be examined (Wadsworth, 1979). Interactional theory, social control theory, differential association theory, social strain theory, and social learning theory are sociological theories that explain the beginning and middle stages

of delinquent behavior. These sociological theories suggest that chronic misbehavior is influenced by social factors. Each is described below.

### *Interactional Theory*

This theory categorizes chronic misbehavior as a part in the whole developmental process a child undergoes (Thornberry, 1987). This theory proposed that children interact with different social factors over a long period of time, which shapes their behavior patterns. This interactive process shapes the behavior regardless of whether it is good or bad behavior.

The interactional theory process starts at a young age when the association or acceptance of conventional society is questioned. The division widens during the onset of puberty when commitment to school decreases and adolescents distance themselves from their parents. This timeframe is one window of opportunity for chronic misbehavior to flourish (Thornberry, 1987). When children in this situation begin associating with other adolescents with similar attitudes chronic misbehavior is reinforced through the social setting.

### *Social Control Theory*

Some experts have concluded that delinquency has been present in every society since the beginning of time. Delinquency is a natural occurrence in human nature and does not need special conditions for it to surface (Rutter, 1984). Delinquency occurs when the societal limitations in preventing deviant impulses are weakened (Empey & Stafford, 1991). Social control theory states that juveniles do not internalize normal civilized conduct and have no conscious of deviating from the social norm. Grande (1988) suggested that juvenile delinquents

also stay away from institutions or groups that uphold or believe in the conventional norms of conduct in society.

### *Differential Association Theory*

According to Thornberry (1987), differential association theory is that no human has a natural instinct or impulse toward chronic misbehavior. Delinquency is modeled and reinforced through the same ways as socially accepted behavior. At a young age, most children either learn acceptable or unacceptable behavior and the outcomes of both. According to behavioral theorists, the consequences they receive for their behavior determines to what extent they continue the behavior (Dunham & Albert, 1987). The basic tenet of differential association theory is that delinquency is a learned social behavior.

### *Social Strain Theory*

The basis of the social strain theory is that there is a negative correlation between social status and chronic misbehavior. Typically, being in a lower social class or status for a teenager creates tension and anxiety, which increases the tendency toward misbehavior or delinquency (Farmer & Payne, 1992). Most adolescents have certain social goals and aspirations and they try to achieve these through legitimate, normal ways. Delinquency results when these adolescents fail to achieve the desired social status and feel there is no other way to attain an acceptable level of social status than by misbehaving (Dryfoos, 1990). If a teenager is continually rejected by the desired social group, a feeling of despair and lost hope abounds. Social strain theory states that many teenagers respond to these feelings by turning to misbehavior to get the attention they are trying to attain (Empey & Stafford, 1991).



### *Social Learning Theory*

According to Ivey (1999), the basis of the social learning theory is that learned social behaviors can be positive or negative or are on a continuum between the two extremes. Children learn social behaviors and are not genetically predisposed to them. There is no evidence that there are natural impulses toward delinquent behaviors in adolescent age children (Ivey, 1999). The assumption is that positive and negative behaviors are socially built. The social learning process is geared toward exposing adolescents to punishments and rewards, role models, and positive or negative experiences (Walker & Sylwester, 1991). Therefore, delinquent activity is learned through the same process as socially acceptable activity (Thornberry, 1987).

These theories lay the conceptual framework for the study to be conducted. They help explain some of the reasons why children may have reading problems that result in discipline problems. The data gathered from this study may provide empirical data to support one or more of these theories.

### Current Research

Illiteracy in misbehaving children has been present in all societies and dates back to the beginning of formal education. Thirty-nine years ago Mulligan (1969) conducted several studies that concluded that illiteracy is overwhelmingly present in juvenile delinquents. Mulligan noticed a disproportionately large number of illiterate children were involved with delinquent activities such as classroom misbehavior, skipping school, and running away from home. He hypothesized that due to their lack of literacy skills, many of these children became increasingly frustrated with school and this frustration created more of the same problems. Mulligan hypothesized that the

majority of these illiterate, delinquent children got more attention and recognition from misbehaving, which rewarded them for not trying to succeed in school.

The correlation between illiteracy and juvenile delinquency dates back more than 40 years ago. This correlation is documented in Miller and Windhauser's (1971) work. They recorded that an abnormally large percentage of children with reading difficulties were being disciplined for delinquent tendencies such as running away, school and classroom disturbance, and truancy. Miller and Windhauser concluded that only 30% of the referred students were reading within two grade levels of their actual grade level, while 70% were reading well below their grade placement. Their study showed these at-risk students became increasingly disinterested with school as they fell further behind their peers. This may have resulted in a large percentage of this group gravitating towards acting out and embracing the notoriety of being labeled a "bad kid." As a result, Miller and Windhauser suggested these children earned more recognition from misbehaving not only in the classroom, but also in society.

Grande (1988) conducted studies throughout the 1980s and identified comparable characteristics between students considered delinquent and students with reading problems. Poor school adjustment was an identifiable characteristic common among students with reading disabilities. These students who demonstrated poor school adjustment were anxious and insecure about school because of their previous educational failures. This situation perpetuated the need to gain personal satisfaction through delinquent behavior. Grande also cited low self-esteem issues as an identifiable characteristic of students with poor reading skills. Grande interviewed students who inherently began school with a positive self-esteem; gradually over time their self-esteem would decline if they were experiencing consistent reading difficulties. Another correlation Grande identified was between juvenile delinquents and students with reading disabilities, they

found low frustration tolerance. Students with reading problems would grow increasingly frustrated the farther they fell behind their peers in school. This, in turn, would cause friction and problems between the at-risk students and their teachers. Many teachers, unaware of the root problem with these types of students, would automatically label them as unruly and disrespectful. As a result, many of these children eventually gave up and were a continued discipline problem and, in many cases, dropped out of school.

A longitudinal study by Larsen (1988) detailed the notable correlations between behavioral and reading difficulties in children. The study concluded that consistent reading difficulties in school would ultimately have a determining effect on the student's future job opportunities. Additionally, the adolescent discipline problems usually associated with at-risk students often became social and criminal problems as students became adults. The conclusion of the study emphasized the need to identify at-risk readers early and to give them the interventions they need in order to help them stay on grade level. When this fails to happen many of these students will be poor students and eventually maladjusted adults.

Natriello (1996) stated that schools must create environments in which youth can experience some kind of success in reading, find institutional participation rewarding, and develop aspirations to continue their schooling. In the past, educators would legitimize the illiteracy problem by shifting the focus off of the school and placing blame on social factors. Schools can do very little about a student's socioeconomic status or innate ability, but the factor of illiteracy may be modified to change the school experience of marginal students (Johnson, 1999). A democratic society is obligated to educate children from all social conditions and family backgrounds. Certain children bring more external issues to school than others, sometimes resulting in schools having to reach beyond the normal schooling process to teach

these students. The federal government has made laws that mandate public schools to educate handicapped children; therefore, schools should modify their approach to reach the at-risk student (Barr & Parrett, 2007).

Recent results from the National Assessment of Educational Progress (NAEP, 2004, 2005) reading exam, shows that 45% of the U.S. school population is made up of below level readers. Hall (2006) said that reading difficulties at an early age, if not corrected, will tend to worsen well into adolescent years and beyond. Hall's research indicated that students who have reading difficulties at a young age, may fall into a cycle in which they do not feel they can be successful academically, so they lose motivation with school. A student who takes this path is more likely to become a child who is disinterested in school, and is eventually a behavior problem (Lane, Wehby, Menzies, Gregg, Doukas, & Munton, 2002).

One variable that plays a role in the link between illiteracy and behavior problems is socioeconomic status. Johnson (1999) concluded that economic status is one of the best predictors of juveniles ending up incarcerated. He claims that those students living in poverty have less supervised structured time, attend schools with fewer resources, and in many cases live in more violent surroundings. Often when a family's main concern is just being able to survive, their focus is not on teaching their children to read (Snow, Burns, & Griffin, 1998). Parents who grew up in poverty and are deficient in the ability to read, will not be able to adequately reinforce reading to their children, especially when they are unable to accomplish the task themselves. Johnson explains that this cycle usually continues from one generation to the next unless the public school intervenes and ensures that these at-risk kids of poverty stay on grade level.

Lane (1980) expands on this theory and links students from low socioeconomic backgrounds with lower IQ scores. He noted that poor students lack the experience, vocabulary,

knowledge, and parental support to attain average or high IQ scores. Students from low socioeconomic backgrounds are more likely to be profiled as poor readers early in school, which often puts them into an educational track that results in low achievement (Dunham & Albert, 1987). If a poor child does not attend a school where high standards and intervention support are prevalent, then his or her chance of succeeding in school is much lower than those students who have such benefits (Lane, 1980).

According to Baugh (1998), the correlation between being poor and illiterate is overwhelmingly more prevalent in the Black community. Baugh's findings outline the African American struggle from slavery through the civil rights era, and the shortcomings in education that this segment of the population endured. Johnson (1999) stated that many poor African Americans have had to deal with the social injustice of educators being openly hostile to the prospect of academic advancement by minorities. In an attempt to meet integration objectives, many Blacks were bussed into predominantly White schools and were categorized as being linguistically handicapped (Baugh, 1998). This practice further exacerbated the illiteracy problem among poor African Americans. Grande (1988) concluded that there is a definite link between the failure of the educational system and the high percentage of African Americans in prison.

