

DO MINUTES MATTER? CONNECTING TARDINESS
TO ACADEMIC ACHIEVEMENT

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Dissertation Prepared for the Degree of
DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2014

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Taylor, Tresa S. *Do Minutes Matter? Connecting Tardiness to Academic Achievement*. Doctor of Philosophy (Curriculum and Instruction), August 2014, 96 pp., 10 tables, 1 figure, references, 173 titles.

Within the scope of all that is expected to be accomplished in education, what difference does a tardy make? This study was designed to examine the significance of tardiness, as it relates to student achievement, as measured by the results of the state math test. It also investigated the generation of change by the campus administrator to improve punctuality, with a new method of enforcing the tardy policy with the use of an electronic data system. This study used archived data from the one high school in a suburban school district in Texas. From a student population of 2,631, two subject groups of 919 and 1,310 were determined.

Spearman rho results confirmed a moderate inverse relationship between student tardiness and results on the state math test. Descriptive discriminant analysis indicated that tardiness contributed to 25% of the variance in the results on the state math test, when considered alone, and had a smaller contribution when considered with other variables. A visual review of the data portrayed an inverse relationship between the occurrences of tardiness and the pass/fail results on the state math test; as tardiness increased, passing rates decreased. Wilcoxon signed rank test results revealed a reduction in the magnitude of tardiness with the implementation of a new method of enforcing the tardy policy.

Tardiness does impact academic achievement, as affirmed in this study. Also, the campus administrator can implement changes that improve punctuality. This study signified that the phenomenon of tardiness should be given greater consideration as a factor impacting both cognitive and non-cognitive development and endorsed that minutes do matter.

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ACKNOWLEDGEMENTS

There are so many people who have helped me in this journey. I appreciate each and every one. Words cannot begin to express my gratitude for my children and their sacrifice on this journey. I extend thanks to my committee. I know there were times when you thought I might not finish the journey, but I did with your assistance. My heartfelt thanks and eternal gratitude to Rick; you inspired me when I wanted to quit and have been the ultimate friend and mentor.

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CHAPTER 1

INTRODUCTION

Background

The education of the youth in America has historically been viewed as important and necessary to the existence of a civilized democracy. The duty of the educational system is to educate the whole child, preparing the child to be a productive member of society. Currently, school districts are being charged with demonstrating increased student academic achievement while decreasing incidents of student discipline. The current level of accountability is more extensive than it has ever been and is not expected to diminish. Academic achievement and discipline issues interact like the see-saw once found on the elementary schoolyard playground; one goes up while the other goes down. Scott and Barrett (2004) stress that “simply maintaining successful behavior greatly increases the likelihood of positive academic engagement” (p. 23).

Within the scope of all that is expected to be accomplished in education, some ask, what difference does a tardy make? It is just a matter of minutes; do those minutes matter? Tardiness affects not only the student who is late for class, but also the other students in class, the teacher instructing the class, the administrators imparting discipline, school district ratings, eventually reaching work places, and in extreme cases, expanding court room dockets with potential financial costs to parents. Johnson-Gros, Lyons, and Griffin (2008) proclaim public schools are under scrutiny to improve student, classroom, school, and district outcomes. It is important to know what difference tardiness makes in the improvement efforts.

Tardiness is a form of truancy (Jones & Lovrich, 2011) and often is a precursor to or associated with other delinquent behaviors (Christenson & Thurlow, 2004). Truancy is a pervasive problem across the nation (Henry & Huizinga, 2007) and holds serious consequences

for the individual student, the family, and society (Jones & Lovrich, 2011). The consequences of problematic attendance have immediate and long term effects, as the problem behavior often continues throughout life (Lounsbury, Steel, Loveland, & Gibson, 2004).

School drop-out rates are considered an area of concern. Research has demonstrated that there are higher rates of absenteeism and tardiness among high school dropouts (Heilbrunn & Seely, 2003), along with a history of a higher frequency of negative behaviors among dropouts (Hickman, Bartholomew, Mathwig, & Heinrich, 2008). Students who drop out of school actually begin disengaging from school long before formally dropping out. Smink and Schargel (2004) describe dropping out of school as a process, not an event. Tardiness often occurs throughout the process, beginning early in the student's educational career (Alexander, Entwisle, & Kabbani, 2001).

Problem behaviors, including tardiness, result in office discipline referrals. Irvin, Tobin, Sprague, Sugai, and Vincent (2004) found that office discipline referrals serve as an indicator of school-wide behavioral climate. Defining the issue more specifically, Johnson-Gros et al. (2008) reported that 50% of problem behaviors occur in a non-class setting, and tardy students are not in class. The academic effectiveness of the school is directly impacted by the social-behavioral climate of the school, claimed Gottfredson (2001). "School characteristics and practices can influence rates of absenteeism and truancy among students," concluded Epstein and Sheldon, (2002, p. 309). These factors help explain why school climate is considered as one measure of effective school leadership (Hallinger, 2003).

Time spent by administrators altering tardy behavior on their campuses is time well invested in removing a direct negative impact on academic achievement acknowledged Fish, Finn and Finn (2011). As professed by Sprick (2003), tardiness causes a loss in instructional

time. In addition to the instructional time lost by the tardy student, is the loss incurred by the remainder of the class with the interruption that occurs when the tardy student enters class testified Reid (2008). One of the most consistent findings in educational research is strong correlation of academic learning time with achievement (Gettinger & Seibert, 2002).

Significant changes in the leadership role of the school principals have occurred since the passage of the No Child Left Behind Act of 2001 (Wohlstetter, Datnow, & Park, 2008). There are increased expectations that the primary role of the principal will be that of the instructional leader. As highlighted by Ylimaki, Jacobson, and Drysdale, (2007), increasing student achievement and raising standardized test scores have become even greater focal points for school administrators with the current high level of accountability. The leadership practices of the school principal have a significant effect on student learning (Lambert, 2002). This reality places greater emphasis on the responsibility of the administrator, as the instructional leader, for ensuring an optimal learning environment for all students.

Previous Research

The research on the correlation between attendance and academic achievement is well established within the literature. Lamdin's (1996) empirical analysis of data from 97 public schools confirmed that student attendance is positively and significantly related to academic achievement. Using data from school districts within two large cities, Johnson (2000) described the significance of attendance as related to performance on state tests. Nichols (2003) acceded that attendance is a critical predictor of student achievement after conducting research to discover factors that may put students at risk for failing Indiana state proficiency tests in math and English language arts. The research of Chen and Lin (2008), which expanded on existing

research dating back to 1954, showed the correlation between interrupted attendance and diminished student performance on exams. Burd and Hodgson (2006) found similar results in their five year study, when looking at the correlation between attendance and attainment, as measured by the final exam. A secondary analysis of national data on attendance, conducted by Chang and Romero (2008), corroborates the immediate impact on academic performance of chronic absences, and details further negative impact in later years. While there is ample research on the effects of absenteeism, the research on the phenomenon of tardiness is sparse, particularly as it relates to academic achievement. Most of the studies provide information on tardiness as additional information gathered during the search of information for another phenomenon, such as absenteeism, dropping out, or delinquent behavior. Studies exist related to the perception of tardiness as a problem behavior and an interruption to the teaching process. The research establishes the existence of the problem of tardiness extending from the pre-school level through high school, and students that begin their educational careers with attendance issues most often continue with that pattern. A few studies have been completed which look at the impact of positive behavior supports on reducing tardy behavior. Overall, the amount of research on tardiness is disproportionate to the magnitude of problems associated with tardiness.

Statement of Purpose

The topics of tardiness and improvement to attendance are significant to multiple stakeholders in light of their reciprocity with academic achievement and the development of lifelong behaviors. The purpose of this study was to see how minutes matter by looking at the relationship between tardiness and academic attainment, as measured by results on the state math exam. This study considered how the campus administrator, as the instructional leader, can

engender a change to improve punctuality, with a successive increase in the academic learning time.

Research Questions

The objective of this study was to probe the phenomenon of tardiness and to consider what possible relationship it might have with academic achievement. Another purpose of the study was to consider the role of the administrator as the implementer of change to improve performance at a campus level. The following questions were proposed to guide this study:

Research Question 1: What is the relationship between tardiness and academic achievement, as measured by the results of the state math test?

Research Question 2: When compared with other independent variables (Age, Excused absences, Unexcused absences, Semester 1 exam grade, Semester 1 grade, Semester 2 exam grade, Semester 2 grade), how well does tardiness predict the academic success of a student, as measured by the state math test?

Research Question 3: At what level of frequency does tardiness relate to academic achievement, as measured by results on the state math test?

Research Question 4: What effect does a change to the method of enforcing the tardy policy by using an electronic data system have on the magnitude of tardiness?

Overview of Methodology

This study used archived data from the one high school in a suburban school district in Texas. Subjects were selected from the total student population of the school. Two subject groups were determined. To be included as a subject for either group, it was necessary that the student had been enrolled in the school for both years that were considered in the study: the year of implementation of tracking tardiness with an electronic system and the prior school year. An additional requirement for one of the subject groups was that the student had to have taken the state math (TAKS) test both years that were considered in the study. This requirement was for

the TAKS test only; students who took the modified or alternate versions of the test were not considered for this subject group.

The district used a web-based student information system, which integrated demographic, attendance, grading, scheduling, and discipline data. Archived data, stored electronically, was acquired for the subjects, after the removal of identifying information. The data were compiled from the 2008-09 school year, the year prior to the implementation, and the 2009-10 school year, the year of implementation of the new method of tracking occurrences of tardiness with the electronic data system. Various statistical techniques were selected for analysis of the data, as part of the process to discover the answers to the research questions developed for this study.

A Spearman's rank correlation coefficient analysis, or Spearman rho, was applied to data collected at one school to determine the relationship between tardiness and academic achievement, as measured by the results of the state math test. The results of this analysis were used to look at the correlation between two sets of data: the tardiness of the student, the independent variable, and the students' scored results on the state math test, the dependent variable. The resulting correlation coefficient provided insight to the direction of the relationship, as well as the magnitude, or strength, of the relationship for Research Question 1.

A descriptive discriminant analysis (DDA) was used for Research Question 2. This analysis was used to examine how well tardiness predicts the academic success of a student, as measured by the state math test, when compared with other independent variables. The other independent variables that were compared with tardiness included Age, Excused absences, Unexcused absences, Semester 1 exam grade, Semester 1 grade, Semester 2 exam grade, and Semester 2 grade. The pass/fail results of the state math test were the dependent variables. The results of the analysis provided insight as to how much each the independent variables

contributed to the overall discrimination of each group (pass/fail). The DDA identifies the contribution of each independent variable to its portion in each group (pass/fail).

A graphical/visual analysis was used for Research Question 3. The visual representation illustrated what level of frequency occurs for tardiness to have an impact on academic achievement, as measured by the results of the state math test. Charts and a graph were used to compare the occurrences of tardiness of students that passed the state math to the occurrences of tardiness of students that failed the state math. The visual representation allows an obvious detection of the correlation between occurrences of tardiness and the results on the state math test.

Wilcoxon signed rank test was the statistical analysis used for Research Question 4. This question considered the effect a change to the method of enforcing the tardy policy had on the magnitude of tardiness, with the use of an electronic data system. The tardiness count of the student body was the dependent variable. The independent variables were the old method of enforcing the tardy policy and the new method implemented with an electronic data system. Data from this analysis provided assistance in understanding if the new method of tardy enforcement made a difference, as evidenced by lower tardiness numbers.

Definition of Terms

The following terms are defined for consistency and clarity throughout the study.

Academic achievement: Successful outcome on the state math (TAKS) test, as determined by a score that the Texas Educational Agency considers a passing result.

Electronic data system: A web-based software program with applications that allow access to student, school, and district data. Access can be provided to parents, in addition to teachers and administrators. Data can be accessed remotely. An example is Skyward, which was

used at the high school in this study. This type of system is a component of a management information system (MIS).

Excused Absences: A temporary absence from school that meets the criteria set forth in Section 25.087 of Texas school law, as defined by Texas Education Agency (2014).

Semester 1 grade: The final grade reported by the teacher for the student in the fall semester of an academic year.

Semester 1 exam: The reported grade for the student on the fall semester exam.

Semester 2 grade: The final grade reported by the teacher for the student in the spring semester of an academic year.

Semester 2 exam: The reported grade for the student on the spring semester exam.

Tardy: The failure of a student to be in the assigned class at the conclusion of the transition period.

Texas Assessment of Knowledge and Skills (TAKS): A criterion-referenced test administered to students in grades 3 through 11. Areas of assessment include reading, English language arts, math, writing, science, and social studies; areas of assessment vary by grade level.

Unexcused Absence: A temporary absence from school that does not meet the criteria set forth in Section 25.087 of Texas school law, as defined by Texas Education Agency (2014).

Significance of the Study

“At the core of school improvement and education reform is an assumption so widely understood that it is rarely invoked: students have to be present and engaged in order to learn” (Chang & Romero, 2008, p. 1). Good attendance is considered to be a sign of an effective school (Roby, 2004). The review of existing literature revealed numerous studies supporting the fact

that good attendance has a significant and positive impact on academic attainment, while attendance problems have a significant negative impact with potentially lifelong effects. Studies included in the literature review indicated that school administrators and teachers consider tardiness to be a major problem within the school setting. When students are tardy, they are missing instruction and increasing the likelihood that they will be involved in other problem behaviors (Sprick & Daniels, 2007). The minutes spent in tardy behavior come at a high cost to the individual student, with a far reaching ripple effect. Chronic tardiness indicates a need for a systemic level of intervention (Kartub, Taylor-Greene, March, & Horner, 2000). Implementation of a system change which promotes student academic performance while decreasing discipline concerns promises to be a win-win for all stake holders. Although there are studies that looked at attendance, their primary focus was on student absences. Making improvements to behaviors of tardiness is an area that has not been given much consideration as a means to accomplish the goal of increasing academic attainment. “In light of the considerable amount of instructional time that can be lost as a result of chronic tardiness, there is a need for more research investigating how schools can increase student punctuality” (Tyre, Feuerborn, & Pierce, 2011, p. 133).

This study specifically examined the impact of tardiness on high school students’ academic attainment, as measured by their performance on the state math test. It is hopeful that the results of this study will increase the awareness of the impact of tardiness on achievement, both on an academic level and in the development of lifelong skills. The results of this study reveal how much minutes do matter and suggest targets that should be considered for improvements. Given the current expectation for schools to demonstrate the academic gains of students, it is important to give careful consideration to measures that provide a positive impact.