Many poor adult African Americans lack the basic reading skills to be able to teach their own kids how to read. Greene (1999) concluded in his research that one of the major literacy success predictors is parents who read to their children. Children benefit the most from reading aloud when they identify letters and words, talk about the meaning of words, and discuss the stories (Fleming et al., 2004).

Dorn (1993) stated that illiteracy is one of, the most prominent indicators of students who drop out of high school. Dorn contended that no other indicator has such a high correlation to dropping out than illiteracy. He concluded that dropping out of high school is just the beginning of the problem for illiterate teenagers. Dorn observed that for the past 20 years obtaining a well-paying job without a high school diploma has been extremely difficult; and, it is even more difficult for someone who cannot read.

Following their longitudinal, multilevel analysis, Goldschmidt and Wang (1999) argued that illiteracy was one of the major determining factors in teenagers dropping out of school. One survey showed that 90% of 17-year-old African American male dropouts were below the expected reading level and, of this group, 78% dropped out in the ninth grade. Overall, in all ethnic and socioeconomic categories, those students who were held back in school at least once were 45% more likely to drop out, and students who were held back two grades were 90% more likely to dropout. Perry et al.'s (2003) research conducted on middle school dropouts showed that grade retention and illiteracy were the most powerful predictors of dropouts.

Often, delinquent teenagers who drop out of high school do not have the skills or the motivation to enter the legitimate job market (Perry et al., 2003). Since they already have a propensity toward misbehavior, many dropouts get in trouble with the law and are incarcerated (Weishew & Peng, 1993). Throughout the nation, curbing illiteracy within our correctional facilities has been a top priority. Quality reading programs in correctional facilities have been shown to reduce the rate of recidivism (Center on Crime, Communities, and Culture, 1997). As educational levels and literacy rates increase among incarcerated youth, recidivism decreases. Because our society values reading ability, federal money has funded quality literacy programs

within our correctional facilities that have shown to improve the chances of success for juvenile offenders (Malmgren & Leone, 2000).

Other research has also indicated that students with severe discipline behavior experienced tremendous academic deficits compared to peers with normal discipline records (Nelson, Benner, Lane, & Smith, 2004). It was identified that in most areas these deficits remained constant over time; however, in the area of mathematics and science, the deficits actually widen over time. This research identified students with discipline problems having an even harder time in subjects that require sequential learning.

According to Sugai and Sadler (2009), individual student academic failure in high school was correlated with three or more suspensions in the ninth grade. In the same study, they found correlations between low grade point averages and specific types of egregious behavior such as fighting, threats of violence, harassment, and psychological torment. Sugai and Sadler studied the in-school suspension program of four middle schools and concluded that students who had no previous major discipline problems had higher GPAs than those students who did. Morris and Mather (2007) conducted a similar, but larger, research project of a school district in Oregon that included six middle schools and four high schools. Students who performed better academically had fewer discipline interventions. These interventions included being sent to the assistant principal's office, receiving detentions, receiving in-school suspension, and receiving out-of-school suspension. Overall, students who had fewer discipline problems did better in school. Sugai and Sadler concluded that poor discipline had a direct correlation with grades.

Luiselli et al. (2005) completed a 3-year study in an inner-city urban school district, finding that reductions in suspensions led to corresponding increases in mathematics test scores. Although reading scores did not increase from the baseline data, incremental increases were

recorded from year 1 to year 3. The third year of the study produced dramatic results. Reading comprehension and mathematics percentile ranks on standardized tests improved 18 to 25 percentage points, respectively. These gains were made by students who had not dropped out of school or given up on school completely and were just attending school for the wrong reasons. Though reductions in suspensions helped many students, the number of discipline infractions went up. School officials felt by reducing suspension interventions many kids did not fear the replacement interventions as much resulting in more discipline infractions. Luiselli et al. (2005) stated that the school system did not anticipate the unexpected rise in discipline referrals but were very pleased with the academic gains due to the changes in discipline intervention.

Horner et al. (2005) proposed similar findings with another school district with 19 schools. Between 2001-2002 and 2004-2005 academic school years, 13 of the schools implemented an intense school-wide discipline review. These schools made a contentious effort to target students who had the potential to succeed academically but were failing due to behavior problems. These researchers compared the percentage of 7th graders who met statewide reading standards in the academic year 2001-2002 with the percentage in the academic year 2004-2005. Out of the 13 schools that improved the discipline climate, 10 had improved outcomes. There was only 1 school in the study that had improved scores that did not participate in the discipline initiative.

According to Tobin and Sugai (2006), problem behavior does not solely lead to poor literacy, and poor literacy alone does not lead to problem behavior. Studies in support of the whole school positive behavior support program have shown that students with discipline problems are more likely to have academic shortcomings that perpetuate an ongoing drain on the educational system (Luiselli et al., 2005). These same studies have shown considerable gains in



variable that support or improve academic performance such as academic engagement, classroom instructional time, time in school due to reduced out-of-school suspensions, and student attendance (Sugai & Sadler, 2009). According to Sugai, Lewis-Palmer, Todd, and Horner (2001), problem behavior and academics are linked and affect each other, and if proper instruction is established, then improving the discipline climate of the school will greatly enhance and improve the instruction.

Recall that Lane et al. (2002) found that poor literacy scores are statistical indicators of later problem behavior. They found that 4th grade students with severe chronic discipline behavior were likely to have significantly lower literacy skills than their peers. To counter this trend, a behaviorally competent school should have the following conditions: (a) a reduction in out-of-school and in-school suspensions that would allow more minutes spent in academic instruction, (b) curriculum variables and classroom management would be adapted so academic assignments are less restricting, (c) less peer reinforcement for academic failure, (d) minutes spent in academic endeavors would be more effective, and (e) an increase in support for positive academic behavior. These corrective initiatives would allow a school to counteract the negative trend between discipline problems and poor academic performance (Lane et al., 2002).

Nelson et al. (2004) acknowledge that behavior and academic supports must be intertwined. The link between effective academic instruction and quality discipline management is paramount to improving and enhancing academic skills and achievement. Students will not learn from just social skills alone and cannot learn to read or write in a classroom that is behaviorally out of control. Students have to have effective behavior support interventions as well as effective instruction in order to succeed (Brophy, 2008).

According to Sloat, Beswick, and Douglas (2007), children who do not learn to read in the primary grades will never learn to read well and have a greater propensity to become a discipline problem. Children who complete the third grade with low literacy skills usually require extra support, trail behind their peers in curriculum knowledge and literacy gains, and have less access to extra support and ordinary curriculum. Sloat et al. also feel the negative consequences of poor literacy skills are low motivation, academic underachievement, poor self-esteem and behavioral problems. These researchers also conclude that these negative ramifications will eventually lead to reduced economic and occupational status for these at risk students.

Underachievement in at-risk students is a multi-faceted problem. Shortcomings at home, within the school and curriculum, and within the social culture itself all contribute in different degrees to academic failure (Carter 2005). At-risk students often have fewer positive role models to follow. They have less support at home for assistance and encouragement. This support begins with early reading and continues with parental emphasis on education and reading. Students from low-income homes or with less educated parents are much less likely to have this support and, as a result, become low achievers (College Board, 1999). They also have more stress at home that subsequently affects academic performance. Gang activity, violence, and other distractions are prevalent in low-income communities.

Carter (2005) also addresses failures in the educational system itself. Because of reading difficulties, the students have difficulty staying on grade-level and attaining entry into higher-level classes. Teacher attitudes include stereotyping groups of students as low achievers. The curriculum is then one-dimensional and boring. Students are not held to high standards, and, as a result, the class fails to hold their interest. The prophecy becomes self-fulfilling. For low-

achieving students, the focus becomes keeping them eligible for either sports or graduation. Teachers are satisfied if the students sit quietly and obediently in their classrooms, earning Cs (Carter 2005).

Finally, the social culture within schools further discourages academic success in at-risk students. Students label academic enthusiasm as “brown nosing.” There is an overriding idea that it is not “cool” to be smart. At-risk students go home to neighborhoods where being a thug is viewed much more positively than succeeding in school. When low-achieving students are surrounded by a peer group that does not respect academic achievement, they miss opportunities for advancement (Carter 2005).

#### Reading Interventions in Gwinnett County

Educators in the Gwinnett County Public Schools believe that being able to read at an early age is one cornerstone for academic success (Gwinnett County Public Schools, 2008). The GCPS Pre-K program emphasizes the importance of introducing students to the alphabet and teaching them how to identify common words and phrases. In kindergarten, the academic knowledge and skills requirements emphasize word development. In the first grade the foundation that was established in Pre-K and kindergarten is built upon by actually teaching phonics and grammar (Gwinnett County Public Schools, 2008). A major factor in whether or not a child gets promoted to the second grade is based on his/her reading ability at the end of the first grade. This is when the GCPS student is first exposed to standardized testing. Students take the Criterion-Referenced Competency Test (CRCT) to determine the correct reading level. These scores, along with the teacher’s recommendation, determine the students’ reading placement.

Students who have below average scores are usually recommended for the Reading Recovery program (Gwinnett County Public Schools, 2008).

The Reading Recovery program (Gwinnett County Public Schools, 2008) is a fully funded department within Gwinnett County Public Schools that assists elementary schools with their struggling readers. In the early 1990s, GCPS adopted a policy to implement a reading intervention program to ensure all kids had the proper reading skills to do well academically (Gwinnett County Public Schools, 2008).

The Reading Recovery program has a director who oversees 10 certified reading specialists. These teachers travel to the schools and meet with struggling elementary school age children to try to get them back on grade level. Students attend regular reading classes during the day, but are pulled out of either recess or an elective to get extra help from a reading specialist. Students work with a reading specialist until they are back on grade level or move on to middle school (Gwinnett County Public Schools, 2008).

After elementary school, students who have not benefited from the Reading Recovery program are most likely tested for possible learning disorders in the realm of special education. Students with major reading difficulties entering middle school will be given reading support through special education or specific reading intervention classes (Gwinnett County Public Schools, 2008).

Students who do not qualify for special education and are behind three or more reading grade levels are placed in a separate additional reading intervention class (Gwinnett County Public Schools, 2008). The philosophy of Gwinnett County Public Schools is that these children will be brought up to their current grade reading level with the help of the reading intervention class that is taken in addition to their normal grade level classes. Students are moved out of the

reading intervention classes by achieving adequate test scores that show them reading on their proper grade level (Gwinnett County Public Schools, 2008).

Gwinnett County Public Schools special education programs test students on a regular basis and track their progress through individual education plans (IEP). These students are usually grouped with other special education students reading below grade level. Special education classes usually have a low student to teacher ratio, enabling the teacher to give more individual attention to those students who need extra reading support. These two programs combined provide adequate service for each middle and high school in identifying below level readers (Gwinnett County Public Schools, 2008).

### Discipline in Gwinnett County Public Schools

The Gwinnett County Public School system takes an active role in managing student discipline (Gwinnett County Public Schools, 2008). The local schools within GCPS have the freedom to determine interventions and consequences within policies and guidelines set forth by the school district (Gwinnett County Public Schools, 2009). A comprehensive discipline code outlining the different offenses and levels of consequences gives local school administrators their framework in which to administer discipline (Gwinnett County Public Schools, 2009).

The GCPS discipline code is divided into categories such as disruption of school, damage to school property, threat or assault on a student or employee, weapons, drugs/alcohol/tobacco, indecency, disregard of directions, unexcused absences, conduct that is subversive to good order, and chronic misbehavior (Gwinnett County Public Schools, 2009). Discipline consequences are divided into three levels, with level three being the most severe. In most cases, administrators can place student infractions into one of the three levels of consequences within the discipline

chart. Level one ranges from after- school detention to 3 days out-of-school suspension. Level two starts with in-school suspension and can go up to 8 days of out-of-school suspension. Level three begins with 9 days of out-of-school suspension pending a disciplinary panel, through the most severe consequence of permanent expulsion (Gwinnett County Public Schools, 2009).

GCPS has specific guidelines administrators have to follow when it comes to chronic misbehaving students (Gwinnett County Public Schools, 2009). A series of documented interventions have to be in place before a student is brought to a disciplinary panel over chronic misbehavior (Gwinnett County Public Schools, 2009). Unlike egregious acts that are sent directly to a disciplinary panel, chronic misbehavior has to be documented over time and behavior intervention plans have to be in place in order to take a student to a GCPS disciplinary panel (Gwinnett County Public Schools, 2009).

When a student is found in violation of the GCPS code of conduct at a disciplinary panel, the panel determines placement for the student. The consequences the panel has to choose from are community service, placement at the alternative school, no educational services for a year, and permanent expulsion (Gwinnett County Public Schools, 2009).

### CHAPTER III

#### METHODOLOGY

As a hearing officer for Gwinnett County Public Schools, I see firsthand an apparent correlation between poor literacy and discipline problems. My job as a hearing officer is to conduct discipline tribunals in accordance with GCPS' policy. The tribunal process starts at the local school where administrators determine whether a school rule infraction is severe enough to go before a district level student tribunal. At the tribunal, there is a district appointed hearing officer (judge) and three GCPS educators that sit on the panel (jury). None of these panel members work at the student's home school. If the student is found by the panel in violation of breaking GCPS rules, then the student's academic, attendance, and discipline records are reviewed to determine placement. This is where the link between poor literacy and discipline problems seems to be common among many of the paneled students. Most of the students with deplorable grades have poor standardized test grades. The common theme of the records review is a trend where the student fell behind early in his academic career and never caught up. Many students lose focus or motivation in their schoolwork due to the overwhelming sense of hopelessness that they will never catch back up to grade level. This is where students appear to gravitate toward being discipline problems. The students are then socially promoted with their peers and are far behind grade level, which is substantiated through their standardized test scores. Whether trying to gain attention or true dissatisfaction of being in class, these students act out and get into trouble. This reoccurring trend led me to want to find out how the relationship between student literacy and discipline emerges over time.

This study examined GCPS students who have been paneled out of their home schools and the link between their discipline and academic problems. The study reviewed the students' academic records using the Georgia High School Graduation Test (GHSGT) scores. The students' cumulative discipline records were examined to assess the pattern of misbehavior over time.

### Study Design

This study identified the number of paneled (suspended or removed from school for disciplinary reasons) high school students who read at least 3 years below expected grade level. The purpose was to examine whether relationships exist between the number of discipline referrals received by students and their reading achievement scores.

The study will also describe relationships between selected variables (socioeconomic status, race, discipline referrals, special education) and literacy. These variables were selected because the review of the research indicated that these concepts were of interest, and they may be important for purposes of accountability. In education today, accountability is a priority not only nationally, but in most local school systems.

### Research Questions

1. How many paneled high school students at the three high schools in Gwinnett County, Georgia read at least 3 years below expected grade level?
2. For paneled students who are at least 3 years below reading level on the high school graduation examination, is there a relationship between reading level and the number of discipline referrals over the course of his/her high school career?



3. Will paneled students who are at least 3 years below reading level on the high school graduation examination differ in their number of discipline referrals when compared by socioeconomic status, race, and participation in special education programming?

### Participants

The study population consisted of all of the paneled students in the 11th and 12th grades during the 2007-2008 school year in three high schools in Gwinnett County, Georgia. The schools from which the sample was drawn were Parkview High School, Berkmar High School, and Duluth High School, which represents the diverse student body in the Gwinnett County Public School system.

Parkview High school, in the southeast corner of the county, is a well-established school known for high test scores and above average community support. Most students who attend Parkview are middle- to upper-middle-class and have lived in the Parkview cluster the majority of their lives. Most students are involved in extracurricular activities and demonstrate school pride. The student body is 66% Caucasian, 18% African American, 10% Asian, and 6% Hispanic. Test scores at Parkview consistently rank among the school district's top performers.

Berkmar High School is geographically in the middle of the county and is a very transient school. The student body is a minority majority with Hispanics having a large portion of the student population followed by African Americans. The student body is 42% Hispanic, 27% African American, 20% Caucasian, and 11% Asian. The Hispanic culture tends to be more transient, which affects Berkmar in the classroom and in extracurricular activities. Test scores are average to low in comparison to the other high schools in the county. Very few students have grown up in the Berkmar community.

Duluth High School is on the northern side of the I-85 corridor. It is a school that has a diverse student population with over half being Caucasian and a large portion of the other half being Asian. The student body is 55% Caucasian, 29% Asian, 10% Hispanic, and 6% African American. Duluth was recently selected to house the Gwinnett County School of Mathematics and Science, in part, because of the school's consistently high-achieving math and science students. Duluth has an average extracurricular program and school spirit could be classified as healthy.

The study sample consisted of all junior and senior students during the 2007-2008 school year that were paneled out of their designated schools. These included students who had already dropped out of school. Gwinnett County Public Schools keeps hard copy records as far back as 10 years and computer records of students since 1995. Benchmarks for the study included looking at data from the Georgia High School Graduation Test. This test is mandatory for graduation and is given to all 11th grade students.

### Data Collection

Data were collected on paneled students over the course of their high school career. The first variable for which data were collected is literacy. Standardized test scores for reading can be obtained from the student's permanent record file (hard copy) and can also be referenced through the school district's computer database. The researcher identified students reading three or more levels below their grade level. The researcher began by looking at sample students' standardized test scores on the Georgia High School Graduation Test (GHS GT).

In high school, students are required to take and pass the Georgia High School Graduation Test (GHS GT). This test measures writing, reading, mathematics, social studies, and

science. Standard baseline scores are used to determine which students are behind in each subject. Students have their first opportunity to take the GHSGT early in their 11th grade year and may take it multiple times until they pass the assessment. The GHSGT was created to ensure that all students graduating from Georgia public high schools have the same standard baseline knowledge. The Georgia State Board of Education implemented this test to try to ensure standards based instruction across the state (Georgia Department of Education, 2006; see Appendix B).