The California Department of Education (2013) alleges “many times, at-risk students are those who are most likely to be chronically tardy or absent” (p. 1). The benefits availed by a decrease in behaviors of tardiness could extend beyond the students’ potential for improved academic attainment to the development of important non-cognitive skills. Benefits may be realized by other students and teachers due to less interruption to instructional time. Administrators potentially will be afforded more time to devote to instruction with fewer discipline concerns. The benefits continue to multiply with more graduates who are able to be productive citizens in society. The awareness brought to the magnitude of the impact of tardiness and the far reaching benefits associated with improvement to tardy behavior support the significance of this study.

Limitations of the Study

Limitations exist within every study. It is the duty of the researcher to be cognizant of the limitations that exist within the study. Generalization of the results of the study must be done with caution when the population for the research is from one setting or school, as is the case in this study. Internal validity is the occurrence of events that could alter the outcome of a study and must therefore be considered. For this study, those occurrences could include maturation of students as a potential impact on reduction in the occurrences of tardiness and external events closely associated with the day of state testing whose scores were used as measures of achievement. There is not a measure of maturation of the students within this study, therefore it is impossible to know if or how much maturation produced variation in results. Data are not available to determine if a particular student, or group of students, had a traumatic event in their personal lives in the time surrounding the day of the state test which could affect their performance on the test. The potential differences among the grading practice of teachers create

the need for the use of caution when comparing exam grades or semester grades and could comprise some of the dependent variables for this study. Another factor with potential to cause variance in the results of the study is the level of teacher cooperation in the adjusted tardiness procedures that are part of the change instituted by the school leadership. While there was an expectation that all teachers would act in accordance with the new procedures, and to the knowledge of this researcher all teachers complied with the expectations, there is no verification that there was 100% compliance of the new procedures.

Delimitation of the Study

A delimitation of a study considers areas that are not included in the study. A delimitation of this study is that an analysis was not conducted on the effect of the school as a whole, in terms of resources saved (i.e. teacher time, administrator time) or the extent of the benefits brought about by any improvement to tardiness rates. While that information could prove beneficial, it was not a consideration at the time of the implementation of the new method for tracking tardiness patterns.

Summary

Both direct and indirect factors can influence a student's level of academic achievement (Roby, 2004), but the "school conditions are under the control of educators and may be altered to better support student learning" (Baker et al., 2001, p. 406). Pervasive tardiness is a sign that expectations for punctuality are unclear and/or consequences are either not being implemented or proving to be ineffective (Tyre et al., 2011). Principals must be agents of implementation and change for schools to improve in response to elevated standards and required assessments

(Conley, 2003). The principal, as the instructional leader, is responsible for addressing the issue of tardiness. A reduction in tardiness behavior curtails time spent in the non-classroom setting, increases exposure to instructional time, supports development of important non-cognitive skills, decreases the potential for additional delinquent behaviors, and ultimately results in greater academic attainment. Improvement to tardiness patterns benefits not only the individual student, but also classmates, the teacher, the administrator, the campus, the school district, the family, and society. The problem of tardiness is serious and needs to be addressed (Zierold, Garman, & Anderson, 2005). Protheroe (2005) asserted the principal must “accept responsibility for identifying and addressing problems that act as barriers to developing and maintaining an orderly school climate” (p. 43). Tardiness behavior is a barrier to an orderly school climate, in addition to being a barrier to academic achievement and the development of important lifelong personal skills.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

This review of the literature examines the issues of tardiness and the associated problems, how minutes matter in education, the connection of the tardy bell to behavior, and the duty of the administrator to correct tardiness behavior, with consideration of the role and importance of education in the United States. The literature review begins with a review of the role of education in the United States and the early recognition of the importance of education for children. The current status of education and the role of accountability are then taken into account. The connection of attendance to academic attainment, including performance on exams follows. After the establishment of the impact of attendance on academic attainment, the issue of tardiness is brought forward, determining that tardiness is perceived as a problem. Because tardiness is a form of truancy, and truancy is a large problem in the United States, an examination of the problem ensued. Truancy is considered a warning sign, frequently associated with other problem behaviors and often associated with students dropping out, with roots that run deep and wide, which is consequently studied. Because student engagement is vital to counteract truancy, the role of engagement, which includes the pro-social development of children, is considered next. This leads into deliberation about the role that the social-behavioral climate of the school has on the academic effectiveness of the school. Within the review of the social-behavioral climate are the areas of discipline, tardiness, and the role of the school administrator in ensuring an environment conducive to maximizing academic achievement. Subsequently, the issue of tardiness and its impact on engagement and academic learning time is contemplated.

This is summed up with the research supporting more effective use of school time as a critical concern.

This concern substantiates the need for the administrator to consider what changes may be needed within the routines of the school day to optimize academic learning time. The review then looks at the role of the administrator as being an agent of change and implementing the necessary changes for improvement. Attention is turned to the review of literature on the usefulness of a management information system for data collection, followed by a review of the need for data monitoring. The literature review ends with acknowledgement of a study program being implemented by the Texas Educational Agency for a new data system that would allow for better tracking of student tardiness.

The Role of Education in the United States

“Historically, the system of free public education in our nation has reflected the American citizenry’s recognition of the importance of education in a democracy” (McCarthy, 2000, p. 32). The importance of education for children was actualized soon after the arrival of the Mayflower, in 1635, when the town officials of Boston sought to hire a schoolmaster “for the teaching and nurturing of children” (Cremin, 1970, p. 180). The Old Deluder Satan Act of 1647 required towns in Massachusetts with fifty or more families to provide instruction in reading and writing. In 1708, education of the youth was encouraged to prevent ignorance that could result in conduct with the potential to threaten the survival of the civilization (Mather, 1828). During the Early National Period of education in the 18th century, men like Ben Franklin, Noah Webster, Benjamin Rush and Thomas Jefferson avowed that an educational system was paramount to the survival of the new Republic. Noah Webster esteemed the role of education as the most

important business of civil society. As noted by Wagoner (2004), Jefferson stated that “if a nation expects to be ignorant and free in a state of civilization, it expects what never was and never will be” (p. 14). Rudolph (1965) recalls how Benjamin Rush challenged the view held by some of his contemporaries that public schools caused more harm than good, a view that was grounded in their disapproval of taxation to support the schools. Rush reasoned that

shall the estates of orphans, bachelors, and persons who have no children be taxed to pay for the support of schools from which they can derive no benefit? I answer in the affirmative to the first part of the objection, and I deny the truth of the latter part of it.... The bachelor will in time save his tax for this purpose by being able to sleep with fewer bolts and locks on his doors, the estates of orphans will in time be benefited by being protected from the vantages of unprincipled and idle boys, and the children of wealthy parents will be less tempted, by bad company, to extravagance. Fewer pillories and whipping posts and smaller jails, with their usual expenses and taxes, will be necessary when our youth are more properly educated than at present. (pp. 6-7)

The 19th century hosted social and educational changes. There was a population shift from primarily rural-agricultural to urban-industrial societies. Contemporaneous to the urban shift, was the influx of immigrants. Between the years of 1846-1856, 3.1 million immigrants came to the U.S., a number equal to one eighth of the total U.S. population at that time. At the forefront of the Common School Movement, Massachusetts passed a law in 1827, making all grades of public school open for the students, free of charge. Massachusetts was first to enact a compulsory school attendance law in 1852; currently all states have mandatory attendance laws. Horace Mann, known as the father of the common school, enounced "education ... is the great equalizer of the conditions of men, the balance wheel of the social machinery" (Cremin, 1957, p. 65).Educators today make “decisions regarding instructional and disciplinary practices in the context of multiple - and sometimes conflicting - cultural values concerning the roles of schools in our society” (Irvin et al., 2004, p. 131). The education and enrichment of the current

heterogeneous student population represents “the cornerstone for the continued success and well-being of this nation” (Shoenfelt & Huddleston, 2006, p. 683).

Current Status of Education in the United States

“Pressure for increased school accountability is a distinctive hallmark of the present period of educational reform” (Elmore, 2007, p. 134). Numerous references document that there is a high level of accountability for outcomes in public schools on multiple levels: district, campus, classroom, and the individual student (Johnson-Gros et al., 2008; Putnam, Handler, Rey, & McCarty, 2005). Schools are increasingly held responsible for meeting performance standards and eliminating achievement gaps (Conley, 2003). Performance accountability is a focal point of federal and state policies (U.S. Department of Education, 2002). Standards and test-based accountability have become staples in the environment of America’s schools (Spillane, Parise, & Sherer, 2011). Public Law 107-110, most commonly known as the No Child Left Behind Act of 2001 (U.S. Department of Education, 2002) is the reauthorization of the Elementary and Secondary School Act of 1965 and set high standards of accountability for schools to show adequate yearly progress for each student, among other provisions, such as having a highly qualified teacher in every classroom. As noted by Elmore (2004), under the No Child Left Behind Act, 95% of the student body, as well as 95% of each subgroup within the student body, are expected to be proficient on the state assessments of reading and math. With the accountability beget by No Child Left Behind (NCLB), each school district is responsible to report accountability results to their state (with the exception of Hawaii, where the whole state is comprised within one district). District data are generated for each campus, further broken down by classroom, and finally performance results for every individual student is actualized (Conley,

2003). The graduation rates for high schools are also an indicator of the school's performance and an accountability measure under No Child Left Behind. Roby (2004) claims strong attendance is an indicator of an effective school. Reid (2006) declared that raising standards and making improvements to attendance are essential for school improvement. Students at schools with higher attendance rates typically realize better performance on achievement tests than students at schools with lower attendance rates confirmed Sheldon (2007). Fredricks, Blumenfeld, and Paris (2004) opine that "even though attendance is compulsory, establishing a commitment to education is essential if youth are to benefit from what schools have to offer and acquire the capabilities they will need to succeed in the current marketplace" (p. 60).

The Connection of Attendance and Attainment

Student attendance is positively and significantly related to academic achievement, concluded Lamdin (1996) based on the empirical analysis of data from 97 public elementary schools. The importance of attendance is critical throughout the student's life, but can have significant impact when chronic absences occur in the early years during the period when basic academic skills are being developed, attributing to interference with future academic progress. This is supported in the report by Chang and Romero (2008), funded by the Annie E. Casey Foundation, a private charitable organization with a focus on improving the future of disadvantaged children, through a secondary analysis of national data on attendance. The report maintains that "chronic absence in kindergarten has an immediate impact on academic performance" (p. 5) and those students subsequently display inferior abilities in math, reading, and general knowledge in first grade. This is further exhibited in an analysis of data on attendance, obtained from the National Center for Children in Poverty and executed by Chang

and Leong (2012). The analysis conveys low plausibility that a students who had been chronically absent in kindergarten and first grade would be reading proficiently in third grade. Even when attendance improved in third grade, the students with chronic kindergarten absences performed lower in fifth grade. An investigation was conducted by the partnership of ECONorthwest, Children’s Institute, the Chalkboard Project, and Attendance Works, using data compiled by the Oregon Department of Education. Using their interpretation of the results of the investigation, Buehler, Tapogna, and Chang (2012) point out that the “researchers found the absences starting in kindergarten predicted poor attendance and lower achievement in the years ahead” (p. 1).

In an effort to validate the findings of previous research regarding attendance and attainment, Burd and Hodgson (2006), expanded on the research using data that covered a five year period for five courses. The research results indicated a correlation between attendance and attainment, as measured by the final exam. The correlations were “significant to the 0.05 confidence level and are therefore unlikely to be due to chance” (p. 3). Current accountability measures rely heavily on student achievement being demonstrated through state exams. Nichols (2003) conducted research to discover factors that could help determine which students were at risk of failing the Indiana state proficiency exam in mathematics and English language arts, using data collected from the graduation classes of 2000 ($n = 2000$), 2001 ($n = 2056$), and 2002 ($n = 2364$). Based on the results of his study, Nichols determined that attendance “remains a critical predictor of student achievement” (p. 120). Chen and Lin (2008) reviewed existing research, dating back to 1954, of the relationship between class attendance and exam performance, and expanded on this research by using a randomized experimental approach.

Their research results supported the existing research, showing diminished student performance on compulsory exams to be linked to interrupted attendance.

Attendance has an impact on achievement; good attendance has a positive impact while poor attendance has a negative impact (Arulampalan, Naylor, & Smith, 2008; Marburger, 2006; Roby, 2004) and the positive impact may be even greater than historically thought (Johnston, 2000). Data collected in studies completed by the school districts in Minneapolis, MN and Rochester, NY, were used by Johnston (2000) to portray the significance of attendance. The study in Minneapolis revealed that students with attendance rates of 95% were twice as likely to pass the state language arts test as those with an 85% attendance rate. Rochester's data indicated that students scoring 85 - 100 on the state English test had attendance rates of 93% or higher, while students with an 85% attendance rate scored below the 54th percentile. Johnston (2000) cites Stuart Biegel, a professor of education and law at the University of California, Los Angeles, "Attendance is so basic that education reformers too often ignore it" (p. 1).

The Issue of Tardiness

Showing up is an important aspect of school (Johnson, Crosnoe, & Elder, 2001). A student who doesn't show up on time is considered tardy. Tardy can be defined as a "student's failure to be in an assigned seat at the sound of the final transition bell or tardy bell" (Tyre et al., 2011, p. 135). Not showing up on time, or being tardy, is considered to be problematic, as shown in the study conducted Fish et al. (2011), who documented "the extent of misbehavior in tenth grade public high school students in 1990 and 2002" (p. 59). The study used two national databases: the National Education Longitudinal Study of 1988 (NELS88) and the Educational Longitudinal Study of 2002 (ELS2002). Perspectives of administrators, teachers and students on

student misbehavior were examined “to compare the type and extent of misbehavior among high school students during this time period” (p. 73). As detailed in the study, administrators perceived tardiness and absenteeism as the most problematic issues of student misbehavior with results being similar over time and among school locations. The data established that teachers perceived 5% of students to be frequently tardy, and the teachers’ perceptions were similar over time. Wiener (2010) asserts that tardiness is a concern even within the early childhood setting, as determined by a national survey of Head Start programs. The survey included rural, suburban, and urban settings. Teacher information collected in the survey expressed that in classrooms, with a maximum of 18 children, three to six various children were tardy on a weekly basis. Banicky and Janicki (2006) prepared the report for the School Board of Virginia Beach, Va. City Public Schools to provide them with information to assist in the goal to “increase support for teachers and administrators that will assist schools in maximizing the use of instructional time” (p. 2). Teachers and administrators from eight randomly selected schools within the district participated in the survey. Student tardiness was rated as a moderate or large impediment to instructional time by the majority of high school respondents and building administrators. Robers, Zhang, and Truman (2010) relay that the survey data collected from the 2007- 08 school year for the National Center of Educational statistics revealed that almost 34% of public education teachers either agreed or strongly agreed that student tardiness interfered with their teaching.