In addition to literacy, the researcher collected data for the following variables. The individual school's cafeteria manager had records that showed which students were on the free and reduced lunch program, which helped determine the SES/poverty variable in the study. Participation in the special education program, race/ethnicity data, and discipline records could be found in archival data that Gwinnett County Public Schools keeps on all students.

### Data Analysis

For Research Question 1, descriptive data were reviewed to determine the number of students paneled who had taken the high school graduation examination and were at least three levels below grade level in reading. Testing history was examined at the 11th grade to identify members of the sample that were three grades below expected grade level.

The second research question was answered by correlating the high school graduation examination reading scores with the number of discipline referrals over the past 4 years. The data analysis was correlational (Pearson Product Moment Correlation).

The third research question was answered using ANOVA (Analysis of Variance), with the dependent variable being the number of discipline referrals, and the independent variables

being literacy, SES, race, and special education. The SES categories were free, reduced, and full lunch support. The race categories were African American, Caucasian, Hispanic, and Asian. The special education category was determined by those students who were in the special education program.

## CHAPTER IV

### RESULTS

The study determined whether there was a link between students who read below grade level and discipline problems in Gwinnett County Schools. The first three chapters of the dissertation presented the background of the study, what led to this study, the review of the literature for the study, and the methodology that was used for the study. The following is a presentation of the study findings.

#### Research Questions

1. How many paneled high school students at the three high schools in Gwinnett County, Georgia read at least 3 years below expected grade level?
2. For paneled students who are at least 3 years below reading level on the high school graduation examination, is there a relationship between reading level and the number of discipline referrals over the course of their high school career?
3. Will paneled students who are at least 3 years below reading level on the high school graduation examination differ in their number of discipline referrals when compared by socioeconomic status, race, and participation in special education programming?

## Null Hypothesis

This study sought to address the following question: Does chronic discipline play a role in students falling behind expected reading level? The corresponding null hypotheses to this research question are as follows:

Ho1: For paneled students who are at least 3 years below reading level on the high school graduation examination, there will be no relationship between reading level and the number of discipline referrals occurring in high school.

Ho2: Paneled students who are at least 3 years below reading grade level on the high school graduation examination will not differ in their number of discipline referrals when compared by socioeconomic status, race, and participation in special education programming.

## Study Participants

In this study, the focal population was paneled students who were enrolled at three Gwinnett County high schools during the 2007-2008 school year. The schools included in the study were Parkview High School, Berkmar High School, and Duluth High School. The sample consisted of junior and senior students who had been paneled for disciplinary reasons and had already taken the Georgia High School Graduation Test. The total number of junior and senior students paneled among the three schools for the 2007-2008 school year was 97. The total students used for the study were 78 participants. The number was low due to the consent of the students for the study. All ethnic backgrounds were represented. The majority of the sample participants were Caucasian (38%). Of the remaining participants, 15% were Asian, 24% were African American, and 21% were Hispanic. Other variables were analyzed in the study, which included special education and socioeconomic status (SES). There were 26 (33.33%) participants

in special education and 52 (66.67%) that were not. Most of the sample participants fell into the category of low socioeconomic status due to the fact that they received free or reduced lunch.

The socioeconomic breakdown consisted of 32 (41.03%), free lunch, 26 (33.33%) reduced lunch, and 20 (25.64%) paid in full for their lunch.

Table 1

*Frequency Table for the Study Sample*

|                      | Students in Grades 11 and 12 | Paneled students |                |
|----------------------|------------------------------|------------------|----------------|
|                      | <i>F</i>                     | <i>f</i>         | % <sup>1</sup> |
| Parkview High School | 1,292                        | 31               | 2.40           |
| Berkmar High School  | 1,632                        | 21               | 1.29           |
| Duluth High School   | 1,151                        | 26               | 2.26           |
| Total                | 4,075                        | 78               | 1.91           |

*Note:* Percentage<sup>1</sup> means the percentage of paneled students in all the students of Grades 11 and 12.

Table 1 shows the analysis of the number of paneled students in the three high schools that read at least 3 years below grade level. Though Berkmar has more students overall, the percentage of paneled students is the lowest.

Table 2

*Frequency Table for Race*

| Race             | <i>f</i> | %   |
|------------------|----------|-----|
| Asian            | 12       | 15  |
| African American | 19       | 24  |
| Caucasian        | 30       | 39  |
| Hispanic         | 17       | 22  |
| Total            | 78       | 100 |

Table 2 provides the analysis for the race of the paneled students who read 3 years below expected grade level. The largest group is Caucasian followed by the African American sub group.

Table 3

*Frequency Table for Special Education Identifier*

| Special Education | <i>f</i> | %     |
|-------------------|----------|-------|
| Yes               | 26       | 33.33 |
| No                | 52       | 66.67 |
| Total             | 78       | 100   |

Table 3 provides the analysis for those students in the study who are in the special education program. Only one third of the paneled students are in the special education program.

Table 4

*Frequency Table for Socioeconomic Status Identifier*

| SES     | <i>f</i> | %     |
|---------|----------|-------|
| Free    | 32       | 41.03 |
| Reduced | 26       | 33.33 |
| Full    | 20       | 25.64 |
| Total   | 78       | 100   |

Table 4 shows the analysis for the socioeconomic status of students in the study. There is a higher percentage of paneled students receiving free meals than those who are in the reduced or full category.



## Data Analysis

In order to determine whether or not chronic discipline plays a role in students falling behind expected reading level, each research question was analyzed. The statistical software package used to analyze the data was Statistical Analysis Software (SAS).

Descriptive statistics were used to analyze the first research question. How many paneled high school students at the three high schools in Gwinnett County, Georgia read at least 3 years below expected grade level? There are 22 out of 78 (28.21%) paneled high school students at the three high schools in Gwinnett County, Georgia, who read at least 3 years below expected grade level. Table 5 summarizes the study sample in terms of frequency and percentage.

Table 5

*Frequency Table for the Study Sample*

|                            | Students in<br>Grades 11 and<br>12 | Paneled students |      | Paneled students who read at least<br>3 years below expected grade<br>level |       |
|----------------------------|------------------------------------|------------------|------|---|-------|
|                            | <i>f</i>                           | <i>f</i>         | %    | <i>f</i>  | %     |
| Parkview<br>High<br>School | 1,292                              | 31               | 2.40 | 7   | 22.58 |
| Berkmar<br>High<br>School  | 1,632                              | 21               | 1.29 | 10  | 47.62 |
| Duluth<br>High<br>School   | 1,151                              | 26               | 2.26 | 5   | 19.23 |
| Total                      | 4,075                              | 78               | 1.91 | 22  | 28.21 |

*Note.* Percentage<sup>1</sup> means the percentage of paneled students in all the students of Grades 11 and 12. Percentage<sup>2</sup> means the percentage of paneled students who read at least 3 years below expected grade level in all the paneled students.

Table 5 shows the number of paneled students who read at least 3 years below expected grade level. Berkmar High School has the highest percentage of students in this category.

First, a statistical summary of other variables in the dataset is provided, which will provide a general picture of the dataset. The dataset here contains two continuous and three categorical variables. For the continuous variables, number of discipline referrals and GHS GT English/Reading test scores, their mean, median, and range will be displayed. For the categorical variables, race, SES, and special education identifier, percentage will be used to summarize.

Table 6

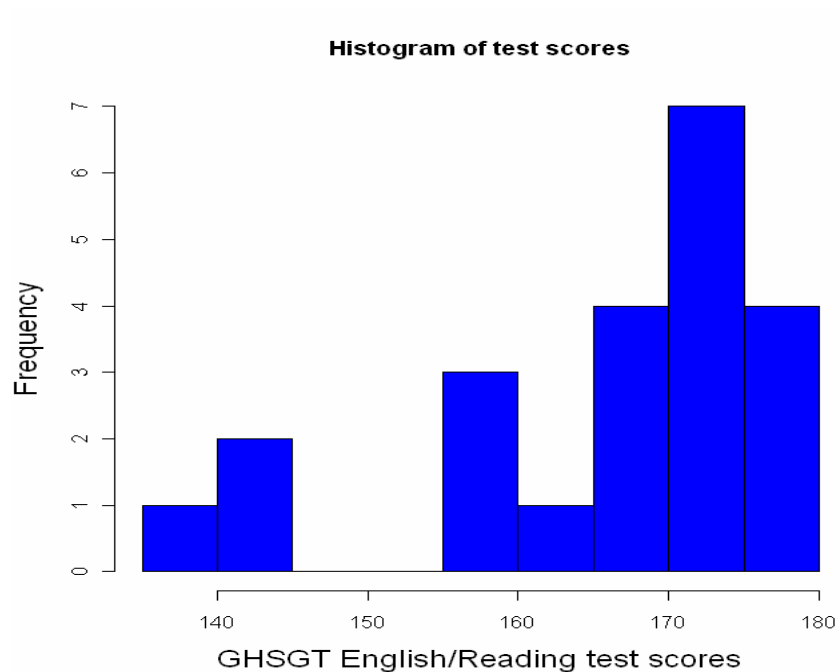
*Descriptive Statistics for the Variables Number of Discipline Referrals and GHS GT English/Reading Test Scores*