These studies clearly portray the problem of tardiness: existing from the preschool level through high school, continuing across time and geographic locations, impeding instructional time, and perceived as the most problematic issue of student misbehavior. Romero recently did an additional analysis on the attendance data previously used for A National Portrait of Chronic

Absenteeism in the Early Grades (2007). While the previous study focused on the absenteeism within the attendance patterns of 21,260 students from kindergarten through fifth grade, the new analysis concentrated on tardiness. (The results on the original study are discussed in greater detail later in this chapter.) Based on this recent analysis, Romero posted the following results for students with chronic tardiness in kindergarten: ten times as likely to be chronically absent in kindergarten and first grade; three times more likely to be chronically absent in grades three and five; weaker academic performance in math, reading, science, and world knowledge compared to the performance of peers who are never tardy (2013). Additionally, students with other at-risk factors are especially vulnerable to the effects of chronic tardiness.

Tardiness and Truancy

Tardy behavior is a form of truancy (Jones & Lovrich, 2011). As disclosed by Henry and Huizinga (2007) truancy is a serious concern in the United States, with such pervasive negative effects that truancy prevention was classified as a national priority by the Office of Juvenile Justice and Delinquency Prevention in 2003. “Truancy has been a persistent problem since the initial state legislative enactments requiring school attendance as a step toward creating the Jeffersonian vision of a literate and civically engaged citizenry” profess Jones and Lovrich (2011, p. 2). “Research into aspects of truancy and school absenteeism is increasing but there is no sign of the phenomenon decreasing in intensity” argued Reid (2008, p. 345). According to Puzzanchera and Sickmund (2008), this is depicted by an increase of 60% in the rates of petitioned truancy cases between 1995 and 2005. Heilbrunn’s (2007) review of research on truancy reminds the reader that dropouts are excluded from truancy data, masking the extent of

the problem. Henry and Huizinga (2007) state a need to “draw attention to the dearth of efficacious truancy prevention efforts in spite of the magnitude of the problem” (p. 1).

As summarized by Reid (2003), “research evidence clearly shows that the prevention and combating of truancy is continually hampered because of a lack of early interventions” (p. 5), with 35% of truancy issues beginning during the elementary years. This phenomenon is documented in several studies. Romero and Lee (2007) illustrate this with data from the Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS-K), conducted by the National Center for Education Statistics. This national longitudinal study followed a sample of 21,260 children who entered kindergarten in 1998, collecting data through fifth grade. Among the students in the study, 25% of kindergarteners, 21% of first graders, 17% of third graders, and 15% of fifth graders were either at risk or were chronically absent. These truancy concerns that begin early in the educational career have the potential to continue and grow. This pattern was upheld in the study completed by Plank, Durham, Farley-Ripple, and Norman (2009). Their study explored the pathways of 9,176 students that entered first grade in the Baltimore City Public School System in 1999-2000 over a period of seven years. During the 1999-2000 school year, when the students were in first grade, 18.4% missed at least one-ninth of their days of enrollment. Within that population, 5.3% missed at least two-ninths of their days of enrollment. For the next four years of the study, the levels of chronic absenteeism, with the students missing at least one-ninth of the days enrolled, remained close: 15.4% in 2000-01; 13.6% in 2001-02; 15.9% in 2002-03; 15.0% in 2003-04. When looking at the data from the 2004-05 school year, for the students who remained "on time" for sixth grade, an increase was noted in the level of chronic absenteeism, with 23.2% missing at least one-ninth of their enrolled days and 9.5% missing more than two-ninths of their enrolled days. The next year, 2005-06, had even higher

levels of absenteeism, with 29.0% missing at least one-ninth of their enrolled days and 13.0% missing more than two-ninths of their enrolled days. A review of attendance data collected by Oregon's Department of Education, conducted by Buehler et al. (2012), also found patterns of chronic absenteeism that started at 24% for kindergarteners, dropping to about 14% by third grade, and then peaking to 38% for students in 12th grade. Balfanz and Byrnes (2012) observed similar patterns of attendance when they combined data from several states and one national survey. Key points from their data review include: chronic absenteeism starts as early as kindergarten; attendance rates show improvement during the elementary grades and are at their lowest levels in third and fourth grades; the improvement noted during elementary years reverse in middle grades, with a rate that increases substantially throughout high school; the highest rate of absences are often in 12th grade; and while students that drop out often had patterns of chronic absenteeism, many graduating students miss significant amounts of school. As stated by Bruner, Discher, and Chang (2011), "a key ingredient for ensuring success in school is helping children – at the beginning of their academic careers - get into the habit of attending school every day" and that "chronic absence can be an important early warning sign that intervention may be needed to ensure a child is on the path to success" (p. 1).

As evidenced in truancy records, when a student is not in class there is a greater likelihood that they will be involved in illegal activities or manifest other serious disorder (Reid, 2004). Based on data from the U.S. Department of Education's survey of school principals ($n = 441$) that asked about the number and types of crimes the principals had reported to police for the 1996-97 school year, Cantor and Wright (2001) reveal a similarity in the rates of drug use and the rates of tardiness for the schools in the survey. Additionally, the group of schools with reports of violent crimes had higher than average rates of tardiness and drug use. Documented

frequently in literature, (Christenson, Sinclair, Lehr, & Hurley, 2000; Hallifors, Cho, Brodfish, Flewelling, & Khatapoush, 2006; Osman et al., 2002), when a student has a pattern of ongoing attendance problems, the student is at risk for other problems.

For their study of the relationship between selected risk factors and problem behaviors, Najaka, Gottfredson, and Wilson (2001) reviewed existing research and chose 87 existing studies which were reviewed, combined, and the results quantitatively summarized. The results signify a positive correlation exists among these problem behaviors: poor attendance, crime, delinquency, alcohol and/or other drug use, conduct problems. Boyles and Goodall (as cited in Reid, 2007) conducted research for Philanthropy Capital whose results attest to the long term damaging effects of truancy, which include lower educational attainment, poorer job prospects, poorer health, crime, and/or imprisonment. In their review of truancy literature prepared for the U.S. Department of Justice's Office of Juvenile Justice and Delinquency Prevention, Yeide and Korbin (2009) proclaim "truancy has been clearly identified as one of the early warning signs that youth are potentially headed for delinquent activity, social isolation, or educational failure. Research has shown that truancy is related to delinquency, substance use and abuse, high school dropout, suicidal thoughts and attempts, and early sexual intercourse" (p. 3-4) and "decades of research have also identified a link between truancy and later problems in marriage, in jobs, and with violence, adult criminality, and incarceration" (p. 4) .

From Truancy to Dropping Out: A Process

Bachman (as cited in Alexander et al., 2001) stated that dropout "... is the end result or symptom of other problems originating much earlier in life" (p. 27). The field of early indicators for high school dropout is underdeveloped, in spite of the fact that the issue of high school

dropouts has been seen as a problem for over 40 years (Jerald, 2006). The school dropout phenomenon has enough significance to have been addressed in No Child Left Behind. The recent focus on assessment and accountability gives further emphasis to the need to “discover possible predictors early in the students’ lives so that intervention strategies may be employed much earlier in their educational careers” (Nichols, 2003, p. 113). Dropping out of school is a process, not an event (Alexander et al., 2001; Smink & Schargel, 2004). Both cross-sectional and longitudinal studies of drop-outs reviewed by Epstein and Sheldon (2002) showed these students had higher rates of absenteeism that began very early in their school careers and increased in subsequent years. Students do not typically wake up one day and, out of the blue, decide that school is not for them. The drop-out process begins much earlier in their school careers and continuously builds until it culminates with the formality of "dropping out" of school. The U.S. Secretary of Education, Arne Duncan, made this point during a presentation to the Campaign for Grade-Level Reading, stating, “We know in pre-k and K who our students most at risk are, those students who are missing 15, 20, 25 days a year. We know right there if we don’t intervene, these are our future dropouts” (2011).

The “roots of dropout extend deep and broad” (Alexander et al., 2001, p. 763). In their report written for the Colorado Foundation for Families and Children and funded by the Colorado Division of Criminal Justice, Department of Public Safety, Heilbrunn and Seeley (2003) acknowledge that students fall behind academically when they are not in school, but ask “what else happens to them?” (p. 2). The answer they uncovered in their review of research is that “school dropouts are more likely to have higher rates of absenteeism and tardiness along with behavior and discipline problems while in school” (p. 3). Histories of negative behaviors, including high levels of absenteeism throughout their childhood, exist in high school dropouts

with higher frequency than found among high school graduates, as noted in the study by Hickman et al., (2008). The authors “theorized that early in their developmental pathways those students who eventually drop out of high school begin to look markedly different from their counterparts who graduate from high school” and examined “the differential developmental pathways of high school dropouts across each grade level of their academic tenure and across all variables recorded in their academic history” (p. 3 - 4). Their results of “multiple *t* tests demonstrated differences between high school graduates and dropouts as early as kindergarten. Further, the developmental progression of graduates and dropouts diverged over time, regardless of which subject data was studied” (p. 3).

The problems related to school dropout branch out widely. Employers spend great sums of money training undereducated workers, while taxpayers are burdened with increased taxes due to undereducated people who are either on public assistance or underemployed (Shoenfelt & Huddleston, 2006). Based on data from the 2000 census, 71% of individuals with a high school diploma were employed, while only 52% of those that had dropped out of high school were employed (Walker, 2007). Half of the welfare recipients and half of the prison population do not have a high school diploma (Alexander et al., 2001). In 1999, Vernez, Krop, and Rydell found the estimated cost to society for each high school dropout to be between \$188,086 and \$297,188. Heilbrunn and Seeley (2003) deduce that “School failure is so costly that there need only be minor success with truancy reduction programs in order to achieve a positive payback” (p. 16). Variables that were found to predict school attendance issues were the same as those found in previous studies to predict attendance issues in the work environment later in life (Lounsbury et al., 2004). Allensworth and Easton (2007) summarize “Improving graduation rates and reducing dropout rates are high-priority items on the national agenda for high-school reform” as

recognition grows “that a high school diploma is a minimum requirement for success in the workplace” and “nationally, nearly one-third of students do not graduate” (p. 1).

The Role of Engagement

Baker et al. (2001) affirmed that “schools, as educational and social institutions, organize themselves so that engagement is fostered or deflected” (p. 420). Yiede and Kobrin (2009) profess that “Engagement has been identified as one key element in preventing truancy” (p. 8). School engagement, is defined by Fredricks et al. (2004) as the interaction between an individual and the environment, and is seen as an antidote for student dropout. These authors further note the use of ‘commitment’ within the description of ‘engagement’ in various dictionaries. Morse, Christenson, and Lehr (2004) expand the definition, stating “student engagement usually includes participation in school activities and the student’s identification with school and the acceptance of school values” (p. 52). Their definition of participation “includes basic behaviors such as the student’s compliance with school and class rules, promptness in arriving at school and classes, attending to the teacher, and classroom participation” and clarified “identification encompasses a student’s sense of belonging, social ties and bonds, relationship with teachers, sense of safety and security at school, and the extent to which the student values school success” (p. 52).

Because dropouts begin disengaging from school long before they actually leave school, Garriott (2007) declares that it is important to intervene early to ensure graduation. Through extensive work with middle and high school students, Balfanz, Herzog, and Iver (2007), realized that “most of the students who eventually dropped out began disengaging from school long before.” (p. 224). Based on this, these authors used longitudinal analyses that followed almost

13,000 students from 1996 until 2004, to expose how certain predictive indicators in 6th grade students, who without intervention, could be used to identify 60% of the students who would not complete high school. The authors contend that the results from their study “confirm and extend prior findings suggesting that students who do not graduate do so in different but identifiable ways” (p. 230). Their study found the most common occurrence of early warning signs among sixth grade students was primarily having the single risk factor of poor behavior or poor attendance, or a combination of two risk factors.

As noted by Marks (2000), the process of school disengagement can begin early in the school career for students feeling that they do not fit in, do not participate, or do not experience academic success. “Adverse peer, school, and personal factors all affect children’s engagement with their education” (Reid, 2007, p. 24) and often result in negative outcomes. Henry and Huizinga (2007) use data from a large probability sample ($n = 1,528$), drawn from neighborhoods with high crime rates to identify key correlates of truancy. The findings indicated that “the two most robust predictors were school performance and involvement with delinquent peers” (p. 10). Further noted in their study, based on a meta-analysis of research studies, a great deal of empirical evidence suggests that a student’s lack of commitment and attachment to school are both important predictors of involvement in delinquency and other undesirable behaviors, therefore students who are disengaged from school are more likely to be involved in truancy. Conversely, behavioral engagement is evidenced with the demonstration of positive behaviors, such as following rules and the absence of negative behaviors, such as skipping class (Fredicks, et al., 2004).

School attendance and punctuality can be influenced by numerous factors, including the student. Students with low school bonds are less likely to be governed by social norms and are

more likely to exhibit problem behaviors (Hirschi, 1969). The child-motivated refusal to attend school, for either all or part of the day is defined by Kearney, Lemos, and Silverman (2004) as *school refusal behavior* (SRB). SRB refers to a spectrum of problematic absenteeism, including being tardy to school (Kearney, 2003). SRB can occur for one or more of the following reasons: “to avoid school-based stimuli that provoke a general sense of negative affectivity (anxiety and depression); to escape aversive school-based social and/or evaluative situations; to pursue attention from significant others; to pursue tangible reinforcers outside of school” (Kearney et al., 2004, p. 276). School plays an important role in determining pro-social development among adolescents (Henry & Huizinga, 2007). Feeling cared for by an adult within the school can help remediate causes of truancy (Virginia Department of Education, 2005).

Social-Behavioral Climate and Discipline

The social-behavioral climate of a school has a direct impact on the academic effectiveness of the school (Gottfredson, 2001; Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Horner, Sugai, Todd, & Lewis-Palmer, 2005; McIntosh, Chard, Boland & Horner, 2006; Walker & Shinn, 2002). Academic achievement is explicitly impacted by school climate (Brand, Felner, Shim, Seitsinger & Dumas, 2003; MacNeil, Prater & Busch, 2009). “Office discipline referrals (ODRs) are widely used by school personnel to evaluate student behavior and the behavioral climate of schools,” with higher levels of school-wide ODRs being associated with higher levels of problematic behavioral climates in schools (Irvin et al., 2004, p. 131). Further noted by Irvin et al. (2004), ODRs possess construct validity as a behavioral measure and have been highly correlated with a number of other behavioral measures. McIntosh et al. (2006) added, “ODRs are indicators of overall patterns of problem behavior” (p. 146). Disciplinary

problems continue to be one of the leading concerns facing schools, as perceived by teachers, parents, and students (Putnam et al., 2005; Safran, 2006). Maintaining discipline has become a higher priority with the preponderance of accountability requirements (Bear, Cavalier, & Manning, 2002). Reviews of office discipline referrals depict tardiness as a discipline problem. Johnson-Gros et al. (2008) conducted a study, reviewing the office discipline referrals issued in the fall semester for a high school ($n = 450$), which indicated that 38% of the office discipline referrals were issued for students' tardiness. Spaulding et al. (2010) in analysis of data collected from 1,510 schools nationwide ($n = 184,567$) for the 2005-06 school year, delineated that office discipline referrals at the high school level were most often for tardiness and skipping class.