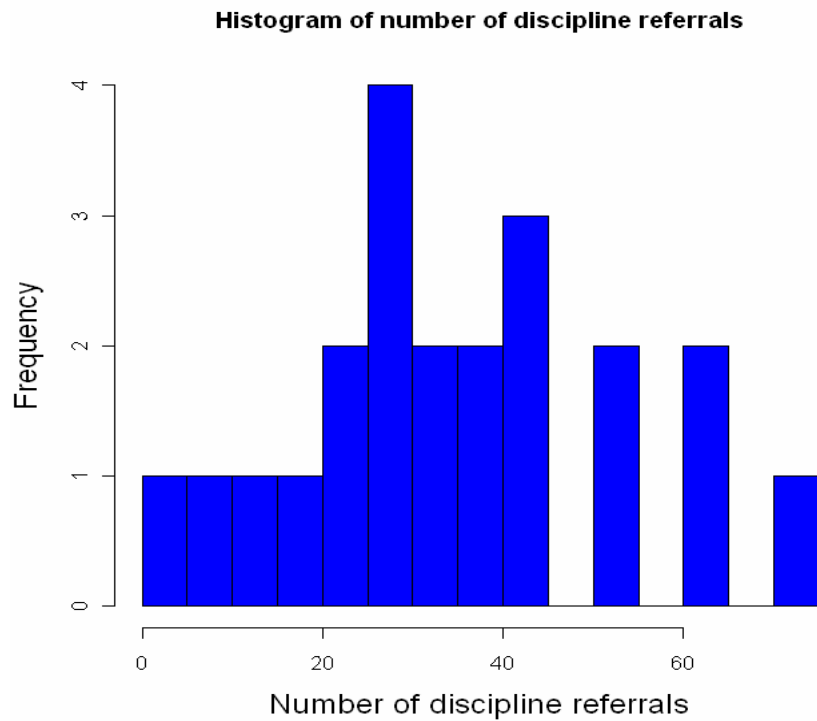
| Variables                          | Mean  | Median | Range      |
|------------------------------------|-------|--------|------------|
| Number of Discipline Referrals     | 35.2  | 32.0   | [3, 71]    |
| GHS GT English/Reading test scores | 166.4 | 170.5  | [139, 179] |

Table 6 shows the descriptive statistics for the variables number of discipline referrals and GHS GT English/Reading test scores. The table gives the mean, median and the range for both variables.

Research Question 2 asks the following: for paneled students who are at least 3 years below reading level on the high school graduation examination, is there a relationship between reading level and the number of discipline referrals over the course of their high school career? To examine the correlation between two continuous variables, the commonly used Pearson product moment correlation may not be appropriate in this case because this method requires the normal distribution assumptions on the variables. There are two ways to check whether the observations come from normal distribution: One is the graphical method based on the histogram

of the empirical distribution, and the other way is to use some statistical tests such as Kolmogorov-Smirnov test, Cramer-von Mises test, and Anderson-Darling test. There are only 22 observations for paneled students who are at least 3 years below reading level on the high school graduation examination, which is a small sample. Normality tests have little power to tell whether or not a small sample of data comes from a normal distribution. A histogram will fulfill the need to see if the distribution deviates grossly from a bell-shaped normal distribution. Figure 1 shows the histograms of these two variables, respectively. As seen, the empirical distributions of both variables are quite different from normal distribution. Thus, it would be appropriate to use rank-based nonparametric method to check the correlation between reading level and the number of discipline referrals over the course of their high school career.





*Figure 1.* Histograms of Number of Discipline Referrals and GHSGT English/Reading test scores for paneled students who are at least three years below reading level on the high school graduation examination.

The Spearman correlation measuring method was used to determine whether the relationship is statistically significant. The results suggest that the relationship between reading level and the number of discipline referrals over the course of their high school career is statistically significant ( $p = -0.46824$ ,  $p$ -value = .028). The more the number of discipline referrals, the lower the GHSGT English /Reading test scores.

The third research question is to describe relationships between selected variables and literacy. Will paneled students who are at least 3 years below reading level on the high school graduation examination differ in their number of discipline referrals when compared by socioeconomic status, race, and participation in special education program? To answer the third research question, an ANOVA (Analysis of Variance) was used with the dependent variable

being the number of discipline referrals, and the independent variable being either socioeconomic status or race or participation in a special education program. The socioeconomic status categories include free, reduced, and full lunch support. The race categories include African American, Caucasian, Hispanic, and Asian. The special education program category is determined by whether a student participates in the special education program or not. There are 22 paneled students who are at least 3 years below reading level on the high school graduation examination. Tables 10-12 summarize the frequency and relative frequency of three independent variables for this group of 22 students.

Table 7

*Frequency Table for Socioeconomic Status Identifier*

| SES     | <i>F</i> | %     |
|---------|----------|-------|
| Free    | 16       | 72.73 |
| Reduced | 5        | 22.73 |
| Full    | 1        | 4.55  |
| Total   | 22       | 100   |

Table 8

*Frequency Table for Race*

| Race             | <i>f</i> | %     |
|------------------|----------|-------|
| Asian            | 0        | 0     |
| African American | 5        | 22.73 |
| Caucasian        | 5        | 22.73 |
| Hispanic         | 12       | 54.55 |
| Total            | 22       | 100   |

Table 9

*Frequency Table for Special Education Identifier*

| Special Education | <i>f</i> | %     |
|-------------------|----------|-------|
| Yes               | 15       | 68.18 |
| No                | 7        | 31.82 |
| Total             | 22       | 100   |

The ANOVA method also requires the normal distribution assumptions on the dependent variable. As can be seen from Figure 1, there is some violation of normality. Thus a nonparametric Kruskal-Wallis test was adopted, which is the nonparametric counterpart of the standard ANOVA method. The results from the three Kruskal-Wallis tests can be found in Table 10. The paneled students who are at least 3 years below reading level on the high school graduation examination showed no significant difference in their number of discipline referrals when compared by either socioeconomic status or race, or participation in special education program.

Table 10

*Kruskal-Wallis Test Results for Socioeconomic Status, Race, and Participation in Special Education Programming*

| Variables                                  | Test statistic | Degree of freedom | <i>p</i> value |
|--|----------------|-------------------|----------------|
| Socioeconomic status                       | 1.309          | 2                 | .52            |
| Race                                       | 2.487          | 2                 | .29            |
| Participation in special education program | 0.320          | 1                 | .57            |

Also, it is helpful to put all four independent variables (GHSGT English /Reading test scores, socioeconomic status, race, and participation in special education program) together and conduct a multivariate analysis to see which factor is the most important one. A generalized

linear model (Poisson regression model with overdispersion effect) was built to examine the relationship between number of discipline referrals and the other four factors. The regression analysis results are shown below.

Table 11

*Goodness of Fit Criteria*

| Criterion                | <i>df</i> | Value    | Value/ <i>df</i> |
|--------------------------|-----------|----------|------------------|
| Deviance                 | 15        | 134.9549 | 8.9970           |
| Scaled Deviance          | 15        | 15.3337  | 1.0222           |
| Pearson Chi-Square       | 15        | 132.0181 | 8.8012           |
| Scaled Pearson X2        | 15        | 15.0000  | 1.0000           |
| Log Likelihood           |           | 229.9648 |                  |
| Full Log Likelihood      |           | -14.1958 |                  |
| AIC (smaller is better)  |           | 42.3915  |                  |
| AICC (smaller is better) |           | 50.3915  |                  |
| BIC (smaller is better)  |           | 50.0288  |                  |
| Algorithm converged.     |           |          |                  |

The list of “Criteria For Assessing Goodness Of Fit” in Table 11 contains statistics that summarize the fit of the specified model. The scaled Pearson Chi-Square statistic equals 1, which indicates that the over dispersion in Poisson regression has been adjusted.

Table 12

*Analysis of Maximum Likelihood Parameter Estimates*

| Parameter      | df | Standard Estimate | Wald 95% Confidence |                | Wald       |            |
|----------------|----|-------------------|---------------------|----------------|------------|------------|
|                |    |                   | Error               | Limits         | Chi-square | Pr > ChiSq |
| Intercept      | 1  | 5.8515            | 1.6326              | 2.6516-9.0514  | 12.85      | 0.0003     |
| GHSGT_test     | 1  | -0.0179           | 0.0097              | -0.0369-0.0011 | 3.41       | 0.0646     |
| Race -- AA     | 1  | 0.3998            | 0.2753              | -0.1399-0.9394 | 2.11       | 0.1465     |
| Race -- C      | 1  | 0.4019            | 0.2874              | -0.1613-0.9651 | 1.96       | 0.1619     |
| Race -- H      | 0  | 0.0000            | 0.0000              | 0.0000-0.0000  |            |            |
| SES -- Free    | 1  | 0.4785            | 0.3128              | -0.1344-1.0915 | 2.34       | 0.1260     |
| SES -- Full    | 1  | 0.8311            | 0.6115              | -0.3674-2.0297 | 1.85       | 0.1741     |
| SES -- Reduced | 0  | 0.0000            | 0.0000              | 0.0000-0.0000  |            |            |
| Spe Edu -- no  | 1  | 0.2365            | 0.2846              | -0.3212-0.7943 | 0.69       | 0.4059     |

The Analysis Of Parameter Estimates in Table 12 summarize the results of the regression parameter estimates with the parameter name, the degrees of freedom associated with the parameter, the estimated parameter value, the standard error of the parameter estimate, and a Wald chi-square statistic and associated  $p$ -values for testing the significance of the parameter to the model.