Through a review of relevant research literature, Irvin et al. (2004) ascertained that problem behaviors resulting in ODR were positively correlated with ODR in subsequent school years ($p < .001$) and the "research findings have shown that the behavior problems that result in ODRs in school are likely to persist into adulthood" (p. 137). This would imply that tardiness behavior could continue to be a concern throughout the student's life, without intervention to correct the behavior. Both cognitive and non-cognitive traits are important in the workplace and both are developed through schooling (Heckman, Stixrud, & Urzua, 2006). Several aspects of accountability, autonomy, and choices are associated with non-cognitive outcomes, such as student morale and commitment, non-disruptive behaviors, disciplinary climate and tardiness (Wöbmann, Ludemann, Schutz, & West, 2007).

Teaching Interrupted: Do Discipline Policies in Today's Schools Foster the Common Good? (Public Agenda, 2004) is a study underwritten by the Common Good, a non-partisan policy group that focuses on legal issues in the United States. This study used national random sample surveys of 725 middle and high school teachers and 600 parents of middle and high

school parents. “The surveys offer a detailed look at the discipline issue, exploring its causes, the effectiveness of current policies, the impact on school climate, and receptivity to various solutions” (p. 1). Good student behavior is essential for teaching and learning to take place, as agreed upon by teachers and parents in the vast majority within this study. Good discipline and behavior are prerequisite for a successful school, according to 97% of the teachers and 78% of the parents. Tardiness was considered to be a serious problem to almost 6 out of 10 of the teachers surveyed. The survey results show the teachers’ belief that the overall atmosphere of the school and the enforcement of policies concerning student behavior were determined by the school’s leadership. The results disclosed that 89% of teachers agree that it’s the principal who sets the tone on discipline and order, with 53% saying they strongly agree.

Literature reveals that school climate is one factor that defines effective leadership (Chauncey, 2005; Fulton, Yoon, & Lee, 2005; Hallinger, 2003, p. 266). Research and practice have consistently demonstrated that a disciplined school climate that conveys order, a sense of community, and higher expectations for behavior for both staff and students has a positive effect on student learning. The principal can be a strong force for creating this type of environment (Protheroe, 2005). Administrators can use ODR data to appraise the level of implementation of the written school policies and the effects of interventions designed to alter student behavior as well as improve school and classroom climate (Irvin et al., 2004, p. 139). Additional survey results from *Teaching Interrupted* indicate that teachers and parents “favor solutions that cultivate an orderly school environment and provide a nip in the bud approach to student misconduct,” with 61% of teachers and 63% of parents strongly favoring the enforcement of “little rules on behavior to set the right tone at school and help avoid bigger problems” (Public Agenda, 2004, p. 33). The survey also showed that 58% of teachers and 60% of parents believe

that most students will behave appropriately when expectations are clear and rules are enforced. Setting clear expectations and standards are vital to the success of a truant student (Virginia Department of Education, 2005). The primary responsibility of shaping the school environment to facilitate optimal learning for students belongs to the school principal (Sergiovanni, 2008). It is the administrator's role to "accept responsibility for identifying and addressing problems that act as barriers to developing and maintaining an orderly school climate" (Protheroe, 2005, p. 43).

The Resource of Time and the Role of the Principal

Time that is used processing discipline referrals reduces the time that the administrator can spend on other activities, specifically instruction and learning (Scott & Barrett, 2004). Gupton (2010) asserted that the most critical part of the principal's job is to focus on student learning. The success of any organization is often dependent on the effectiveness of its leader (Drysdale, Goode, & Gurr, 2009). Increased accountability has sharpened the focus of school principals on increasing student achievement and raising standardized test scores (Wong, Nicotera, & Guthrie, 2007; Ylimaki et al., 2007). Alig-Mielcarek and Hoy (2006) testify that "Instructional leadership has become an increasingly important aspect of reforming and improving the performance of schools" (p. 29). NCLB calls for principals to have "the instructional leadership skills to help teachers teach and students learn" (NCLB, p. 146). The changes brought about by NCLB have influenced compelling changes in the leadership role of school principals (Institute for Educational Leadership, 2000; Firestone et al., 2001; Portin, Alejano, Knapp, & Marzolf, 2006; Vanderhaar, Munoz, Rodosky, 2006; Wohlstetter et al., 2008). School principals are changing how they define their responsibilities to focus more on leading and managing instruction (Spillane et al., 2011). Frequently communicated in literature, the

leadership practices of school principals have meaningful effects on student learning (DeMoss, 2002; Lambert, 2002; Leithwood & Riehl, 2003; Wagner et. al., 2006; Waters, Marzano, & McNulty, 2003). Elmore (2007) reiterates that “The purpose of leadership is the improvement of instructional practice and performance...” (p. 66). The Center on Education Policy (2008) echoed that improvements to curriculum and instruction, along with increasing student engagement time, are important to realizing better student outcomes.

Tardiness and the Impact on Academic Learning Time

Tardiness causes a loss in instructional time (Fish et al., 2011; Gettinger & Ball, 2008; Sprick, 2003). The study conducted by Spaulding et al. (2010), noted that a large portion of the ODRs (which most often were for tardiness and skipping class) resulted in some form of suspension or detention, which further “reduces the total number of instructional minutes available” to the student (p. 81). A large portion of students who are expelled do not receive any form of an alternative education opportunity (Wasser, 1999). Along with the loss of instructional time for the tardy student is the further impact of the tardy behavior on other students with interruption to their instructional time (Lazear, 2001; Ready, 2010; Reid, 2008). Time use studies, such as the one conducted by Smith (1998) for the Consortium on Chicago School Research, express the loss of school time occurs for various reasons, including interruptions to instruction. The late entrance of a tardy student interrupts instruction, and the interruptions occur repeatedly with each additional tardy student entering at a separate time. Consistent tardiness at the secondary levels increases exponentially the amount of lost instructional time over the course of an academic year (Sprick, 2003). The loss of just 1% of instructional time annually equals to a loss of 3,600 instructional hours, based on 400 students, 5 hours per day (Roby, 2004).

“Instructional time lost to widespread tardiness is likely to significantly affect the capacity of the entire student population to meet rigorous academic standards” (Tyre et al., 2011, p. 132).

Tardiness and the Impact on Engagement

Maximizing the learning time for all students is a practice of effective teaching (Gettinger & Stoiber, 1999). The importance of teaching methods and the student’s engagement in the learning process was noted years ago by Currie (as cited in Berliner, 1990) in the following passage from the teaching methods book *The Principles and Practices of Common School Education*:

The art of teaching [consists] of the means by which the teacher sustains the attention of his class. By attention, we do not mean the mere absence of noise and trifling; or that inert passive state in which the class, with eye fixed on the teacher, [gives] no symptom of mental life; not that intermittent and almost unconscious attention bestowed on some casual topic which strikes their fancy; not the partial attention given by a few . . . in the immediate neighborhood of the pupil addressed. The only satisfactory attention is that which is given voluntarily and steadily by all during the entire instruction and in which the mental attitude of the class is actively engaged along with the teacher in working out their own instruction. (p. 224)

A prerequisite for engagement in the instruction is for the student to be present in the learning environment. Tardiness encroaches on the learning environment of the classroom. The interruptions caused by tardiness interfere with the teacher’s instruction and the engagement levels of all students.

Gettinger states “the earliest and most extensive research program to examine the relationship between learning time and achievement was the Beginning Teacher Evaluation Study (BTES)” conducted by Denham and Lieberman (1980). The concept of academic learning time (ALT) was derived from that study and was found to have a strong positive correlation with academic achievement. Academic learning time is the time in which students are actually

engaged in learning. “Academic learning time is one of the most important correlates of achievement, and its linkage with learning is one of the most consistent findings in educational research” (Gettinger & Seibert, 2002, p. 13). The correlation between time and student achievement becomes stronger with increased engaged time (Silva, 2007). Efforts to increase student engagement have been a theme of school reform (Marks, 2000). The interconnections of engagement and academic attainment have the potential to produce important cumulative differences among students (Johnson et al., 2001). Increasing academic learning time helps schools in the effort to ensure adequate yearly progress (Center on Educational Policy, 2008). Dewey (as cited in Baker et al., 2001) emphasized that “educators have the responsibility to adjust conditions in schools until student learning and engagement is optimized” (p. 419). One of the best practices for increasing academic learning time is to assess the use of instructional time and identify areas that need improvement (Gettinger & Seibert, 1999). Decreasing tardiness behaviors is one way to adjust the condition in school that will increase instructional time for all students and allow for optimal engagement.

Use of School Time: A Critical Concern

The “current emphasis on accountability and assessment makes the effective management of school time more important than ever” noted Silva (2007, p. 9). The loss of instructional time due to chronic tardiness denotes a need for increased punctuality and reduced tardiness. Many factors have an impact on achievement, either directly or indirectly and some of the variables can be controlled (Roby, 2004). According to Miles (2000), schools need to rethink the use of resources, including time. Improvement of the use of time during the school day was among the top items recommended in the report *Getting Smarter, Becoming Fairer: A Progressive*

Education Agenda for a Stronger Nation (Brown et al., 2005). A considerable amount of time is spent each school day on planned non-academic subjects and activities such as transition between classes, announcements, and procedural/maintenance tasks. Instructional time can be increased with the better use of time (Tyre et al., 2011). An estimated 75 hours, or 15 days, are lost at the high school level each year due to the time spent changing classes and the beginning of class activities (Wöbmann, et al., 2007). Government regulations have increased the focus on the “core technical work of school”, that being instruction (Spillane et al., 2011, p. 586). Review of research confirms a high correlation between the time students are engaged with instruction and student achievement (Scott & Barrett, 2004). The logic of time reform could be simplified to more time in school will yield more learning and therefore a better student outcome, but not all time in school is equal (Silva, 2007). Classroom management and the efficiency of the structure of classroom activities has tremendous variability among teachers (Cohen, Raudenbush, & Ball, 2003), therefore great differences in the use of the allocated time for instruction exists, further resulting in variation of the amount of ALT, or engagement, of the student. Putnam et al. (2005) conclude “Our nation’s schools have a growing need for improved educational programming and system restructuring” (p. 521).

The restructuring of a system or routine necessitates a cost-benefit analysis. A cost-benefit analysis looks at the change in individual behavior and examines the impact of that behavior on the system as a whole. It is a comparative analysis of the benefits of the individual /system versus the cost of the intervention in terms of desired outcomes. The administrator “must determine and evaluate how change in individual behavior affects important outcomes in the system as a whole” (Scott & Barrett, 2004, p. 21). This entails looking at costs in terms of all resources, such as time, not just monetary costs. Baer, Wolf, and Risley (1987) contend the cost-

benefit analysis is “the essence of effectiveness” (p. 322). Chronic tardiness can significantly decrease instructional time and significantly impact the capacity of the entire student population to meet rigorous academic standards (Tyre et al., 2011). The routine of taking attendance uses the resource of time by the staff responsible for documenting the attendance. Instructional time is lost when the tardy student enters the room. Time is required for the administrator to process an ODR that the student receives due to tardiness/attendance problems. In extreme cases, additional resources are used when the student is referred for legal action within the court system. Improvements to the tardy behavior would then decrease the time needed to document the tardiness, increase instructional time, increase the time the administrator has to address other issues, such as instruction and learning, remove the potential expenditure of resources from legal action, and remove the negative impact on the potential of the rigorous academic standards not being met.

Changes to the Existing Routine

Principals must be agents of implementation and change for schools to improve in response to elevated standards and required assessments (Conley, 2003). Pervasive tardiness is a sign that expectations for punctuality are unclear and/or consequences are either not being implemented or proving to be ineffective (Tyre et al., 2011). Kartub et al. (2000) stress “If more than 3% of students are engaged in the same disruptive behavior, the environment, not the students, needs to change” (p. 179). It is the responsibility of the principal to examine the tardiness issue and determine what changes need to be implemented to rectify the problem. Routines can be defined as “recurring patterns of behavior of multiple organizational members involved in performing organizational tasks” (Feldman & Rafeli, 2002, p. 311). The taking of

attendance at school meets this definition of a routine. This is particularly true at the secondary level, where the routine of taking attendance is done multiple times each day, at the beginning of each class period. Organizational routines consist of the structure of the routine and the actual performance of the routine by specific people, at specific times, and in specific places (Feldman & Pentland, 2003). Certain features of a routine can contribute to potential change of the routine, as well as provide stability within organizations (Feldman, 1988). The stimulus feature defines the reason for the routine and it often results in the need for activities that are repetitive in nature. The history feature portrays how a routine has been used within the organization. The feature of rules, roles, and resources distinguishes how the routine is performed. Changes to a routine may occur to repair, expand, or thrive (Feldman, 2000). School routines may experience change by repair when the current routine does not provide a desired result or when new problems surface that require altering the routine. A routine requires expansion when unanticipated possibilities occur. Changes can also occur when the desired result of the routine is achieved, yet an attempt is made to increase the level of achievement. “Alterations in routines may occur not only to address problems or to overcome a difficulty with producing desired outcome (e.g. reduced tardiness to class) but also to help an organization realize continuous improvement” (Conley & Enomoto, 2009, p. 368).

Data Collection Using a Management Information System

“The primary rationale for high-quality attendance data is the relationship between student attendance and student achievement”, according to the National Forum on Educational Statistics (2009, p. 1). One method of performing the routine of taking attendance is with a paper based method of tracking attendance. Newman-Ford, Fitzgibbon, Lloyd and Thomas (2008) conclude

that this method is “fraught with intrinsic shortcomings, causing data inaccuracies” (p. 702), thus, from the perspective of Feldman (2000) presented earlier, indicating a need for repair changes to the attendance taking routine. Feldman further states that routine changes occur when other possibilities or new opportunities are considered. When changes to a routine are implemented they may be challenged at the beginning, but will become normalized over time (Spillane et al., 2011). Schools have begun to use technology, in the form of management information systems (MIS), to track student attendance, along with other student data (Daniels & Johnson-Ferguson, 2001; Wiley, 2004). The implementation of the system or additional uses of the system creates changes to existing routines; this change is a form of expansion to the existing routine of taking attendance. Management information systems “maintain, support, and provide inquiry, analysis, and communication tools that organize student accountability data into information to support the educational process” (Barrett, 1999, p. 1). Reasons for use of MIS include that increased accountability expectations can be met with the data collected and used in reporting accountability measures (McIntire, 2004). The use of MIS can assist the administrator in determining the areas of weakness for each student (Conley, 2003). It can also provide an overview of the school’s areas of strength and areas in need of improvement. Additionally, the use of the MIS can allow individuals outside of the school (parents) the capability to access information on the student (McIntire, 2004). While the parent doesn’t have the ability to view all the information within the system, it can provide feedback to the parent on attendance and grades. This can improve communication between the school and home (Telem, 2005) building strengthened connections. Schools can use the information collected in the management information systems to make “data-based decision making regarding student problem behaviors, administrative decisions, and the improvement of school climates” encourages Spaulding et al.

(2010, p. 84). These data-based decisions can help to serve the ultimate goal of connecting bells to behavior, by decreasing tardiness while increasing academic achievement and positive outcomes for the student.

Data Monitoring

Districts and schools should use existing data to monitor and identify students with attendance issues. No Child Left Behind requires school districts and their schools to monitor attendance and truancy. The U.S. Secretary of Education, Arne Duncan (2011), proclaims that 90% is not an “A” when it comes to attendance. The average daily attendance (ADA) is typically used as the measurement for attendance compliance and 95% ADA is often considered as a good attendance rate. Bruner et al. (2011) claim “this is not necessarily the case” (p. 2), giving an example of a school with 200 students that has 95% ADA. Within that school, it is possible that 30%, or 60 students could have chronic attendance issues, each missing nearly a month of school over the course of the school year. Hoachlander, Dykman, and Godowsky (2001) parallel an ADA of 90% or higher with making an A on a test; on the surface, an ‘A rating’ on the ADA seems commendable, but in reality, it is not what it seems. “This is one of the rare instances when 90% is not a good grade” state Balfanz and Byrnes (2012). “It is possible for a school to have 90% average daily attendance and still have as many as 40% of its students chronically absent because on different days different students are in school ” (p. 8). The authors include that the average daily attendance masks more than it reveals. It is important for the data to be analyzed to determine if the absences are from many students missing just a few days or a small number of students with chronic attendance issues. An example of this can be seen with a study conducted for Attendance Works and the Child and Family Policy Center.

School-by-school attendance information for elementary schools in three urban districts was obtained in an effort to help better the understanding of the relationship between ADA and chronic absence. The data included both the average daily attendance rate and the percentage of students who met the definition of chronic absenteeism. The information was then plotted and degree calculated to which the ADA could “explain” or “predict” the level of chronic elementary absenteeism (Bruner et al., 2011). The analysis found that: schools with ADA rates higher than 97% rarely have a problem with chronic absenteeism; with rates between 93 and 97% ADA, there was a need for closer examination to establish the scope of the problem; and there is an absolute likelihood that a high concentration of absenteeism exists when the ADA rate is below 93%. Districts and schools need to have a thorough understanding of the composition of their ADA and not just look at the overall ADA rating. The data need to be scrutinized to reveal any students with attendance issues so that interventions and supports can be implemented.

While the average daily attendance is used in compliance reporting, tardiness rates are not included in the reported data. The lack of required compliance reporting for tardiness may give a false sense that tardiness isn’t important. However, Young, Reddehase, Andrade, and Lindley (2011) declare that the tardiness rate is a key indicator of student success, particularly in the lower grades where attendance is taken only once a day, similar to the class period attendance for middle and high schools. Young et al. (2011) recall that tardiness rate was repeatedly named as needed for elementary students by participants in stakeholder meetings, with over 2,600 educators in attendance, conducted by the Texas Education Agency (TEA) in March and April of 2010. TEA is implementing the Texas Student Data System, a statewide system for collecting and reporting education data for publicly funded schools within the state of Texas. This system will provide additional data that will expand across years, to allow educators

to implement more individualized instruction and interventions. There are 100 local educational agencies that will begin using the system in the 2013-14 school year, with successive waves of implementation to follow, with all publicly funded schools being required to use the system by the 2016-17 school year. One feature of the Texas Student Data System is the Tardy Rate metric, which will enable educators to identify students who have missed an excessive amount of instructional time, track patterns of tardiness, allowing for immediate attention and intervention. The data can be aggregated by individual students or for the class as a whole. According to the TEA website, teachers ideally should review attendance and tardiness daily, but on a weekly basis at a minimum, to focus on issues before attendance declines or tardiness increases to a critical level. It denotes that, when coupled with other indicators of performance, closely monitoring tardiness can identify several early intervention opportunities. Further, it states that developing student ownership of and engagement in academics is critical to improving attendance.

Summary

The review of literature clearly narrates the importance of attendance in the form of absences on academic achievement; however there is a lack of literature on how tardiness can impact academic achievement. One theme that clearly resonates throughout the literature is "early": the problem of tardiness starts early, truancy in the early years continues and grows throughout the student's school career; early intervention is needed to prevent drop outs - considering that dropouts begin demonstrating problems as early as kindergarten, and the disengagement associated with tardiness becomes rooted early in the school years. The literature reiterates the value of the resource of time. It chronicles how minutes matter with the problems

caused by tardiness that includes the loss of instructional time to the tardy student and extends the loss to other students as instruction is interrupted. The literature exposes the extensiveness of the problem that begins with tardiness, as well as the snowball effect that occurs without intervention. The literature apprises the significance of tardiness for administrators as the resource of time is used processing office discipline referrals, reducing the time available to focus on instruction and learning. The multiple responsibilities of the administrator to be the instructional leader, enforce discipline, and shape the school climate all have a relationship with tardiness, as established in the literature. As featured in the literature, educators have a responsibility to optimize learning and engagement by adjusting conditions that act as barriers. The use of management information systems to enhance the process of tracking attendance is subscribed to in the literature. The realization that the tardiness rate is a key indicator of student success and the need for a closer examination of tardiness behavior is endorsed with the impending implementation by the Texas Educational Agency of a statewide system for tracking educational data that includes a tardy rate metric. The literature review clearly indicates a need for a greater awareness of the potentially significant negative impact of tardiness, or how the minutes matter in academic achievement and the development of lifelong skills.

CHAPTER 3

METHODOLOGY

Purpose Statement

The purpose of this study was to determine the significance of tardiness, as it relates to student achievement. Do minutes matter? The study examined how minutes matter by looking at the relationship between tardiness and academic attainment, as measured by results on the state math test in one high school and examined other potentially related factors. This study also considered whether the campus administrator, as the instructional leader, engendered a change to improve punctuality, with a successive increase in the academic learning time, by tracking tardiness with an electronic data system. This chapter includes a description of the design of the study and the selection of the subjects. Also described in this chapter is the methodology for data collection and the statistical treatments that were used to analyze the data collected for this quantitative research.

The purpose of educational research is to secure additional knowledge about a particular phenomenon, ideally with results that can be generalized (Popham, 1993). To explain the variability of a phenomenon of interest, the dependent variable, a study is conducted of its relations or co-variations with other variables, the independent variables (Pedhazur, 1997). Research contributes to the field of education with four types of knowledge: description, prediction, improvement, and explanation (Gall, Gall, & Borg, 2003). According to Gall et al. (2003), through descriptive research, information is collected, organized, and summarized about a phenomenon and the associated issues. The phenomenon is defined, measured, and clarified, offering a greater understanding of the phenomenon. Prediction research gathers information that predicts a phenomenon is likely to occur in certain circumstances: predicting the likely

success or failure of students, helping determine who may need prevention programs. Improvement research investigates the effectiveness of interventions by comparing the improvement of an average student who received the intervention to an average student who did not receive the intervention or received less of the intervention. The intervention is considered to have had a positive effect when the student receiving the intervention demonstrates a better performance than the student not receiving (or receiving less of) the intervention. The larger the positive effect, the more powerful the intervention is considered to be, and those with an effect size of .33 or larger are considered to be able to be beneficial. Explanatory research seeks to provide insight into the interrelationships that exist within and around the phenomenon being studied. Explanatory research may be referred to as causal research, as it seeks to explain the relationships or what causes the nature of the problem being studied. Gall et al. (2003) express that “Researchers ideally frame their explanations as theories about the phenomenon being investigated. A theory is an explanation of a certain set of observed phenomenon in terms of a system of constructs and laws that relate these constructs to each other” (p. 7).

This study contributes to the knowledge base of educational research in multiple ways. It is descriptive, as information about the phenomenon of tardiness and its associated issues are collected, organized, and summarized. While studies exist that have looked at the issue of attendance and its impact on academic attainment, including results on state tests, the phenomenon of tardiness and its impact on academic attainment, as measured by a state exam has not been studied. It is predictive, with the prediction of diminished academic performance when tardiness behaviors are high; confirmation suggests that these students need intervention and direct action is needed to implement a change to improve the tardiness rate. It is explanatory,

as insight into the interrelationships existing within and around the phenomenon of tardiness is provided.

Research Questions

Research Question 1: What is the relationship between tardiness and academic achievement, as measured by the results of the state math test?

Research Question 2: When compared with other independent variables (Age, Excused absences, Unexcused absences, Semester 1 exam grade, Semester 1 grade, Semester 2 exam grade, Semester 2 grade), how well does tardiness predict the academic success of a student, as measured by the state math test?

Research Question 3: At what level of frequency does tardiness relate to academic achievement, as measured by results on the state math test?

Research Question 4: What effect does a change to the method of enforcing the tardy policy by using an electronic data system have on the magnitude of tardiness?

Description of the School

This study used archived data collected in a suburban school district in large metropolitan area within the state of Texas. The school district is comprised of 3 high schools, 7 middle schools, and 21 elementary schools. The district also has an alternative school, which houses various programs, such as the career center, the program for pregnant or parenting teenagers, GED and credit recovery programs, the discipline alternative placement, and an intensive behavior classroom. The data used for this study are from one of the high schools. The campus meets the criteria to be a Title1 school but chose not to accept Title 1 funding. The campus discussed in this study was the first one within this suburban school district to implement the new method of enforcing the tardy policy. The school had 7 administrators, 9 counselors, 195 teachers, along with numerous other support staff and school personnel. The demographics within the student body of the high school are described in Table 1.

Table 1

Student Body Demographics

		2008-09		2009-10	
		<i>N</i> = 2725		<i>N</i> = 2631	
		Count	Percent	Count	Percent
Gender	Male	1351	49.58	1355	51.5
	Female	1374	50.42	1276	48.5
Grade	9 th	720	26.42	751	28.54
	10 th	811	29.76	704	26.76
	11 th	588	21.58	613	23.3
	12 th	606	22.24	563	21.4
Age	14	139	5.1	118	4.48
	15	535	20	551	20.94
	16	722	26.5	695	26.42
	17	817	29.98	704	26.76
	18	430	15.78	502	19.08
	19	70	2.57	48	1.82
	20	2	0.07	12	0.46
	21	0		1	0.04
Spec. Ed	No	2435	89.36	2354	89.47
	Yes	290	10.64	277	10.53
SES	Paid	1329	49.55	1063	40.74
	Free	1083	40.38	1259	48.26
	Reduced	270	10.07	287	11
	Unknown	43		22	

Subjects were selected from the total student population in the school. The criterion used to select the subjects was that the student had to be enrolled in the school for both years that are being considered: the year of implementation and the prior school year. There were no restrictions regarding the grade level or repetition of the math class, or any other class. The

subject may have been classified in the same grade level both years, due to not obtaining enough credits to move up to the next classification. A subject in this situation did not automatically repeat math class, but may have repeated the math class in the subsequent year. It is possible that a subject moved up to the next classification but failed the math class and subsequently repeated the math class and state test. An additional criterion for the subjects on Research Question 1, Research Question 2, and Research Question 3 was that the student needed to have taken the state math (TAKS) test both years; there was no criteria for which state math (TAKS) test was taken. This subject group is referred to as Subject Group 1. Subjects for Research Question 4 just needed to meet the criteria of having been enrolled in the school for both years that are being considered: the year of implementation and the prior school year. This group of subjects is referred to as Subject Group 2. Participation in the state math test was not a requirement for this group since the focus of this research question was the dynamics of the magnitude of tardiness before and after the implemented change in the enforcement of the tardy policy. Demographics for each student group can be located in Chapter 4.

There are numerous electronic data systems available on the market for public schools that allows data to be stored in a web-based information system. The web-based student information system used by this district is Skyward. This system integrates demographics, attendance, grading, scheduling, and discipline. An additional system was developed to assist with enforcing the existing tardy policy when administrators noticed that the number of students in the hallways after the tardy bell seemed to exceed the reported occurrences of tardiness. The additional program collected the date and time of each occurrence of tardiness, total occurrences of tardiness across all classes, and the consequences that were assigned for violating the school district tardy policy. The tardy policy provided a consequence of an office referral after the third

occurrence of tardiness. Prior to the implementation of the additional program, each teacher entered the attendance information for their class and was responsible for reporting any student that was in violation of the tardy policy to the campus administrator. The data reported by the teacher applied only to occurrences of tardiness for that class, while the new system of tracking tardiness considered occurrences of tardiness across all classes, on a cumulative basis. With the implementation of the new tardy enforcement program, each tardy student reported to the attendance office, where the tardy occurrence was entered into the electronic data system for tracking. Each administrator was then responsible for tracking the tardiness patterns for an assigned portion of the student population. The consequence for violating the tardy policy remained the same, with an office referral after the third occurrence of tardiness; however the occurrences became cumulative, across all classes.

Initially, in the school year of 2008-09, the new system was implemented on just one floor of the building for a three day period for a trial run. The following week it took effect for the entire building. Teachers were instructed that they were no longer to admit students after the tardy bell rang. They were to shut and lock the door when the tardy bell rang and to post a sign on the door that read, "The tardy bell has rung and you are late. Please report to the office to get a tardy pass so you can be admitted to this class." The archived data used in this study was from the year of implementation and the year prior to the implementation. The new system was initiated in the fall of the 2009-10 school year, but it not done at the beginning of that year, therefore the 'year of implementation' is less than a full school year.

Instrumentation

The state assessment, Texas Assessment of Knowledge and Skills (TAKS), was used to measure student achievement. The state began using the TAKS in 2003 and will continue to be used as the exit level assessment tool for students through the 2015 cohort. While the TAKS instrument is administered in the areas of math, reading, writing, science, and social studies, this study focused exclusively on the results of the TAKS math assessment. The area of math was chosen because of the direct instruction associated with the subject material being assessed. The TAKS version of the state assessment was chosen as the measurement instrument over the newer state assessment instrument, the State of Texas Assessments of Academic Readiness (STAAR), because the STAAR has been administered for only two school years.