Table 13

*Results of Type 3 Analysis for the Regression Model*

| Variables                                  | <i>Df</i> | Chi-Square Statistic | <i>p</i> |
|--|-----------|----------------------|----------|
| Test scores                                | 1         | 3.34                 | .068     |
| Race                                       | 2         | 2.83                 | .243     |
| Socioeconomic status                       | 2         | 2.90                 | .235     |
| Participation in special education program | 1         | 0.68                 | .409     |



Type 3 analyses are used to test the significance of the main effects in the regression model. In Table 13, entries in the chi-square column are likelihood ratio statistics for testing the significance of the effect added to the model containing all the preceding effects. For example, the chi-square value of 3.34 for GHSGT English /Reading test scores represents the difference in log likelihoods between fitting a model with only an intercept term and a model with an intercept and GHSGT English/Reading test scores. The resulting  $p$ -value of .068 is slightly greater than 0.05, which indicates that the effect of this variable is not significant. This result is consistent with what we have seen in answering Research Question 2. Similarly, the chi-square value of 2.83 for race represents the difference in log likelihoods between the model with the intercept and GHSGT English/Reading test scores and the model with the intercept, English/Reading test scores and race. This effect is not significant, as indicated by the  $p$ -value of .243. The same conclusion can be drawn for SES and the participation of special education program, whose  $p$ -values are .235 and .409, respectively. These statistical test results suggest that the variables socioeconomic status, race, and participation in special education program do not have significant influence on the number of discipline referrals. The conclusion is consistent with that drawn based on the nonparametric Kruskal-Wallis test above. The above statistical analyses were conducted through SAS 9.2. The plots in Figure 1 were drawn by using R software.

### Summary of Results

There were 28.21% of the paneled high school students at the three high schools in Gwinnett County, Georgia, that read at least 3 years below expected grade level. When comparing the relationship between reading level and the number of discipline referrals for these

students we find a significant negative correlation. The students who had a higher number of discipline referrals made considerably lower scores on the GHSGT English/Reading test.

All three of the independent variables (socioeconomic status, race, and participation in the special education program) were tested to determine whether there was a higher percent of discipline referrals within each group. The data reflect that paneled students who are at least 3 years below reading grade level on the high school graduation examination show no significant difference in their number of discipline referrals compared by race, socioeconomic status, or participation in the special education program. There is no correlation between the number of discipline referrals of students categorized in SES, race, and special education compared to students meeting the same criteria outside those groups.

## CHAPTER V

### DISCUSSION, LIMITATIONS, IMPLICATIONS, AND FUTURE RESEARCH

The first purpose of this study was to identify the number of paneled (suspended or removed from school for disciplinary reasons) high school students who read at least 3 years below expected grade level. The second purpose was to examine the relationship between selected variables and literacy. Following a brief summary of the results of the study, this chapter includes a discussion of the findings, study limitations, practical implications, and recommendations for future research.

The study generated data responses to one research question: For paneled students who are at least 3 years below reading level on the high school graduation examination, is there a relationship between reading level and the number of discipline referrals over the course of his/her high school career? The focal population was paneled students who were enrolled at three Gwinnett County high schools during the 2007-2008 school year. The schools included in the study were Parkview High School, Berkmar High School, and Duluth High School. The sample consisted of junior and senior students who had been paneled for disciplinary reasons and had already taken the Georgia High School Graduation Test. The total number of junior and senior students paneled among the three schools for the 2007-2008 school year was 97. The total students used for the study were 78 participants. The number of participants was low due to the required consent of the students for the study. The study also compared whether ethnicity, socioeconomic status, and participation in special education were significant variables associated with students who were behind in reading and discipline problems.

The theoretical framework for this study consisted of several theories that are associated with adolescent illiteracy and chronic misbehavior. The two main theories are differential treatment theory and susceptibility theory. Differential treatment theory is where officials treat students differently who are behind reading level, which perpetuates their chronic misbehavior (Luiselli et al., 2005). Susceptibility theory is when students have a propensity to consistently make poor judgments on decisions that will affect their education and future (Jule, 1988). There are five other sociological theories that support the link between adolescent illiteracy and chronic misbehavior (Wadsworth, 1979). Interactional theory, social control theory, differential association theory, social strain theory, and social learning theory are sociological theories that explain the beginning and middle stages of delinquent behavior. These sociological theories suggest that chronic misbehavior is influenced by social factors.

### Discussion of the Findings

As noted previously in Chapter I, null hypothesis Ho1 states, for paneled students who are at least 3 years below reading level on the high school graduation examination, there will be no relationship between reading level and the number of discipline referrals occurring in high school. The results indicate that over the course of a student's high school career there is a significant negative correlation between the number of discipline referrals and a low reading level.

On average, the students who had more discipline referrals had lower Georgia High School Graduation Test English/Reading test scores than those students who had fewer discipline referrals. This finding validates the theory that reading problems equal behavioral problems (Brier, 1989). Over 40 years ago, Mulligan (1969) found that a considerably large number of

adolescents with reading disabilities were categorized as juvenile delinquents. Mulligan attributed the high rate of reading problems to increased levels of frustration and continued academic failures throughout the students' school years. He believed that most of these adolescents acted out both in society and school in an attempt to mask their reading/academic problem.

One major reason for the findings may be the transient lifestyle many students experience in metro Atlanta. Students who move three or more times during their schooling years are much more likely to get behind in reading and subsequently become discipline problems (Morris & Mather, 2007). Many students who begin their educational career having difficulty in reading only get farther behind when their families move on a consistent basis. The challenges of fitting in socially and learning a new school routine makes staying on reading grade level difficult for many students (Hall, 2006). The social aspect of fitting in at a new school can provide the excuse for a struggling reader to become a discipline problem to hide his/her academic difficulties. It becomes easier for a transient student to play the part of the discipline problem than put in the extra effort to overcome existing reading problems (Dryfoos, 1990).

Another possible factor that contributes to the study's findings of the correlation between reading difficulties and chronic discipline is low expectations. Until recently, many of the GCPS students who were behind grade level in reading were not held accountable for their academic shortcomings. With the adoption of the federal initiative No Child Left Behind, the success of all students on all levels has become paramount in most school systems including Gwinnett County Public Schools (Gwinnett County Public Schools, 2008). Students who are allowed to fall behind academically have a greater propensity to become discipline problems than those who stay on grade level (Archwenety & Katsiyannis, 2000). Several of the students in this study did not

spend their entire academic career in Gwinnet and had not always been exposed to academic rigors and standards. Prior to No Child Left Behind, many students with academic and discipline shortcomings were tracked in remedial or “vocational” classes (National Assessment of Educational Progress, 2005). Gwinnett County Public Schools has adopted a plan to try to phase out remedial or technical track programs to create a culture of high expectations for all students (Gwinnett County Public Schools, 2009).

The study results revealed no significant correlation between the number of discipline referrals and the variables socioeconomic status, race, and participation in the special education program. These findings add credibility to the theory that discipline problems cross all racial and socioeconomic barriers (Barr & Parrott, 2007). Children who have fallen behind grade level in reading are commonly thought to be associated with a certain ethnicity or social group. The failure to provide children with the proper educational foundation in the early developing years significantly increases the possibility of continued problems in reading and reasoning (Dryfoos, 1990). Most children who fail to overcome these problems either give up on school all together, or mask their academic shortcomings by becoming the class clown or trouble maker. If this delinquent behavior pattern is validated and accepted as normal, then the child will continue to fall further behind academically. This cycle of underperforming adolescents who turn to non-academic behaviors for validation is a problem with our educational system and cannot be linked to any particular group (Morris & Mather, 2007).

The results indicated that over the course of a student’s high school career there is a significant negative correlation between reading level and the number of discipline referrals. On average, the students who had more discipline referrals had lower Georgia High School Graduation Test English/Reading test scores than those students who had fewer discipline

referrals. The variables socioeconomic status, race, and participation in the special education program did not have a negative impact on students that have literacy problems.

### Limitations

There are several limitations that affected this research study. The study was conducted at three high schools within the Gwinnett County Public School System. Gwinnett County Public School System is a diverse school system but does not give a true perspective of the study nationally or internationally. The three high schools chosen for the study; Parkview High School, Berkmar High School, and Duluth High School, have different student bodies but does not give an exact snapshot of the student demographics within the Gwinnett County Public School System.

Another limitation is that the study participants have had different educational experiences and personal backgrounds which, along with low literacy, may negatively affect their behavior/performance. Some of the students in the study have grown up in Gwinnett County, while others have been exposed to several other school systems that have different standards and expectations. Some students might have been exposed to a more rigorous academic upbringing, while others could have had to endure a subpar educational experience for most of their academic careers. Measuring family involvement in a student's education is difficult and cannot be compared in this study. It could not be determined whether the study sample had the same family involvement. These cultural and educational experiences may have negatively affected the study participants' behavior, which proves it difficult to determine if difficulty in reading was the major reason behind their chronic discipline problems.

The research sample posed a limitation because of the inability to locate study participants and get their permission to participate. The total number of students eligible for the study was 97. These were junior and senior students paneled among the three schools for the 2007-2008 school year. Unfortunately, only 78 participants gave their permission to be included in the study. Therefore, the sample size played a major limitation of the study. However, even though the sample size was quite small, the researcher gained valuable experience from completing this research project.

The final limitation revolves around clearly defining a reading disability. School officials struggle with the dilemma of identifying students with learning disabilities who are truly not learning disabled, and making the mistake of failing to identify those who truly are disabled (Nelson et al., 2004). Many students with learning difficulties do not meet eligibility criteria determined by a school system and therefore do not receive the help they need. In this particular study, the Georgia High School Graduation Test was used to determine whether the study participant was below reading grade level. Benchmarks on the writing/reading portion of the Georgia High School Graduation test measure if a student is on or off reading grade level. This is not an exact determination as many students are poor test takers or do not give their best effort on standardized tests.

### Practical Implications

Early, structured academic and behavioral interventions must be provided in the schools in order to break the cycle of poor student achievement among at-risk learners. Constant, formal intervention is imperative in reaching low-achieving adolescents before misbehaving becomes their escape from academic problems (Natriello, 1996). Educators cannot be afraid to intercede



early in a student's education if there are signs of reading and behavioral problems. Often school personnel identify potential problems early but are hesitant to act because of the concern over putting labels or tracking students so early in their academic career (Brophy, 2008). A child's early development will often determine what kind of student and person he or she will become. The prospect of not intervening early in an at-risk student's life is a gamble that school systems and communities cannot afford to take. The money spent on early reading and behavioral intervention programs will be far less than dealing with a juvenile delinquent later in life (Land & Letgers, 2002).

School personnel may benefit from partnering with parents, social workers, juvenile justice agencies, and the local clergy in order to reach every at-risk student. These relationships should be based on a collaborative approach, ensuring that everyone involved is looking out for the best interest of the student. An at-risk student needs a formal plan of action developed by all support stakeholders that outlines every intervention for the skill deficient student. The plan needs to include not only academic support but behavioral and social support as well. Successful intervention programs have clear guidelines, benchmark assessments on progress, and program administrators who ensure program completion of all students (Horner, Sugai, Todd, & Lewis-Palmer, 2005).

Establishing a collaborative reading intervention program starts the process of preventing at-risk kids from gravitating towards juvenile delinquency. Accurate data should be kept on all aspects of an intervention program to track progress and to identify shortcomings (Carter, 2005). Intervention programs should be continually assessed for effectiveness from school personnel, parents, and outside government support agencies. A comprehensive program evaluation needs to be assessed annually in order to identify program deficiencies and maintain or improve

program strengths. Program evaluations also provide school systems with valuable data in which to justify a program's worth. With school funding continually being cut, intervention programs are scrutinized as being nonessential programs to eliminate in order to make budget. A well-documented intervention program that can show substantial progress in increasing student achievement is extremely valuable to most school systems (Morris & Mather, 2007).

### Future Research

The size of this study was small due in part to the number of willing participants that could not be reached to participate in the study. Future studies need to gather longitudinal data across school districts and states in order to obtain a larger study sample for analysis. A larger study sample would give more accurate data on whether similar students across the country are dealing with reading and discipline problems.

A more in-depth measure of different educational experiences over time may provide additional knowledge about how this variable affects at-risk children. This measure may help determine how much a transient lifestyle negatively impacts student achievement and adolescent behavior. Gathering data on the different educational programs the various study participants experienced may allow the researcher to identify similarities and differences among the study participants. Family involvement would also be beneficial to measure because of the impact it has on a child's education. Family involvement should be studied to determine how much of an effect it has on student achievement and, specifically, reading. The level of family involvement in support of reading will give the researcher a better understanding of the positive affects on behavior.

Finally, a more specific definition of what constitutes a reading/learning disability should be identified and used for future studies. This study used a broad definition that included students who read three grades below grade level and had fallen behind academically. Determining a specific definition for reading disability could be difficult because most states just emphasize the methods for identifying learning disabilities as guidelines. The final decision of placement comes from the local school system. Nationwide there are no differences between poor and disabled readers on measures of processes most directly related to reading (Sugai & Sadler, 2009).

It is our mission as educators to make certain that all students acquire the academic skills and knowledge they will need in order to be well-adjusted productive citizens. Students arrive at school from different backgrounds and are faced with many challenges. This study highlights the need for intervention programs that target at-risk readers. Students who fall behind grade level in reading have a greater propensity of becoming behavioral problems and falling behind further. Early detection is paramount in helping these kids, due to the fact that the farther they fall behind the less likely they will ever thrive in school again. Each school system needs to place a priority on at-risk readers. Reading intervention programs will not only improve student achievement, it will also improve behavior because more kids will have the ability to attain academic success.

### Conclusion

The purpose of this study was to identify the number of paneled (suspended or removed from school for disciplinary reasons) high school students who read at least 3 years below expected grade level. The study also analyzed relationships between selected variables (socioeconomic status, race, discipline referrals, special education) and literacy.

The results indicated that over the course of a student's high school career there is a significant negative correlation between reading level and the number of discipline referrals. On average, the students who had more discipline referrals had lower Georgia High School Graduation Test English/Reading test scores than those students who had fewer discipline referrals. The variables socioeconomic status, race, and participation in the special education program did not have a negative impact on students who have literacy problems.

School systems must support early reading and behavioral intervention programs in order to prevent students from gravitating toward juvenile delinquency. The money spent on these programs will be far less than problems the school system and society will incur if a student becomes a statistic like the ones in this study.

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APPENDIX A  
AUTHORS OF SUPPORTING RESEARCH

| Variable                             | Authors of supporting research  |
|--------------------------------------|---|
| Literacy Level and Special Education | Arcwamety & Katsiyannis, Beebe & Mueller, Brier, Broder, Dunham & Albert, Empey & Stafford, Grande, Johnson, Keilitz & Dunivant, Larson, Miller & Windhauser, Thornberry, Wadsworth, Walker                                 |
| Literacy Level and SES               | Barr & Parrett, Cameron & Heckman, Gaskins, Greene, Jule, Kirsch & Jungeblut, Land & Letgers, Morrison & Mantzicopoulos, Smith & Hester, Snow, Burns & Griffin, Velluntino & Scanlon  |
| Literacy Level and Gender            | Alexander & Natriello, Entwisle & Horsey, California Assembly Office of Research, Catterall, Farmer & Payne, Grissom & Sheppard, Hammack, Hoffer, Holmes, McDill, Natriello & Pallas, Roderick, Rumberger, Wehlage & Rutter |
| Literacy Level and Race              | Bryant & Vaughn, Linan-Thomspon & Ugel, Dryfoos, Gaskins, Ivey, Pinnel & Lyons, Deford & Bryk, Rutter & Giller, Stroup & Robbins  |

APPENDIX B  
DATA COLLECTION FOR LITERACY

Eleventh

CRCT and/or special education testing

Twelfth

GHS GT and/or special education testing

APPENDIX C

PROVERTY THRESHOLDS FOR 2007

## Poverty Thresholds for 2007 by Size of Family and Number of Related Children Under 18 Years

[Download this table as an XLS \(16k\).](#)

| Size of Family Unit               | Weighted Average Thresholds | Related children under 18 years |        |        |        |        |        |        |        |           |
|-----------------------------------|-----------------------------|---------------------------------|--------|--------|--------|--------|--------|--------|--------|-----------|
|                                   |                             | None                            | One    | Two    | Three  | Four   | Five   | Six    | Seven  | 8 or more |
| One person (unrelated individual) | 10,590                      |                                 |        |        |        |        |        |        |        |           |
| Under 65 years                    | 10,787                      | 10,787                          |        |        |        |        |        |        |        |           |
| 65 years and over                 | 9,944                       | 9,944                           |        |        |        |        |        |        |        |           |
| Two people                        | 13,540                      |                                 |        |        |        |        |        |        |        |           |
| Householder under 65 years        | 13,954                      | 13,884                          | 14,291 |        |        |        |        |        |        |           |
| Householder 65 years and over     | 12,550                      | 12,533                          | 14,237 |        |        |        |        |        |        |           |
| Three people                      | 16,530                      | 16,218                          | 16,689 | 16,705 |        |        |        |        |        |           |
| Four people                       | 21,203                      | 21,386                          | 21,736 | 21,027 | 21,100 |        |        |        |        |           |
| Five people                       | 25,080                      | 25,791                          | 26,166 | 25,364 | 24,744 | 24,366 |        |        |        |           |
| Six people                        | 28,323                      | 29,664                          | 29,782 | 29,168 | 28,579 | 27,705 | 27,187 |        |        |           |
| Seven people                      | 32,233                      | 34,132                          | 34,345 | 33,610 | 33,098 | 32,144 | 31,031 | 29,810 |        |           |
| Eight people                      | 35,816                      | 38,174                          | 38,511 | 37,818 | 37,210 | 36,348 | 35,255 | 34,116 | 33,827 |           |
| Nine people or more               | 42,739                      | 45,921                          | 46,143 | 45,529 | 45,014 | 44,168 | 43,004 | 41,952 | 41,691 | 40,085    |

**Source:** U.S. Census Bureau

(United States Census Bureau, 2007).