Participation in the state assessment instrument is required of each student enrolled in any Texas public school until the exit level exam is passed. The results are used for accountability purposes, as required by the state and by NCLB, to determine adequate yearly progress (AYP). Each student receives a score that indicates if the student "met expectations" or "did not meet expectations", which can be translated to a pass or fail result. While each student is required to participate in the state assessment, not all students are required to take the same level of assessment. A different version of the state test may be considered for students who receive special education services and who meet the necessary participation requirements of one of the other versions. This study looked exclusively at the results of the TAKS test, not the other levels of TAKS-Modified or TAKS-Alternate; all students within the sample population took the TAKS version of the test. It should be noted that the exclusion of the other versions of the state test does not exclude students from the sample population who have been identified to receive services from special education. Therefore, if a student within the sample population had been

identified as receiving special education services, the student took the TAKS version of the state test, not an alternate version. There were two subject groups for this study. To be considered for this study, the student had to be in attendance for both the 2008-09 and the 2009-10 school years. Additionally, students in Subject Group 1 had to have taken the TAKS version of the state test both years. The data for any student that did not meet those specifications was not considered.

Data Collection Procedures

I submitted a request to the school district personnel to use the data necessary for this study, after its approval by the UNT Institutional Review Board. The process assured the anonymity of the district, the school, the staff, and the students. Student confidentiality was maintained by the use of an identifying number assigned to each student. Demographic information, attendance data, and test results were obtained through the archived data within the district's electronic data system. The data was sent electronically to me and then stored electronically without student identifiers.

Data Analysis Procedures

Statistics are quantitative methods of describing, analyzing, and drawing inferences from data. An important part of any research is determining the correct statistical technique. Multiple methods of data analysis are available for researchers. These include statistical tests that can be used to examine the underlying relationships between variables, either the explicit relationships between variables or the differences between groups. A variable can be defined as any characteristic that is measured in a dataset: any factor that is under investigation. Variables can be categorical in nature or quantitative/numerical. The variables are classified as either

independent variables or dependent variables. The independent variables, or explanatory variables, are studied to determine how they explain, predict, or influence other variables, referred to as the dependent variables. Pallant (2007) explains that the researcher begins by looking at the research questions, considering which variables will be analyzed, and discerns the nature of the data. Next, it is crucial to check for any violations of the underlying assumptions of the statistical technique. If all assumptions are met, the researcher can begin with the data analysis; if there are any violations to the assumptions, the researcher must resolve to find the suitable statistical technique. Various statistical techniques were used in this study to explore relationships, detect the strength of relationships, detect the existence of change, and visually analyze data.

A Spearman's rank correlation coefficient analysis, or Spearman rho, was used for Research Question 1 to determine the relationship between tardiness and academic achievement, as measured by the results of the state math test. The Spearman rho looks at the nature and extent of the relationship between two variables. For this study, it was used to look at the correlation between two sets of data: the tardiness of the student, the independent variable, and the students' scored results on the state math test, the dependent variable. Measurements of skewness and kurtosis were used to check for normality in the distribution of the data. When data is more normally distributed, there is a less likely chance for distortions or biases to occur in the data. Values of zero for both kurtosis and skewness would indicate a normal distribution. Kurtosis indicates the peakness or flatness of the distribution in comparison to the normal curve, while skewness indicates the degree of symmetry around the means for the data distribution (Hinkle, Wiersma, & Jurs, 2003). Skewness measures a lack of symmetry in a distribution; indicating lopsidedness (Salkind, 2011). A negative value indicates that the distribution is

negatively skewed. The kurtosis values for both the dependent and independent variables for this study were high. Therefore, nonparametric tests were needed to analyze the data, because these tests are not affected by non-normal and heterogeneity of variance (Hinkle et al., 2003). A Pearson product-moment would have been used if the data had a normal distribution; however conditions of normality were not met. A second assumption is that a monotonic relationship exists between the variables. When a monotonic relationship exists, one of two conditions exists: either as the value of one variable increases, so does the value of the other variable or as the value of one variable increases the other variable value decreases (Laerd Statistics, 2014). After the tests for normality were completed, the statistical method was employed. The analysis was conducted using Minitab 17 statistical software.

Discriminant analysis can be used for prediction or description. For the purpose of this study, descriptive discriminant analysis (DDA), referred to as discriminant analysis, was used. Discriminant analysis, as defined by StatSoft (2013), is used to classify variables into categories, using two or more mutually exclusive groups of cases. Discriminant analysis is used when it is known which group the case belongs to, such as students that passed the state test or students that failed the state test. These two groups are well defined, mutually exclusive, and defined prior to the analysis of the data. The focus of this analysis is on revealing major differences among the groups (Stevens, 2002) and uses discriminant functions to “give a direct indication of which variables are most closely aligned with the unobserved trait that the discriminant function represents” (p. 289). Group differences tend to be emphasized and group similarities deemphasized with descriptive discriminant analysis (Sherry, 2006), and use of DDA minimizes the likelihood of Type 1 error by using one statistical procedure to establish exactly where groups differ on given variables.

It is important to begin by looking at the homogeneity of variance/covariance to assess the multivariate normality and equality of correlations and variances found across the groups. This is important because, when they are equal, any differences found in the discriminant analysis can be attributed to nature of the variables under study rather than to pre-existing differences between the two groups. Box's *M* test of normality and homogeneity of variance/covariance is used for this determination. The desired result would be no statistical difference in the Box's *M* test; in this study, there was a finding of statistical significance in Box's *M*. Sherry (2006) states that "Box's *M* is considered an overly sensitive test" (p. 669), but DDA is robust to violations of this assumption when the sample size is relatively equal or large for both groups (Tabachnick & Fidell, 2007). Therefore, based on those considerations, it was determined that DDA could be used for Research Question 2, to formulate the relationship between the dependent variable group (pass or fail) and the set of quantitative independent variables (tardiness, age, excused absences, unexcused absences, semester 1 exam grade, semester 1 grade, semester 2 exam grade, semester 2 grade).

Next an evaluation of the statistical significance of the discriminant functions was performed. The number of functions is equal to the number of groups – 1, so for this study there is one function. An evaluation cannot be completed on that function if it is found to be non-significant. The Wilks' lambda statistic can range from 1 to 0; 1 indicates that all group means are the same while a zero indicates that they are different. A smaller lambda value indicates better variable differentiation between groups. The lambda value for this study indicated that there was a statistical significance found and therefore the results could be interpreted. The effect size reveals an estimate of the magnitude of the relationship between the variables and is

calculated by $1 - \text{Wilks' lambda}$. The effect size indicates how much contribution to group separation the variables provide.

The eigenvalues are then calculated to reveal the ratio of between-groups to within-groups. A good function has a large variance between groups but very little variance within groups, which is reflected by a large eigenvalue. A canonical correlation is generated with the canonical discriminant functions. Values close to 1 mean that most of the observed variance in the degree of association between the discriminant score and the group's discriminant score is explained by differences between the groups.

The discriminant analysis identifies the contribution of each independent variable to the proportion in each group (pass/fail). A simultaneous comparison of all the independent variables provides insight as to how much each variable contributes to the overall model, when adjusting for the other variables. Sherry (2006), states that the researcher evaluates three things to determine where the differences exist: structure coefficients, the standardized function coefficients, and the centroids. The structure coefficient tells how closely each variable is related to the discriminant function, while ignoring the other variables. The standardized function coefficients compare the relative value of a variable, with the other variables taken into account. These coefficients tell the nature of the linear equation that creates the discriminant function. The final calculation in this analysis is the group centroid. This calculation gives the mean of the discriminant scores that resulted from linearly combining the observed dependent variables. Distances between the group centroids shows the extent to which the dependent variable differentiated. Cases with scores near the centroid are predicted as belonging to that group. This can be used to determine group participation of future cases. The SPSS statistical software, version 21, was used to complete this analysis.

A graphical/visual analysis was used for Research Question 3. The visual representation illustrated what level of frequency occurred for tardiness to have an impact on academic achievement, as measured by the results of the state math test. The chart compared the occurrences of tardiness of students that passed the state math to the occurrences of tardiness of students that failed the state math. The data was presented in two charts; one showed the actual number of students that passed or failed per tardiness occurrence total, while the second chart represented the pass/fail as percentages. The data from the second chart, using percentages, was then depicted on a graph, allowing obvious detection of the correlation between occurrences of tardiness and the results on the state math test.

The Wilcoxon signed rank test was the statistical analysis used for Research Question 4. This question considered the effect a change to the method of enforcing the tardy policy had on the magnitude of tardiness, with the use of an electronic data system. The Wilcoxon signed rank test was designed to use with repeated measures, where subjects are measured on two occasions or under two conditions (Pallant, 2007). It compares the magnitude and the direction of the differences between two groups (Salkind, 2011). The Wilcoxon signed rank test is similar to a paired samples t-test, but the assumption of normally-distributed data is not required; it only assumes the data to be ordinal (Hinkle et al., 2003). This non-parametric test operates in a manner similar to the way most people think. Most often the answer sought is whether the outcome was better or worse; was there an improvement when a particular intervention was implemented. There is a fundamental concern for having evidence to make decisions about what programs and practices work (Schneider, Carnoy, Kilpatrick, Schmidt, & Shavelson, 2007). This analysis provided assistance in understanding if the new method of tardy enforcement made a difference, as evidenced by lower tardiness numbers. The tardiness count of the student body

was the dependent variable. The independent variables were the old method of enforcing the tardy policy and the new method implemented with an electronic data system. This analysis was executed using the SPSS statistical software, version 21.

Summary

This chapter has reviewed the purpose of educational research in the study of a phenomenon. The instrumentation, data collection procedures, and data analysis procedures proposed to answer the designated research questions are detailed. Details are provided about the analysis of quantitative data used to help explain the impact of tardiness on academic achievement, as measured by the state test in math; the strength of the relationship between tardiness and the results on the state math test as compared to the strength of the relationship of other factors; what level of frequency of tardiness may have an impact on academic achievement; and what changes occurred in the school's rate of tardiness when the campus administrator implemented a change in the enforcement of the tardy policy. The school population was described. As explained within this chapter, subjects for the study include students that were in attendance at the school for both the 2008-09 and 2009-10 school years. The requirement of having taken the state math test both years was needed for all questions except Question 4. Various statistical methods were employed, with the use of two statistical software products, to answer the research questions proposed for this study.

CHAPTER 4

RESULTS

Introduction

The purpose of this study is to see how minutes matter by looking at the relationship between tardiness and academic attainment, as measured by results on the state math exam. A secondary purpose of this study was to determine if the campus administrator, as the instructional leader, can execute a change to improve punctuality, with a successive increase in the academic learning time. This chapter reviews the results of the statistical analysis conducted for the corresponding research questions designed for this study. The results are presented in the form of charts and/or diagrams along with narrative descriptions. The statistical analyses presented were performed using Minitab 17 statistical software for Research Question 1. The SPSS statistical software, version 21, was used for Research Question 2 and 4. For Research Question 3, no statistical analysis was employed.

Data Analysis

Research Question 1

What is the relationship between tardiness and academic achievement, as measured by the results of the state math test?

A non-parametric statistical measure, the Spearman rank order or Spearman rho, was used for Research Question 1, to determine the relationship between the occurrences of tardiness and the score results on the state math test. Archived data were obtained from the 2009-10 school year for the state math test scores of students that had attended the school and taken a state math test in both the 2008-09 and 2009-10 school years. This subject group is referred to as Subject Group 1. The statistical procedure was conducted using the Minitab 17 software. The

demographic statistics for the subjects group 1, using archived data from the 2009-10 school year, are documented in Table 2.

Table 2

Demographics for Subject Group 1

<i>N</i> = 919		Count	Percent
Gender	Male	461	50.16
	Female	458	49.54
Grade	9 th	40	4.35
	10 th	424	46.14
	11 th	455	49.51
Age	15	97	10.55
	16	398	43.31
	17	373	40.59
	18	51	5.55
Race	Am Ind/Al Nat	4	0.44
	As/Pac Islnd	85	9.25
	Black	48	5.22
	Hispanic	373	40.59
	White	409	44.50
SES	Paid	464	50.49
	Free	353	38.41
	Reduced	102	11.10

The descriptive statistics for the dependent and independent variables are presented in Table 3. Normality within the data distribution is an assumption of many statistical analyses. A determination of normal distribution can be made by the measurements of skewness and kurtosis; values of zero for both kurtosis and skewness indicate a normal distribution. Skewness measures the lack of symmetry in a distribution; indicating a lopsidedness (Salkind, 2011). A

negative value for skewness, as found for the dependent variable of math TAKs scores, reveals that the distribution is negatively skewed. The kurtosis expresses how flat or peaked a distribution appears, as compared to a normal distribution depicted in the bell curve (Salkind, 2011). The kurtosis values for both the dependent and the independent variable are high. These results supported the need to use a nonparametric test to analyze the data for this research question.

Table 3

Descriptive Statistics for Math TAKS Scores and Tardiness Occurrences

Variables	<i>n</i>	Mean	<i>SD</i>	Skewness	Kurtosis
Math TAKS Scores - Dep. Variable	919	2187.0	187.7	-0.97	5.96
Tardiness Occurrences - Indep. Variable	919	1.457	2.162	2.38	7.45

The non-parametric Spearman rank order (ρ) correlation was used to examine the potential relationship between the occurrences of tardiness and the results on the state math test, or Math TAKS scores. The Spearman ρ correlation coefficient was statistically significantly ($r_s = -0.379, p = 0.00$). A correlation coefficient value of 1 (either positive or negative) would reflect a perfect relationship, while a value of zero would indicate no relationship. The correlation coefficient ($r_s = -0.379$) would be considered a moderate relationship between TAKS score and tardiness occurrences. The negative value reflects an inverse correlation between the variables, while one is going up (tardiness) the other is going down (test scores).

Research Question 2

When compared with other independent variables (Age, Excused absences, Unexcused absences, Semester 1 exam grade, Semester 1 grade, Semester 2 exam grade, Semester 2 grade), how well does tardiness predict the academic success of a student, as measured by the state math test?

A descriptive discriminant analysis was used to formulate the relationship between the dependent variable group (pass or fail) and the set of quantitative independent variables contributing to the discrimination of each group. The use of the discriminant analysis allowed me to identify the contribution of each independent variable to the proportion in each group (pass or fail). I conducted a simultaneous comparison of all the independent variables, which provided insight as to how much each variable contributed to the overall model, when adjusting for the other independent variables. The subjects are the same as those described for Research Question 1, located in Table 2.

It was important to begin by looking at the homogeneity of variance/covariance to assess the multivariate normality and the equality of correlation and variances found across the groups. This is important because, when they are equal, any differences found in the discriminant analysis can be attributed to the variables under study rather than the two groups being very different from the onset. The Box's *M* test of normality and homogeneity of variance/covariance is used for this determination. The desired result would be no statistical difference in the Box's *M* test, to assure equal variance across the groups; in this study, there was a finding of statistical significance in Box's *M*, as seen in Table 4. "Box's *M* is considered an overly sensitive test of non-normality" (Sherry, 2006, p. 669). The descriptive discriminant analysis is robust to violations of this assumption when the sample size is relatively equal or large for both groups (Tabachnick & Fidell, 2007). Therefore, based on those considerations, it was determined to continue with the analysis.

Table 4

Results of the Box's M Test of Homogeneity of Variance/Covariance Matrices

Type	Value
Box's M	594.647
F Approx.	16.270
df1	36
df2	513323.619
Sig.	.000

Next an evaluation of the statistical significance of the discriminant functions was performed. The number of functions is equal to the number of groups - 1, so for this study there is one function. An evaluation cannot be completed on that function if it is found to be non-significant. The Wilks' lambda statistic can range from 1 to 0; 1 indicates that all group means are the same while a zero indicates that they are different. A smaller lambda value indicates better variable differentiation between groups. The lambda value for this study is rather large, as seen in Table 5, indicating a smaller variable differentiation between the groups, however there was a statistical significance found and therefore the results can be interpreted. The effect size reveals an estimate of the magnitude of the relationship between the variables and is calculated by $1 - \text{Wilks' lambda}$, or $1 - .790$. This yields an effect size of .21, indicating that the variables provide limited contribution to group separation. It should be considered that other factors exist that may better explain the group separation. These factors can include parameters outside the control of the school, such as IQ, SES, etc.

Table 5

Tests of Statistical Significance of Each Function Using Wilks' Lambda Statistic

Test of Function	Wilks' Lambda	Chi-Square	df	Sig.
1	.790	189.300	8	.000

The eigenvalues are then calculated to reveal the ratio of between-groups to within-groups. A good function has a large variance between groups but very little variance within groups, which is reflected by a large eigenvalue. The eigenvalue for this study was .265, which would be considered small. A canonical correlation is generated with the canonical discriminant functions. Values close to 1 mean that most of the observed variance in the degree of association between the discriminant score and the group's discriminant score is explained by differences between the groups. The canonical correlation generated in this analysis was .456, which is a medium value.

The structure coefficients, standardized function coefficients, and centroids were evaluated to identify where differences exist. The structure coefficient tells how closely each variable is related to the discriminant function, while ignoring other variables. As shown in Table 6, the independent variables are listed in descending order, with the strongest correlation found in Semester 2 Grade (S2), followed by Semester 2 Exam Grade (SE2), Semester 1 Grade (S1), Unexcused Absences (Unex), Semester 1 Exam Grade (SE1), Tardiness (Tard), Excused Absences (Exc), and finally Age (Age) with the weakest correlation. The variance accounted for is calculated by squaring the variables' value, therefore tardiness only accounts for 25.20% of the variance of scores on this function.

Table 6

Structure Matrix Table for Structure Coefficients

	S2	SE2	S1	Unex	SE1	Tard	Exc	Age
Function1	.914	.815	.786	-.628	.610	-.502	-.229	-.003

The standardized function coefficients compare the relative contribution of a variable, with other variables taken into consideration; these are shown in Table 7. These coefficients tell the nature of the linear equation that creates the discriminant function. It is important to consider the structure coefficients with the standardized function coefficients. A variable with a low (zero) structure coefficient and a large standardized coefficient is referred to as a suppressor variable.

Table 7

Standardized Canonical Discriminant Function Coefficients

	S2	Unex	SE2	SE1	Age	Tard	Exc	S1
Function1	.424	-.298	.297	.194	.143	-.082	-.040	.016

The final calculation in this analysis is the group centroid. This calculation gives the mean of the discriminant scores that resulted from linearly combining the observed dependent variables. Distances between the group centroids shows the extent to which the dependent variable differentiated. Cases with scores near the centroid are predicted as belonging to that group. This can be used to determine group participation of future cases.

Research Question 3

At what level of frequency does tardiness relate to academic achievement, as measured by results on the state math test?

A visual inspection of the data was conducted for Research Question 3, to compare the pass/fail rate of the state math test with the occurrences of tardiness. Table 8 presents the number of students that passed the state math test and the number that failed the state math test for each recorded occurrence of tardiness. Table 9 presents the data for students passing or failing in the form of percentages aligned to the recorded tardy frequency. A closer inspection of these charts reveals that 85% of the subjects who did not have any record of tardiness passed the state math test. At the other end of the spectrum, the group of students with nine or more occurrences of tardiness had an 81% failure rate. The point of intersection appears to be at seven to eight occurrences of tardiness, with an average of a 50% failure rate for that group of students. The failure rate doubles with just one tardy: 15% with zero occurrences of tardiness and 33% with just one tardy.

Table 8

Comparison of Pass/Fail Frequency to Occurrences of Tardiness

# of Tardies	0	1	2	3	4	5	6	7	8	9	10	11	12	17
# Passed TAKS	358	141	69	37	20	18	19	5	3	1	1	0	1	0
# Failed TAKS	61	70	35	28	16	7	8	4	4	2	3	5	2	1
Total N= 919	419	211	104	65	36	25	27	9	7	3	4	5	3	1

Table 9

Comparison of Pass/Fail Percentage Rate to Occurrences of Tardiness

# of Tardies	0	1	2	3	4	5	6	7	8	9	10	11	12	17
% Passed TAKS	85	67	66	57	56	72	70	55	43	33	25	0	33	0
% Failed TAKS	15	33	34	43	44	28	30	45	57	67	75	100	67	100

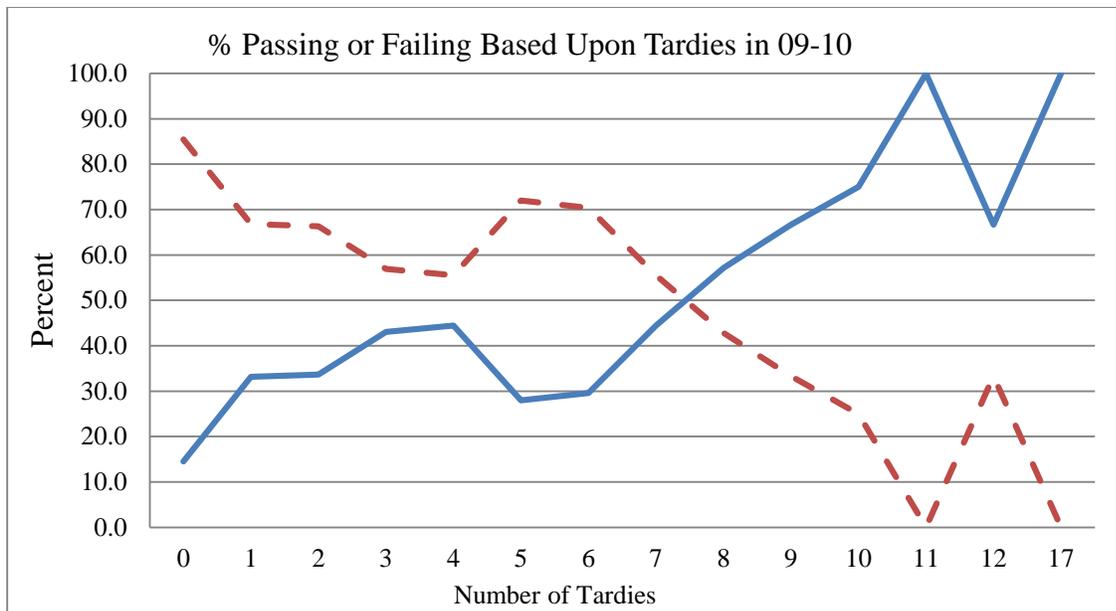


Figure 1. Pass/fail rate by percentage to occurrences of tardiness.

Figure 1 is a graphical representation of the data presented in the chart in Table 9. The dotted line represents the students that passed the state math test. While the line isn't perfectly straight, it does reflect the decline in the percentage of students that passed the state math test as occurrences of tardiness increased. Conversely, the solid line represents the students that failed the state math test; it clearly illustrates the pattern of increased failures on the state math test as occurrences of tardiness increased.

Research Question 4

What effect does a change to the method of enforcing the tardy policy by using an electronic data system have on the magnitude of tardiness?

The Wilcoxon signed rank test, a non-parametric measure, was the statistical method completed for this question, to compare the magnitude, or occurrences, of tardiness before and after the implementation of the change to the method of enforcing the tardy policy. The analysis

compared one group of subjects on two different occasions. The data for this question was obtained from archived data for students who were enrolled in the school for both the year prior to the implementation of the new method of enforcing the tardy policy (2008-09) and the year of the implementation (2009-10). The descriptive statistics listed in Table 10 reflect the student's age at the beginning of the 2008-09 school year; age is not listed for the 2009-10 school year, given the understanding that each student is one year older the following year. The sex and race category remain constant for both years. The grade levels of the subjects are provided for both the 2008-09 and the 2009-10 school years. Unlike the age of the student, the grade level of each student does not always increase. The student is required to obtain a set number of credits to be classified in a particular grade level; if the credits are not obtained, the student's grade classification does not change until the credit requirements are satisfied. An example of this can be seen in the table for grade 9: there were 497 in 2008-09 and 47 of those students were still classified as a 9th grader in 2009-10. This group of subjects is defined as Subject Group 2. Participation in the state math test was not a requirement for this group since the focus of the research question was the dynamics of the magnitude of tardiness before and after the implemented change in the enforcement of the tardy policy.

The results of the analysis completed using the Wilcoxon signed-rank test revealed that of the 1,310 subjects, 830 had fewer occurrences of tardiness with the new method of enforcing the tardy policy, 127 had an increase in the occurrence of tardiness, and 353 remained constant in the occurrences of tardiness. The results determined a median decrease in the occurrences of tardiness with the implementation of the new method of enforcing the tardy policy, when compared to the occurrences of tardiness prior to the implementation. The Wilcoxon signed-rank test revealed a statistically significant reduction in the occurrences of tardiness with the

implementation of the new method of enforcing the tardy policy, ($z = -22.67$, $p .000$).

According to Cohen (1988), correlation coefficients of .30 are considered to be of medium size and those of .50 are considered large. The effect size for this test was - 0.44, is above the medium range, falling closer to the range considered to be large. It is important to note that this study compared the occurrences of tardiness in the 2008-09 school year to those in the 2009-10 school year, with the 2009-10 school year serving as the year of implementation of the new method of enforcing the tardy policy. The new method was not fully implemented until October of 2009. It was not possible to separate the data for that period of time prior to the implementation of the new method of enforcing the tardy policy. Consequently, the data for the comparison of the time period of the old method of enforcing the tardy policy covers a larger period of time than the period of time for the new method of enforcing the tardy policy and some of the data for the implementation period is from the before implementation phase (August till October). In spite of this fact, there was an evidence of a positive effect of the implementation of the new method of enforcing the tardy policy on reducing tardiness behaviors. A review of archived records further revealed that the tardiness rate for the 1st period class reduced from the 2009-10 school year by 77% in the 2010-11 school year, further indicating the benefit of the new tardy enforcement policy.

Table 10

Demographics for Subject Group2

<i>N</i> = 1310		Count	Percent
Gender	Male	645	49.24
	Female	665	50.76
Grade 2008-09	9 th	497	37.94
	10 th	524	40.00
	11 th	288	21.98
	12 th	1	0.08
2009-10	9 th	497	37.94
	10 th	524	40.00
	11 th	288	21.98
	12 th	1	0.08
Age	14	113	8.63
	15	425	32.44
	16	482	36.79
	17	275	20.99
	18	12	0.92
	19	3	0.23
Race	Am Ind/Al Nat	5	0.38
	As/Pac Islnd	122	9.31
	Black	89	6.79
	Hispanic	578	44.12
	White	516	39.39

Summary of Results

This chapter reviewed the results of the various statistical analyses conducted for the research questions of this study. The Spearman rho, a non-parametric technique, was utilized to

determine the relationship between tardiness and academic achievement, as measured by the results on the state math test. The results indicated a moderate inverse relationship between the occurrences of tardiness and the score results on the state math test. A descriptive discriminant analysis was conducted to investigate how tardiness, when compared with other independent variables (age, excused absences, unexcused absences, semester 1 exam grade, semester 1 grade, semester 2 exam grade, semester 2 grade) contributed to the academic success of a student, as measured by the state math test. When considered alone, tardiness contributed to 25% of the variance in the results (pass/fail) of the state math test. Its contribution to the variance was even smaller when considered with the other variables. The results imply that other factors not considered in this study may better explain the group separation (pass/fail). A visual review of the data, presented in the form of charts and a graph, was used to investigate at what level of frequency occurs for tardiness to have an impact on academic achievement, as measured by the results of the state math test. Based on the review, the pass/fail ratio is 50% with seven to eight occurrences of tardiness. The review clearly portrayed an inverse relationship between the occurrences of tardiness and the results on the state math test; as the occurrences of tardiness increased, the passing rate of the state math test decreased. The Wilcoxon signed rank test, a non-parametric statistical analysis, was completed to examine the magnitude of tardiness prior to the implementation of a new method of enforcing the tardy policy to the magnitude of tardiness with the implementation of the new method of enforcing the tardy policy, using an electronic data system. In spite of the fact that there was an overlap in the before and after implementation periods, with fewer months in the after implementation period, the results revealed a reduction in the magnitude of tardiness with the new method of enforcing the tardy policy. The effect size of .44 is very close to what is considered to be a large effect size (.50). An additional review of

archived data for the subsequent year found a 77% reduction of tardiness occurrences for the first period. The results of these analyses suggest that tardiness is a factor in student success and should be given greater consideration as an area that can be addressed by administrators to promote greater student achievement.

CHAPTER 5

DISCUSSION, CONCLUSIONS, RECOMMENDATIONS

Introduction and Findings

The purpose of this study was to answer the question: do minutes matter? The study was designed to examine the significance of tardiness, as it relates to student achievement, as measured by the results of the state math test. Additionally, this study was constructed to investigate whether the campus administrator, as the instructional leader, generated a change to improve punctuality, with a successive increase in academic learning time. Research questions were developed, the appropriate statistical methods were determined, and finally analyses were completed with archived data, using Minitab 17 and SPSS software, and visual/graphical representation.

Research Question 1: What is the relationship between tardiness and academic achievement, as measured by the results of the state math test?

Research Question 2: When compared with other independent variables (age, excused absences, unexcused absences, Semester 1 exam grade, Semester 1 grade, Semester 2 exam grade, Semester 2 grade), how well does tardiness predict the academic success of a student, as measured by the state math test?

Research Question 3: At what level of frequency does tardiness relate to academic achievement, as measured by results on the state math test?

Research Question 4: What effect does a change to the method of enforcing the tardy policy by using an electronic data system have on the magnitude of tardiness?

For Research Question 1, a non-parametric statistical measure, the Spearman rho, was utilized to determine the relationship between tardiness and academic achievement, as measured by the score results on the state math test. The analysis produced a correlation coefficient ($r_s = -0.379$). This finding is considered as a moderate relationship with an inverse correlation.