## APPENDIX D

### SAS CODE FOR STATISTICAL ANALYSIS FOR HIGH SCHOOL STUDENT'S DATA

**The following is the SAS code to do statistical analysis for high school student's data**

```
*****;
* SAS code for the analysis of high school student data;
*****;
```

\* First, input the original dataset into sas;

**data** one;

input si \$ race \$ ses \$ spe\_edu \$ dis\_ref ghsqt;

cards;

|     |    |         |     |    |     |
|-----|----|---------|-----|----|-----|
| P1  | C  | reduced | yes | 32 | 185 |
| P2  | AA | free    | no  | 16 | 190 |
| P3  | AA | reduced | yes | 53 | 197 |
| P4  | A  | full    | no  | 9  | 235 |
| P5  | C  | full    | no  | 12 | 205 |
| P6  | C  | reduced | no  | 27 | 181 |
| P7  | C  | free    | yes | 17 | 187 |
| P8  | H  | reduced | no  | 5  | 210 |
| P9  | C  | reduced | no  | 10 | 219 |
| P10 | AA | free    | yes | 71 | 173 |
| P11 | C  | full    | no  | 45 | 200 |
| P12 | AA | full    | no  | 20 | 195 |
| P13 | AA | reduced | no  | 3  | 179 |
| P14 | C  | full    | no  | 13 | 255 |
| P15 | C  | reduced | yes | 12 | 160 |
| P16 | H  | free    | yes | 33 | 175 |
| P17 | A  | full    | no  | 27 | 263 |
| P18 | AA | reduced | yes | 40 | 157 |
| P19 | C  | full    | no  | 22 | 213 |
| P20 | C  | full    | no  | 6  | 245 |
| P21 | C  | reduced | yes | 18 | 199 |
| P22 | C  | free    | yes | 29 | 169 |
| P23 | AA | reduced | no  | 11 | 201 |
| P24 | C  | full    | no  | 18 | 214 |
| P25 | AA | full    | no  | 2  | 237 |
| P26 | C  | reduced | no  | 41 | 190 |
| P27 | A  | free    | no  | 55 | 216 |
| P28 | H  | full    | yes | 38 | 170 |
| P29 | C  | full    | yes | 19 | 191 |
| P30 | A  | reduced | no  | 8  | 211 |
| P31 | C  | free    | no  | 26 | 193 |
| B1  | H  | free    | yes | 29 | 166 |
| B2  | H  | reduced | no  | 16 | 179 |
| B3  | AA | free    | yes | 51 | 142 |
| B4  | H  | free    | yes | 10 | 177 |
| B5  | C  | reduced | no  | 19 | 204 |

|     |    |         |     |     |        |
|-----|----|---------|-----|-----|--------|
| B6  | AA | free    | no  | 35  | 180    |
| B7  | H  | free    | yes | 31  | 160    |
| B8  | AA | free    | no  | 23  | 221    |
| B9  | AA | reduced |     | no  | 25 207 |
| B10 | H  | free    | no  | 13  | 199    |
| B11 | H  | free    | yes | 63  | 139    |
| B12 | C  | reduced |     | no  | 20 239 |
| B13 | AA | free    | no  | 20  | 255    |
| B14 | C  | free    | yes | 3   | 191    |
| B15 | H  | free    | no  | 29  | 173    |
| B16 | A  | full    | no  | 9   | 213    |
| B17 | H  | free    | no  | 44  | 164    |
| B18 | AA | reduced |     | yes | 24 219 |
| B19 | AA | free    | no  | 45  | 172    |
| B20 | H  | free    | no  | 18  | 203    |
| B21 | H  | free    | no  | 21  | 178    |
| D1  | A  | full    | no  | 31  | 256    |
| D2  | C  | free    | yes | 27  | 190    |
| D3  | C  | reduced |     | no  | 65 171 |
| D4  | C  | reduced |     | no  | 19 201 |
| D5  | H  | free    | yes | 29  | 166    |
| D6  | A  | reduced |     | no  | 11 261 |
| D7  | C  | reduced |     | no  | 25 267 |
| D8  | C  | free    | yes | 42  | 175    |
| D9  | AA | free    | no  | 39  | 188    |
| D10 | C  | reduced |     | no  | 41 193 |
| D11 | C  | free    | yes | 15  | 224    |
| D12 | A  | full    | no  | 3   | 277    |
| D13 | A  | full    | no  | 15  | 290    |
| D14 | C  | reduced |     | no  | 33 189 |
| D15 | C  | free    | yes | 52  | 145    |
| D16 | AA | free    | no  | 23  | 203    |
| D17 | H  | reduced |     | no  | 17 214 |
| D18 | H  | free    | yes | 22  | 171    |
| D19 | A  | full    | no  | 12  | 263    |
| D20 | AA | reduced |     | no  | 26 180 |
| D21 | C  | reduced |     | no  | 10 229 |
| D22 | AA | full    | yes | 41  | 187    |
| D23 | H  | free    | no  | 13  | 213    |
| D24 | A  | free    | no  | 2   | 278    |
| D25 | A  | full    | no  | 9   | 254    |
| D26 | C  | full    | yes | 38  | 182    |

;

**run;**

\*\*\*\*\*;

```

*Frequency tables for categorical variables;
proc freq data=one;
tables race ses spe_edu;
run;

*****.
*Create a variable to indicate whether a student is
*at least 3 years below reading level;
data two;
set one;
if ghs<180 then belowexp='yes';
if ghs>=180 then belowexp='no';
run;

*****.
* Number of paneled students who
* are at least 3 years below reading level;
proc freq data=two;
tables belowexp/chisq;
run;

*****.
*Create a dataset containing only the paneled students
*who are at least 3 years below reading level;
data three;
set two;
if ghs<180;
run;

*****.
*Frequency tables for categorical variables for the
*paneled students who are at least 3 years below reading level;
proc freq data=three;
tables race ses spe_edu;
run;

*****.
*Correlation analysis to detect the relationship between reading
*level and the number of discipline referrals;
proc corr data=three spearman;
var dis_ref ghs;
run;

*****.
*recode the categorical variables;
data four;

```

```

set three;
if race='A' then race2=1;
if race='AA' then race2=2;
if race='C' then race2=3;
if race='H' then race2=4;
if ses='free' then ses2=1;
if ses='reduced' then ses2=2;
if ses='full' then ses2=3;
if spe_edu='yes' then spe_edu2=1;
if spe_edu='no' then spe_edu2=2;
run;

*****.
*try the standard ANOVA (may not be appropriate here);
proc glm data=four;
class spe_edu;
model dis_ref=spe_edu;
run;

*****.
*Nonparametric Kruskal-Wall test, which is the
*nonparametric counterpart of the standard ANOVA method;
proc npar1way data = four;
class ses;
var dis_ref;
run;

proc npar1way data = four;
class race;
var dis_ref;
run;

proc npar1way data = four;
class spe_edu;
var dis_ref;
run;

*****.
*build a generalized linear model
*(Poisson regression model with overdispersion effect);
proc genmod data=four;
class race ses spe_edu;
model dis_ref=ghsgt race ses spe_edu
/dist=Poisson type3 scale=pearson;
run;

```

## APPENDIX E

### R CODE TO DRAW THE HISTOGRAMS IN THE STATISICAL ANALYSIS

**The following is the R code to draw the histograms in the statistical analysis**

```
#####  
# R code to draw the histograms for GHS GT English/Reading  
# test scores and Number of discipline referrals  
#####  
  
#set working directory  
setwd("D:/Dissertation/Mark/")  
  
#input the dataset  
mark.data <- read.csv(file="D:/Dissertation/Mark/disserdata.csv", sep="," , header=T)  
  
#Histograms for all paneled students  
#1.Histogram of test scores  
hist(mark.data$testscore, main = "Histogram of test scores", nclass = 10, col="blue",  
xlab="GHS GT English/Reading test scores", cex.lab=1.5)  
  
#2.Histogram of number of discipline referrals  
hist(mark.data$numdiscipline, main = "Histogram of number of discipline referrals", nclass = 10,  
col="blue", xlab="Number of discipline referrals", cex.lab=1.5)  
  
#Histograms for paneled students who are at least 3 years below reading level  
#1.Histogram of test scores  
hist(mark.data$testscore[mark.data$testscore <180], main = "Histogram of test scores", nclass =  
10, col="blue", xlab="GHS GT English/Reading test scores", cex.lab=1.5)  
  
#2.Histogram of number of discipline referrals  
hist(mark.data$numdiscipline[mark.data$testscore <180], main = "Histogram of number of  
discipline referrals", nclass = 10, col="blue", xlab="Number of discipline referrals", cex.lab=1.5)
```