For Research Question 2, a descriptive discriminant analysis was used to formulate the relationship between the dependent variable group (pass or fail) and a set of quantitative independent variables, including tardiness. This statistical method identified the contribution of the independent variables to the discrimination of the group (pass or fail). Tardiness accounted for 25.20% of the variance of results (pass/fail) on the state math test, when considered alone. The contribution of tardiness to the variance (pass/fail) was even smaller when considered along with the other independent variables. The magnitude of relationship between the variables was reflected in the effect size of .21, indicating that the variables provided little contribution to group separation. Therefore, it should be considered that other factors exist that may better explain the group separation, including factors outside the control of the school.

For Research Question 3, I utilized a visual inspection of the data to scrutinize the pass/fail rate of the state math test by the occurrences of tardiness. The inspection of the data revealed that 85% of the subjects without any record of tardiness passed the state math test, while subjects with nine or more occurrences of tardiness had an 81% failure rate. The failure rate more than doubled from 15% with no occurrences of tardiness to 33% with just one occurrence of tardiness. The pass/fail rate was 50% with seven to eight occurrences of tardiness. The graphical representation of the data clearly illustrated the pattern of increased failures on the state math test as occurrences of tardiness increased.

The Wilcoxon signed rank test, a non-parametric measure, was the statistical technique completed to inspect the magnitude, or occurrences, of tardiness before and after the implementation of the change to the method of enforcing the tardy policy. The results of this analysis for Research Question 4 confirmed a statistically significant reduction in the occurrences of tardiness with the implementation of the new method of enforcing the tardy

policy ($z = -22.67$, $p .000$). The effect size for this test was -0.44 , which is above the medium range, falling closer to the range considered to be large. A further review of archived records revealed that the tardiness rate for the 1st period class reduced by 77% the following year. These results reveal that the administrators of this school identified a problem area and took action that produced a positive change. This is what is expected in the current era of accountability. The campus has continued the use of the electronic method of enforcing the tardy policy and additional schools have implemented the system, both within and outside of the district.

Discussion

Multiple sources of literature located during the review of research for this study that considered the impact of attendance on academic achievement (Lamdin, 1996; Chang & Romero, 2008; Chang & Leong, 2012; Buehler et al., 2012), however no studies were found that specifically considered the impact of tardiness on academic achievement. Attendance has an impact on achievement; good attendance has a positive impact while poor attendance has a negative impact (Arulampalan et al., 2008; Marburger, 2006; Roby, 2004) and the positive impact may be even greater than historically thought (Johnston, 2000). Data collected in studies completed by the school districts in Minneapolis, MN and Rochester, NY, was used by Johnston (2000) to portray the significance of attendance. The study in Minneapolis revealed that students with attendance rates of 95% were twice as likely to pass the state language arts test as those with an 85% attendance rate. Rochester's data indicated that students scoring 85 - 100 on the state English test had attendance rates of 93% or higher, while students with an 85% attendance rate scored below the 54th percentile. A review of the data from this study, presented visually, illustrated that 85% of the subjects who did not have any record of tardiness passed the state

math test. At the other end of the spectrum, the group of students with nine or more occurrences of tardiness had only a 19% passing rate.

Studies were located that examined the correlation of attendance and exam scores. Nichols (2003) conducted research to discover factors that could help determine which students were at risk of failing the Indiana state proficiency exam in mathematics and English language arts, concluding that a strong negative, inverse correlation existed between the state test results and average yearly absences. Roby's (2004) research on the correlation of student achievement, measured on the Ohio proficiency test and average school building attendance rates revealed moderate to strong relationships for each grade included in the study. The Spearman rho analysis completed for this study, indicated a moderate, inverse relationship between tardiness and academic achievement, as measured on the state math test. Using data that covered a five year period, Burd and Hodgson (2006) expanded on previous research, with results similar to the previous research that indicated a correlation between attendance and attainment, as measured by final exams. Chen and Lin (2008) also reviewed the relationship between class attendance and exam performance. Their research results supported previous research, showing diminished student performance on compulsory exams to be linked to interrupted attendance. Likewise, the graphical representation of the data for this study clearly illustrated the pattern of decreased passing rates on the state math test as occurrences of tardiness increased.

Protheroe (2005) declared that the administrator has to accept responsibility for identifying and addressing problem areas that inhibit an orderly school climate. This is important since the social-behavioral climate of the school has a direct impact on the academic effectiveness of the school (Gottfredson, 2001; Gottfredson et al., 2005; Horner et al., 2005; McIntosh et al., 2006; Walker & Shinn, 2002). Academic achievement is explicitly impacted by

school climate (Brand et al., 2003; MacNeil et al., 2009). Occurrences of tardiness are a part of the school climate. An alteration to a routine can address a perceived problem and potentially help the school realize improvement (Enomoto & Conley, 2007). The building administrators of the school for this study perceived tardiness as a problem and took action to implement a change to the routine of tracking tardiness, using an electronic data system. The results from the Wilcoxon signed rank test revealed an improvement to the tardiness rate, with a reduction in the occurrences of tardiness after the implementation of the new method of tracking tardiness.

Contributions to the Field and Future Research

This study contributes to the field of educational research by bringing attention to the impact of tardiness on academic achievement and the multiple issues associated with tardiness that can have further negative implications for student achievement. As noted in the literature review for this study, tardiness has been viewed as impeding teachers' ability to teach, is an obstacle to maximizing academic learning time, monopolizes the time of administrators with increased office discipline referrals, and is associated with other negative behaviors. I believe the data from this study shows that minutes do matter. This study illustrated that the administrator can take action to implement a change that has the potential to improve academic achievement.

Attendance data are reported to the state, but tardiness data are not currently monitored by state agencies. In spite of all these adverse impacts associated with tardiness, I don't believe the issue of tardiness rates high on many, if any, administrators lists of target areas for academic improvement. I feel that this is an area that should be further researched: do administrators believe that minutes matter to academic achievement and is this an area that the administrator

has considered addressing to realize improvement in student achievement? If it is being addressed, how is that being done? The impending statewide system for tracking educational data, to be implemented by the Texas Educational Agency, will provide tardiness data, along with other student information. Research could be conducted into how districts or schools plan to use these data to monitor tardiness and implement interventions when needed. While it was not a part of this study, another area that could be researched is the amount of time expended by various school staff members related to tardiness. This could include the time of the data clerk, the classroom teachers, administrators, and truancy officers. The study could consider both the actual time expended and the associated financial cost of the time. A consideration for future research would be the use of independent variables that have less chance of variation and more standardization. For example, in Research Question 2, semester exam grades and semester grades were used as independent variables. There might be significant variation between teachers for these variables, so a standardized measure, such as the Iowa Tests of Basic Skills test might be used as the measure for academics. The results from this study clearly illustrated an improvement to punctual attendance with a decrease in the occurrences of tardiness. Future research could investigate if there was an improvement in academic achievement for those students who had improved punctuality. Future research could also examine the attitudinal responses of the students, teachers, administrators, and attendance clerks to the new method of enforcing the tardy policy.

Implications for Practice

A basic implication for practice is the need for a system of setting a clear expectation of promptness. As demonstrated by the results in the study, students respond to the level of

expectation set at the campus. Schools with high expectations along with high levels of support often have the best attendance records (Virginia Department of Education, 2005). It begins with the building administrator setting a clear expectation of how tardiness will be addressed: clear expectations for both the students and the staff. At-risk students are those most likely to be chronically tardy (and absent); a pro-active attendance policy and strategies to address the issue will help close the achievement gap (California Department of Education, 2013).

Due to the relationship between attendance and achievement, high-quality attendance data are needed (National Forum on Educational Statistics, 2009). This research suggests improvements can be made to attendance data with the use of an electronic data system. Many school districts have already implemented these systems. The impact of the tardiness on academic achievement, as documented in this study, suggests the need to use the available data and monitor students' occurrences of tardiness more closely than it has been historically monitored. "High-quality data serves as the foundation for understanding where students are during the school day" and these data "provide the information needed for schools to formulate practices, programs, and policies to improve attendance rates" (National Forum on Educational Statistics, 2009, p. 33). A further implication is the need for some action on the part of school personnel to address the behavior when a pattern of tardiness is identified. The classroom teacher is the one with first-hand knowledge of a student's tardiness, but the building administrator should inspect the data and determine what patterns exist and which students need intervention.

Much attention is given to improving academic achievement and that is important. Equally important is the development of non-cognitive skills, such as being on time. These skills actually contribute to academic achievement (Wolfe & Johnson, 1995; Duckworth & Seligman,

2005). The curriculum of some schools include character development, which may include direct instruction in the basic behaviors, such as of being on time, but little evidence is available regarding how school policy approaches the development of non-cognitive skills (Deke & Haimson, 2006). These skills may be more malleable than cognitive skills, and as such, may be more responsive to instruction (Heckman et al., 2006). Heckman et al. (2006) also note that the early interventions, such as enriched childcare centers, improved non-cognitive skills. Given their contribution to academic achievement and perceived malleability, a greater focus on the non-cognitive skills seems an obvious implication for practice.

The common, reoccurring theme throughout the literature review can be summed up in one word: early. Attendance is important throughout the school career, but is critically important in the early years when basic academic skills are being developed. Based on the research reviewed, the attendance in the early years not only impacts acquisition of basic skills at that time, it has long term effects on further academic acquisition and attendance (Chang & Romero, 2008; Chang & Leong, 2012; Buehler et al., 2012). Tardiness is a concern, even in the early childhood years (Wiener, 2010). The students who have chronic tardiness in kindergarten are ten times more likely to be chronically absent in kindergarten and first grade, three times as likely to be chronically absent in grades three and five, and have weaker academic performance when compared to peers without tardiness (Romero, 2013). Tardiness is a form of truancy (Jones & Lovrich, 2011) and the prevention and combating of truancy is hampered because of a lack of early interventions (Reid, 2003). Truancy is documented as an early warning sign of potential delinquent activity, social isolation, and/or educational failure (Yeide & Korbin, 2009). Dropping out of school is the culmination of a process, leading up to that event, and is the end result of problems that originated earlier in life (Alexander et al., 2001). Duncan, U.S. Secretary

of Education, insists that as early as pre-k and K, it is known which students are most at risk and if intervention doesn't happen early, these students become our future dropouts (2011). The results of research conducted by Hickman et al., (2008) documented differences between high school graduates and dropouts as early as kindergarten. Because dropouts begin disengaging from school long before they actually leave, early intervention is critical to ensure graduation (Garriott, 2007). This process of disengagement begins early in the school career when students lack a feeling of belonging, lack participation, or don't experience academic success (Marks, 2000). Students with behavioral engagement demonstrate positive behaviors, such as following rules and the absence of negative behaviors, such as skipping class (Fredicks et al., 2004). A study of death row inmates disclosed that the truancy beginning early in the school career and a continued pattern of school failure were typical of this population (Schroeder, Guinn, Chaisson, & Houchins, 2004). An unequivocal implication for practice is obvious: early intervention is crucial.

The importance of education for children in the United States was actualized soon after the arrival of the Mayflower (Cremlin, 1970) and continues to be touted as important today, as chronicled in the No Child Left Behind Act. The data depicts a very different reality; 1/3 of children do not graduate with a regular diploma within four years of entering high school (Barton, 2004; Barton, 2005; Greene & Winters, 2002; Greene & Winters, 2005). There were 1.1 million 16 to 19 year olds and 2.4 million 20 to 25 year olds without a high school diploma and not enrolled in school in 2003 (U.S. Bureau of Labor Statistics). Thirty years ago, the typical time period for dropping out of school occurred between eleventh and twelfth grade, as pointed out by Barton (2005). Today, dropping out typically occurs between ninth and tenth grades; this is a younger population with even less education, which will increase the level of difficulty they

face in finding a job. Barton further noted that this trend toward dropping out of school earlier is occurring during a time of educational reform with a strong emphasis being placed on student achievement. In interviews of 467 high school dropouts, almost half of them confessed that they wished they had completed school and not dropped out (Bridgeland, DiIulio, & Morison, 2006). The implication for practice is strong: action must be taken to improve the graduation rate.

The overriding implication for practice is that action is necessary. This study investigated the action taken at one school to improve punctuality and decrease occurrences of tardiness. The data indicated an improvement, with declined occurrences of tardiness, but tardiness was not totally eliminated. While research substantiates the importance of teacher effectiveness on student academic success, even the best teacher cannot be effective unless the student is in class (National Forum on Educational Statistics, 2009). Further action can be taken to look at the students who continue to have a problem with tardiness and assess their needs individually. Of the 476 high school dropouts interviewed by Bridgeland et al. (2006), 70% reported that they would have been more likely to stay in school with increased supervision of their attendance. Truancy reduction can include systems change, school based programs, and/or court based programs, with some programs having elements from various programs. While the types of interventions, settings, approaches and strategies can vary, to make a difference, schools must “be comprehensive, flexible, responsive, and persevering...view children in the context of their families, deal with families as parts of neighborhoods and communities, have a long-term, preventive orientation... and encourage practitioners to build strong relationships based on mutual trust and respect.” (Schorr, as cited in Baker, Sigmon, and Nugent, 2001, p.7). Cushman’s (2005) *Fires in the Bathroom: Advice for Teachers from High School Students* shares personal thoughts of students who had a history of skipping class, or truancy. These students

expose feelings of loneliness - being a face in a crowd; compared skipping to an addiction that is hard to break; and were hurt by sarcastic comments made by teachers when they did return to class, such as "glad you could grace us with your presence." Policies or procedures that create barriers to on-time attendance should be reconsidered. Gonzalez, Richards, and Seely (2002) caution against actions that create further disengagement, such as suspension; lack of a personal approach, such as automated phone calls, which can be ignored or erased by students; or actions that are counterproductive, such as connecting grading or participation in elective activities to attendance. When barriers are replaced with supports, positive outcomes can be achieved. "When attention is paid to the conditions that can improve student achievement, completion rates will improve" (Barton, 2005, p. 19).

Summary

Cognitive and non-cognitive abilities are shaped early in life and the differences in the abilities can persist and grow; both abilities are crucial in life, stressed Heckman et al. (2006). Accountability for achievement and overall school success have never been greater than they are today (Wohlstetter et al., 2008). It is important to study connections as they relate to outcomes- academic achievement, problem behaviors, or dropping out of school (Johnson et al., 2001). The review of data should lead to action. The purpose of data inspection is to help navigate changes and monitor improvement efforts (Learning Point Associates, 2006). A specific and detailed approach is necessary to create a comprehensive plan to address attendance issues (Kearney, 2008). Interventions that take aim at the student, family, community, and the student's school are also needed (Baker et al., 2001).

Tardiness can be viewed like the indicator light on a car; when the light comes on, the driver most likely doesn't know what the problem is, but knows that there is a problem. Responsible driver do not wait until the engine blows up to take action; they take the car in for an inspection so that the problem can be repaired. Educators need to heed the warning light and know that minutes do matter.

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